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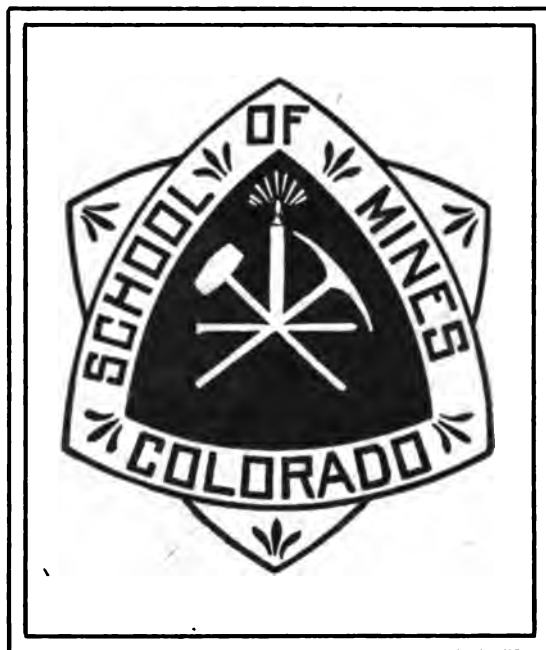




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# COLORADO SCHOOL OF MINES MAGAZINE

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# COLORADO SCHOOL OF MINES

## MAGAZINE

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No. 1

### Natural Laws and Flotation

Will H. Coghill, '03, Professor of Metallurgy, Oregon School of Mines, Corvallis, Ore.

Quite recently our attention was called to the lag between theory and practice in the chemical industry and the consequent use of poorly founded empirical formulae in many of its branches. Again, we recall, the long struggle of the cement industry without scientific aid; and G. H. Clevenger<sup>1</sup> reminds us of a striking example of the lag of science when he relates the early history of the Washoe process which was wont to employ a promiscuous collection of strong drugs and vegetable decoctions and every mill-hand had his secret process of working his silver ore.

As in the example just cited, the art of flotation has advanced far beyond the general knowledge of the natural laws upon which it is based. I will try to show the application of some of those laws that are not well known.

Why does rain fall in drops and not in long liquid threads? Or, to put a more pertinent question subject to the same answer to one who would unravel the mysteries of flotation, why does air pass through the Callow cell in bubbles and not in elongated cylinders with the cross section of the mesh of the carpet?

It is a common observation that a stream of water in air, or of air in water, breaks into spheres.

According to Lohfelds<sup>2</sup> a stream of water in descending (in the air) acquires more and more speed, and consequently becomes thinner and thinner as it descends; but, owing to its being stretched out in this way, the amount of surface for a given volume of liquid increases till it eventually breaks up into drops, so that by the rearrangement of shape the water may come to have less surface than if it remained in a stream.

Again, observe the threads of water emerging from a lawn sprinkler. Does cohesion hold the liquid molecules together as it does in sewing-thread, for example, or do these liquid cylinders break into drops? Of course, the latter happens, and it does so because of unstable equilibrium produced by surface tension. For, if at any

point the diameter is less than at a neighboring point by the least quantity imaginable we know that, since pressure varies inversely as the diameter, the water would be squeezed out of the restricted section by the liquid film. Likewise, if a certain section is a trifle large it will bulge into a sphere. In any case a great number of droplets will form. What is the size of these droplets?

It is a fact subject to mathematical demonstration that the lateral surface of a cylinder whose length is equal to the circumference is equal (approximately) to the surface of a sphere of the same volume. The

exact ratio is,  $\frac{S_s}{S_c} = 0.895$  where  $S_c$  is

the lateral surface of a cylinder whose length is equal to the circumference, and  $S_s$  is the surface of a sphere of the same volume. Further, it can be proved that if the cylinder has a length equal to 0.715 of its circumference its lateral surface will equal the surface of a sphere of the same volume.

A liquid cylinder, therefore, could not reduce its surface by breaking into lengths equal to or less than 0.715 of the circumference, but it would be in unstable equilibrium in lengths greater than this, and liquid spheres would be a natural consequence provided no forces oppose this rearrangement. The same applies to a cylinder of air in water. Thus we have rain drops, and bubbles in a Callow cell.

While the cylindrical shape may be maintained for several diameters when a stream of water issues from a nozzle, the cylinders of air moulded by the carpet in a Callow cell are so unstable that we are able only to observe the drops. The physics of these "drops" of air that break away from the carpet and rise through the pulp is analogous to that if the drops of water that form on, and break from, a glass dropping-tube. It is to be expected, then, that within certain limits the volume of the separate air bubbles varies as the mesh<sup>3</sup> of the carpet and as the surface tension of the liquid.

The importance of getting a carpet that

<sup>3</sup> Mesh is here taken to be analogous to the dropping-tube.

<sup>1</sup> Some Technical Applications of Capillary and Electro-capillary Chemistry by W. C. McC. Lewis, Met. and Chem. Eng., Sept. 1, 1916.

<sup>2</sup> Eng. and Min. Journal, Sept. 2, 1916.

<sup>3</sup> Textbook of Physics.

is just the right mesh is well known. Fully aware, then, that size of bubble may easily be altered, let us see how results might be affected. The assumption upon which this approximation is based is that the efficiency of the cell is directly proportional to the amount of sphere-surface present at any instant—taking, of course, the same amount of air in every case.

For the derivation of this variable we have two principles. First, for a given amount of air the total surface is proportional to the reciprocal of the diameters of the bubbles.<sup>5</sup> Second, the slip (velocity of bubble) varies as the  $3/2$  power of the diameter.<sup>6</sup>

All other things being equal, the quantity of air in the cell at any time varies as the reciprocal of (inversely as) the slip. Therefore, for a given quantity of air fed to the cell, the amount of sphere-surface at any time varies as the reciprocal of the diameter times the reciprocal of the  $3/2$  power of the diameter, i. e.,  $1/d \times 1/d^{3/2} = 1/d^{5/2}$  or inversely as the  $5/2$  power of the diameters.

This is on the assumption that the bubbles do not coalesce before they come to the surface to form a froth. Unfortunately, if the carpet is of an uneven mesh, the large bubbles will slip through the water faster than the small ones, and in the event of a collision may coalesce.

For illustration the following assumed case is presented in which there is a change in size of bubble due either to carpet or surface tension:

Assume that the change is from 10 to 12 mm diameter. Since the total sphere-surface in the cell at any instant varies inversely as the  $5/2$  power of the diameter we find that due to a 20% increase in diameter there is a 37% drop in collecting surface. Laboratory tests are necessary to find whether this is of more than academic interest. I offer it only as suggestive of a

<sup>5</sup> This is a well-known principle set forth in books on ore dressing where it is used to calculate the power required to crush rock. It is applied again by physical chemists who wish to determine the increase in surface with the subdivision of a given mass. To examine this numerically we start with a unit volume, one cubic centimeter, in the shape of a cube. The surface is six square centimeters. If we now subdivide the mass into cubes having an edge of one-tenth of the original dimension, viz., one mm, we obtain 1,000 cubes, each of which has a surface of six square mm, so that the aggregate surface of the subdivided mass is now 60 sq. cm. or ten times the original surface. It will easily be found, according to Emil Hatschek in "Colloids", that on further subdivision the aggregate surface grows in inverse ratio with the linear dimensions. The same principle applies to a subdivided sphere.

<sup>6</sup> As a large stone falls faster in water than a small one, so does a large bubble rise faster than one of lesser diameter. This principle is recognized by pump manufacturers so that now we have air-lift pumps with atomizing devices to reduce the size of bubbles to a minimum in order to make the velocity relative to that of the water as near zero as possible. It is stated in "Pumping by Compressed Air" by Ivens, p. 98, that slip varies as the square root of the volume of the bubble. This is equivalent to  $3/2$  power of the diameter.

loop-hole through which we can go for further knowledge.

Why does a large globule of mercury break into many droplets when poured onto a plane surface? Why is it possible for the impeller of the M-S machine to "beat the air into the pulp," making an emulsion of air in water?

Pour mercury onto a plane surface and note the great number of droplets that roll away as if they were repelled by electric charges. Do what you will and these droplets will not all coalesce to form one large globule. It is impossible to restore the union without confining them. What law offers the explanation? We can solve this question by applying the principle of Le Chatelier, which, in one form, says that, whenever we apply an external force to any system in equilibrium the system will if it can, alter in such a way as to diminish the effect of the applied force.<sup>7</sup> The external force applied to the mercury is gravity, which causes it to spread until its surface is so great that it can be diminished by the formation of droplets.<sup>8</sup> The air bubble in the M-S machine is flattened by the force of the blows of the impeller, and it breaks as soon as its surface is greater than that of smaller bubbles of the same volume.

The discontinuity of the liquid and gaseous cylinders, and of the mercury globule, must not be thought of as instantaneous, for it is known that it is not. This is shown by a photograph<sup>9</sup> of a liquid jet, Fig. 1. The little drops between the big ones are made from the narrow necks which form before the jet finally breaks. Another very beautiful illustration of this instability is that of a wet spider's web, shown in Fig. 2, when again the water gathers itself up into spherical beads. If the fluid is very viscous the effect of viscosity may counter-balance the instability due to surface tension; thus it is possible to get long thin threads of molten glass and quartz. Or, a substance may be so very "viscous" that there is no manifestation of surface tension until it is softened by heat; a leaf of metal<sup>10</sup> beaten out cold will, when raised to a certain temperature, commence to crumple and shrink. This is the result of the action of surface tension forces which diminish in intensity more slowly than does the mechanical rigidity when the temperature is raised.

Why is it that two wetted objects floating on water seem to attract one another, and that two objects floating on a liquid which does not wet them seem also to attract one another? How do you account for the conduct of the cork in the glass

<sup>7</sup> Physical Chemistry, by Bigelow, p. 339.

<sup>8</sup> Discontinuity of this nature is closely related to emulsification and is taken up in "Handbook of Colloid Chemistry," by Ostwald, p. 78, etc.

<sup>9</sup> Text-book of Physics, by Poynting and Thompson, p. 151.

<sup>10</sup> Surface Tension Effects in Metal, by F. C. Thompson, Engineering, May 19, May 26, and June 2, 1916.

of water in the well-known after-dinner "trick"? Why do the shredded particles of sea-weed form "islettes" in the quiet portions of a bay as if they were glued together? Can we resolve into its components the force that makes floating pieces of galena jump together as if they were magnetized.

This state of affairs is diagrammatically<sup>11</sup> represented in Figs. 3, 4 and 5, and may be completely explained by reference to the following general principle; namely: Over any portion of the free surface of a liquid which is plane, and at all points in the

be pulled about in the bowl it will tow the other behind it.

Oddly enough the same thing happens when neither of the two floating bodies is wet by the liquid, as for instance two pieces of paraffine or two pieces of beeswax, a case which is diagrammed in Fig. 4. Here the pressure at *a* is that of the atmosphere; the pressure at *m* is considerably greater; while at *n*, on the same level with *m*, but in the open air, the pressure is only that of the atmosphere.

The result is, therefore, two forces in the direction of the arrows tending to hold the two bodies together.

Only one other possibility remains, namely, one of the bodies may be wet and the other one not. When two such bodies float near each other, it will be observed that,



Fig. 1

liquid which are at this same level, the pressure is constant and is equal to that of the atmosphere. As one ascends in the liquid from this level the pressure diminishes; as one descends in the liquid, the pressure increases.

Thus in Fig. 3 the pressure at *b* is the same as that at *a*; and the pressure at each of these points is that of the outside atmosphere. As one ascends to the point *c* between the two floating corks the pressure diminishes, while outside the liquid the pressure remains that of the atmosphere. The result is a force in the direction from the greater to the less pressure, which holds the two bodies together, so that if one cork

<sup>11</sup> General Physics, by Crew.



Fig. 2.

in the region between them, Fig. 5, the liquid does not rise quite so high against the wetted one as it does on the outside of the wetted one. Note also that in the region between the bodies the liquid rises a little higher against the body which is not wet than it does on the outside of this same body.

Following the ordinary laws of dynamics, as in the preceding cases, the pressure at *a*, at *i*, and at *f* is that of the atmosphere; pressure at *h*, and at *e*, which is on the same level, is greater than that of the atmosphere. Hence there is a force from *e* towards *i* as indicated by the arrow.

The pressure at *s*, which is higher in the liquid than *a*, is less than that of the atmosphere, resulting in a force from *f* towards

s, as shown by the arrow. Accordingly the two bodies appear to repel each other.

By the use of this principle the conduct of the cork, sea-weed and galena can be explained. It will be referred to again.

The angle of contact opens another loophole to the investigator in flotation. In the Mining and Scientific Press, Sept. 2, 1916, I dealt in a general way with the components that give rise to the angle at

sion for a molecule at the interface would be drawn equally in all directions—a condition identical to that of a molecule within a liquid.

It would be of great advantage to us if we could test our minerals in the working solutions and approximate the ratio of these forces; for we wish to have a liquid surface tension membrane around the ore and none around the gangue. I will now un-

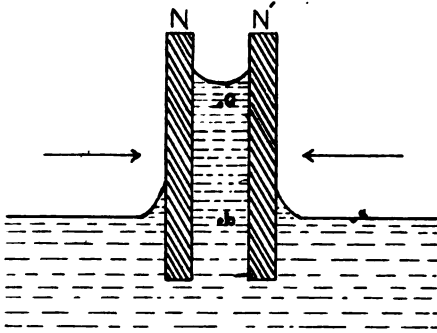


Fig. 3.  
Attraction of two bodies each wet by the liquid

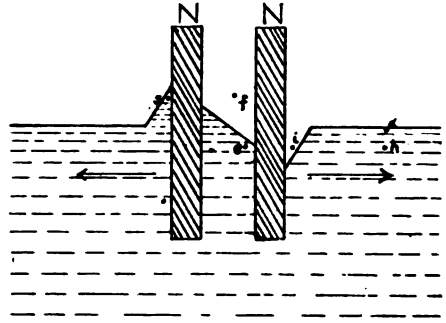


Fig. 5.  
Repulsion of two bodies, one of which is wet, the other not.

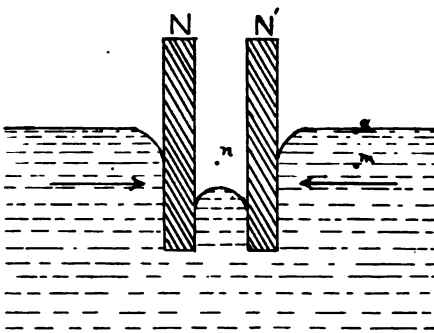


Fig. 4.  
Attraction of two bodies, neither of which is wet by the liquid

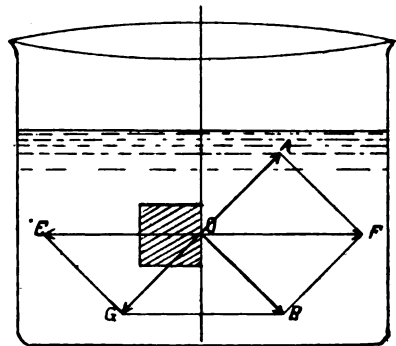


Fig. 6.

which liquid meets solid. It must now be stated specifically that at the interface of a two-phase system the resultant lies in the phase in which there is surface tension. A better understanding of the position of the resultant of the forces acting on a group of liquid molecules at the liquid-air interface of a three-phase system will be gained by what follows.

When a mineral is submerged and the forces of adhesion and cohesion are equal it is obvious that there is no surface ten-

dertake to outline the principles of such a test.

To do this we will use the "component and resultant" method but, instead of considering a group of molecules at the surface of the liquid let us assume that the solid is submerged and that cohesion and adhesion are equal.

See Fig. 6, where the cohesive force "OF" of the liquid molecules equals the adhesive force OE. The resultant is therefore zero, and there is no surface tension at the in-

terface. Now, instead of considering the force or resultant OF, let us replace it with two components, OA and OB, which represent the cohesive force of the liquid above and below OF respectively. Having eliminated OF, let us reduce the level of the liquid so that the liquid-air interface will be at O, i. e., so that we deal with the contact of three phases instead of two. OA will then become zero, and we will have left only OB and OE, the resultant of which (OG) turns into the solid, making an angle of 45° with the interface. From this it follows that, when there is no surface tension at the contact of two phases, the "angle of contact" is 45°; if the angle of contact is greater than 45° there is a liquid surface tension film. This conclusion—derived in a purely theoretical manner, and to be taken as only suggestive—is of interest in connection with what follows.

Mr. Sulman states<sup>12</sup> that he and his collaborators measured the contact angle of a great many minerals, but I am not aware that either the method or the results have been published. At first thought it would seem to be a misfortune that these results have not been made public, but after all they would have only an academic value, since each case must be dealt with separately.<sup>13</sup>

However, in the absence of Mr. Sulman's results, I will quote some figures obtained by Dr. A. K. Huntington. See appended table. This table serves an

**Contact Angle, Water against Minerals.<sup>14</sup>**

Pale yellow blende.....	55°
Pale yellow blende, another.....	63°
Dark blende on principal cleavage.....	53°
Dark blende on principal cleavage.....	50°
Dark blende, another.....	69°
Galena .....	58°
Stibnite .....	47°

Quartz and magnetite—completely wetted.

interesting role in connection with my deduction from the force polygon given above. The deduction was that when there is neither positive surface tension nor negative interfacial tension the angle of contact is 45°.<sup>15</sup> The table shows that minerals which are commonly considered floatable have an angle greater than 45°. It would follow then that when submerged they are encased in a liquid surface tension film much the same as air is encased in a soap bubble.

It is a fact, then, that there is a constant angle which differentiates between positive surface tension and negative interfacial tension.<sup>16</sup> Whether or not it is exactly 45° I am not able to say, but all evidence so far points to its being very close to that figure.

It is at any rate now perfectly obvious that the angle of contact of the working solution against the mineral is significant. Unfortunately there are many cases where

the mineral grains are so small and intimately intermixed that observations are impossible, but on the other hand there are many ores that are amenable to such determination

The contact angle cannot be measured against a vertical face because the angle is distorted by the force of gravity; but it can be measured without error by inclining the face of the mineral until the surface of the water is horizontal. It would be difficult to determine just when the surface is horizontal but for the principle so lucidly set forth by Professor Crew as quoted above. If lycopodium powder, talc, or charcoal is spread upon the liquid surface it will dart to or away from the mineral until its face is at such an angle that the liquid meets it in a horizontal plane. This angle is the angle of contact.

One should not become confused if a mineral floats when the angle of contact indicates that the liquid would turn up and pull the mineral down. The criterion is the presence of a liquid surface tension film under the mineral. If it exists and the mineral floats, an equilibrium is reached when the downward force of gravity is neutralized by an opposite force that is the sum of the weight of water displaced and the vertical component of the contractile force of the film bounding the dimple.

I wish to express thanks to Mr. O. C. Ralston for his critical reading of these notes. Mr. Ralston expresses a regret that I do not show more nearly the direct application of what I have written about the flotation. No one regrets this more than I do. If the reader will recall that at a meeting of the local membership of the American Institute of Mining Engineers in San Francisco less than a year ago not one of those in attendance was able to give a definition of surface tension, I think it will be obvious that we have indeed made rapid progress. This progress is due, in part, to literature becoming more accessible by this kind of writing. I know from experience how difficult it is to get literature on this subject in an isolated place such as those are where a large proportion of the workers are employed, and since I am now more fortunate in that respect, I am trying to collect all facts that seem to be closely related to the subject, hoping that a few will be of direct benefit, and that a study of the others will give a broader vision. There is an enormous mass of material in the libraries that has to be considered, and only those who have undertaken to review it can understand the meaning of the word correlation. I have been impressed that science at this moment needs correlation more than research.

<sup>12</sup> The reader will please bear in mind that this deduction is based on assumptions whose only justification is that they seem to be consistent. Facts are wanting.

<sup>13</sup> Taggart and Beach, in Bulletin No. 116 A. I. M. E., used negative interfacial tension to denote that the solid has greater attraction for the molecules of the liquid than the liquid molecules have for each other. The liquid would consequently tend to spread over the solid. I take it here in the same sense.

<sup>14</sup> Mining and Scientific Press, April 15, 1911, p. 518; April 29, 1911, p. 583.

<sup>15</sup> A detail report of his methods would be, however, a valuable contribution to science, and it is hoped that we will have some day the benefit of his experience.

<sup>16</sup> Dr. A. K. Huntington, Faraday Society, Vol. I, 1905-6.

## USES OF CONCRETE WITH SPECIAL REFERENCE TO MINING.

By Prof. R. S. Hawley.

(Part of illustrative lecture delivered before the Scientific Society of the Colorado School of Mines, December 8, 1916.)

(The slides with which this lecture is illustrated are furnished by the Portland Cement Association of Chicago.)

Every engineer should be a builder; whether he be an adherent of the mechanical, civil, electrical or mining branches of the engineering profession, he must keep before him this all-important fact that he must build, construct, promote, and not only that, but he must do this efficiently if he would succeed. To my mind, there is something incongruous in the expression "efficiency engineering," because it is difficult to conceive of engineering as not being associated with efficiency and economy. So the engineer must build efficiently. He must know relative values of materials. He must be able to judge. He must make selections.

In giving this talk on the uses of concrete it must not be inferred that we are advocates of the use of concrete in preference to other materials in construction work. We would, however, call attention to the fact that with the constantly increasing prices of lumber as well as the price of skilled labor in carpentry, brick and stone masonry and the like, it is of no little importance that every engineer and particularly the mining engineer, be familiar with the uses of concrete in construction work.

It is not our purpose to attempt to enumerate all of the uses which are made of cement or concrete, but to call attention to some of the more recent applications in various industries and particularly in mine structures. The extent which concrete has been increasing in its use in all branches of structural work is hardly less remarkable, though much less striking than the advance that has been made in the design and use of the electric motor or the automobile.

Railroad corporations, factory owners, farmers, county commissioners, and, in fact, practically all classes of men who have construction work of any kind, now look to concrete as the one material that can be satisfactorily used in many kinds of structural work.

One reason for its use in many places is the ease with which it can be prepared. By following simple rules most anyone can make a very respectable wall, approach, sidewalk, without the necessity of employing skilled labor. To be sure, poor cement, poor sand, wrong proportions, etc., will give poor results.

Ten or fifteen years ago concrete was scarcely known to the masses of people, but today we find that a bulletin sent out by the Portland Cement Association lists about one hundred uses for concrete on the farm alone. Some of these might be mentioned to show the variety of uses. Cisterns, tanks, troughs,

drives or walks, ice-houses, fence posts, vegetable cellars, septic tanks, hog wallows, hydraulic rainhouses.

Railway companies find many uses of concrete in the construction of bridges, stations, sheds, platforms, turntable pits, signal towers, tunnels, reservoirs, ties, coaling stations, telegraph and power poles and towers.

In drainage work the concrete culvert is taking the place of the old log or stone culvert, the small steel bridge is being replaced by the reinforced concrete structure. Concrete flumes are common.

The office building of the Packard Motor Car Co., Detroit, Mich., built of concrete with concrete ornamentation, is an example of what may be done in large concrete buildings of this kind.

St. Joseph's Parochial School, New Orleans, La., is of combined brick and concrete construction.

That concrete may be used satisfactorily for inside as well as exterior construction is well illustrated by the Butterine Plant of the John F. Jelic Co., Chicago. Metal gullage plates on the floor are used to take the wear of the trucks moving from one part of the plant to the other.

The plant of the Chicago Bridge & Iron Works is peculiar in that it is designed with very low monolithic walls and has a concrete tile roof.

The Union Terminal Cold Storage Co. of Chicago is of combined brick and building with reinforced concrete ceilings which are clearly shown. The outside wall of the building is constructed of brick.

A general view of the Delta Dam, Delta, N. Y., illustrates clearly the common use of concrete in this type of structure. It might be added that concrete has been a great factor in the hydro-electric development and the irrigation projects of the last ten years.

The average engineer is more or less familiar with cement sidewalk construction, yet it is well within the memory of us all that it was a question whether a plank or cement walk was preferable. At the present time city ordinances mostly forbid the laying of any kind of walk but cement.

The use of concrete for streets and highways is yet more recent, but experiments have shown that cement has entered this field as a close competitor of asphalt, macadam, and other paving materials.

The extent to which this kind of work is carried on is well illustrated by the equipment of the Wayne Co. Road Commissioners, consisting of engines, cars and auxiliaries valued at \$60,000.00. The building of concrete highways is not as difficult as we are sometimes led to believe. It is true that some difficulty is experienced in localities where the weather is severe. The expense of shipping sand to localities where it is not obtainable is a factor to be considered, but a concrete road when completed is one that appeals to all drivers of vehicles, particularly to the automobilist. There is no doubt but that the common use of the automobile and the auto truck will force an en-



tire change in the construction of public highways.

Concrete highways, however, are not always successful. If the concrete is laid under poor specifications it will rapidly pit and crumble. Poor underdrainage will cause upheaval and cracking of the concrete and rapid deterioration of the road. Concrete laid in cold weather is not always satisfactory.

Concrete is also used quite extensively for paving of streets. In the central states, Indiana, Michigan, Illinois, Minnesota, Wisconsin, Iowa, Missouri during the years 1914 and 1915 the total yardage of concrete laid on city streets exceeded any other type of pavement. (Data from Portland Cement Association.)

Some advantages claimed for concrete roads and pavements because of its properties may be enumerated as follows:

1. First cost moderate.
2. Maintenance low.
3. Long life.
4. Firm, dustless, clean, not noisy, non-slippery.
5. Sanitary, attractive, easily distinguishable at night.
6. Equally serviceable during any part of the year.
7. Usually built principally of materials that are found in local points.
8. Labor for construction—mostly unskilled.

There are some objections to concrete structures which should be noted. In concrete factories it is difficult to install mechanical equipment such as shaft hangers, piping, etc. Concrete floors are sometimes dusty unless treated with a specially prepared concrete paint. It is somewhat more difficult to heat a concrete building than one of brick or a frame structure. Experiments have proved that a 12 inch concrete wall will lose the same amount of heat as an 8 inch brick wall, and that an ordinary lath and plaster construction with siding will conduct less heat than either brick or concrete.

Perhaps the principal objection to the use of concrete in general building construction is the difficulty in obtaining good architectural effects which are easily obtainable in brick, stone or marble. This applies particularly to private residences, office buildings, and large public buildings.

In mine construction concrete has been increasing its use particularly in the coal mines of the east, tho to a considerable extent in the ore mines of the middle west. Sometimes its use in one locality is extensive and sometimes limited, depending upon local conditions. The concrete mine plant at Cresson, Pa., is an example of the numerous adaptations of concrete in one place. At this plant practically all of the surface buildings are built of concrete.

The D. L. & W. Coal Co., near Scranton, Pa., has a very neat design for the slope of the tunnel, and the engine room and fan house are built of reinforced concrete.

The Black Diamond Coal Co., Lathrop, O., have built a reinforced concrete tippie.

One of the neatest plants that has come to our observation in the West is the underground hoist and compressor room in the Silver King Mine at Park City, Utah. The hoist room is neatly cemented up and the walls are painted, giving a clean, neat appearance. The compressor room adjoins the hoist room. The rooms are warm, perfectly dry, and clean.

The H. C. Frick, Co., Filbert, Pa., have lined the side walls of the shaft bottom with concrete. The overhead construction consists of I-beams upon which rest concrete slabs. An underground stable in this mine provides comfort and safety for the animals.

Fans for air supply are easily and conveniently fitted in concrete housing. In fact small buildings of any sort or irregular walls are easily constructed of concrete because of the convenience of making wood forms for the same.

The coal chute of the Ford, Bacon & Dous Co. is a good illustration of the use of concrete in this type of structure.

A reinforced concrete coal breaker has been built by the Lackawana Coal Co. at Taylor, Pa., and a cement stucco tippie by the same company at Cresson, Pa.

In connection with mining work we should mention the use of pre-cast concrete units which have proved efficient in replacing portions of mine timbering. An article describing the manufacture and use of such units may be found in the Engineering News of Sept. 7, 1912. The Proceedings of the Lake Superior Mining Institute for 1913 contains an article entitled, "Reinforcing No. 2 Hamilton Shaft with Reinforced Dividers and Plates and Concrete Walls." This article should be read by every mining engineer.

The use of the cement gun in fire-proofing linings of shafts, filling cracks in rock by shooting cement mortar, and in making a coating of cement of a few inches thickness should be mentioned in this connection.

#### Good in Either Case.

Mabel—What are you going to do with all these flowers after the carnival is over? It's a shame to waste them.

Maud—They won't be wasted. If Jack sees me before papa does there'll be a wedding, and if papa sees Jack before I do there'll be a funeral.—Puck.

#### Just For Tonight.

"My dear, do me a favor tonight, will you?"

"Certainly. What is it?"

"When we are dining with the Browns kindly refrain from calling my attention to how beautifully Mr. Brown carves."—Detroit Free Press.

If more people would specialize in everyday work, it would be a better world.—Deseret News.

### THIRD PROSPECTORS' COURSE, FEBRUARY 5 TO MARCH 3, 1917.

The Short Course for Prospectors, which was inaugurated by the Colorado School of Mines in January, 1915, proved so popular and profitable to those who attended, that in 1916 the course was extended. As a result of the success which attended this innovation, it has become an established part of the work of the School of Mines and will be offered annually as long as there is any apparent need or demand. The third annual Short Course for Prospectors will be given at Golden during the four weeks beginning February 5 and ending March 3, 1917.

The only important change from the course of 1916 will be a shortening of the time from five weeks to four. It is planned to condense the work and keep the prospectors occupied throughout the day instead of in the morning only. This will be an advantage from the point of view of instruction and will make the course less expensive to those who attend.

All of the courses will be of the most practical nature and will comprise instruction in mineralogy, common minerals and rocks; elementary chemistry; principles of ore dressing, assaying and the more common metallurgical processes; methods of valuing, buying and selling ore; placer and lode mining; location of mining claims; first aid to the injured and safety engineering. These courses are outlined in detail on succeeding pages. They will be given entirely by regular members of the faculty and will consist of lectures, supplemented by laboratory demonstrations.

Prospectors and others who expect to take advantage of this work are asked to notify the school authorities as soon as possible, in order that ample preparation can be made for the work. Address all correspondence to The Registrar, Colorado School of Mines, Golden, Colorado.

#### Fee.

A single fee of two dollars is charged for the entire course of four weeks, and is payable in cash on registration.

### OUTLINES OF THE COURSES OFFERED.

#### Common Rocks and Minerals—Prof. Patton and Prof. Ziegler

A course of thirty-six hours, mostly laboratory practice, devoted to the study of common minerals and rocks. The instruction will include blowpipe reactions, using the simplest apparatus and appliances. A few of the rarer ores in which prospectors are just now greatly interested, such as those of tungsten, molybdenum, etc., will be considered.

#### Geology—Prof. Patton.

An eight-hour lecture course devoted to such geological features as throw light on the origin and manner of occurrence of ore deposits and on the structural features frequently met with in mining. These latter

include faults and folds, strikes and dips, and the mutual relationship of rock masses.

Particular attention will be given to the kinds of rocks, geological conditions, etc., which appear to affect ore deposition. An important part of prospecting is to know what may be sought for in the different formations.

#### Chemistry—Prof. Test and Prof. Ballar.

A course of thirty-two hours, mostly laboratory work, with such time taken for lectures as may be necessary. The object of the course is to make the prospector more familiar with the use of such apparatus and chemicals as may aid him in supplementing his field work, and to equip him with knowledge of the characteristic properties of the common metals. Some work on the commercially important rare metals will also be given.

#### Metallurgy and Assaying—Prof. Young and Prof. Haldane.

The work in the department of metallurgy is given in two divisions; the first division comprises eight lectures covering the subjects outlined below. In addition there will be given four afternoons demonstration work in the assaying and metallurgical laboratories. The second division comprises twelve lectures in ore dressing and metallurgy, together with four afternoons demonstration work in the experimental laboratory. The nature of the demonstration work will be determined largely by the requirements of the class.

#### First Division—Prof. Haldane.

Principles and methods of sampling, as used in mines, mills and smelters; methods of assaying common ores; determination of the value of ores from assay or analysis; how ores are bought and sold; the value of an ore to the producer; simple tests for the prospector.

#### Second Division—Prof. Young.

Nature of ores, crushing, sizing and classification; coarse and fine concentration in water; methods of dry concentration; amalgamation; flotation; electrostatic and magnetic separation; determining percentage extraction; the cyanide process; leaching copper and zinc ores; smelting lead and copper ores; simple treatment plant for prospectors.

The laboratories and experimental plant afford exceptional opportunities for demonstration and the student will be given every reasonable facility to study methods and mechanical appliances.

#### Placer Mining—Prof. Wolf.

This four-hour course includes a discussion of the theory and practice involved in the recovery of precious metals from sand and gravel deposits. Among the subjects considered are: panning, rocking, sluicing, hydraulicking, dredging, dry placering, etc. Typical operations are described for the purpose of illustration.

**Mining Claims—Prof. Wolf.**

This eight-hour course includes instruction in the methods of acquiring title to mineral lands in the United States. Practical methods of locating and surveying mineral lands are described and instruction is given in the preparation and filing of documents used in acquiring title to lode and placer claims; mill and tunnel sites; timber, stone and coal lands; water rights. Mining laws which are important to the prospector are discussed and explained.

**Lode Mining—Prof. Wolf.**

This eight hour course includes a discussion of surface prospecting, methods employed and equipment required. The opening and developing of prospects to the best advantage are discussed, as also proper methods of sampling in the mine and on the dump.

**Mine Safety Engineering—Prof. Roberts.**

The course in Mine Safety Engineering includes the following:

1. General safety in mines.
2. Explosives: Composition of explosives in general use in coal and metal mines and quarries; composition of resultant gases from explosives and the dangers of going back too soon after shots are fired; the proper and improper methods of handling explosives.
3. Mine gases; gases encountered in coal and metal mines, prospect holes and shafts, their composition, methods of detecting and removing same, and precautions to be taken to prevent accumulation; methods of recovering and removing men overcome by same.
4. Mine lighting.
5. Mine fires; their causes, methods of preventing and extinguishing same.
6. Mine rescue methods and appliances, including demonstrations of various types of mine rescue apparatus in use, resuscitating devices, pulmator, lung motor, etc.
7. First aid to the injured; a full and complete course in first aid will be given at night to all those who care to take same. this will include the following: The human body; wounds, with and without bleeding; bruises, sprains and dislocations; fractures, simple and compound; bandages and splints; shock, fainting, poisoning, etc.

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**BUREAU AND SCHOOL PLAN  
CO-OPERATION.**

Within a short time the United States Bureau of Mines will begin work on the problems of the mining industry of Colorado, working in co-operation with the School of Mines. The government bureau was moved to Golden in order that there might be greater co-operation between the school and the federal experts, but this has been impossible because the government has been finishing work begun before the bureau was moved to Golden.

The bureau has been investigating the possibilities of radium extraction from the

ores of the Western states, working under a contract with the National Radium institute, a private corporation. The work has about been finished, and a new field of investigating will then be entered. The radium reduction plant in Denver will be sold to a private person or corporation. Because the gas available in Denver is needed for the reduction of radium, a small force of men will remain in Denver until the first part of 1917. With the exception of one room in Denver, the entire laboratory of the bureau will be in Golden by January 1.

Just what work will be undertaken by the bureau has not yet been determined. President Parmelee, of the School of Mines, has been making inquiries of the mining men of the state in an endeavor to find out what problems are most in need of investigation. Hereafter all work of the bureau will be done in conjunction with the State of Colorado and in co-operation with the School of Mines.

One of the campaigns being undertaken by the United States Bureau of Mines is that of preparedness in coal and metal mines, so that if disaster comes there may be a definite plan of action in saving life. The reports from the Golden office of the bureau, taken in conjunction with those of the other offices throughout the country, have been compiled in Washington and a report outlined. This report is being sent to practically all the mines in the United States.

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**NO CARS.**

A coal man went to heaven one day  
(As coal men sometimes do),  
And they gave him a job, with princely pay,  
Of running a coal train through  
To the Kingdom of Hell, with instructions  
to haul  
From the fiery brimstone bars  
All the railroad men whom he could recall;  
But they gave him, alas, no cars.

So a message he sent to the realms of Hell  
For the railroad men to be  
On the watch for his train, and he rang  
the bell  
With a chuckle of fiendish glee,  
And the men lined up as they writhed in pain  
On the fiery brimstone bars,  
But when the coal man showed up with his train,  
My God, he had no cars!

And so, through endless cycles of years,  
The railroad men line up,  
With hope dispelled, with groans and tears,  
As they drain the bitter cup.  
The coal man he makes his run on time,  
From the pearly gates to the fiery bars;  
While the railroad men in anguish chime:  
"My God, my God, no cars!"

—Coal Age, December 2, 1916.

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Vol. VII. JANUARY, 1917. No. 1

## THE NEW YEAR.

Nineteen sixteen was one of the most prosperous years the mineral industry has ever had, and all indications point to an even more prosperous year in nineteen seventeen.

The war in Europe has given you steady work, and on the average increased income. Don't forget the most innocent victims of the war—the Belgian kiddies—no matter WHO is to blame for the war, THEY certainly are not. Pass them a few crumbs from our well-filled table.

## \$120,000 PREFERRED STOCK. HEALTH-GIVING AND LIFE-SAVING BELGIAN KIDDIES, LTD.

(A Corporation to be Organized Under the Laws of Humanity.)

10,000 Shares of a Demand Value of \$12 Each.

Registrar None  
 Trustees: Hoover, Honnold & Co.  
 To offer, subject to no over-subscription or allotment, \$120,000 preferred stock as much more as we can get rid of, in Belgian Kiddies, Ltd., concerning which we have a receipt of full reports from H. C. W. L. Honnold, Edgar Rickard, and our well-known mining engineers, which we summarize as follows:

The object of this stock issue is to provide one meal per day for ten thousand children for the year 1917. Each

with "why left hand"

share sold means 365 square meals for one child.

II. Our business is constantly growing, and no estimate can be made of the requirements for 1918.

III. Security of the principal is absolutely assured by the personal management of H. C. Hoover and associates.

IV. That no cash dividends will ever be paid is absolutely guaranteed.

V. The stock is probably only part paid and is fully assessable.

VI. The stock is preferred as to holders, the subscribers being preferably taken from the members of the mining and metallurgical professions, and their wives and sisters.

VII. The demand value of the shares shall be \$12, preferably payable in advance, but installments will be welcomed if more convenient to the subscriber.

The legality of this issue has been passed upon by no one, but the committee can convince any one of its necessity.

Applications for stock should be mailed at once. Address subscriptions to

BELGIAN KIDDIES, LTD.

Room 2124, 120 Broadway, New York City.

## BELGIAN KIDDIES, LTD.

An informal committee of mining engineers, from all over the United States, are undertaking to give our friend, Herbert C. Hoover, a Christmas present, by taking off his shoulders part of the burden which he and his associates have been carrying for the last two years and a half.

During this time, the United States has received a great deal of gratitude from Belgian people which it has not deserved. To the Commission for Relief in Belgium all praise is due for its work. The C. R. B.—as it is known—has distributed in Belgium goods costing about \$227,000,000, of which the United States has contributed \$10,000,000, or about 4.3 per cent of the total; and much of this has come from a few large foundations. The commission has purchased in the United States goods to the amount of \$125,000,000. We have not even paid a fair commission thereon. Reduced to a per capita basis, we have given 8 cents apiece. Canada has given 18 cents per capita; New Zealand, \$2.34, and little Tasmania \$6.25 a head. Yet the United States gets most of the credit. We have been obtaining gratitude under false pretenses.

This is naturally discouraging to us who know and appreciate the work of American engineers in Belgium. These men have been keeping alive a population of nine million on one meal a day. This is not enough for children. (Would you like it for yours?) At present one million children are failing in health, and the C. R. B. has asked us Americans to assume the proper feeding of these children as our little share of the big job.

To do this right the C. R. B. has started to give the children a nourishing noon-day

meal, and it has not the money to carry it on. This costs only one dollar per month per child (three cents a day). This seems incredible, but as the overhead expenses of the C. R. B. are only three-fourths of 1 per cent of the gross costs, you will understand that this is real engineering efficiency.

As engineers we want to show our appreciation and so we have organized an informal syndicate to float a new venture. We would like to cable Hoover that we will take a block of "Belgian Kiddies" off his hands.

Don't you want to come in with us?

Sincerely yours,

(Signed by sixty widely-known American mining and metallurgical engineers.)

#### COLORADO METAL MINING ASSOCIATION MEETING.

The fourth annual meeting of the Colorado Metal Mining Association was held at the Brown Palace Hotel in Denver, January 3, 4 and 5, 1917, for the purpose of electing directors from the various metal mining counties of the state and the transacting of other business.

Among questions considered for a definite plan of action were the following:

Proposed repeal of the present law for the taxation of producing mines.

Proposed change in laws regarding the Industrial Board and Compensation Insurance.

Action of Association regarding regulation of smelters by Utility Commission.

Proposed tariff laws affecting tungsten and other metals mined in this state.

Cooperation of the state association with similar organizations of other states for mutual benefit.

Proposed changes in federal Mining laws. Government conservation policies and continued withdrawal from development of public lands.

The following Golden men were elected delegates from the Jefferson county branch of the Colorado Metal Mining Association to the fourth annual meeting of the association: W. G. Haldane, J. C. Roberts, James W. Myers, G. W. Parfet, W. H. Wright. The alternates are George J. Young, G. M. Cheney, J. H. Winchell, S. S. Small. The state meeting will be held at the Brown Palace hotel on January 9, 10 and 11, and leading mining men from all parts of the West will be in attendance. Harry J. Wolf is director of the Jefferson County branch.

#### A NEW DEGREE—AERONAUTIC ENGINEER.

The l'Ecole Superieure d'Aeronautique et de Constructions Mecanique, Chemin de Morex (Batiment Lemanis), Lausanne (Suisse), France, gives instruction both theoretical and practical in the construction and operation of airplanes, balloons, dirigibles, etc., and grants the degree of Aeronautic Engineer upon completion of the course.

#### MINES MEN ON ALL-STAR FOOTBALL TEAMS.

On the official eleven, picked by the vote of the various coaches, Heitzman, Worth and Snick Schneider were given places on the All-Colorado team. Schneider gave way to VanPelt, of Utah, for the All-Conference team. Captain Billy Williams was mentioned for a place on the team, but the large number of excellent half-backs kept him off the mythical aggregation.

#### W. S. STRINGHAM MINES FOOTBALL CAPTAIN FOR 1917.

Bill Stringham was elected captain of the football team for next year. Stringham played halfback and quarterback on this year's eleven, and was one of the best punters in the Conference. Stringham entered Mines from West Denver High School in 1912. He made his "M" in football in 1914. He then stayed out of school a year, re-entering this fall.

#### FIFTEEN MINES FROSH GET SWEATERS.

Fifteen members of the freshman class at the School of Mines are to receive numerals and jerseys for work in class football. The men who will be awarded the honors are: Bunte, captain; Beaton, manager; Bailey, Houssels, Wales, Creeth, Benbow, Prately, Hamilton, Linderholm, Snodgrass, Fegan, Hardy, W. F. Billisoly, Clough.

#### MINES BASKET BALL PROSPECTS GOOD.

Prospects for a strong basketball team at the School of Mines are brighter than for a number of years. A host of good material is practicing daily in the gymnasium. About thirty men are trying for positions. Most of the men are speedy, but are smaller than the average basketeers. Six of the "M" men will be eligible for the five. They are Captain Murphy and Miller, forwards; Hofus, guard, and Coulter, center. George Roll, center, has not yet decided whether or not to play basketball this year. Taylor, a guard of two years ago, will be back the second semester.

#### SENIOR NOTES.

K. S. Ferguson.

The new schedule posted for the second semester indicates that the metallurgists will have Power Plant Design and Coal Mining added to their old schedules. The Miners have Metallography added to theirs. One lab period is given over to Mine Examinations, and Safety Engineering continues through the next semester with one lab and one lecture. As the schedule now stands, the Seniors have twenty-five required hours, which include every afternoon and Saturday mornings.

No favorable action has been taken on the Senior trip by the faculty as yet. In view

of the fact that the Seniors are anxious to take the trip and the Alumni recommend it, the faculty should work with the committee appointed by the Seniors to this purpose. The men who have taken this trip in the past generally concede this trip to be the best thing they get their last year in school, and are of the opinion that it should be retained.

A new ruling passed by the faculty provides for a fine of five dollars for all those registering late.

Professor Young took the class through the Sutton, Steele and Steele plant, and also the National Radium Institute. The party was accompanied by Dr. Moore of the United States Bureau of Mines.

Dr. Patton appreciated his vacation the morning of the metallurgy trip to Denver to such an extent that he gave the Seniors a chance to raise their grades the next time they met.

The students, in general, were well supplied with turkeys, geese and ducks—the remainder could only get four in a row.

Congratulations are due the class of 1920 for their dance given during December.

Assistant Football Coach Allmendinger has left for his home in Ann Arbor, Mich.

Hez. Winchell spent the holidays in Golden, the attraction there proving stronger than the bright lights fifty minutes away. He is certainly making strenuous efforts to graduate.

Max Hofus spent the holidays in Pittsburgh, Pa., as delegate to the Sigma Alpha Epsilon convention.

### FRESHMAN NOTES.

#### F. L. Serviss.

At the last time that we met we were discussing the Freshman ball. Guggenheim Hall shone forth in all its splendor on the eventful evening. Solomon in all his glory could not have stood comparison with the beauty and magnificence of the scene. It was an event that will ever stand out in the memory of those who attended.

Great credit is due to the members of the committee who by their ingenuity and much labor made such a success of the affair. The class as a whole sincerely thanks them for their earnest efforts and feels that they may well be proud of their success.

Just as we were becoming reconciled to our dainty Frosh caps, it comes time for us to change to something more in season, although not so artistic. When, in the light of later years we show this little piece of goods to our children's children and tell them many tales of college life at Mines in the old days, may we have every reason in the world to be proud that we are of the Class of 1920.

The Frosh had better beware of those horrible (?) Sophs. They seem to think that we are just crazy to hang around the qual lab. when they are trying to bluff Dad that they are working, and have

published a warning for all Frosh to keep away.

"A word to the wise is sufficient," Imogene; tell mother that we will not bother you so she won't worry. To be accused of hanging around the Sophs makes us both mad.

During the last week a change has been noted on the faces of several students. The coming finals are the cause of it all. Resolve to do your best, fellows, and Math. 205 will take care of itself.

Several of the students have left for home during the holidays, some have left for other reasons, and are afraid to go home.

It would seem that the Junior editor is not very well acquainted with his colleague, Walt O'Reilly. He does not know that Walt will do anything for money or to get his name in print, even though it be in the Frosh column.

Beaton has left our midst to enter Yale. We wish him luck and trust that he may soon become reconciled to the fact that he is in Yale and not in Mines.

Wishing all a New Year full of dreams come true, health, wealth and all that makes life worth while.

### NIGHT SCHOOL AT LEYDEN.

The Mines night school at Leyden has been very successful so far. The miners are taking great interest in all the courses offered, and the school has had to secure larger quarters to accommodate the additional mathematic classes that have been recently organized.

There are now three classes in mathematics, and one in elementary English for foreigners. The total enrollment is thirty-two. Ten Mines men comprise the teaching force.

It is planned to offer courses that will prepare the miners for the state mine examinations. As this will require some knowledge of algebra and of chemistry of gases, subjects upon which few of the men are prepared, it will be necessary to first take up these branches.

So much interest has been shown in the First Aid and Rescue Work, it has been necessary for Dr. Roberts to choose an extra night for this work to prevent interference with the other classes.

### HAMMER AND TONGS.

The Hammer and Tongs honorary fraternity of the School of Mines had quite a hilarious time Wednesday afternoon, December 6th, while initiating John J. O'Malley, Guy Young, R. V. Gibson, W. H. Williams, J. H. Winchell, L. K. Worth, Fitch Robertson, Rex Oliveros, H. G. Buckley, Walt B. Tongue, H. G. Schneider, Lincoln Ehnbohm and T. H. Andrews.

Some of the warriors early that afternoon came down from court house hill, wearing straw hats and with barrel staves in hand. They sat down in front of the Rubey National Bank and whittled a good while

on each stove, so that they could put it on hot where it would do the most good. Thirteen new members were initiated.

#### COLORADO SCHOOL OF MINES SCIENTIFIC SOCIETY.

After several years in which little interest has been taken, the Colorado School of Mines Scientific Society has again become active, and the first of the series of lectures was given in the chemistry building, December 8th. Prof. R. S. Hawley gave the first lecture; his subject, "The Uses of Cement."

#### MISCELLANEOUS.

Prof. George J. Young spent his Christmas vacation in San Francisco.

T. C. Doolittle and family have moved into the pretty Searls' residence on the School of Mines campus grounds.

President H. C. Parmelee delivered a lecture at Fort Collins Saturday, December 9th, to the Sigma Xi Scientific fraternity on "Human Engineering."

Prof. W. J. Hazard addressed a meeting of the Denver Jovian League Wednesday, December 13. Subject, "The Mining Engineer and Electricity."

Members of the junior class at the School of Mines made the annual metallurgy trip to Pueblo early in December. The inspection of the steel works was under the direction of Prof. W. G. Haldane.

#### Consolation Dance.

Mines students who could not get home for their Christmas vacation, held a consolation dance at Guggenheim Hall, New Year's evening.

President H. C. Parmelee spoke at the annual meeting and dinner of the Denver Bar Association held Monday evening, December 4th, in Denver, at the Albany Hotel. His subject was "Taking Care of the Human Element in Mining."

Professor H. C. Parmelee left the Thursday evening before Christmas for New York City, where he represented the Rocky Mountain Athletic Conference at a meeting of the National Intercollegiate Association which convened in that city December 26th and 27th.

Dr. Roberts has secured moving picture films illustrating zinc and copper mining and smelting operations, and mine rescue work from the U. S. Bureau of Mines. These films will be run at the Gem Theater in Golden some time in the week of January 8th. Admission free to Mines students. These same films were used by Dr. Roberts to illustrate his lectures on safety and first aid work at Leadville and Red Cliff, Colo., January 3rd and 5th.

What becomes of all the money that people are going to save tomorrow?

# ALUMNI

#### SEPTEMBER C. S. M. MAGAZINES WANTED.

An unexpected demand for the September, 1916, issue combined with a larger loss of copies in the mail than usual has exhausted our supply. If you do not preserve your files of the Magazine we would appreciate the return of the September number.

#### PERSONALS.

'86.

Charles A. Gehrman's address is now 327 East Lawrence avenue, Springfield, Ill.

William B. Lewis of New York paid a brief visit to Denver and Golden the latter part of December.

'95.

George A. Kennedy is mining engineer for the Western Chemical Manufacturing Company. He has given up his office in the Symes building and his business address is now care of the company, Denver, Colo.

Robert S. Stockton visited friends and relatives in Golden during December. He returned to Strathmore, Canada, before New Year's.

'97.

Arthur H. Buck is engaged in examination work at Leadville, Colorado, where his address is care of the Hotel Delaware.

John Gross is in charge of a property at Georgetown, Colorado. Box address 43.

Prof. William J. Hazard gave an address at the meeting of the Denver Jovian League, Wednesday, December 13th. His subject was, "The Mining Engineer and Electricity."

'98.

James E. Dollison of Alma, Colorado, attended the Christmas reunion of the Dollison family at Golden.

'00.

Daniel Harrington, who is engaged in an investigation of health conditions in the Butte district for the U. S. Bureau of Mines, now has his headquarters at the Montana School of Mines, Butte.

Lloyd Robey's Denver address is 970 South Pearl street.

'01.

M. C. Scheble has returned to his old position in charge of the "Compania Carbonifera Agujita" in Northern Coahuila, Mexico. His address will be Box 135, Eagle Pass, Texas. About two and a half years ago the Mexican revolutionists destroyed most of the million-dollar surface plant of the company. Since then the various Mexican governments have worked the property on a small scale. The property has lately been returned to the company and work has been resumed in a small way.

Scheble reports that northern Coahuila is quiet and that they are operating the property without any difficulty. Many Ameri-

can companies are trying to operate and help all they can to restore Mexico to prosperity.

'02.

Arthur H. Collbran, who has been general manager of the Seoul Mining Company of Korea, for the past eight years, has relinquished the active management for a year in order to obtain a vacation and look after personal mining interests in the United States and the Orient. Collbran built up the Seoul holdings from mere prospects to one of the best paying properties in the Far East.

After several months spent in this country Collbran expects to return to the Orient about March. His address until that time will be San Miguel, California. In the Orient, care of C. W. Davidson, Seoul, Korea.

A. C. Watts was in Denver the latter part of December completing arrangements for the regular annual meeting of the Rocky Mountain Coal Mining Institute which will be held at the Albany Hotel January 22, 23 and 24.

'03.

Harry G. Palsgrove has returned to Denver from Costa Rica, Central America, and expects to remain in the United States. He is now temporarily out of town on a mine examination. His Denver address is 4147 Stuart street.

'04.

Francis A. Thomson, head of the department of mining engineering, State College of Washington, recently made an exhaustive examination of quartz properties near Pierce City, Idaho, for New York interests.

'05.

Frank J. Reinhard, province president of the Sigma Alpha Epsilon fraternity, and M. T. Hofius, delegate from the School of Mines chapter, left Golden the week before Christmas for Pittsburg to attend the biennial convention of the fraternity. There are 18,000 S. A. E. men in the United States, and there was an attendance at the convention of 1,500.

'07.

W. P. Phelps is Superintendent of the Yago-Alaska Gold Mining and Milling Co., Kink, Alaska.

'08.

Russell R. Bryan has resigned from his position with the Quincy Mining Company at Hancock, Michigan, and is taking a vacation at his home in Hotchkiss, Colorado. He visited the School on December 16th while on his way home.

F. F. Frick is in charge of all the experimental work for the Anaconda Mining Company at Anaconda, Mont. His street address is 306 Hickory.

Karl G. Link is at Danby, San Bernardino County, California.

Cranston H. Carpenter is with the U. S. Smelting Company at Checotah, Oklahoma.

'09.

Kyosuke Iwai, who is Superintendent of the Yusenji Copper Mine for the Takeuchi Mining Company of Japan, called at

the School about the middle of December. Iwai is making an extensive tour of inspection of the big copper properties of this country. He expects to return to the Orient some time in February.

E. B. Wood's address is now 1058 St. Paul street, Denver, Colo.

W. E. Canning, of Anyox, British Columbia, visited the School January 2nd while on his vacation. Mining is booming in British Columbia, and because of the bonuses paid on account of the high metal prices, wages are very good. Canning expected to return to Anyox later in the month.

'10.

I. A. Purdy is metallurgical statistician for the Timber-Butte Mill. His address is care of the Leonard Hotel, Butte, Mont.

Samuel M. Soupcoff's address is 417 North Craig street, Pittsburg, Pa.

We were mistaken in the address of Walter R. Brown given in the December number. Brown, who was Chief Engineer for the Nevada Consolidated Copper Company at Ruth, Nevada, for a good many years, is now located at San Pedro, New Mexico.

'11.

Frederick Engle has accepted the position of chemist for the U. S. Smelting Company at Checotah, Oklahoma.

'12.

L. M. Banks visited Arizona before his expected departure for Chili. While in Arizona Banks decided not to leave this country and accepted the position of agent for the Grand Leasing Company at Metcalf, Arizona. Box address 301.

Nelson S. Greensfelder, whose Colorado Springs address is 311 East Willamette street, spent the holidays at his home in Kirkland, Mo.

Arnold W. Harris has left Hurley, New Mexico, and his address is now 1019 Hobart building, San Francisco, Calif. He is with Bradley, Bruff and Labarthe, Designing and Construction Engineers.

Charles R. Hill and Andrew J. May, Jr., are leasing at Breckenridge, Colo.

Miss Eleanor Ruth Chase Schellenberg arrived at the home of Mr. and Mrs. Gustave William Schellenberg, 919½ Twenty-first street, Sacramento, California, on December 20, 1916. Note Schellenberg's change of street address.

Albert L. Toenges has accepted the position of Mining Engineer for the Mine La Motte Company, at Mine La Motte, Madison County, Mo. Mine La Motte is the oldest mine in the United States, and is twenty-six miles by road from Flat River, Mo. Toenges's address will be Fredericktown, Mo.

'13.

Frank A. Downes, who is assayer for the Aurora Consolidated Mines Company in their big cyanide plant at Aurora, Nevada, spent the holidays with his mother and sister in Greeley and Golden, calling at the School several times after Christmas. Downes expected to return to Aurora about January 8th.





Harvey Mathews.

Harvey Mathews and Miss Leuella Danford were married at the home of the bride's parents, Mr. and Mrs. C. M. Danford, in Arvada, Colorado, Monday, January 1st. Mathews is on a vacation from Nicaragua, where he has a good position at the Bonanza Mine, N. C. & L. Co., at Prinzapalca. F. A. Downes, '13, was best man at the wedding. The young couple expected to sail for Bluefield, Nicaragua, the first week in January.

John F. Myers spent several days in Denver and Golden the week of December 11th. Myers has had charge of the zinc flotation experimental work for the Empire Zinc Co., at their experimental plant at Canon City.



Benjamin A. Rusman.

Benjamin A. Rusman and Miss Fay Lodge, of Tooele, Utah, were married on Thanksgiving Day at Farmington, Utah. The young couple managed to keep it quiet for about two weeks.

J. Sterling Place completed his contract with the Braden Copper Co. at Rancagua, Chili, and on December 1st assumed the

position of Chief Engineer for the Compañia Estanifera de Llallagua, Llallagua, Bolivia, South America. His address is as above. Place has been with the Braden Copper Co. since October, 1913, and acted successively as Head Sampler, Engineer and Assistant Mine Foreman. Place ends his letter as follows:

"I am surely glad to read that the School is doing so nicely, also that the fellows who represent that institution are all enjoying success in their profession.

"With best wishes and lots of success to our new president, Mr. Parmelee, and all the Faculty. Also good luck to all the boys, and more than luck to the Class of '13, I am,

"Yours very truly,

"J. STERLING PLACE, '13."

L. G. Trueheart is at Metcalf, Arizona.

Peter A. Young called at the School December 27th. He spent the holidays with his relatives in Denver. Young is with the U. S. Gold Corporation at Sugar Loaf, Colo.

'14.

Merritt Hutton, who is Chief Engineer for the Rembrandt-Peale interests, with headquarters at St. Benedict, Pa., called at the School December 26th. Hutton has twenty-five coal mines to look after with a combined output of over four million tons a year.

Mrs. Gertrude Turner is enjoying a visit from her son, John H. Turner, who arrived December 25th from Bolivia. Mr. Turner left the head of the Tipuani River on election day, and in spite of the fact that he made good connections, was until Christmas day completing his journey to Golden. He has been in Bolivia two years and two months, completing his contract with the Bolivia Gold Exploration Company. For some time he was superintendent of the property, his place, when he resigned, being taken by Ethelbert Dowden, also a former Mines man. George W. Schneider, '94, is general manager of the property, a big placer proposition.

'15.

J. H. Greenwood's address is 531 First avenue, Salt Lake City, Utah.

Henry W. Kaanta has left Telluride, and his address is now Bingham, Utah.

Jay J. Burns, care of Vernon Mining Company, Ironton, Colo.

'16.

R. M. Fullaway is Superintendent of the Dewey Mine at Gazelle, Siskiyou County, California. The Dewey Mine has been reopened after a shut-down of ten years. Electric power has made it possible to operate again. It is a gold property, with a ten-stamp mill, a concentrating plant and a leaching plant.

By mistake we gave Murray E. Garrison's new address in Butte, Mont., as on Glenarm instead of Galena street. His correct address is 415 West Galena street, Butte, Mont.

M. M. Levy is at No. 44 Fairmount Apartments, Salt Lake City, Utah.

Roy H. Miller has moved to 209 East Third street, Anaconda, Mont.



# COLORADO SCHOOL OF MINES

## MAGAZINE

Vol. VII.

GOLDEN, COLO., FEBRUARY, 1917.

No. 2

### Adequate Acreage and Oil Conservation†

By Max W. Ball, '06; U. S. Bureau of Mines.

#### Universal Use of Oil and Gas.

It is not necessary, before this Congress, to emphasize the necessity for careful conservation of our oil and gas supply. By January 1, it has been estimated, there will be 3,000,000 automobiles in use in the United States. More and more the American merchant depends on gasoline to deliver his goods; the American farmer to pump his water, plow his fields, and carry himself and his crops to town. Fords multiply and cover the earth. Very likely petroleum takes you to the office in the morning and takes you home at night. If it does not furnish the power it lubricates the bearings. In the evening it takes you and your family for a spin along streets lighted by natural gas or gas made from petroleum. It heals the burn you got from the engine, cures the baby's croup, and furnishes the family with chewing gum. Mr. Northrop, of the Geological Survey, has pointed out that every American industry is dependent in greater or less measure on petroleum or natural gas; and indeed can you imagine modern life without gasoline, kerosene, vaseline, fuel oil, or lubricants?

Should it become necessary to defend our American life and American ideals against a foreign foe the first line of defense will be dependent on oil for fuel. All of the modern war-craft are being built to burn oil exclusively. I recently heard a naval officer say, "Yes, oil is more expensive than coal, but so is smokeless powder more expensive than black, and we might as well return to one as the other."

#### Limited Supply.

How great is our supply of these substances on which our daily life so much depends? An estimate furnished Congress by the Secretary of the Interior, early in the present year, based on the most complete data in possession of the government, gives the amount of oil remaining in the ground as perhaps, 7,704,000,000 barrels. Independent estimates made about the same time by Ralph Arnold and Mark L. Requa do not

differ widely from this. The figures at first glance seem enormous, but they represent less than 29 years' production at last year's rate.

This does not, of course, mean that in 29 years our oil fields will be exhausted. As exhaustion approaches, production will be slower and slower. Oil from Latin-American fields is already entering our markets. As soon as prices warrant, the great oil-shale deposits of Colorado, Utah and Wyoming will be made to yield petroleum and its products. Thus there is little danger that by 1945 the oil fields of the United States will have been exhausted and abandoned, but there is grave danger that by 1945, and in fact long before, we will be paying the increased prices consequent upon increased cost of production from depleted fields, transportation from foreign countries, and mining and treating deposits from which the oil must be distilled.

#### Necessity for Conservation.

It is evident that here is a resource the use of which is rapidly increasing, the dependence upon which is well-nigh universal, and the readily available supply of which is limited. There could be no situation calling more clearly for prevention of waste, economical production, and careful use—principles of wise development and proper utilization which we comprehend by the word "conservation." If the American people have need to practice conservation with regard to any natural resource, it is with regard to their supplies of oil and natural gas.

#### Enormous Quantities Wasted.

Are we practicing this conservation? Within the last few weeks I have seen millions of cubic feet of natural gas wasting into the air—gas so rich in gasoline that it dripped from the trees like an April shower. I have seen wells capable of yielding 40,000,000 cubic feet of gas each, being deliberately drowned out by pumping water into the gas sands. Reckless drilling, defective casing, careless plugging are flooding great areas with water and losing forever enormous quantities of oil. It has been testified before the Corporation Commission of Oklahoma that ordinary methods leave from 25 to 85 per cent of the oil in the ground, and this estimate is concurred in

† Address delivered at Nineteenth Annual Convention of American Mining Congress.

‡ Paper by John D. Northrop, read before Convention of Oil and Gas Producers' Association of West Virginia, 1915. See Petroleum Age, October, 1915, page 6.

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Forms and Proximate Causes of Waste.

If we feel these losses in the high prices of the present day, how much more will we feel them ten, twenty or thirty years from now? Is it not time we considered them seriously and tried to determine upon some remedy? Suppose we begin by studying in a little more detail the nature and forms of waste and the proximate causes.

Hasty Drilling and Production Methods.

What is the usual history of an oil field? Someone drills a wild cat well and discovers oil. Immediately a horde of companies and individuals rush in, leasing every tract in the neighborhood of the discovery. Conservatism, competition for leases, and a general public sentiment against large holdings result in the fields being cut up into small tracts. Then everybody starts to drill at once, as fast as he can. Smith knows that unless he reaches the oil and before Brown, who is drilling just across the line, Brown will draw some of the oil from under his land. On the other three sides are Jones, Mulder and Standard Oil, each drilling as many wells as he can get tools for, and Smith must race them all, well for well. If he doesn't he might as well quit and

At last he drills into the oil sand, about two screws ahead of Brown, Jones, Snider and the Standard, and finds that the oil is accompanied by gas at high pressure. Now Smith is no ignoramus. He has studied the habits of oil and gas wells. He knows that it is the gas which drives the oil from the sand into his well and forces it to the surface. He knows that if allowed to flow without restriction the gas will exhaust first, leaving much of the oil in the sand. He knows that by restricting the flow he can considerably increase the total flush production of oil. This is the course he would like to follow, but he knows that if he restricts the flow of his wells Jones and the rest will allow theirs to flow unrestricted, and he will be drained of some of the oil that is rightfully his. Brown, Jones, Snider and the Standard each looks at it the same way, and as a result the wells of the field flow wide open, the gas pressure in the oil sand is soon exhausted, and the recovery of the remaining becomes an increasingly difficult and expensive, if not impossible, operation.

About this time the wells of the field begin to make water with the oil. Jones is sure that Smith's hasty setting of the water string was defective, and that water has leaked through to enter the oil sand. Smith is equally sure that the leakage is in Brown's or Jones' well, and Brown is certain that Snider or the Standard is guilty. The chances are that each of them is right, but the great outstanding fact is that the field has been ruined, and that the public has been permanently deprived of thousands of barrels of its oil.

McMurry, W. P., and Lewis, J. O., Bureau of Mines Technical Paper, 119, 1916.

### Demoralization of Market.

So much for the drilling side of it<sup>1</sup>. Let us turn to another side. It is fair to assume, based on the history of the industry, that when the first well is brought in in this field the market is already fairly well supplied with oil. A market for the oil of the new field must, then, be found or created, and this is a task which, if the general oil market is not to be demoralized, must be accomplished slowly. The new field should, therefore, be brought in gradually, a well at a time, as the market is built up for it, the oil being left in the ground until it is needed. The necessary pipe-line facilities would be installed in advance of any great production, little storage would be required, the operator would receive a fair price for his oil, and the drilling wastes already cited be reduced to a minimum.

Is this the way it works out in general practice? Not much! Smith has only a small lease. He must produce his oil as quickly as possible or lose it. Brown, Jones, the Standard, and the hundred and one other operators in the field are in the same fix. Everybody gets his oil out as fast as he can. He has to. As a result, the maximum production of the field is thrown on the market practically all at once. If the field is an extensive one the result can only be a demoralization of the market, with inadequate prices to the operators not only in this field, but throughout the region, and perhaps throughout the country.

### Premature Abandonment of Small Wells.

At first thought this lowering of prices would appear to be a good thing from the consumer's standpoint, but let us look a little further. All over the older fields are hundreds of wells which once were big producers, but which have now dropped down near the lower limit of profitable production. One of these wells will produce but a small amount daily, but its aggregate future production, if properly handled, may run into thousands of barrels. The total production from this class of wells is large, but if the price of oil drops the margin of profit in their operation is wiped out and the wells are abandoned. In most cases the abandonment is permanent, the wells are ruined, and the oil remaining in the ground is no longer available except at prohibitive cost.

### Inferior Uses of Oil.

Let us consider another effect of lowered prices. There are many uses for which coal and oil are equally adapted. The supply of coal in the United States is immensely greater than that of oil. To burn oil for a purpose for which coal is equally adapted is an enormous waste. Yet that is what is done whenever the price of oil falls so low that it is cheaper for these inferior uses than coal. And this is not the worst of it.

<sup>1</sup> For actual examples of these wastes see Bureau of Mines Technical Paper, 130, by W. F. McMurray and J. O. Lewis.

When the price of oil falls abnormally low as it did a year and a half ago, vast quantities of crude oil are burned as fuel without separating out the gasoline, kerosene, and other lighter constituents. Think of it! Burning oil under boilers without taking out the gasoline. Yet whenever prices are so low that it is cheaper to burn the crude than to refine it, the crude will be burned and the gasoline lost. Thus in the long run the result of these lowered prices is to increase the average price of oil and its products.

### Storage Losses and Storage Charges.

Nor is the demoralization of prices the only result of suddenly throwing the maximum production of a field onto the market. Perhaps when the discovery well is brought in the pipe-line facilities of the field are inadequate; perhaps there are none at all. Can our friend Smith wait until transportation becomes available, leaving his oil in the sand, the storage nature provided for it? If he does he stands a chance of never getting it, for his neighbors will have it. No, he has no alternative. If he wants his oil he must bring it to the surface and store it as best he may until he can sell or transport it. If he sells, the purchaser probably stores, waiting for a market and the inevitable rise in price. Thus most of the field's maximum production goes into storage—steel tanks if they are available, earthen reservoirs, if nothing better can be had—down the creek in too many cases. I have already pointed out what waste this means under even the most favorable circumstances; how Cushing crude lost approximately a fifth of its gasoline in steel storage; how California is estimated to lose a fourth the value of her oil through evaporation; how one large company lost 6 per cent of its stored oil from lightning. And there is another angle to this matter of storage. It costs almost as much to store oil in steel tanks for a considerable period as it does to obtain the oil in the first place. Think that over for a moment, and figure out who pays that storage charge. You know that neither the producer, nor the pipe-line company, nor the refiner, nor the jobber, pays it, but that it falls on you and me and the rest of the consumers.

### Unnecessary Wells.

While we are talking of charges against the industry, let us consider another and very heavy charge. We have supposed that Smith owned a small acreage, and that he is a man of keenness and foresight. Studying the character of the oil, the porosity and dip of the sand, and the gas pressure, he concludes that three wells, properly placed, will obtain all the recoverable oil from his lease. He knows also that a dozen wells will drain the tract far more quickly, though at four times the expense. He would like to produce his oil in the economical, careful way, but across one line is Jones, across the other Brown, and to north and south are

Snider and the Standard Oil Company. Each has considered the same problem, each has competitors on every side, each is drilling as many wells as he can as fast as he is able. Smith doesn't consider long. He gets a dozen strings of tools dropping as soon as his finances let him. Of course, the oil costs four times what it should, but so does everyone else's oil in the field, the general price is correspondingly high, and whoever buys the oil pays the extra expense.

Do not think this is an overdrawn picture, or that the item is a small one. Just have a look at this diagram of the famous Glenn Pool of Oklahoma, taken from hearings before the Senate Committee on Public Lands, January 12, 1915. It shows that the total cost of drilling in the Glenn Pool was \$11,250,000, and estimates that all the oil could have been obtained for \$3,177,000; a useless expenditure of \$8,073,000. Is that a negligible item? Is that the way the public's necessities should be produced? Eight million out of eleven millions expended uselessly! Three hundred and fifty-four per cent of what it should have cost! And who do you suppose paid the extra 254 per cent? Do you think for a minute that the companies that drilled those extra wells paid for them in the long run? Of course not! Those wells were paid for by the man with a machine, or a gasoline pump, or a farm tractor, by the laborer whose home is lighted by kerosene.

#### Fundamental Cause of These Losses.

These are some of the ways in which oil and gas are being wasted, some of the reasons why petroleum products are high in price. Let us see if we can discover in them some fundamental cause, some condition that may be remedied.

The first thought that suggests itself is that the operators must be grossly ignorant or grossly careless. Perhaps this is in a measure true. Smith should have had a pump and a slush-pit ready to mud off the gas and water sands he encountered. But does this go to the root of the matter? Why was Smith in such haste to start that he had neglected these precautions? Why wouldn't he wait for the equipment when he found he needed it? Because he feared his neighbors would drain his oil. Yes, and why was this an ever-present, driving fear? Because he held only a small tract. There we have it, gentlemen! There is the root of the whole trouble—the small holding. Let us go back over the history of the field.

We saw that as soon as the field was discovered it was leased up in small tracts. Then we saw the Smiths, the Browns, the Joneses and the Standard Oil drilling for dear life, each trying to get the oil from under his little tract and a bit of the other fellow's before the other fellow could get it. Why? Because each tract was so small it could be drained by wells on the surrounding tracts.

We saw that the race was so keen that

wells were improperly drilled, that gas was allowed to waste into the air or dissipate itself through barren formations, that water was allowed to enter the oil sands, and that great quantities of oil were left underground, never to be recovered. Why? Because the small holding forced each man to race with his neighbor.

We saw the entire flush production of the field thrown on the market at once, demoralizing market prices, forcing the premature abandonment of wells in other fields, resulting in the burning of unrefined crude and the waste of the more valuable products. We saw the maximum production of the field go into storage, where the losses from evaporation and fire were enormous, and where the cost of the oil was nearly doubled. What caused these things? The fact that every holder of a small lease must drill it up as soon as possible.

Lastly, we saw the cost of production more than 300 per cent what it should have been. And what was the reason? That every man must drill his lines as fast as might be, and must completely drill up his land at the earliest moment. Why? Because the oil under his small holding could be taken from him by wells on surrounding tracts.

Ignorance there may be, carelessness there undoubtedly is, but back of ignorance, of carelessness, of reckless, headlong methods is the real cause—the fact that the average holding is so small that speed is the owner's sole protection. Let him be careful if he can, let him be economical if he can find a way, but careful or careless, reckless or conservative, he must be speedy if he would survive. The small holding is his master.

#### The Remedy—Adequate Acreage.

Here, then, we have isolated the cause. Have we not at the same time discovered the remedy? If the small holding has brought the wastes and losses of the oil industry, will not adequate acreage cure these evils? Let us go over them again.

If Smith's lease is large enough so that he does not fear draining by Jones or Brown or Snider, he will undoubtedly drill more carefully. When he encounters the high-pressure gas sand he will mud it in, where it can be drawn on at some time in the future when it has a commercial value. He will mud in the water sand also, and none of the wells of the field will be flooded by infiltrating water. When he finds gas in the oil sand he will restrict the flow so that the maximum amount of oil may be brought out by the gas, the life of the well be prolonged, and its yield augmented. Thus the main dangers of waste in the drilling and handling of the wells are eliminated.

If the holdings in the field are of adequate size, Smith will not fear Brown, nor Brown, Jones. The field can, therefore, be brought in gradually, building up a market for the production as the production is in-

creased. There is no demoralization of market prices, no premature abandonment of wells in other fields, no burning of unrefined crude, no letting of oil go down the creek, no storage of huge quantities, no great evaporation or fire losses, no tankage charges.

Finally, if the holdings are of adequate size, the number of line wells will be reduced to a minimum, and there will be no inside wells drilled from fear of drainage. The drilling cost will be little if any above 100 per cent what it should be, instead of more than 300 per cent.

Do you think these views of the benefits of adequate acreage are too rosy? Not long ago I had the pleasure of visiting first Cushing, a typical small-holding field, and then Augusta, Kansas, the major part of which is held in large blocks. You know the history of Cushing; how it was thrown on the market almost over night, how the bottom dropped out of oil prices, how millions of cubic feet of gas went to waste, how millions of barrels of oil went into storage, and how the production suddenly fell off nearly 70 per cent. At Augusta physical conditions do not differ greatly from those at Cushing. The average wells of each field do about the same. Both have areas of great gas production. Around the outskirts of the Augusta field are small holdings, and here Cushing conditions may in time be duplicated. But with these things the resemblance between the two fields ceases. In the large-block part of the Augusta field I saw no gas going to waste, no huge quantities of oil in storage, no feverish drilling activity. I gained an impression of order, of care, of efficiency and business-like methods. And then, to show that the difference is not a matter of locality or State law, I stumbled onto a small holding, a church yard of perhaps ten acres, and there the derricks fairly jostled the tombstones.

I found some people in Augusta who complained because, although the oil field has brought the town prosperity, it has brought no such boom as other places have known. A dealer in acreage was very bitter. "It's all because of large holdings," he said. "If this field had been cut into small tracts like Cushing, it would have been and gone long ago." I agreed with him.

#### Arguments Against Adequate Acreage.

Is it monopolistic?

Falling to get from the Augustans any farsighted arguments against adequate acreage, I have tried to find some for myself. In the first place, large acreage somehow sounds monopolistic. I find that wherever I talk acreage someone holds up his hands and says, "Oh, but that would be creating a monopoly." But would it, now? What is a monopoly? According to Webster it is "the sole power of dealing in any species of goods, or of dealing with a country or market." Giving a man a large instead of a small oil lease certainly doesn't grant him

any such "sole power" as that. The New Standard Dictionary gives a similar definition and adds, "especially \* \* \* such control of a special thing, as a commodity, as enables the person or persons exercising it to raise the price of it above its real value, or above the price it would bring under competition." Now it is easy to see how granting a man a lease on all the oil lands in the United States, or in some part of the United States, or of all the oil of a particular grade in a given region might be giving him a monopoly as thus defined, but it is difficult to see how giving him an adequate lease in any given field would bring him within the definition. He could not raise the price above the real value, or above the price the oil would bring under competition, for he would be in direct competition with oil produced from similar leases in other fields, or in the same field if the field were a large one.

Perhaps the idea that adequate acreage tends toward monopoly is based on a belief that each small lease represents the entire holdings of a company or individual in a given field. Of course this is not the case. In the major fields a company holds a tract here, another there, a third yonder, a fourth, fifth and sixth beyond. The trouble is not that the acreage held by one company is too small, but that it is broken up into such small units, instead of being in a compact block. If each company operating in Cushing had held all of its acreage in a single unit, the history of the field might have been radically different, with no harrowing tales of waste and losses.

#### Does It Eliminate the Small Operator?

If we have laid the monopoly ghost, let us turn to another and more real objection to large acreage—that it eliminates the small operator. But does it? To my mind it would tend to eliminate the very small operator, but not the operator of moderate resources. The competition for leases would probably be less of a cutthroat struggle if the leases were larger, and the acreage price would perhaps be less. If so, the operator of moderate resources could swing a larger lease than he can now, particularly in view of the fact that he could handle his lease more economically after getting it.

Before we expend any sympathy on the very small operator who might be lost in large-unit operations, suppose we consider his present status. How many of him do you think get a foothold in any field of consequence? Very few indeed. And what happens to those who do? When the field is flooding the market and tankage is high, they cannot afford to buy or lease storage. They must produce their oil; they cannot care for it after it is produced. Talk about your upper and nether millstones!

What do they do? Sell their leases for a song to some big company with plenty of tankage, or, if not forced quite so far, sell their oil to the company at prices that do not

cover the cost of drilling the wells. That is the way the small-acreage system encourages the small operator. How many genuine little fellows, for example, got rich in Cushing?

Then there is another angle to this small-operator question. Suppose for the moment that adequate acreage will put him out of business. Can we afford to continue wasteful, careless, extravagant methods for the sake of giving him a job? After all, whose interest is paramount, that of the public or that of the small operator?

#### Will Regulation Accomplish the Same Results?

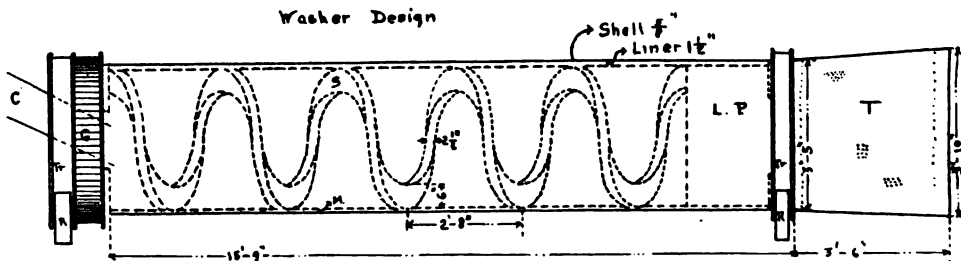
There remains one point to be considered: Can the same results be accomplished by some other means? How about laws and regulations against waste? I believe thoroughly in such legislation. In Oklahoma the supervision of Indian lands by the Bureau of Mines and of commercial lands by the Corporation Commission has proved beyond a doubt that proper drilling methods can be enforced and enormous waste prevented under proper laws, but there are certain things which it is hard to reach by administrative regulation; such, for example, as the drilling of too many wells, racing along property lines, premature production, storage losses, and the like.

There is another phase of the regulation matter which to me seems important. It

is much easier to regulate a man's business if your regulations run with, rather than contrary to, his economic interests. When economic necessity goes counter to regulation and statute, the operator can be depended upon to find some way to avoid the regulation and nullify the statute. And whenever it becomes profitable for the operator to prevent waste he can be depended upon to do so without compulsory regulation.

#### Conclusion.

Hear, then, the conclusion of the whole matter. If you would prevent waste of oil and natural gas, if you would do away with careless drilling methods, excessive production charges and storage losses, if you would insure the production of the maximum amount of oil at the minimum cost, if you would help to maintain a reasonable price for petroleum and its products in the years to come; then do your part in creating a public sentiment in favor of adequate acreage. You may not find it a popular propaganda just now. You will doubtless be accused of advocating monopoly and probably branded as a corporation partisan. But if you take one step toward imbedding the acreage idea in the popular mind, or incorporating it into State legislation, or embodying it in oil-field practice, you will have assisted in conserving the oil and gas deposits of the United States, and will have rendered a valuable public service.



#### WASHER FOR WET, CLAYEY ORE, WITH ROCKS 6" TO CLAY 200 MESH.

L.P.—4 Lifting Plates to lift rock to height of discharge opening.

C.—Feed Chute. Mill Solution is added here as well as in the bin above discharge chute.

S.—Spiral cast in sections with Liner M. Intake 1' 4", discharge 1' 9" diameter.

T.—Trommel with holes  $\frac{1}{2}$ " inside diameter and 9-16" outside diameter.

Tr.—Trunions resting on rollers R.

R.—Rollers, two each end.

M.—Side Liner cast in sections with Spiral.

G.—Gear.

Capacity 20 tons per hour for clean product.

Mill Head (washer feed) 35%—2 mesh. Instead of the lifting plates at discharge end could have discharge the full diameter of washer and make height of spiral 8" instead of 6".

The Trommel should be about 5' long for

clean product. Present length gives fair product.

Oversize from Trommel dumps onto 14" conveyor 18° slope at speed of 100 feet per min. too much solution is carried up. Should be 24" conveyor at speed not over 80 feet per min.

RPM, 12; HP, 8. Total cost, including repairs, \$0.05 per ton.

The washer delivers a clean product to grizzlies, crushers and ball mill and removes fines from the ball mill feed. It has reduced our operation costs twenty per cent. I think that the idea of a simple spiral for a washer is a new one. The credit for the idea is due to Mr. H. C. Wilmot (former manager) and Mr. T. R. Hunt, '05. Mr. Hunt worked up the design.

The washer has been in steady operation since January, 1916. The rollers need changing every four months. Other repairs small.

L. L. PULLEN, '10,  
Mill Superintendent, Syndicate Mining Co.,  
Arroy, Masbate, P. I.



## Mining Investments\*

By Prof. G. M. Butler, '02, Dean of College of Mines and Engineering, University of Arizona.

The prevailing high prices of metals has led to such a boom in mining that the newspapers are filled with advertisements offering mining stocks for sale at such low prices and with the promise of such large returns to the investor that many people have been sorely tempted to invest hard-earned savings in such ventures. This temptation is strengthened by the repetition of numerous stories concerning people who have within the last year or two won considerable sums by "taking a flier" in mining stocks; and it is to be feared that serious losses will be reaped in the near future by many who can ill afford them. That some of the offerings now being made in the newspapers have merit, is undoubtedly true; but it is equally true that many, perhaps the majority, are purely "wildcat" schemes which can yield profits only to the promoters or through stock manipulation. It seems likely, therefore, that some advice from one who is deeply concerned in promoting the best interests of the mining industry will interest those now inclined to yield to the temptation just mentioned, especially school teachers of whom the writer is proud to call himself one.

In the first place it should be understood that an investment in mining stocks is in most cases purely a speculation, not an investment. It is safe to look with distrust upon anyone who offers a "gilt edge" or "absolutely safe" investment in mining stocks. There may be a few coal, iron, or copper stocks which fall in the category just mentioned, but these are the exception rather than the rule, and do not offer high enough returns to be very attractive. Outside of these, all mining or oil and gas operations contain an element of chance—enormous in some cases and small in others.

Most mines are so highly capitalized and such a large proportion of the proceeds go to the original owners or promoters that the profits from their operation must be enormous in order for a small investor to receive dividends which will repay him for the chances taken when investing in their stocks. It is true that market manipulation may cause the price of a stock to rise to high figures even when the company issuing it has a property of doubtful value which is unproductive and whose future is wholly problematical. That this will be true in the case of any given stock can rarely be foreseen by the small investor unless he is in a position to gain "inside information." Whoever purchases mining stock in such a property without this inside information is gambling just as much as is he who

stakes his money on the turn of a card or a wheel. If one is willing to take the risk involved, and has no moral scruples against such actions, he may make more money than from years of work at his profession or trade, but he ought to go into the venture with his eyes wide open, and realize the conditions bearing upon his speculation.

For the reasons just given, it is usually foolish, or worse, to put money which one cannot afford to lose into the purchase of mining stocks. If such a loss will mean hardship to one's family, this procedure cannot be too highly condemned. If, however, one has saved a small sum, the loss of which can be regarded philosophically, it is perhaps just as well to invest it intelligently in mining stock as in any other of the myriad "get-rich-quick" schemes which flood the market. In order to invest intelligently in mining stocks, one should give careful consideration to the following suggestions:

Do not believe what anyone says about a prospect or mine unless he be a man of unquestioned integrity and ability and one with a knowledge of the business of mining. The officers of a company should be carefully considered, special importance being placed upon their reputation for square dealing. The mere fact that they are wealthy men should have little bearing upon one's conclusions, since, unfortunately, wealth and honesty do not always go hand in hand.

No property is worthy of consideration by the small investor unless a competent mining engineer has reported favorably upon it. Unfortunately there are many men who call themselves mining engineers who have no rightful claim to this title. The mere fact that a man has mined successfully does not make him a mining engineer. In fact, few men who have not had a long and thorough training along geological lines are competent to pass upon an undeveloped prospect. Advertisements which have recently appeared in the newspapers contain reports made by men who are said to be well-known engineers in which "dikes of limestone" and "flows of limestone and chert" are mentioned, terms which not only mean nothing to a geologist, but which indicate that the user is wholly unfamiliar with the language of geology, or else is inexcusably careless in its use. Careful inquiry should therefore be made as to the professional standing of those engineers who have examined and reported upon a property in which interest is felt.

It will often pay well to have a competent mining engineer pass upon the prospectus or report of a company before considering the purchase of its stock. This will cost but a nominal sum, and will do much to safeguard the interests of the prospective purchaser.

No one but a competent mining engineer and geologist is capable of determining the merits of a mine. An examination and re-

\* From The Arizona Teacher, Tucson, Ariz., December, 1916, Vol. VI, No. 4.

port made by a business man, no matter how capable he may be in his own line, is worse than useless, since he may readily be deceived into making statements which have little or no basis in fact.

Mistakes commonly made by a non-miner are the assumption that a very few high assay figures make a mine, and that profits are certain simply because the property in which he is interested is near some big producer. In this connection it should be remembered that comparatively rich ore is rarely found throughout a deposit, but occurs therein in shoots or lenses of relatively small size; and that profitable mining is dependent upon the dimensions of such shoots rather than those of the deposit as a whole.

There are very few prospects containing any ore at all in which a few high grade samples cannot be found. It is the probable size, position and average value of the ore shoots that counts rather than the total dimensions of the deposit, or the grade of a few samples taken at a few points therein.

While the copper deposits occurring in this State in other than vein form are often of large size, and are sometimes composed entirely of good ore, it is still true that the grade varies considerably from point to point, and it is the average value of the whole which must be considered, not the grade of the richest parts.

In connection with the statement that proximity to a producing mine should not be given too much weight, it should be noted that hundreds of instances are known where such proximity has meant nothing to the properties immediately adjacent. In fact, the vein which produces good ore for a distance greater than that covered by one mining claim is the exception rather than the rule; and it is notoriously true so far as oil and gas properties are concerned, that a dry well may be drilled very close to a heavy producer or even between two such producers.

While it is a fact that disseminated or contact deposits in the Southwest are apt to be found in any district at all points where the geological conditions are similar, it is equally true that only an unusually well-trained geologist is capable of judging as to the similarity of such conditions.

The somber hue of the picture I have painted is, it will be seen, not due so much to risks inherent in the mining industry itself, as to man's cupidity and dishonesty. It is unfortunately true that deceit is not a new thing in mining. Agricola, writing about 1550, said: "They even state that the scum of the miners exists wholly by fraud, deceit, and lying. For to speak of nothing else but only those deceits that are practiced in buying and selling, it is said that they either advertise the veins with false and imaginary praises, so that they can sell the shares in the mine at one-half more than they are worth, or, on the contrary, they sometimes detract from the esti-

mate of them so that they can buy shares for a small price."

The picture I have drawn has, fortunately, a much brighter side, and it is my desire to call especial attention to it; for nothing is further from my wishes than to discourage investments in mines. By all means become interested financially in the industry if able to afford taking the risks involved. No other line of human endeavor offers greater profits if it yields any at all, and no other industry has the same fascination as mining. One should not forget that there is risk, often great in any form of business. It is claimed that 95 per cent of those who engage in legitimate forms of business fail. The percentage of failures of real mines, not "wildcat" schemes, is certainly much lower than this now, since scientific technical training and the application of business principles to the industry have removed much of the element of wild speculation which once surrounded it.

How, then, can a man become interested in mining with the greatest degree of safety? If tempted to buy a small amount of stock, secure, as already suggested, the opinion of a good engineer concerning the company, and be sure that it is not over-capitalized, and that all the proceeds from the sale of stock will go into the development of the property. Follow the engineer's advice regardless of personal inclination.

Another inexpensive method involves the grub-staking of one or more energetic and experienced prospectors. A prospecting party consisting of one practical miner, and one scientifically trained man with a good knowledge of mineralogy is most apt to be successful.

If one has a few thousand dollars to invest, the best plan is to purchase a controlling interest in a promising prospect after securing a favorable report from a competent and unprejudiced mining engineer and geologist. An examination of this kind will cost several hundred dollars, but this money is well expended. One cannot hope to secure a controlling interest in a developed mine for a few thousand dollars, so, in following this advice, one must accept the risk which always accompanies the exploitation of an undeveloped prospect. If, however, one has been guided by the advice of a good engineer, this risk need be no greater than is involved in an investment in many legitimate business enterprises; and the prospect may yield returns enormously larger than one can hope to secure from any other form of investment.

The best plan of all is for a score or more of people to form a syndicate for the purpose of securing control of and developing several promising prospects. If each member of the syndicate contributes \$25.00 to \$50.00 a month, or even less, it will not be long before a sufficient sum accumulates to permit active search for prospects to begin. One or two experts can then be employed to examine prospects brought to the attention

of the syndicate; and, even if no good properties are found and the syndicate is forced to disband, so much money can be returned to members of the syndicate that no individual will suffer any considerable loss.

If such a syndicate is kept in operation long enough, favorable results are almost certain, especially if two or three promising prospects are acquired, for, if one proves profitable, the gains from it will much more than counter-balance the losses resulting from several failures. By following this plan, a small group of Mississippi Valley teachers cleared \$200,000 in a few years at a cost of \$10.00 per month; while a group of Denver lawyers made millions in this way through operations in Creede and Cripple Creek.

This is virtually the plan followed by the Guggenheims and other great exploration and development companies. It reduces mining to a business involving very little risk, and removes money expended in mining from the realm of wild speculation to that of fairly safe investment.

**MEXICO, SOUTH AND CENTRAL AMERICA OFFERED SCHOLARSHIPS AT SCHOOL OF MINES.**

As a part of the Pan-American policy of the United States, the Colorado School of Mines is offering a free scholarship each year to a student from Mexico and each of the Central American and South American countries. These students will be picked by competitive examinations from the boys of the country.

The scholarships were authorized by the board of trustees of the Golden school at its last meeting and the ministers of public instruction in the various countries have been notified.

In making the offer to the ministers, President Parmelee says: "The Colorado School of Mines is led to offer this scholarship in the belief that it will advance the cause of mining education and will also provide for the more intelligent exploitation of the mineral resources of the American continent."

The student must be a young man of good character, directly interested in mining engineering and must have suitable preparation in mathematics and science. The scholarships will save the students about \$200 per year.

**STATE SCHOOL HEADS AGREE ON MILL LEVY.**

**New Plan Will Do Away with "Panhandling" in the State Legislatures.**

The School of Mines has entered the agreement with the other schools of the State in regard to finances and appropriations from the legislature. This agreement is characterized by leading Colorado citizens as the "best educational program that has ever been attempted in Colorado."

The program as outlined calls for a regu-

lar mill levy for maintenance needs of the State schools and an additional mill levy for the building needs. It makes the schools more efficient and does not force them to beg successive legislatures for sufficient funds to keep alive.

In the past the various needs of the schools have been taken care of by direct appropriation, and it has often been the case that this appropriation has had to be cut at the last minute because of lack of funds. The new program, which is to continue for a period of ten years, gives the schools an assured income. The representatives of all the schools have united on the plan and it is likely to go through the legislature.

This plan will not go into operation until the present year's taxes are collected, however, and in the meantime the schools of the State need funds for current maintenance. These needs will be taken care of by the regular appropriation bill for each school.

The .22 of a mill increase for maintenance purposes would be apportioned as follows: University of Colorado, .08 of 1 mill; Agricultural College, .06; State School of Mines, .02; Teachers' College, .04; Gunnison Normal School, .02.

The combined increase as proposed by the plan would be .72 of 1 mill, raising something over \$800,000 annually on the present valuation, and providing an increase of approximately \$300,000 for maintenance in addition to the \$500,000 building fund. The total millage for State schools under the new plan would be 1.37 mills, or \$1.37 on \$1,000 valuation.

Schenectady

;New-York

Feb -18-1916

Dear Sur-see yourAd up here in papers and thought i; would answer it just to seeif it is still open for the right mani have had about -12; years experens at light; work and think i can take car of your job all right about all of my experens has been on banken transformers that is banken to for ;110-and-220vol and all so banken tree transformers for -110- 220-and;440 can take car of motors at all tims and keep down all trubbells know all about arks and so on and i am a-all a round line Foremen in side and out and can keep work up as it ought to be for i have work on all good jobs

Was foremen in thous places Des ;moines

-iowa Salt -lake city utah-

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steel plant Pokettello -ideaho-syracuse

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Wellit dont make about that part as long as ican du Your work to cut short i been around summ at that work

Schenectady -

new-york

(The above application was actually received by one of our graduates in answer to an advertisement for an electrician.)

# Colorado School of Mines Magazine

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#### THE NEW CATALOG.

Volume twelve, Number one of the Colorado School of Mines Quarterly is the Catalog Edition; the first catalog that has been published for several years. Among the changes to be noted in the new catalog is the offering of an optional five-year course for students who can afford the time to do so, or who are unable to successfully carry the fairly heavy four-year course. This change will probably cause more or less discussion. Many of the students look upon it as an attempt to practically abolish the four-year course.

Another change that has been taking place in recent years is the great increase in the number of scheduled courses. The first impression of an old-timer would be that there must be a great increase in the amount of ground covered, but on closer examination it will develop that most of these numerous courses are only given one or two hours a week and are really only divisions of the old principal subjects spread out thin to cover a semester or whole year. From the standpoint of efficiency, at least, this system of teaching certainly invites discussion and possibly criticism.

The catalog has been well edited and the arrangement is good. The index is complete and thoroly cross-referenced. Because of its size and cost, it has not been mailed to the regular quarterly list, but will gladly be sent to any one requesting it, either of us or directly of the School.

Send for a copy and tell us what you think of it, whether you are in favor of the changes or not.

#### THOSE NEW YEAR RESOLUTIONS

Have been so universally adopted that the assistant secretary-treasurer has nearly developed writer's cramp making out receipts. However, you need not let this deter you from adopting them yourself, as the above mentioned a. s. t. is didexterous and can sign his name equally poorly with his left hand.

#### IT PAYS TO ADVERTISE.

Write articles and send them to the Magazine for publication. Of course if you send them to the larger technical journals you may get from ten to fifty dollars apiece for them, but they will reach a wider circle if first published by the Colorado School of Mines Magazine.

This statement may sound foolish, but it is true nevertheless. Here is the reason: No technical journal considers our magazine as a financial rival and therefore does not hesitate to reprint any original article of value we may publish, and give us credit.

Practically every original article we have printed since the Magazine was started has been republished in from one to ten of the leading technical journals, depending on its originality and value.

Send us that article first. The ultimate wider circulation will be of more value to you than the few dollars you may get for it elsewhere.

#### TRUE AMBITION.

There are plenty of maxims about success

And they're most of them good to know;

They preach the gospel of toll and stress

And of keeping alert, aglow.

But this is the motto that's best unfurled

For the youth of the land to scan,

"I have my work to do in the world,

And I'll do it the best I can."

It may not bring you to wealth or fame

Or the cheers of the fickle mob;

But it means you're certain to "play the  
game"

And tend to your daily job.

And though no wreath on your brow be  
curled

You'll be one of the worth-while clan

Who have their work to do in the world

And do it the best they can.

And whether you're trapper or district supe

Or miner or engineer;

Or whether you sit in the pay clerk's coop

Or a mule train's yours to steer,

Make this the slogan that you've unfurled

And hold to it hard, young man,

"I have my work to do in the world,

And I'll do it the best I can."

I should like to rule over men and things

As the greatest of leaders do;

But whatever fortune the future brings

I would like to have this true,

That men will say, as the dirt is hurled

On my coffin, "He made good,

For he had his work to do in the world,

And he did it the best he could."

—Berton Braley, Coal Age, Dec. 16, 1916.

## Conference Schedules, 1917.

### BASKETBALL.

- Jan. 19—C. A. C. vs. Wyo. at Laramie.  
 Jan. 20—C. A. C. vs. Wyo. at Laramie.  
 Jan. 26—C. S. M. vs. U. C. at Golden.  
 Jan. 27—C. C. vs. C. A. C. at Fort Collins.  
 Jan. 30—D. U. vs. C. S. M. at Denver.  
 Feb. 2—C. A. C. vs. U. C. at Boulder.  
 Feb. 3—C. S. M. vs. C. C. at Colorado Springs.  
 Feb. 6—C. S. M. vs. D. U. at Golden.  
 Feb. 10—C. A. C. vs. Wyo. at Fort Collins; U. C. vs. C. S. M. at Boulder.  
 Feb. 12—D. U. vs. Wyo. at Denver.  
 Feb. 13—C. S. M. vs. Wyo. at Golden; U. C. vs. C. A. at Fort Collins.  
 Feb. 17—C. C. vs. U. C. at Boulder.  
 Feb. 21—C. C. vs. C. S. M. at Golden.  
 Feb. 24—C. A. C. vs. C. S. M. at Fort Collins; D. U. vs. C. C. at Denver.  
 March 2—D. U. vs. C. A. C. at Fort Collins.  
 March 3—C. C. vs. U. C. at Colorado Springs; Wyo. vs. D. U. at Laramie.  
 March 7—C. S. M. vs. C. A. C. at Golden.  
 March 10—C. S. M. vs. Wyo. at Laramie; C. C. vs. C. A. C. at Colorado Springs; D. U. vs. C. U. at Boulder.  
 March 16—C. C. vs. D. U. at Colorado Springs.

### BASEBALL.

- April 14—C. C. vs. C. S. M. at Colorado Springs.  
 April 18—C. S. M. vs. D. U. at Denver.  
 April 21—C. A. C. vs. Mines at Fort Collins; U. C. vs. C. C. at Boulder; C. S. M. vs. C. A. C. at Fort Collins.  
 April 25—U. C. vs. Mines at Golden.  
 April 28—C. C. vs. C. A. C. at Colorado Springs; U. C. vs. D. U. at Boulder; C. C. vs. C. A. C. at Colorado Springs.  
 May 4—C. A. C. vs. U. C. at Fort Collins; U. C. vs. C. A. C. at Fort Collins.  
 May 5—D. U. vs. C. C. at Denver.  
 May 10—C. S. M. vs. C. C. at Golden.  
 May 12—C. A. C. vs. D. U. at Fort Collins; U. C. vs. Mines at Boulder.  
 May 16—C. S. M. vs. D. U. at Golden.  
 May 18—D. U. vs. U. C. at Denver.  
 May 19—C. A. C. vs. C. C. at Fort Collins.  
 May 25—C. A. C. vs. D. U. at Denver; U. C. vs. C. C. at Colorado Springs.  
 May 30—C. A. C. vs. U. C. at Boulder; D. U. vs. C. C. at Colorado Springs.

### FOOTBALL.

- Sept. 29—U. C. vs. Wyo. at Boulder.  
 Oct. 6—Mont. State vs. Denver at Denver; Wyo. vs. Aggies at Laramie.  
 Oct. 13—Denver vs. Colorado at Denver; Wyo. vs. Mines at Cheyenne; Aggies vs. Mont. State at Fort Collins.  
 Oct. 20—Mines vs. Colorado at Denver; Utah vs. Wyo. at Salt Lake City; Utah Aggies vs. Mont. State at Bozeman.  
 Oct. 27—Denver vs. Aggies at Fort Collins; Colo. College vs. Utah at Colorado Springs. Utah vs. Wyo. at Laramie.

- Nov. 3—Colo. College vs. Colo. at Boulder; Utah vs. Aggies at Salt Lake City; Denver vs. Wyoming at Laramie.  
 Nov. 10—Mines vs. Colo. College at Denver; Utah vs. Colo. at Boulder; Aggies vs. Utah Aggies at Logan; Denver vs. Wyo. at Laramie.  
 Nov. 17—Denver vs. Mines at Denver; Colo. College vs. Aggies at Colorado Springs; Utah Aggies vs. U. of C.  
 Nov. 24—Aggies vs. Mines at Denver.  
 Nov. 29—Denver vs. Colo. College at Denver; Colo. vs. Aggies at Fort Collins; Utah vs. Utah Aggies at Salt Lake City.

### SOPHOMORE NOTES.

#### I. M. Charles.

Various final examinations, especially the one in mineral land surveying, resulted disastrously for some of the Sophomores, and there are now only seven straight Sophomores who have no conditions. Wolf has, however, agreed to give all those who "funked" his course a re-examination this semester, so that none should be kept back by this course. Many thanks are due the committee, Mulford, Carr and Sunquist, who interviewed Professor Wolf.

Richardson and Bilhelmer went to Ray, Ariz., together. They both expect to return to school next year.

Dyson has quit school permanently and taken a position with the Hardesty Manufacturing Company of Denver. The following item from the Denver Times of December 7, 1916, explains the situation:

#### Easterne Wins Denver Girl.

"Another interesting engagement is announced today; another Denver girl has been won by an Easterner. Judge and Mrs. Charles L. Allen announce the engagement of their only daughter, Miss Gladys St. Clair Allen to John Carlisle McElroy Dyson, the son of Captain and Mrs. Charles Dyson of Washington, D. C.

"This announcement does not come as a surprise to society. Since Mr. Dyson's arrival here over a year ago he has showered attentions on Miss Allen. No date has been set for the wedding.

"Miss Allen is one of the most attractive members of the younger society contingent. She is a petite brunette and possesses a gracious and natural manner. She attended the University of Colorado and is a member of the Kappa Kappa Gamma sorority. Dyson attended the Colorado School of Mines and is a member of the Sigma Alpha Epsilon fraternity."

Fulenwider, Huleatt and D. L. Jones have not registered this semester though they, like most of the students who leave this school, intend to re-enter. Jones and Fulenwider contemplate attending the University of Colorado, and Huleatt the University of Chicago for this semester.

Keep your mind on your work and so avoid accidents.

**FRESHMAN NEWS NOTES.****Fred L. Serviss.**

Thank the Lord, the finals are over! Nothing much doing in Golden now. During the interim some of us were more or less victims of the system. Not a few suffered abuse from the inside organization. If it is a case of the "survival of the fittest," quite a number survived but do not feel so very "fit!"

The new rules adopted by the faculty without being duly sanctioned by the student body, do not, strange to say, meet with the approval of the latter. No doubt class "cuts" will be out of style before long.

Don't forget your hymn books next Thursday, boys. The strains of "Pretty Baby" will give way to those of "Onward, Christian Soldiers!"

Freshmen are urged to contribute to the "Prospector," the annual which is published by the Junior class of the school. Original articles, poems, drawings, and pictures of school activities are desired. Drop your contributions in the box to be found on the bulletin board in Guggenheim Hall. The box is emptied as soon as full, so that there is always room for more.

The frosh are strong in basket ball. Eight men are in excellent form and are sure to be heard from. Coach Carter is very well pleased with the showing of the first year men and promises great things in the way of basket ball next year.

Don't forget Chapel next Thursday morning at the third hour. The committee will dock you if you don't watch out.

**MISCELLANEOUS.**

Dr. F. W. Traphagen and family, who moved to Georgetown a few months ago, have returned to Golden to make their home.

Arthur W. Stedman of the engineering corps, Company A, has been notified that he passed the U. S. Army examination and was appointed first sergeant in the regular army.

Athletic Director Carter, of the School of Mines, has been named a member of the advisory committee of the American Amateur Athletic Association for swimming and water sports.

A modern automobile engine has been purchased by the School of Mines and is to be set up in the mechanical engineering laboratory to be used for demonstration and testing purposes.

W. S. (Bill) Stringham, football captain-elect, has left school and will not return until next fall. Stringham will endeavor to bolster up his finances in the Joplin mining district and return to Golden for the football season next fall.

Ted Stuart, who was coach of the Mines football team a number of years ago, has been appointed assistant general attorney for the Denver & Rio Grande Railway. He

takes his new office February 1. He served as assistant attorney general under Benjamin Griffith for two years, and for the past four years has been connected with the legal department of the Burlington and Colorado & Southern Railways.

Dr. J. C. Roberts left January 31st for Glenwood and Aspen, where he will give talks on mine safety. This is part of the work which the School of Mines is carrying on in co-operation with the University of Colorado extension work.

A crowd of more than nine hundred people attended the lecture given by Prof. J. C. Roberts at Leadville Friday evening, January 5th. The lecture was accompanied by moving picture films showing conditions in the mining districts of New Jersey, Joplin, Goldfield and Garfield, Utah. The lecture was also given at Red Cliff, Saturday night. At Leadville a Mines graduate, Hugh Watson, manager of the Yak tunnel, was in charge of arrangements, and another grad, Russell Paul, of the Empire Zinc Company, was in charge at Red Cliff. Professor Roberts made another trip to these towns a few weeks later and gave practical demonstrations of mine safety work and first-aid treatment.

**Golf Links.**

Golden will have a golf club if the plans of F. G. Carter, athletic director, and a number of Golden business men go through. Nothing definite has yet been decided, but Mr. Carter has been discussing the feasibility of his plan and has found Golden people enthusiastic about the idea.

"Of course we are planning nothing elaborate or pretentious at this time," Mr. Carter says. "Our course at first would be only six holes, with clay greens. This would serve to get the matter started, however, and interest Golden people in the game of golf."

More than twenty business and professional men of Golden have promised their support to the enterprise. In addition, a number of School of Mines faculty members and administrative officers will enter in with the plan. Students at the school and summer visitors are others who would be interested.

If the plans go through, a lease will be taken on land lying southwest of Golden, south of the Williams highway to Lookout Mountain. The land in its present condition is ideally situated for golf, with numbers of natural hazards. A small sum of money would serve to fit the course with what apparatus is needed. This ground is also conveniently situated.

**Mines Sweaters.**

"M" sweaters for the Mines football men and "1920" jerseys for the freshmen players have been received and awarded to the various players.

# BASKETBALL

R. F. White, '18.

MINES 14—COLORADO 37.

January 26th, Mines Gymnasium, Golden.

COLORADO. POSITION. MINES.

Bersford .....R. F..... Murphy  
 Eastman .....L. F..... Taylor  
 Puyear .....C..... Coulter  
 Harris .....R. G..... Hofius  
 Sears .....L. G..... Bunte

Field Goals—Colorado: Bersford 5, Eastman 4, Puyear 5, Harris 3. Mines: Murphy 1, Coulter 5.

Substitutions — Colorado: Breckenridge for Puyear; Buckley for Eastman; Warner for Harris. Mines: Dunn for Murphy (1) Garnett for Taylor; Miller for Coulter; Lindholm for Hofius; Crispell for Lindholm; Galluci for Bunte.

Referee—Durand of Colorado.

The Miners made the first score and held the advantage early in the game, but toward the latter part of the first half the Colorado Five gained the lead by a succession of long shots and they stayed in the lead throughout the remainder of the game.

Pretty soft for those tall, handsome dogs from Boulder when the ball is under the basket—all the little fellow can do is to jump up and kick 'em in the shins.

MINES 21—U. OF DENVER 35.

January 30th, University of Denver, Denver.

The game was fast and interesting throughout and many spectacular plays were made on the part of both teams. A big crowd was in attendance.

The teams displayed splendid early-season form and the outcome for a hard season is looked for.

Hofius and Galluci were put out of the game on account of personal fouls.

Coulter, the crack guard of the Miners, threw but three out of the seven fouls, but the long passes by him were easily the feature of the game.

The Minister aggregation showed improved form after Robb, former South Denver High School star, went in.

The two teams will meet in a return engagement at Golden on February 6.

The lineups follow:

DENVER. POSITION. MINES.

Mahoney (10) .....R. F..... Murphy (0)  
 Corfman (2) .....L. F..... Taylor (6)  
 McLoughlin (13).....C..... Coulter (13)  
 L. Bunger (2).....R. G..... Hofius (2)  
 F. Bunger (2).....L. G..... Galluci (0)

Substitutions: Robb for Corfman, Gilligan for Lee Bunger, Miller for Murphy, Pitsner for Hofius, Dunn for Taylor, Bunte for Galluci. Tub Morris, referee.

There is much to look forward to in our basketball. There have been from three to five teams out every night this season and Coach Carter has given us some long delayed pointers.

There are a dozen Freshmen who show promise for next year, and Carter's "bed rock" work will be showing up before long. We can't expect to win every year, but "look out below," 'cause from the amount of pep that was shown at the last mass meeting it is to be expected that the Miners will push their little basketball team just as hard as they push their football teams.

## EXTRA!

Mines 26

C. C. 51

### 'DYNAMITERS GET SURPRISE.

The Mines basketball team played the role of slaughterer in a drama entitled "The Slaughter of the Innocents," at the Gymnasium, Tuesday, January 23rd. Manual Training High five took the leading part and experienced little trouble in cleansing the Gymnasium floor with the slaughterers, the score being 25 to 14. The Mines Varsity team had absolutely no chance against the Speedy Manual team, the score at the end of the first half being 19 to 6, with the Miners having the 6. In the second half a team composed of Freshmen represented the Miners and the score for this half was 8 to 6 in favor of Mines. The Manualites have one of the strongest teams in Denver and recently defeated the University of Denver quintette by a score of 18 to 7.

### MUST CUT OUT ROWDYISM.

Poor Sports Will Endanger Their Own Basketball Team.

Enforcement of every rule of the game, the numbering of all players as in football contests and the requirement that team captains must be responsible for the sportsmanlike conduct of spectators, were feature measures passed Friday night, January 19th, at a meeting of the basketball committee of the Rocky Mountain Intercollegiate Conference faculty. No stone was left unturned in the faculty's efforts to clean the game, recent complaint that laxity in obeying the rules had resulted in acts of rowdyism fast becoming a menace to the sport having stirred the conference officials to prompt action.

The referee was given the right to call upon either captain to suppress unsportsmanlike conduct on the part of supporters of the teams, and is permitted to call for time in which to take action in such cases. Failure on the captain's part to check rowdyism shall result in the imposition of a fitting penalty by the referee.

The referee further shall have the right to expel from the hall any spectator whose actions interfere with the game's progress.

A number of other new rules regarding the game were adopted.

Coach Carter represented the School of Mines at the meeting.

# ALUMNI

## MONTANA ALUMNI MEETING.

The Montana branch of the C. S. M. Alumni Association got together at a very enjoyable dinner at the Silver Bow Club in Butte on January 6th. Some of the old standbys could not be there and we missed them, but the attendance was about as usual in point of numbers, for we had Mr. Dan Harrington and Mr. Buehler with us. There will be a dinner, followed by the annual election of officers, at the Montana Hotel, Anaconda, on February 27, 1917. On the afternoon of that day it will be the pleasure of the Anaconda men to show the Washoe Works to all the Alumni from Butte and other places who care to come over early.

The Mines men here are under the impression that it is the intention of those in control of such matters to abandon the Annual Senior Trip and to take instead many short trips about the State. We are unanimous in thinking that this change is not a good one and we wish by means of this letter, which we trust you will publish in the "Magazine", to invite discussion of the matter by the Alumni of the School.

In the opinion of those men here who have taken the long trip including the Butte District, there is no more valuable feature of the course at Golden. A few of the reasons for this are:

(1) Colorado, while presenting many valuable phases of mining and metallurgical practice, does not afford the opportunity of seeing modern and extensive copper mining and reduction. The Butte District is undoubtedly the greatest in the world. Mining and metallurgical history are being made here within a radius of thirty miles which it is an injustice to allow any Mines Senior to miss seeing.

(2) Many Seniors are, by means of the long trip, enabled to make acquaintances and to come into contact with operations which mean jobs to them. It is a rare class that does not leave several men in Butte and Anaconda.

(3) While the trip has never been regarded as an advertising scheme, there is no doubt that it makes the men of importance in the western mining field think about the School and the men it is training, when they want to employ technical skill or when advising boys where to get a mining education.

(4) It has always been a pleasure to the Mines Alumni in the Butte District and to the technical men in charge of operations here, to welcome the Mines Seniors and to show them every courtesy. We will miss them if they do not come.

We hope that the other Alumni organizations and the scattered Alumni will express themselves thru the Magazine, for we feel

that the trip is important and should not be abandoned.

Very truly yours,

E. L. LARISON, '05.

Secretary, Montana Branch

C. S. M. Alumni.

Anaconda, Mont., January 24, 1917.

## PERSONALS

'95.

Stricken with attacks of appendicitis, Lewis B. Skinner, vice-president and general manager of the Western Chemical Manufacturing Company, and his daughter, Miss Olive, are at St. Joseph's and St. Luke's hospitals, respectively. Miss Skinner was taken to St. Luke's hospital a few weeks ago, and is well on the way toward recovery at the present time. Her father was taken ill several days ago.

C. T. Durell's address is 1145 West Kensington Road, Los Angeles, Calif.

L. R. Wallace, care of the Andes Copper Mining Company, Casilla 230, Antofagasta, Chile, S. A. Wallace is general manager of the company.

George A. Kennedy's business address is now care of the Western Chemical Mfg. Co., Denver, Colo.

'97.

Marshall D. Draper has returned to Denver from California and reopened his office. Office address is 213 Boston Building, Denver, Colo.

A. H. Buck, 3856 Xavier St., Denver, Colo.

George F. Powell has left Virginia and is now at his permanent address, 4624 Gramercy Place, Los Angeles, Calif.

Dr. Royal P. Jarvis has returned to his old position with the Cananea Consolidated Copper Company. His address will be, care of the company, Cananea, Sonora, Mexico.

'98.

The recent fire at Alma, Colo., burned all the way around the assay office and residence of James E. Dollison, but a vacant lot and an intervening street prevented the destruction of his property. Dynamite used to stop the spread of flames broke all the glass in the buildings not burned and ruined a set of assay scales in Dollison's office.

Charles N. Stephens is now engaged in the manufacture of liquified SO<sub>2</sub> gas. The company he is with expects to put up a 550-foot stack. Stephens writes that they expect to place a red lantern on the top to keep airships from colliding with it. Stephens is with the Tacoma Smelter, Tacoma, Washington. His street address is 1111 N. K.

'00.

Harry P. Taylor's residence address is 2360 W. 23rd St., Los Angeles, Calif.

Edwin H. Platt has moved his office from the Equitable Building, to 208 Colorado National Bank Building, Denver, Colo.

'01.

F. E. Lewis has changed his address in Butte, Mont., to 314 W. Gold St.



'02.

Walter L. Ehrlich's address in New York City is 30 W. 70th St.

Frank M. Estes has left Spokane, Wash., and his address is now care of the A. S. & R. Co., Casilla No. 2, Valparaiso, Chile, S. A.

'03.

Augustus D. Cox, 427 Roberts St., Reno, Nevada.

Henry E. King has left Victor, Colo., and is now in Honolulu.

'04.

Miss Mary Radle Anderson arrived at the home of Mr. and Mrs. Axel E. Anderson, January 22, 1917.

'05.

E. F. Richards is manager of the Childers Leasing Co., Box 51, Midvale, Utah. His permanent address is 1006 Hobart Building, San Francisco, Calif., care of Brayton & Richards.

W. O. Chamberlain has moved his office to 330 First National Bank Building, Denver, Colo.

Frank J. Reinhard, who is Province Archon of the Sigma Alpha Epsilon fraternity, installed a chapter of the fraternity at the University of Wyoming the latter part of January.

G. N. Pfeiffer is now assistant engineer for the Utah Fuel Company at Castle Gate, Utah.

'07.

George P. Moore is chemist at Winsted, Conn. Winsted, Conn., is now his permanent address also.

Charles A. Filteau has resigned as manager of the St. Lawrence Talc Company to take the management of the National Mines, Ltd., Cobalt, Ontario, Canada.

'08.

F. F. Frick's address in Anaconda, Mont., is 306 Hickory St.

Karl G. Link is with the Tom Reed Gold Mining Company at Danby, Calif. His address is care of the company and via Goffs.

In the January issue, thru a slip on our part, we credited C. E. Leshar to the United States Bureau of Mines, under "Recent Articles by Mines Men". This was in reference to a paper on "The Cost of Coal", by George Otis Smith and C. E. Leshar. George Otis Smith is director of the United States Geological Survey and Leshar is also with the U. S. G. S. This paper was reprinted in full in Science; Metallurgical and Chemical Engineering; The Black Diamond, and a number of other papers, as well as in the Salt Lake Mining Review, where we noted it.

William R. Chedsey has accepted the position as Assistant Professor in Mining at the Pennsylvania State College, State College, Pa. He commenced his work there at the beginning of the semester, about February first.

'09.

A. F. Hallett is chemist for the Empire Zinc Company at Canon City, Colo.

C. B. Hull is Engineer and Geologist for the Nevada-Wonder Mining Company; at Wonder, Nevada.

Robert I. Kirchner's address is Box 147, Silver City, New Mexico.

'10.

Walter R. Brown is at San Pedro, N. M. His permanent address is 966 Twelfth St., Oklahoma City, Okla.

E. F. Jones' box address at Tyrone, N. M., is No. 8.

R. J. Farrar's box address at Mullen, Idaho, is 354.

J. H. East, Jr., who has been Safety Engineer for the Oliver Iron Mining Company at Hibbing, Minn., has resigned to accept a similar position with the Chile Exploration Co., Chuquicamata, Chile, S. A. East made a good record at Hibbing, where the accident list has been considerably lower during the past few months than it ever was before, in spite of the fact that more men were employed.

'11.

W. G. Matteson has resigned as Geologist for the Empire Gas & Fuel Company of Oklahoma to accept a similar position with the Texas Company at Houston. His address is box 1735, Houston, Texas.

Hamilton W. Baker is manager of the Sunnyside Mines Company at Brunzell, Idaho.

Morris V. Andre, Jr., and Miss Florence Ruth Hudson were married at Salt Lake City on Tuesday, January 2nd. They expected to return to Prescott, Ariz., about the first of February, but severe storms there interrupted work so that they may not return for some time longer. Temporary address is 266 E. Broadway, Salt Lake City, Utah.

Walter J. Mayer is now engaged in a contract to retimber an old shaft of the Golden Reef Mine, near Frisco, Utah, and to sink it further. He has to retimber two hundred and twenty-five feet and sink another two hundred twenty-five feet. He expects to be busy there for several months, the mail sent to his permanent address, No. 3 Hicks Apartments, Salt Lake City, will always be forwarded to him.

James A. Lannon and Miss Brita Bent were married Saturday, December 16th, at Ouray, Colo.

'12.

Thru our ignorance of the newest wrinkle in wedding announcements, we made the awful mistake in the January number of announcing the arrival of Miss Eleanor Ruth Chase Schellenberg in the family of Mr. and Mrs., when it should have been an announcement of the marriage of Miss Eleanor Ruth Chase to Mr. G. W. Schellenberg. We humbly apologize for our mistake.

Jay L. Emrich's home address in Durango, Colo., is 800 Seventh Ave.

E. S. Geary has joined the staff of the General Engineering Company of Salt Lake City. His address is No. 12 Hill Apartments, Salt Lake City, Utah.

'13.

C. L. French is now with the Research Corporation of New York, in the experimental department, and is at present on an assignment with the Hercules Powder Company. He left Utah the latter part of December, making a visit to his home in Michigan on his way East. His address is 19 Fort Greene Place, Brooklyn, N. Y.

Charles F. Oram's address in Leadville, Colo., is 136 E. Eighth St.

John R. H. Billyard is now with Benedict, Boyle & Stronck. His address is, care of the company, 1314 Peoples Gas Bldg., Chicago, Ill.

Daniel B. Gregg is with the St. John Mines, Ltd., Montezuma, Colo. Gregg visited in Denver and Golden the latter part of January.

M. S. G. McGregor's residence address is 1615 Bath St., Santa Barbara, Calif.

Victor A. Light and Walter J. Aillinger have both moved from Goldroad, Ariz., to Oatman, Ariz.

'14.

E. G. Snedaker is Field Engineer in the Exploration Department, Goldfield Consolidated Mines Company, Crocker Bldg., San Francisco, Calif.



Lemuel K. Taylor

Lemuel K. Taylor and Mlle. Olga Marzinkevitch, daughter of M. P. P. Marzinkevitch, were married November 19, 1916, at Hankow, China. Taylor is connected with the Standard Oil Company in China.

W. L. Beck is back in Mexico with the 4 C. Co., Geological Department, Cananea, Sonora, Mexico.

Theo. H. M. Crampton is now at Octave, Ariz.

Thomas W. Callahan is now engineer for the Compania de Real del Monte y Pachuca. This is one of the properties of the United States Smelting Company. Address, care of the company, Pachuca, Hidalgo, Mexico.

'15.

H. W. Kaanta's address is, care of Bingham-New Haven, Bingham, Utah.

A. B. Beall, Jr., is at Sioux City, Iowa, Box 354.

Charles A. Rogers has accepted a position with the Chile Exploration Co. at Chuquicamata, Chile, S. A. He expected to leave for Chile the latter part of January. Rogers paid a visit to Denver and Golden before leaving.

D. C. Dodge, Jr., has been transferred to the Ferro Alloys Company plant at Utah Junction. His future address will be his permanent one, 861 Humboldt St., Denver, Colo.

Arthur C. Daman is with the Stearns-Roger Manufacturing Company of Denver. Daman's residence is 3047 Williams St., Denver, Colo.

D. W. Butner is now with the Juragua Iron Company at Firmeza, Cuba.

Charles F. Haselton is with the Odanah Iron Co., Hurley, Wis. His address is, care of the company.

'16.

Milton M. Levy has accepted a position with the Chile Exploration Company, at Chuquicamata, Chile, S. A.

Walter H. Ralph decided the United States looked better to him than Mexico, and his address is now General Delivery, Bisbee, Arizona.

August Chatin is now employed in the Engineering Department of the C. F. & I. Co., Pueblo, Colo. His residence address is 1510 Routt Ave.

#### RECENT ARTICLES BY MINES MEN.

"Koering Metal Recovery Drum," by Malcolm H. Carpenter, ex-'09; *The Salt Lake Mining Review*, pages 41-42-43, January 15, 1917.

"Review of Cyaniding in 1916," by P. M. McHugh, '11; *The Salt Lake Mining Review*, pages 46 and 49, January 15, 1917.

"Elementary First Aid for the Miner," by Daniel Harrington, '00, and W. A. Lynott; *Miners' Circular* 23, U. S. Bureau of Mines.

"Preliminary Survey of the Geology and Mineral Resources of Curry County, Oregon," by G. M. Butler, '02, and G. J. Mitchell. This article of 136 pages and 41 illustrations, comprises the October, 1916, number, Vol. 2, No. 2, of "The Mineral Resources of Oregon," published by The Oregon Bureau of Mines and Geology.

"The Pilot Butte Oil Field, Fremont Co., Wyo.," by Victor Ziegler, Assistant Professor of Geology. This is *Geological Bulletin* No. 13 of the State of Wyoming, a pamphlet of 136 pages containing a number of large maps and other illustrations. L. W. Trumbull, '04, is State Geologist. Professor Ziegler and party made the survey and examinations for this report during the summer vacation of 1916.

"Counter-current Decantation at the Hollinger," by Luther B. Eames, '05; *Canadian Mining Journal*, January 1, 1917, page 3. Extract from paper read at the New York meeting A. I. M. E., February, 1917.

If you want to set the pace, be sure you are on the right path.

**"THE SUPERIORITY ITCH."**

By Dr. Frank Crane.

The most widespread and obnoxious plague among the spirits of men and women is the love of superiority.

We pander to it, develop it, glory in it, even make a religion of it, and all it does is to hurt.

Why does a husky parent slap his little child, or beat him, or otherwise tyrannize over him?

Because physically is about the only way he is superior to his offspring, and abusing the helpless little one feeds his superiority-greed.

Why does a husband browbeat his wife, refuse to talk to her as an equal, make her beg for every cent she gets and treat her generally after the fashion of a bounder?

Because the gentle woman is his superior in many ways, and it irritates him; so he preens his superiority the only way he knows how.

Why do you make a practise of criticism, always find some nasty remark to make of one whom others are commending? just to show you are superior.

Why do we set prizes for children in school, urge them on to excel and instill ideas of getting on and getting up in the world?

We are teaching the thing we love—superiority.

Why do we linger under the vicious system of competition in business and hate so to come to any principle of co-operation?

Because we are superiority-worshippers.

We have no objection to the parson's goodness.

Its air of superiority that goes with it that riles us.

A virtuous woman is beyond praise, but virtue without humility is zum davon laufen—to be run away from.

Superiority is the peculiar vice of virtue, the stench of perfection, the nausea of morality, the repellence of religion.

It is the hate-maker extraordinary of the world.

The real reason why the Germans hate the English, and sing hate-songs and drink hate toasts and all that sort of thing is that infernal air of superiority that envelops the English as an aura.

And it is the German strut and brag, equally obnoxious as the English, that goads Germany's enemies to undying fury.

If it were not for universal septic superiority on both sides the war might be settled in ten days.

Perhaps the only method of getting it out of the system is the method they are using—the club.

Most of the uplift work and soul-saving work and reform work suffers from this same scab of superiority. Where is the man who will help us, relieve our poverty, improve our minds and manners or redeem our souls, and not once convey the impression that he is superior to us?

Can you "do good" to people and not

get found out, and not want to be found out?

Can you relieve another's distress and get slapped in the face for it—and be glad?

Come! come! No more "uplift" stuff, please. We don't want to be lifted up—we want to be pushed up.

And all this whine about your not being appreciated. What it means is that the good you do is done for the purpose of getting your superiority-itch scratched.

All the real good ever done in the world was done by those who did it in secret and ran away because they did not want to be caught at it.

—McClures Magazine, December 1916.

**HE KNEW WHERE HE WAS.**

There is a man down in Birmingham, Ala., who is employed by a big industrial concern to keep its several thousand employees in good humor. Of course, he has an official title, but that is really what he does. Naturally, he has a fund of good stories. Among the number is this true one, which he tells to illustrate the importance of knowing one's ground even under difficult circumstances.

An old negro track-walker on the Cincinnati Southern Ry. was held up one day by three desperadoes, who had just robbed a train a half hour before.

True to racial instinct, the old negro ran, and despite a fusillade of shots fired at him, cleared one or two barbed-wire fences and got away whole.

The robbers were captured, and at the trial Uncle Zack was the State's star witness in proving their identity. He told of how he was held up at the point of a gun with a mouth like a funnel, how he ran and was shot at repeatedly; how by doubling his resolution he cleared the wire fences and finally escaped. He identified the robbers as the men who shot at him.

The lawyer for the defense took Zack and made him retell the whole story. He made him admit that after he started to run he never looked back. His flight over the fences was vividly recounted. Finally, to utterly rout the old negro and discredit his whole tale, the lawyer for the defense shouted at Zack:

"You say you ran?"

"Yessir, I sho' did", replied Zack.

"You heard shooting, but you never looked back?"

"Yessir, I hee'rd de shootin' all right, but I wuz too busy goin' to ever look back."

"You say they were shooting at you?"

"Yessir, dey sho' wuz."

"Now, isn't it a fact," shouted the lawyer, "that these men you say you heard shooting were firing in the air?"

"No, sir," said Zack, "dey wuzn't, cause if dey had been dey would have hit me sho', cause dat's whar I wuz most ov de time."

(Coal Age, December 16, 1916.)

The average man's idea of revenge is to take the alarm clock out into the back yard and hit it with an ax.



First Aid and Mine Rescue Work at the C. S. M. Mine.

**MINERS DEFEAT NORTH DENVER.**

The Mines basketball team defeated the North Denver High School five January 19th, by the score of 39 to 19. Practically the entire Mines squad was used during the contest.

**Movies to Picture Mine Rescue.**

A rescue from a mine disaster was staged at the clay pits Wednesday, January 10th. The actors were students from the mine rescue classes at the School of Mines. The scene was staged for the Selig-Hearst moving picture weekly service and will be shown in picture theaters in all parts of the United States.

**Golden Smelter to Be Wrecked.**

The plant of the Golden smelter was sold by the owners, Barnett and Barclay, of New York, to The Grimes Brothers Metal Co., of Denver, who will wreck it.

**THE SORTING AND SIZING OF MEN.**

In the business of mining there is an important process that has to do with the selection of men for the real jobs. Each company has a set of invisible screens through which all employees are sifted.

Those ever present immortals "TIME and TROUBLE" laboriously and slowly, but unceasingly, turn the crank that agitates the sieves.

The coal mine manager stands close by carefully watching the process. He changes the sieves from time to time, according to his company's needs.

The greater the requirements, the bigger the mesh. Little men with little minds and few qualifications are shaken through and disappear with the crowd.

Likewise grumblers, grouches, knockers, idlers, clock-gazers, booze-fighters and men who do only what they are told to do, all sift through, and each one is known by a number rather than a name.

Charles M. Schwab tells how Bill Jones, one of Carnegie's boys, picked a draftsman. He asked the superintendent to pick the most capable man he had and was told that they were all first-class workers. Jones wasn't satisfied and said, "Tell every man to stick on the job until seven o'clock." The order was a surprise to the draftsmen, as it came in a slow season. But they kept on cheerfully. As seven o'clock drew near, Jones noticed that the men kept looking up to see how much more time they had to put in. All save one. Over in a corner a young man was so absorbed he had forgotten the time, and when the others had hustled out at the stroke of the hour he was still bending over his work. Needless to say, Jones picked him for the job, and he became a high-salaried engineer.

Every real boss is continually on the lookout for signs and traits indicating the character of the men he employs. The only way to keep out of the bin of mediocrity and

rise above the crowd is to be so filled with knowledge, enthusiasm and manhood that "TIME and TROUBLE" can't shake you through the screen which has been placed to measure your worth.—Coal Age, November 4, 1916.

**Mines Victorious.**

From Lookout Mountain,  
O'er hill and pines,  
Far rings the story of the glory of the  
Mines,

From East and West  
The crashing echoes answering call,  
Mines! Mines! Victorious, the champions of  
all.

Cheer! Cheer! Here we are again  
To cheer with all our might.

Cheer! Cheer! Here we are again  
To cheer for the blue and white.  
SIS BOOM! AH!

Mines! Mines! Our colors we'll defend,  
Mines! Mines! Victorious to the end,  
Will hear the echo of our cheer,  
Oh, give 'em hell! Give 'em hell, Mines!

From A. Coor's brewery down the street to  
Paul's,

All around in Golden town, the thirst echo  
calls,

"What will we do for beer?"

The clay-pits lure in vain,  
Mines! Mines! Drink Mannah now,  
Take up the sad refrain.

Beer! Beer! Never any beer—  
Those joyous days are past.  
Beer! Beer! Never any beer—  
We have to be good at last.  
DRINK MANNAH!

But even if we all are dry,  
Our pep is never going to die;  
We'll have more strength to raise the cry;  
Oh, give 'em hell! Give 'em hell, Mines!

**Seein' Things at Night.**

If a body see a body  
Passin' 'round the rye  
Should a body tell on a body  
Or merely wink an eye?

Nothing in the world makes a man so  
mad as to dream that he is kissing a pretty  
girl and wake up and find that a deprived  
fly is waltzing around the ragged edge of  
his mouth.

**GREECE HER KNEE.**

It is told of Colonel Roosevelt that in his  
school days he was once called upon to re-  
cite a poem. Bravely he began:

At midnight, in his guarded tent,  
The Turk lay dreaming of the hour  
When Greece, her knee—

There he faltered. Twice he repeated,  
"Greece her knee," then quit dead. The old  
professor looked at the future president  
over the top of his spectacles, then re-  
marked: "Greece her knee once more, The-  
odore. Perhaps she'll go easier then."

If I had known in the morning  
 How weary all the day  
 The words I said  
 Would trouble my mind  
 I said when I went away,  
 I had seen more careful tarfing,  
 Now given you needless pain,  
 For we tax "our own"  
 With work and time  
 We may never take back again.

For 'tis in the quiet evening  
 I may give you the kiss of peace,  
 Yet I might be  
 That never for me  
 The pain at the heart should cease!  
 How many go forth in the morning  
 That never come home at night!  
 And hearts have been broken  
 By harsh words spoken,  
 That sorrow can never set right.

We have careful thought for the stranger,  
 And smiles for the sometime guest,  
 But oft for "our own"  
 The bitter tone,  
 Tho' we love "our own" the best,  
 Ah! lips with curse impatient!  
 Ah! brow, with that look of scorn!  
 'Twere a cruel fate,  
 Were the night too late  
 To undo the work of the morn.

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# COLORADO SCHOOL OF MINES

## MAGAZINE

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No. 3

### Countercurrent Decantation at the Hollinger\*

By Luther B. Eames, '05.

The recovery of dissolved gold from slime pulp in the cyanide process was first accomplished by intermittent decantation. This simple process consists in mixing with the pulp containing the values in solution, a solution of lower gold content, settling the mixture in a tank and decanting the clear supernatant fluid. The thick pulp remaining in the tank is pumped to a second tank together with more barren solution and again settled and decanted. After several repetitions of this operation, values are so far reduced that further washing is not profitable. The gold recovery of this process is high, but the plant required is bulky, labor cost is high and the amount of solution to be precipitated is excessive.

As early as 1901, a plant was built in the Black Hills of South Dakota by John Randall, employing the same principles but attempting to make the process continuous by substituting for flat-bottomed tanks, cones which operated continuously, receiving a constant feed and discharging a steady stream of thickened pulp. These cones were operated in series, the thick underflow of the first one forming, with a stream of diluting solution, the feed to the second cone of the series. Barren solution was added to the tank immediately preceding the discharge tank and, after being slightly enriched by the low-grade pulp in this tank, overflowed to form a diluting solution again for the richer feed entering the third tank from the end of the series, and so on back to the richest tank of the series. Clear water was used for the wash in the final tank. This is the principle on which all successful countercurrent decantation plants operate at the present time, but Randall's plant was not successful because of mechanical difficulties in getting a continuous thick discharge from his cone tanks. A similar plant was built in South Africa, altho there the washes were not repeatedly used, as in Randall's case, but were precipitated after each contact with the ore. This was also abandoned because of mechanical difficulties and the cost of precipitating the large quantities of solution that had to be used. For a number of years the process was not used, and it was not until the introduction of the Dorr thickener that the minds of metallurgists began to turn again to the continuous decantation principle.

In 1910, two decantation plants were built, making use of flow sheets similar to that used by Randall nine years before, but substituting Dorr thickeners for the cones. One of these was at Mocerito in Sinaloa, Mexico, and was installed under the direction of C. Dupree Smith, while the other was designed by J. V. N. Dorr, assisted by the writer, for the Vulture Mines Company of Wickenburg, Arizona. While perhaps not perfect at first, both of these pioneer plants were so successful as to encourage further installations, few and scattering at first, but in considerable numbers during the past three years.

#### The Hollinger Decantation Plant.

The Hollinger decantation plant consists at present of five rows of 40-ft. tanks, four tanks to a row, forming a plant of five units. The tanks are arranged with a difference in elevation of 2 ft. 6 in. between steps with the final tanks of the series the highest, so that all solutions gravitate thru and out of the plant to precipitation. The Barret specification roof is supported on flat trusses, the lower chords of which pass just above the tank and rims. These trusses also serve to support the thickener mechanisms and the walks between the tanks.

The diaphragm pumps used were designed by the company's staff, and have been very reliable and economical. They are all three-throw or triple pumps so that in spite of the large tonnage handled the duty on each diaphragm is light. It is not uncommon for diaphragms to last 300 days, while the life of the present type of valves and seats has yet to be determined.

The pumps are used not only for pulp transfer, but also for the final discharge. This makes regulation of the final discharge for moisture much easier, more reliable, keeps the work of the operator all on the upper floor and allows the tailings to be discharged at a considerably greater elevation than would otherwise be the case.

The barren solution and water added to each row are measured by separate float-reading weir boxes, assuring uniform results from the various units.

The plant is operated by one man per shift who oils all machinery, watches and adjusts the pumps and records their performance. The solution man makes titrations and regulates the addition of water solution, but has no other duties in the decantation plant. A

\* Abstract from a paper read at the New York meeting, A. I. M. E., February, 1917.

operation on lay shift makes all repairs and has time for other work.

The cost for each tank including motor and electrical losses is under 1 H. P., while the centrifugal pump consumes about the same amount.

The costs for the twelve weeks from January 28 to April 21, 1916, have been taken as a basis for what is done by this plant at its present capacity. During this time 85,854 tons of ore decanted at a cost of \$599.00 for electrical operating power, and \$1,194.00 for steam at \$1.00 per ton for power and supplies and \$1.00 for labor, making a total of \$1,793.00 per ton for decantation. Labor is not much higher here than it will be in the future, as a greatly increased tonnage is to be treated while supplies and power should remain nearly the same. The cost as it stands is about 40% of the cost of filtering on leaf filters at about the same daily tonnage.

In the area of the Porcupine district the recovery by dilution seems to be almost the theoretical maximum. Absorption does not seem to have any appreciable effect. There is a slight dissolving during decantation which, while it adds to the recovery, makes the soluble loss somewhat greater than it would otherwise be.

The figures quoted below on chemical consumption and recovery refer to only two units of the Hollinger plant. The figures of these units are given because the other units of the mill share their feed with the original Moore filter plant, and likewise their barren solution, while for commercial reasons the two units in question have been given a separate solution system and separate precipitation process. These two units are therefore the only ones upon which all the figures are available.

In computing the results quoted, however, it should be borne in mind that the flow sheet has been modified in this plant somewhat because of limitations of space, so that the overflow of T 2 instead of that of T 1 goes to precipitation. The effect of this is to reduce the theoretical value of the overflow of tank 3 c, at 3 to 1 precipitation.

A statement of results follows:

Quantity covered, same as that for which the above given - from January 28, 1916, to April 21, 1916:	
Tons of ore treated.....	28,885
Value of ore treated.....	\$8,92
Value of solution precipitated.....	100 to 285
Value of solution precipitated.....	110,604
Value of cyanide, 0.9 lb. per ton,.....	0.0045%
Value of cyanide per ton of ore.....	0.46 lb.
Value of cyanide between pulp feed and solution.....	25c
Value of cyanide in barren solution.....	32c
Value of cyanide in tails.....	4.5%
Value of cyanide in overflow of solution.....	11.71c
Value of cyanide in overflow of ore dis.....	9.77c

It is theoretically possible, taking into consideration the flow sheet, the grade of ore treated, the barren solution used and the thickness of pulp attained, to have reduced the overflow of the last tank to 7.6c., leaving a difference of 4.1c. to be accounted for by continued dissolving absorption, etc.

Viewed in one way it may be said that actual losses are 54% higher than theoretical, but where one is dealing with samples so easily affected by faulty manipulation and where any error except losses in assaying tends to raise the results, a check to 4c. does not seem bad. The average loss would have been somewhat less if the occasional high results had been omitted, but this was not done.

From the foregoing, I believe one is warranted in concluding that a reasonably accurate forecast can be made of the results to be expected from a decantation plant and that these results may compare very favorably with the results obtained from filter plants.

### THE NEED AND ADVANTAGES OF A NATIONAL BUREAU OF WELL-LOG STATISTICS.\*

By W. G. Matteson, '11.

In 1915, the State of California passed a law of great scope and importance. This law has been in successful operation for a year and may be briefly described as an act "establishing and creating a department of the State Mining Bureau for the protection of the natural resources of petroleum and gas from waste and destruction through improper operations in production; providing for the inspection of petroleum and gas wells; requiring all persons operating petroleum and gas wells to make certain reports" and providing the necessary officers and assessments to carry out the provisions of the act.

The statute provides for a separate department of the State Mining Bureau, under the general supervision of the State mineralogist, with a staff composed of a "state oil and gas supervisor" and four deputies.

It rules that all petroleum and natural gas wells shall be drilled, operated or abandoned under the supervision of the State supervisor, who shall order such tests or remedial work as seems to him necessary to protect the interests of property owners and the general public.

It also provides for a board of arbitration to consider orders given by the supervisor which are not acceptable to the well owner.

Section 18 of the act, which is the provision that is directly related to this paper, requires "the owner of any well referred to in this act to keep a careful and accurate log of the drilling of such well," and further requires that this log shall show the character and depth of the formations passed through or encountered in the drilling, particularly the location and depth of the water-bearing strata, the character of the water en-

\* Paper read at the New York meeting, A. I. M. E., February, 1917.



countered (so far as ascertained); whether the water was shut off, and, if so, at what point; that it shall show completely the amounts, kinds and size of casing used; the depth at which oil-bearing strata are encountered; the depth and character of the strata, and whether all water was successfully and permanently shut off so as to prevent percolation or penetration into the oil-bearing strata.

This log is to be kept in the local office of the owner or operator, subject to the inspection of the supervisor or any of his deputies at any time during business hours, and a copy is to be filed with the deputy supervisor immediately upon the completion of the well, or upon the completion of any additional work on the well.

The owner of any well drilled previously to the enactment of this act must furnish to the supervisor a complete and correct log of the well, so far as may be possible, together with a statement of the present condition of the well.

It is evident from the foregoing that the main object of the act is to extend the life and increase the productivity of oil fields by preventing the injudicious drilling of wells without taking the proper precautions to prevent encroachment of salt water in the oil- or gas-bearing sand, and to shut off overlying and underlying water sands which might flood the oil-bearing strata. In a field where many operators are drilling quickly to obtain first production, the necessity of taking adequate measures against the encroachment and infiltration of water is fully understood. Yet the act, as outlined, is capable of even much broader application. The ideas, included or suggested, are so pertinent and important that similar statutes in all States having oil-producing properties or prospects should be strongly urged. For this and other reasons which follow, the enactment of a Federal law, similar in design to the California statute and supplemented by the establishment of a National Bureau of Well-log Statistics, seems advisable.

No one realizes the urgent need for such a law more than the geologist, who, in his frequent examination of territory where outcrops are scarce, scattered or nil, often discovers that logs of wells, drilled several years previous, were not taken, or are not available, or that such logs as are obtainable are almost useless because of the careless and unsystematic manner in which they were recorded. Hundreds of such monuments to inefficiency may be found in our oil-producing States today.

The problem, moreover, bears a close relationship to the theme of conservation. Various experts have calculated that with current consumption and production, our present oil fields will be exhausted in from 25 to 50 years. If America is to maintain her industrial supremacy, this exhaustion of our present oil supply must be offset by the discovery and development of new fields. The larger companies have foreseen this contingency, and, acting on their convictions, are organizing efficient geological corps and

spending hundreds of thousands of dollars annually in an attempt to open up new territory. From an economic and industrial viewpoint, their efforts demand the strongest coordination on the part of State and Federal government. A good percentage of the territory now under private investigation has been marked by the work of the wildcatter, and were accurate logs of such test wells at hand, probably much of such territory would be condemned at once, permitting the time, labor and money to be devoted to the investigation of some other region. Conservation of private capital devoted to the exploitation of natural resources must be given serious consideration as well as the conservation of the natural resources in question.

Since our recent progress in drilling methods and our increased understanding of the many peculiarities of oil and gas horizons, the geologist can no longer be satisfied with the statement that any wildcat test was a dry hole. He must ascertain which of the many factors might account for the dry hole in question and often only careful examinations of well logs will convey this information. In some districts where outcrops are few and scattered or covered by soil and detritus, the geologist is often forced to rely entirely on well logs in working out structural relationships. The Gulf Coast Tertiary fields, characterized largely by palustrine and marine deposits of cross-bedded, unconsolidated, often unstratified sands, clays, sandy clays and clayey sands, furnish an excellent illustration. Hundreds of wildcat wells are being drilled today by independent operators in Texas, Louisiana and Mississippi. In many instances well logs constitute practically the only data by which the structure of such virgin territory can be worked out, yet such data are either neglected or taken in such an inconsistent manner as to be of little value. It was during the examination of such territory that the potential possibilities of some such law and organization as is suggested in this article was forced upon the attention of the writer.

Although a State has taken the initiative in this important matter there are many reasons which favor national legislation and the establishment of such a bureau as part of the government organization, preferably as an adjunct to the U. S. Geological Survey. Doubtless there will be a conflict of opinion in this regard, but it is evident that State legislation is contingent on too many probabilities such as political favor, lack of funds, etc. State legislation is apt to be vacillating, delayed, and lack uniformity. A national law would insure standard methods of procedure, would become operative in all States simultaneously, and the question of funds should not prove a serious handicap. The U. S. Geological Survey possesses a statistical department unsurpassed in its ability to handle such work, while government geologists could render a much-needed service by devising a standard form and method of taking and recording logs. The importance of uniformity can not be over-emphasized.

The information accruing from such a

bureau is as vital and valuable to the government as to the oil producer, since well logs are generally sought by the government geologists wherever possible in working out the structure of the various quadrangles comprised in the geologic folios being annually issued, and often such logs constitute the only positive information obtainable. All these considerations are strong arguments for government supervision and legislation and the importance of obtaining such data in intelligent form becomes more evident.

Of course, it might be objected by some operators that logs which were obtained by private investment are valuable to the original investors and should not be open to public scrutiny. Such an objection is often legitimate, but there are many ways of overcoming it, such as specifying that the logs will not be available for public inspection so long as the operator in question holds valuable options on said property.

Obviously the details of such a project as the establishment of a National Bureau of Well-log Statistics must command careful thought and development. The California law suggests an outline into which may be incorporated numerous, far-reaching provisions. Doubtless the California statute will be altered from time to time as experience gained from operation points to the advisability of new amendments. The author has merely attempted to give some definiteness to an idea which he believes to be sound, practical and worthy of serious consideration. He trusts that it may promote such discussion and suggestion as will eventually result in some constructive action embodying the principle which has been defined.

### THE DINOSAUR.

Behold the mighty Dinosaur,  
Famous in prehistoric lore,  
Not only for his weight and strength  
But for his intellectual length.  
You will observe by these remains—  
The creature had two sets of brains—  
One in his head (the usual place),  
The other at his spinal base.  
Thus he could reason a priori  
As well as a posteriori.  
No problem bothered him a bit;  
He made both head and tail of it.  
So wise he was, so wise and solemn,  
Each thought filled just a spinal column.  
If one brain found the pressure strong,  
It passed a few ideas along;  
If something slipped his forward mind  
'Twas rescued by the one behind;  
And if in error he was caught  
He had a saving afterthought.  
As he thought twice before he spoke  
He had no judgments to revoke;  
For he could think, without congestion,  
Upon both sides of every question.  
Oh, gaze upon this model beast,  
Defunct ten million years at least!

—Exchange.

### INSTITUTIONS GET SMALL SUM FROM TAX.

State Tax on Property Plays Small Part When All is Summed Up.

By H. C. Parmelee, President Colorado School of Mines.

Since the opening of the legislature there has been the customary comment regarding appropriations and the increase in tax levies, with particular stress laid on the financial program of the State educational institutions. The latter has been the subject of considerable adverse criticism and is meeting with some opposition in Denver because it involves an increased taxation.

I believe it is not generally realized how small a part the tax for State purposes plays in the total taxation assessed against an individual or a company. The fact is that the tax paid by the average citizen for all State purposes is small compared with that levied against him for city and county purposes.

In order to illustrate this contention in the simplest terms, let us inquire into the tax paid by a citizen of Denver, or of the five towns in which the State institutions are situated, namely, Boulder, Fort Collins, Greeley, Golden and Gunnison, and let us base the taxation on a valuation of \$1,000 worth of property.

This will apply either to the small home owner or to someone whose business is assessed at a valuation of \$1,000, and the figures derived from this illustration can be readily applied to larger property owners.

The total State levy for all purposes on the 1916 valuation is 2.07 mills, or \$2.07 per \$1,000 of valuation, and this tax supports all the State activities, including the general support of the government, the charitable, penal and educational institutions, etc. The tax levy in Denver for city and county purposes only, excluding the State tax, is 14.93 mills, or \$14.93 per \$1,000 of valuation. This means that a citizen of Denver holding a property valued at \$1,000 pays \$14.93 per annum to the city and County of Denver and \$2.07 per annum to the State of Colorado.

#### How the Money Goes.

It is interesting now to observe that of this \$2.07, which a Denver citizen pays to the support of the State, only 55 cents is for the support of the State educational institutions at Boulder, Fort Collins, Greeley, Golden and Gunnison, which is divided among those institutions as follows: State University, 20 cents; Agricultural College, 15 cents; Teachers' College, 10 cents; School of Mines, 7 cents; Normal School, 3 cents.

Under the program which the educational institutions now have in the State Senate an increase in these small levies is being asked for, so that out of the State tax, which each citizen is obliged to pay, he will contribute the following sums per \$1,000 of valuation to each of the educational institutions, namely, State University, 28 cents; Agricultural College, 21 cents; Teachers' College, 14 cents; Mines, 9 cents; Normal, 5 cents.

In other words, taking the School of Mines as an example, we say to the citizen of Den-

ver: "You are now paying to the city and county of Denver \$14.93 per annum on each \$1,000 worth of property you own; you are paying to the State of Colorado \$2.07 on each \$1,000 worth of property that you own, and of this \$2.07, seven cents go to the support of the Colorado School of Mines.

"We are now asking you to contribute 9 cents to the support of the Colorado School of Mines instead of 7 cents, and we contend that this is not burdensome taxation. The other institutions are in the same position and make similarly modest requests."

The following table has been compiled to show taxes paid by a resident of Denver or each of the towns in which the State educational institutions are situated, from which it will appear that State taxes are exceedingly small and that the portion which the State educational institutions receive is almost negligible.

Tax per \$1,000 of valuation paid by a resident of the following towns:

City and County	State	Educational Institutions
Denver .....	\$14.93	\$2.07 \$0.55
Boulder .....	20.43	2.07 .55
Fort Collins .....	21.25	2.07 .55
Golden .....	22.95	2.07 .55
Greeley .....	23.23	2.07 .55
Gunnison .....	17.23	2.07 .55

In conclusion, it is pointed out that at present the educational institutions are receiving 55 cents per \$1,000 of valuation. All of this is for general maintenance. In addition to this there is a request for 50 cents per \$1,000 of valuation for the next ten years only to provide a building fund. It requires no further demonstration to show that State taxes are not our high taxes and that the greatest expense comes in the support of the city and county.

**SPANISH AT THE SCHOOL OF MINES.**

The courses instituted at the beginning of the school year in Spanish, under Professor Dolman, have aroused great interest among the students of the Colorado School of Mines and have had a very large attendance. All told, one hundred fifty-six (156) students received instruction in Commercial Spanish, and one hundred thirty-two (132) students received formal credit. A very large proportion of these students are now sufficiently advanced to transact a considerable amount of the business of life in the Spanish language. The classes, besides conversational work in the language, are now largely engaged in studying commercial forms and writings and in reading current literature in Spanish, such as newspapers and periodicals.

The work of the department, together with the scholarships to students from Latin American countries which the Board of Trustees have given at the suggestion of President Parmelee, has received the favorable comment of the Pan-American Union. Excerpts follow from a letter of Honorable

John Barrett, the Director General of the Union:

Copy.

John Barrett Director General Francisco J. Yánes Assistant Director

**Pan American Union**

- Argentina Honduras
- Bolivia Mexico
- Brazil Nicaragua
- Chile Panama
- Colombia Paraguay
- Costa Rica Peru
- Cuba Salvador
- Dominican Rep. United States
- Ecuador Uruguay
- Guatemala Venezuela
- Haiti

Washington, D. C., U. S. A.,  
February 26, 1917.

My Dear Professor Dolman:

I thank you for your letter of February 21st, with its enclosure. I wish to congratulate you and, through you, the Colorado School of Mines on this evidence of the practical interest it is taking in promoting the cause of real Pan Americanism. The scholarships which the Board of Trustees, at the suggestion of President Parmelee, have offered to students from our sister republics can not fail to attract much attention throughout Latin America and be regarded as proving that the educational institutions of the United States are awake to the advantages of Pan Americanism.

I consider what you have done to be of such importance that we shall give special publicity to it in the Spanish and Portuguese issues of our monthly Bulletin, and proper consideration in our English edition.

Please be good enough, moreover, to let me know of any replies which you may receive from the letters that you addressed to the Ministers of Public Instruction in the Latin American countries.

Always wishing to keep in touch with you in progressive Pan Americanism, I remain

Yours very cordially,

(Signed) JOHN BARRETT.

**OPPORTUNITY'S REPLY.**

They do me wrong who say I come no more,  
When once I knock and fail to find you in;  
For every day I stand outside your door  
And bid you wake and rise to fight and win.

Wail not for precious chances passed away;  
Weep not for golden ages on the wane;  
Each night I burn the records of the day,  
At sunrise every soul is born again.

Laugh like a boy at splendors that have sped:  
To vanished joys be blind and deaf and dumb,  
My judgments seal the dead past with its dead;

But never bind a moment yet to come.

(A reply to Ingall's poem "Opportunity.")  
—Owen Raymo.

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### ATHLETIC EDITOR.

R. F. WHITE.....1913

VOL. VII. MARCH, 1917. No. 3

### WHAT IS EFFICIENCY?

Stripped of all verbiage and psychological  
dissection, efficiency simply is doing your  
work well.

Therefore, to be efficient, one must first  
have a clear idea of his required duties and  
his optional extension of these duties.

These being known, it only remains to per-  
form well the work for which you are paid,  
and in addition to take on as much more  
work as opportunity to serve your employer  
presents and your abilities can compass.

### How to Become Efficient.

First. Ask your superior for a clear, com-  
prehensive outline of the work he expects  
you to do and how he wants it done.

Second. Ask him further to suggest pos-  
sible expansion of your activities along lines  
of value to him and calculated to increase  
your value to the concern.

Third. Lay out a written schedule of your  
expected and possible activities and record  
daily each completed performance, each  
omission, and, in your opinion, what per-  
centage of efficiency you attained in any at-  
tempt to do a thing in which you did not  
wholly succeed.

Fourth. Strive daily to improve your per-  
formance, and to broaden your abilities and  
their application, crediting yourself with all  
sure progress and debiting yourself with all  
failures or partial failures.

Fifth. Make a monthly summary of your  
efficiency for your own study and compar-  
ison with past and future months.

Sixth. If the record fails to improve as a  
whole or in detail, go to your superior and

ask his advice on how to overcome the ob-  
stacles that seem to block your progress.

The system here suggested is an automatic  
one based on the principle that every earnest  
man is the best judge of his own efficiency.

He knows when he is tardy.

He knows when he is on time, yet wastes  
time before getting into action.

He knows when his mental or physical  
motor is running and consuming energy  
without being in gear.

This system makes every man his own  
handicapper and his own undodgeable  
censor.

The suggestion that appeal for advice be  
made to his superior is based on the fact  
that any intelligent employer thinks far  
more of the earnest striver for success who  
recognizes his own shortcomings and sin-  
cerely seeks help than the vain-glorious  
braggart who assures himself and everyone  
else he is a world-beater in his line.

Try this system for six months and pre-  
pare for a surprise in the shape of promotion  
and increased pay.—Dupont Magazine, De-  
cember, 1916.

### IMPORTANT TESTS MADE.

School of Mines Carrying on Interesting  
Experiments.

Within the past month the experimental  
plant at the Colorado School of Mines has  
been confronted with some of the most in-  
teresting experiments in crushing and grind-  
ing that have come to the notice of the  
School. The results of these experiments  
will be of considerable value to engineers  
and those who have problems in pulverizing  
ore or rock of different degrees of hardness,  
and as soon as the experiments are com-  
pleted they will be compiled by Professor  
George J. Young, who has charge of the  
work, and will be published in the School of  
Mines Quarterly, which is available for free  
distribution.

The first problem which was presented to  
the School was that of reducing forty tons  
of coke to as fine a powder as possible. Coke  
is of a texture and hardness not commonly  
met with in the metallurgical field, and, as  
a consequence, it will be interesting to know  
the ability and capacity of the ordinary  
crushing machines in handling material of  
this type. A number of variations have been  
made in the method of treatment, but gen-  
erally speaking they covered the use of a  
jaw crusher, roll and tube mill.

Following the treatment of the coke, sim-  
ilar experiments are to be conducted on  
limestone, which has a still different tex-  
ture and degree of hardness, and will afford  
a very interesting comparison with ores of  
a certain type. This is to be followed later  
by experiments on a very hard silicious ore,  
so that when the entire test is completed  
there will be comparative data on the crush-  
ing and grinding of materials of different de-  
grees of hardness. Complete data are being  
kept on power consumption, labor, capacity  
of machines, etc., so that the results will be  
of direct value to engineering in the metal-  
lurgical field.

## COLLEGE NEWS

### JUNIOR NOTES.

D. R. Locke.

We have been sneaking down back alleys and around corners for the past two months to dodge Mr. Harrington, who has been hot on our trail. We can't understand just why this is, but suppose these notes do serve to fill space, and of course nobody is compelled to read them. Therefore, here they are again.

The preparations for the advent of the 1918 Prospector are putting gray hairs in the heads of the Annual Board. Reilly is becoming a physical wreck through his valiant efforts to get the necessary photographs taken, and Barber has been able to remove to a much more ornate studio through his proceeds from the affair. The Business Managers will be accomplished holdup men when they get through with the local and Denver advertisers. And as for the Prospector, we feel sure that it, like other young things, will be a howling success when it arrives.

Everybody is still trying valiantly to hang onto his 5%, but it is a heart-breaking job. As a hint, an apple or a wildflower might make your professor forget that absence of last week, and you might not have missed anything more serious than a lecture on "Consideration" that time anyway. M. E., Section 2, is still careering happily along, though Cap declares he is making little progress in memorizing the book, and Chuck can't see how you are going to figure Boiler Economy by the ratio of pounds of water fed to the boiler to the pounds of coal consumed in case you are burning sawdust. Happy did his best the other day to give a quiz in E. P. T. that everybody would get. He almost succeeded.

After keeping the class in suspense for some time, fearing they would lose their most accomplished and versatile member, Cris finally decided to resign from the Idle Rich Colony and return to our studious midst. We don't know what Dorsey would have done had "Tuffy" left him.

Bill Charles, who always had a penchant for lime-lit affairs, managed to pull off the most sensational one of his career by his high-speed Wedding March and rapid departure for elsewhere with his bride. We all wish them an equally rapid rise to fame and fortune.

Professor Young has been scouting about suspiciously these past few days. He must be afraid some camera man will snap him unawares.

The other day in Spanish, Professor Dolman asked Cap: "Esta Vd. cansado?" As Cap hesitated he added: "Are you tired?" "Oh," said Cap, "Si, Señor, soy cansado." "No," said Dolman; "you should have used 'estoy,' not 'soy.' That is used to show a

condition that is continuous and unchangeable."

"I know it," said Cap. "That's why I said: 'Soy cansado.'"

Steve Fullaway's letter to Ralph was greatly appreciated by the E. P. T. class. Doubtless some members will follow the excellent advice it contained.

The following ad. appeared in a local paper last week:

#### Wanted.

A chronically insomniac stenographer to attend and take notes in Wolf's Mining courses so that employers can sleep more peacefully. Apply Junior Class, C. S. M.

In conclusion we wish to call your attention vunce again to der fact dhat der Oil and Gas continues to flow very fluently under Professor Ziegler's efficient guidance.

### SOPHOMORE NOTES.

I. M. Charles.

February passed with much study and little excitement. Basketball men have been busy, however, and some of the social demons have been "stepping out."

Professor and Mrs. C. C. Van Nuys entertained the physics class Friday evening, February 9th. The evening was thoroly enjoyed by all those present. The professor has entertained twice since—February 16th and March 2nd, in Room 114, Chemistry Building.

A class meeting was held February 6th in the Gymnasium Building. T. B. Romine was elected class vice-president to succeed E. L. Bilheimer, and J. A. Poulin, Sophomore representative on the Integral Club board to succeed C. K. Richardson. An assessment of 25 cents a month was levied on all members of the class to help meet the expense of the Junior promenade next year.

Professor Zeigler was lecturing on corundum, one day, and telling of his graduate work at Columbia University, endeavoring to find a means of distinguishing artificial rubies from genuine. He observed that he had some fine specimens at home, but had forgotten to bring them to class. "High grading," said Coulter, in a loud whisper. He might as well drop mineralogy.

Metzger was also awarded a prize for handing in his hat at a physics quiz and taking his paper with him.

### FRESHMAN NOTES.

F. L. Serviss.

Pre-season baseball and track dope show the frosh much in evidence chasing the alluring "M." Our class made an excellent showing in varsity basketball and look as promising in these other two branches of sport.

Five of our first semester classmates are now attending D. U.—Beaton, Hay, L. Spezia and the Turre twins, George and Joseph. They would all rather be good preachers than poor mining engineers, it would seem. Luck to them.

It has been rumored that a time clock is

to be installed in the drawing Lab., so as to permit Professor Lucht more time for other things, instead of keeping his eye peeled for tardy students and listening to their varied and most alluring excuses.

Those C. W. C. girls sure made a hit here with the Mines fellows. After the singing it was surprising how quickly the girls paired off and with not a few first-year men. Truly they are beginning young.

We are now on our last lap of the first year and all are hoping for a decent finish. However, spherical trig and analytical geometry are most detrimental to a spurt on the home stretch.

The last month was so short there was no time for anything of note to happen, hence the brevity of this column.

By the way, several things are promised for March 17th. As we used to know it, that day was the anniversary of driving the snakes out of Ireland, but now we shall know it as more than that. Watch, look and listen. 'Nuf sed.

#### Y. M. C. A. NOTES.

On Monday night, February 26th, a group of twenty-five high school boys met in the Y. M. C. A. room and organized a Hi-Y Club for the Golden High School. The purpose of the club is to secure a unified group thru which meetings and campaigns might be held. The first activity of the club will be a weekly Bible Study Class. Other activities such as hikes and games will follow as soon as the weather permits. Considering the amount of interest shown in the organization up to this time, its permanency seems assured.

The moving pictures on Safety Engineering shown at Leyden Mines by the teachers of the night school, packed the hall. The Miners took great interest in seeing how other men mined coal. President Parmalee and Dr. Roberts gave short addresses relative to the night school work and the School of Mines.

In spite of the extremely unfavorable weather, the Colorado Women's College Glee Club gave their entertainment to a large and appreciative audience on Friday night, March 2nd, in Guggenheim Hall. Every number was enthusiastically received and encored—sometimes more than once.

"The successful men are they who have worked while their neighbor's minds were vacant or occupied with passing trivialities, who have been acting while other men have been wrestling with indecision. They are the men who have tried to read all that has been written about their craft; who have learned from the masters and fellow-craftsmen of experience, and profited thereby; who have gone about with their eyes open, noting the good points of other men's work, and considered how they might do it better. Thus they have carried themselves above mediocrity and in striving to do things the best they could, have educated themselves in the truest manner."

#### PROSPECTORS' COURSE.

The prospectors' class this year had thirty-odd members. Three women took the course. There was, perhaps, a smaller percentage of men actually engaged in mining or prospecting than in previous years, and a larger percentage from the cities. Mining is booming now and few mining men can spare the time for study. All the members expressed their appreciation of the course, and a number expect to return next year and take it again.

#### STORK EXPRESS.

News was received Saturday, February 17th, from Rolla, Missouri, of the birth of a ten-pound baby girl to Professor and Mrs. G. A. Mullenburg. Professor Mullenburg was instructor in geology here for a couple of years. Miss Mullenburg's given name is Ruth Ione.

#### FIRE THREATENED TEST RESIDENCE.

A serious fire was averted by a narrow margin at the C. D. Test residence Monday, February 19th, when a Christmas tree stored in the basement became ignited. Postman C. A. Pfeiffer was called in and helped extinguish the fire before much damage was done. The tree was set on fire by children playing with candles.

#### PRESIDENT ADDRESSES U. OF C. STUDENTS.

President H. C. Parmelee addressed the students of the University of Colorado, at Boulder, Tuesday, February 13th, at chapel. His subject was "Engineering Education as a Training for Citizenship."

#### HELEN MACGREGOR WEDS WILLIAM CHARLES.

The ceremony was performed at the home of the bride's mother, Mrs. H. M. Rubey, Saturday, February 17th, Rev. Don Frank Fenn officiating. Immediately after the wedding the young couple left for Ray, Arizona, where they will make their home. The bride is the youngest daughter of Mrs. H. M. Rubey. She attended college at Sea Pines, Massachusetts, and at Fulton, Missouri. Mr. Charles was a Junior at the School of Mines.

#### MISCELLANEOUS.

Victor C. Alderson now has his office at 185 Devonshire Street, Boston, Massachusetts.

Nearly all the members of the Sigma Nu Chapter attended the annual meeting and banquet held at the Kaiserhoff Hotel in Denver the night of February 23rd.

Professor Victor Ziegler was recently elected to membership in the Sigma Xi scientific fraternity at the Iowa University as an alumnus member. Alumni members to be elected must have made some notable contribution to science.

"Was Smith surprised when you told him he had flunked math?"

"Yes, he said it never entered his head."

## Conference Schedules, 1917.

### BASEBALL.

- April 14—C. C. vs. C. S. M. at Colorado Springs.  
 April 18—C. S. M. vs. D. U. at Denver.  
 April 21—C. A. C. vs. Mines at Fort Collins;  
 U. C. vs. C. C. at Boulder; C. S. M. vs.  
 C. A. C. at Fort Collins.  
 April 25—U. C. vs. Mines at Golden.  
 April 28—C. C. vs. C. A. C. at Colorado  
 Springs; U. C. vs. D. U. at Boulder; C. C.  
 vs. C. A. C. at Colorado Springs.  
 May 4—C. A. C. vs. U. C. at Fort Collins;  
 U. C. vs. C. A. C. at Fort Collins.  
 May 5—D. U. vs. C. C. at Denver.  
 May 10—C. S. M. vs. C. C. at Golden.  
 May 12—C. A. C. vs. D. U. at Fort Collins;  
 U. C. vs. Mines at Boulder.  
 May 16—C. S. M. vs. D. U. at Golden.  
 May 18—D. U. vs. U. C. at Denver.  
 May 19—C. A. C. vs. C. C. at Fort Collins.  
 May 25—C. A. C. vs. D. U. at Denver; U. C.  
 vs. C. C. at Colorado Springs.  
 May 30—C. A. C. vs. U. C. at Boulder; D.  
 U. vs. C. C. at Colorado Springs.

### MINES WIN CELLAR CHAMPIONSHIP IN BASKETBALL.

After many years at the top in basketball and then one year when we missed the championship by a narrow margin, we decided to give the other conference fives a chance just to make the game interesting.

For the past three seasons we have been just as far down the ladder as it was possible to be. We lost consistently and failed to win a game. We are not especially proud of this record, but we expect to change it next year. There is no possibility of a change for the worse, so we will just try the top again.

When games were scheduled with Wyoming this Fall, we were sure we would have at least two victories to our credit, but that dream bubble was shattered when it was found that the expense would be too great to bring the Wyoming team to Golden.

The individuals on the Mines team played good basketball this year, but the team work was very poor. If we can "get together" next year there will be a different tale to write next March. Anyway, we are all back of the team, win or lose.

### MINES 11—U. OF COLORADO 32.

The basketball team of the University of Colorado defeated the Mines team at Boulder, February 10th, by the score of 32 to 11. The university boys played far better than the Miners and scored apparently at will. Puryear, the varsity center, was the star, making eighteen of the points on nine baskets that he threw from the field. The game was fast, with no features apart from the fine work of Puryear. The lineup:

Colorado—Beresford 8, Breckenridge, Warner 2, forwards; Puryear 18, center; Harris, Chapman 4, Sears, Noggle, guards.

Mines—Murphy 9, Taylor, Garnett, forwards; Coulter 2, center; Hofus, Buntz, Galluci, guards.

Referee—Hickox of Colorado College.

### MINES 24—COLORADO COLLEGE 53.

The Tigers from Colorado Springs defeated the Mines basketball team at Golden, February 21st, by rolling up a score twice as large. The Tigers made 53 points while the Mines were making 24. Peterson of Colorado College was the star of the evening, he throwing twelve field goals. Holman of the same team did nearly as well. Taylor and Coulter did best on the Mines' team. The lineup:

School of Mines—Taylor, Murphy, forwards; Coulter, center; Galluci and Hofus, guards; Bunte, Dunn, Pitser, Christell, substitutes.

Colorado College—Peterson, Liljstrom, forwards; Holman, center; Taylor, Schweiger, guards; Rawlings, Cornish, Cooper, Thompson, substitutes.

Referee—Ashmore of the University of Colorado.

### MINES 8—AGGIES 31.

The basketball team of the State Agricultural College easily defeated the five from Mines, February 24th, at Fort Collins. Humphrey of the Aggies was the star of the evening, he making 19 of the 31 points put on the Aggies' score. The miners got but 8 points altogether. The lineup:

Aggies—Humphrey, Allen, forwards; Helbeck, center; Dotson, Hoch, guards; Brown, Shaffer, Olson, substitutes.

Miners—Taylor, Murphy, forwards; Coulter, center; Galluci, Hofus, guards; Miller, Garnett, Dunn, substitutes.

Referee—M. C. Evans of Boulder.

### MINES—AGGIES GAME.

This game at Golden, March 8th, closed the season in basketball for the Mines team. Other conference games still to be played are: C. C. and Aggies at Colorado Springs, U. of D. and U. of C. at Boulder on March 10th, and then C. C. and U. of D. at Colorado Springs on March 16th. Colorado College will probably win the championship.

If you think you are beaten, you are;

If you think you dare not, you don't;

If you like to win, but you think you can't,  
It's almost a cinch you won't.

If you think you'll lose, you're lost,

For in the world we find

Success begins with a fellow's will;

It's all in a state of mind.

Professor—"Brown, where do they get mineral wool?"

Brown—"I really don't know; but I expect it is sheared from hydraulic rams."

Usually Efficient—"Now," said the professor of chemistry, "under what combination is gold most quickly released?"

"Marriage," declared the bright student.

**START BASEBALL PRACTICE.**

The baseball squad has been holding indoor practice in the gymnasium, and as soon as the weather moderates a little they will be put through their paces on the outside. For the present, work is being confined to a little batting practice and warming up the pitchers.

The prospects for a championship team are better than they have been for years. Nearly the entire team of last year will be on the field again this spring. In fact, Coach Carter can put an entire team of veterans on the diamond, and will probably do so unless some of the many Freshmen who reported show considerable class. Heitzman, the football star, is the captain this year and is depended on to do the bulk of the pitching, although Sealey and Pittser are good moundsmen also.

C. Schneider, last year's first baseman; H. A. Robinson, second base; Billy Williams, third base, and Dickinson, shortstop, are all here again and will probably play in their old positions. O'Neil, Taylor and Putnam will be in the outfield, unless some aspiring Freshman is able to displace one of them.

The Senior trip has always interfered seriously with the pennant aspirations of the School of Mines, but has been abolished this year. With this obstacle removed we expect to show the other members of the Rocky Mountain Conference a few things about baseball, and add another pennant to the already large collection we have in the Integral Club.

The Mines track team may journey to Laramie on May 12th for a dual meet with the University of Wyoming.

**SCHOOL OF MINES AGAIN OFFERS SCHOLARSHIPS TO ACCREDITED HIGH SCHOOLS OF THE STATE.**

The prospects of securing one of these scholarships has proved a stimulus to better work among high school students, not only because of the honor which they confer to the recipient, but because of their intrinsic value to one who has to meet the expenses of a college education.

The scholarships offered by the Colorado School of Mines to the accredited high schools of the State, amounting in all to 71, relieve the student of the payment of fees amounting to a total of about \$40 per year. With the inauguration of these scholarships in 1916 they were awarded to 42 students of high scholastic standing in as many high schools of Colorado and a large proportion of that number are now in the midst of their freshman year at the School of Mines at Golden. As the value of these scholarships become more generally recognized the honor is being more eagerly sought and it is expected that when the awards are made this coming summer practically every accredited high school in the State will be represented. The present is a particularly favorable time to pursue a course of study in mining engineering because the mining industry is in a most prosperous condition and is likely to be for some years to come.

**A L U M N I****PERSONALS.**

'91.

C. Dupree Smith was in Boulder, Colo., during February. Smith has been traveling around the country so much it is difficult to keep any permanent address.

'95.

A. L. Eaton's address is Mills Building, El Paso, Texas. El Paso is the general headquarters for mining men from Mexico, who hope some day to be able to return to their positions.

C. M. Eye, who is superintendent of the Benquet Consolidating Mining Company, Baguio, P. I., writes: "We have just finished our first full calendar year of operation and it has been a very successful one. We produced from 17,360 tons ore milled, 21,076.8 ounces of gold bullion, worth \$277,854.73. From being in debt to the extent of some 75,000 pesos at the beginning of the year, we paid off this and had two dividends of 5% on the full capital stock of a million pesos and made a lot of improvements, carried on active development work and had a goodly reserve left. We increased the amount of our warehouse stock from 20,000 pesos to 50,000 pesos and finished the year with cyanide stock on hand to last for fifteen months at present rate of usage. Knowing the cyanide market, you will know what this means to us." Eye does not expect to return to the United States for a year or more.

'98.

R. W. Lucy has left Denver, and his address is Room 23, D. & R. G. Depot, Salt Lake City, Utah.

Fred Johnston, who has been assistant Superintendent of the Arkansas Valley Smelter at Leadville, for a good many years, has been transferred to the East Helena plant in Montana. His address is East Helena, Montana.

'99.

News came from Anyox, B. C., early in February of the birth of a fine eleven-pound son to Mr. and Mrs. Arthur R. Hodgson.

'05.

L. L. Middelkamp and wife are paying a rather extended visit to the States from Ellamar, Alaska, where Middelkamp is in charge of the Ellamar Mining Company's property. After a short visit in Denver and Pueblo, Middelkamp left for Phoenix, Arizona, the latter part of February, where he expects to spend a few weeks visiting various copper properties in that section of Arizona. It is probable that he will return to Alaska about the middle of March.

Robert McCart, Jr., is in El Paso, Texas. His address is 222 Mills Building.

E. E. Greve's address is 206 Bayne Avenue, Bellevue, Pennsylvania.

William J. Hallett, chief engineer for the Union Pacific Coal Company, visited the



school March 1st, on his way back to Rock Springs from a business trip to Omaha, Nebraska.

Fred C. Carstarphen was elected president of the Engineers' Club of Trenton, New Jersey. Mr. Carstarphen is tramway engineer for the American Steel and Wire Company, at Trenton, and is celebrated in his profession as designer and builder of the heaviest aerial tramway in the world, which is located in Utah and has a capacity of 285 tons per hour.

J. F. O'Byrne's address is 31 Amherst Place, Jamaica, Long Island, New York.

'09.

W. A. Wasley has returned to his position in Mexico where his address is care of Tigre Mining Company, Esquedo, Sonora, Mexico, via Douglas, Arizona.

E. J. Ristedt's address is now Box 100, Miami, Arizona.

R. E. Geary has left the Gold Hunter Mine and Smelter Company at Mullan, Idaho, and is now with the North Star Mine at Hailey, Idaho. The North Star Mine recently suffered from a disastrous snowslide which killed eighteen men. While we have not heard directly from Geary since the slide, we believe he escaped.

Robert I. Kirchman is now at Silver City, New Mexico, where his box number is 147.

'10.

D. C. Kelso is rearranging and making tests at the flotation mill of the Gold Hill Contracting Company. His address will be Gold Hill, Boulder County, Colorado.

Mr. and Mrs. Otis W. Swainson were guests of Professor and Mrs. Harry M. Showman early in February. Swainson has just returned from several years in the Philippines, where he has been engaged in the U. S. Coast and Geodetic Survey work. After a short stay in Colorado, Swainson was called to Washington, D. C. He will be located in this country for some time and his permanent address will be care of the U. S. Coast and Geodetic Survey, Washington, D. C.

Owing to the length of time it takes for mail to reach the United States from the Philippines and to confusion in the transmission of the news to the Magazine, we are just announcing the marriage of L. L. Pullen and Miss Edna Rae Saunders, which occurred in the American Cathedral at Manila, Philippine Islands, January 29, 1916. Pullen's address is Aroroy, Masbate, Philippine Islands.

Robert M. Keeney's office address in Denver is 603 Symes Building.

In the February number we made a mistake in Walter R. Brown's permanent address. This should be 966 Twelfth Street, Oakland, California.

'11.

K. H. Matheson visited the School February 7th while on a two months' vacation from Sabana Grande, Honduras, C. A. He spent the month of January and early part of February in the States, and expected to sail from New York for Honduras about February 12th.

James A. Lannon called at the School February 27th while on a short trip to Denver from Sneffels, Colorado. Lannon is General Superintendent of the Atlas Mining Company.

Morris V. Andre, Jr., is now living in Park City, Utah. He is engaged in flotation work at the Broadwater Mill.

'12.

Ross R. May has left Butte and is now with the Empire Zinc Company in Colorado. During last summer he spent some time at Gilman assisting in examination work, later about six weeks in Arizona, and then was in Leadville for some time. Early this year he was in Gilman again for a while, but his permanent address will be care of the Empire Zinc Company, 703 Symes Building, Denver, Colorado.

Thru an oversight on our part last month we left out the announcement of the arrival of Donald Robert, six and a half pounds, who came to the home of Mr. and Mrs. Donald Dyrenforth, in Denver, January 18th.

Frank B. Saxton's street address in Victor, Colorado, is 611 Victor Avenue.

A. L. Toenges's box address at Fredericktown, Missouri, is 644.

E. H. Murchison is now in Leadville, where his address is care of Quincy Block. He has been working with Carl A. Allen, '05, as sampler and assistant surveyor. He is now assistant engineer for the Yak Mining and Tunnel Company.

John Davenport accepted a position as Assistant Superintendent of the Virginia Smelting Company, at West Norfolk, Virginia, where his address will be care of the company.

'13.

S. E. Watson's address is now 521 West Sixth Street, Anaconda, Montana.

'14.

Allen E. Craig has changed his street address in Butte, Montana, to 1426 Evans.



John H. Turner

John H. Turner and Miss Ruth N. Kettinger were married in Denver, Wednesday evening, February 28th. The young couple left for Salt Lake City for their honeymoon. Turner has a position offered him in Utah and may remain there.

Mark U. Watrous is now in Metcalf, Arizona, Box 24.

Louis F. Clark is chemist for the Andes Copper Mining Company. Address care of Jorge Laurrien, Casilla 230, Antofagasta, Chile.

Lemuel K. Taylor's address is care of the Standard Oil Company, Kiukiang, Kiangsi, China.

Arthur Krohn is with the Tucson, Arizona, Copper Company, Box 81, Sasco, Arizona. This is a new copper property just starting to operate and is about 35 miles west of Tucson. Krohn writes that the camp is a very pleasant place.

A. R. Brousseau, after a short visit in Golden, has left for the East. Definite address later.

Eugene G. Snedaker of the Goldfield Consolidated Mines Company was in San Francisco during the week of February 12th.

Wallace H. Hayden is draftsman for the Westinghouse Machine Company, at East Pittsburg. Address is 520 Jeannette Street, Wilksburg, Pennsylvania.

'15.

A. E. Bolam is assayer for the Arizona Copper Company. Address Box 237, Metcalf, Arizona.

'16.

Walter H. Ralph's address is Box 226, Bisbee, Arizona.

#### THE SENIOR TRIP.

Minas de Matahambre.

Pinar del Rio, Cuba, Feb. 19, 1917.

I am in favor of and recommend the Senior trip. I am positive that a majority of the graduates are of the same opinion. The trip does a young graduate a world of good, although he may not realize it at the time. The privileges extended to the class by the various operating companies give excellent opportunities to see things. When a man is alone and wishes to inspect some mine or plant, there is often much red tape to unwind before he is given a permit. Most of the places visited are new to the majority of the class. This affords a general study of the place and a special study of methods and processes in each camp. To gain first-hand knowledge of the advancements and improvements in mining and metallurgy the best plants must be visited and thoroly inspected. This knowledge comes in very handy when you have work of a similar character. It is well for an engineer to know of the methods and conditions in all important camps. How often one regrets not having visited a place where something is noteworthy. It may be a geological formation that exposes Nature's secrets; or a novel and economical method in mining; or some metallurgical process. The observance and study of all of these gives a knowledge which cannot be had in the classroom. Many Seniors obtain positions at different places during the trip, which they probably would not have heard of but for the trip.

Speaking of my Senior trip, I regret not having visited Butte and Anaconda. At the time satisfactory arrangements could not be

made with the railroads, so the Butte trip was omitted from our itinerary. I believe that all the men in my class who have not visited the Butte district regret this omission.

The total expense of the trip is \$125 or \$150. This expense comes quite heavy on some of the men, and naturally their arguments are against the trip. But it is evident that a man alone could not undertake this trip with \$150. Not only this, but his privileges would be limited and explanations would be lacking.

Very truly,  
F. EUGENE HEATLEY, '15.

#### EX-MINES PERSONALS.

'94.

E. E. Smith's box address in Salida, Colorado, is 537. Smith is an old-timer in Salida and conducts the only assay office in the place.

'09.

Malcolm H. Carpenter has been superintending the installation of the Koering Cyanide Process of the Investors Company mill, twelve miles from Sheridan, Wyoming, in the Tobacco Root Mountains. Carpenter expected to finish the installation about March 1st and return to the East after short stops in Salt Lake City and Denver. His permanent address is 4630 North Racine Avenue, Chicago, Illinois.

'14.

David H. Orr has decided to return to mining and to complete his course at the Colorado School of Mines. He resigned his commercial position in the East, and arrived in Denver with his wife, March 4th. Orr expects to engage in mining somewhere in Colorado for the next year or so and then complete his work at Mines.

'16.

February 18, 1917.

That some of my old friends might be interested to know that I left Detroit, January 1st, to take charge of the four six-ton electric furnaces and two twenty-ton open hearth that the Canada Cement Company, Ltd., have in operation at Montreal. At present we are making nine-point two (9.2) shell steel, carbon 40/45, manganese 55/65, silica 20/30, and phosphorous and sulphur, 0.04. After the war the company expect to go into the high-grade alloy steel business, duplexing from the open hearth to the electric furnaces.

Although I am very much interested in this work, I will return to Detroit March 1st, where the Standard Tool and Manufacturing Company have offered me the position of Assistant Manager and Purchasing Agent.

Yours very truly,

F. H. BREENE.

Permanent address, 349 East Larned Street, Detroit, Michigan.

#### Man Who Knows.

"The doctor says I am working too hard."  
"I'd put more faith in that diagnosis if it came from your boss."

## NOTES ON ELECTRICITY AND MAGNETISM.

This set of notes by C. C. Van Nuy, Professor of Physics, is really a textbook on the subject, and is so used by the students here. It is printed in uniform style with our other sets of notes, on regular size letter paper, 8½ by 11, punched, so that they may be placed in loose-leaf binders if desired. Printed on one side of the sheet only, leaving abundant room for additional notes, sketches, etc. There are sixty-nine sheets in the set, neatly bound in a tag-board cover and completely indexed. Price \$2.00, delivered anywhere.

You will find this set a valuable reference book on the subject. Send for a set now. Here is the Index:

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**GIVES FREE LECTURES.**

**School of Mines Professor Talks on First Aid and Mine Rescue.**

Within the past two or three months nearly a dozen towns in the State have been favored with free lectures on the methods used in offering first aid to the injured and in mine rescue work. These lectures are a part of the extension service given to the citizens of the State by the Colorado School of Mines and are delivered by Professor James C. Roberts, who is in charge of the Department of Safety Engineering at the School of Mines at Golden. Professor Roberts has lectured at Denver, Georgetown, Leadville, Red Cliff, Aspen, Glenwood Springs, Florence and Canon City, and is available for similar lectures at any town in the State which is sufficiently interested in his line of work to invite him to come and address a public gathering.

The portion of the lectures devoted to first aid work is of interest to any industrial organization as well as to a mining community. Professor Roberts takes with him a complete first aid and rescue equipment and demonstrates in a very practical manner the application of the apparatus. The meetings which have been held in the various mining camps of the State have proved to be exceedingly valuable and have been largely attended. Thus far only a small portion of the State has been covered and it is to be hoped that other mining and industrial communities will be sufficiently interested in this phase of the work of the Colorado School of Mines to arrange for lectures by Professor Roberts. These lectures can be given under the auspices of any organization in a community, and arrangements will be made promptly on a request at the Colorado School of Mines at Golden.

**Along With the Red Lamp.**

"Now, Rastus," said the judge, "tell us just exactly where the automobile hit you."  
 "Judge," was the earnest reply, "ef Ah'd be'n a-carryin' a license numbah it sho would 'a' be'n busted to a thousand pieces."

**THE LAND OF BEGINNING AGAIN.**

I wish that there were some wonderful place  
 Called the Land of Beginning Again,  
 Where all our mistakes and all our heart-  
 aches  
 And all of our poor selfish grief  
 Could be dropped, like a shabby old coat,  
 at the door,  
 And never put on again.

I wish we could come on it all unaware,  
 Like the hunter who finds a lost trail;  
 And I wish that the one whom our blind-  
 ness had done  
 The greatest injustice of all  
 Could be at the gates, like an old friend that  
 waits  
 For the comrade he's gladest to hail.

We would find all the things we intended  
 to do  
 But forgot, and remembered—too late,  
 Little praises unspoken, little promises  
 broken,  
 And all of the thousand and one  
 Little duties neglected that might have per-  
 fected  
 The day for one less fortunate.

It wouldn't be possible not to be kind  
 In the Land of Beginning Again;  
 And the ones we misjudged and the ones  
 whom we grudged  
 Their moments of victory here  
 Would find in the grasp of our loving hand-  
 clasp  
 More than penitent lips could explain.

For what had been hardest we'd know had  
 been best,  
 And what had seemed loss would be gain;  
 For there isn't a sting that will not take  
 wing  
 When we've faced it and laughed it away;  
 And I think that the laughter is most what  
 we're after  
 In the Land of Beginning Again!

So I wish that there were some wonderful  
 place  
 Called the Land of Beginning Again,  
 Where all our mistakes and all our heart-  
 aches  
 And all of our poor selfish grief  
 Could be dropped, like a shabby old coat, at  
 the door,  
 And never put on again.

—A. P. in Gumption.

Professor—"Bruce, you've never had algebra, have you?"  
 Bruce—"Certainly; I took it one year."  
 Professor—"Well, you may have been exposed, but you surely didn't take it."

Hollow Hopes.—"Never despair. Somewhere beyond the clouds the sun is shining."  
 "Yes, and somewhere below the sea there's a solid bottom. But that doesn't help a man when he falls overboard."

**BIBLIOGRAPHY ON THE FLOTATION OF ORES.**

In January, 1916, Jesse Cunningham, Librarian for the Missouri School of Mines at Rolla, compiled a bibliography entitled, "Concerning Concentrating Ores by Flotation." This compilation was printed in Volume 8, Number 1, of the Bulletin of the Missouri School of Mines. This compilation also contains all flotation patents granted up to the date of publication.

Recently the U. S. Bureau of Mines published Technical Paper No. 135, "Bibliography of Recent Literature on Flotation of Ores," January to July, 1916.

Anyone interested in flotation will find these bibliographies of value.

**OIL AND PROSPERITY.**

By Walt Mason.

We had a quiet, pleasant town, that had for virtue wide renown. We had no bloated millionaires, we heard no talk of bulls and bears. We jogged along our hum-drum way, and earned some kopecks every day, and blew our modest surplus in for gasoline and cars of tin. Then some misguided son of toil drilled in the earth and found some oil. Behold, in less than seven shakes, the town was full of noisy jakes, of derricks, drills and wells they talked, and shrieked of millions as they walked. Then all the village went insane; we all had oil upon the brain.

The lineman quit his lofty perch, the pastor left his helpful church, the grocer dropped his wholesale prunes, the tailor shook his pantaloons, the plumber jumped his honest toil, to rush around and yawp of oil. And all the tinhorn gamblers came, and many girls of rancid fame, and roughnecks blew in by the score, and loafers found an open door. I stand and view the seething grad, where all the people are gone mad, and sigh, in Cherokee and Dutch, "Prosperity may cost too much."—From "Oildom," December, 1916.

Mistakes? Certainly we make them. And they will occur in every publication until millenium. A prominent minister said, not long ago: "To save an editor from starvation, take his paper and pay for it. To save him from bankruptcy, advertise in his paper. To save him from profanity, write your correspondence plainly on one side of the sheet and send it in as early as possible. To save him from mistakes, bury him—dead people are the only ones who never make mistakes."—Salt Lake Mining Review.

A Seattle judge says that the sight of a woman's ankle on Wall Street would put a quietus on any gold panic by drawing all the crowd away. Right; a man who would worship the golden calf in preference to a shapely one of flesh and blood deserves to be tortured by panic all his days.

**WORTH THE PRICE.**

First select a girl (a pretty one). Then bet her a dollar you can kiss her without

touching her. (This sounds impossible and will appeal to her sporting blood.) Next, kiss her and pay the dollar like a good loser. Who wins? —Harvard Lampoon.

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<p><b>Burgess, Charles W.,</b> <i>Mining Engineer.</i> Specialty: Examination and Reports of Mines in the Joplin District. Mgr. O. F. &amp; L. Mining Co. 717 W. 3d St., Webb City, Mo.</p>	<p><b>Hammond, John Hays,</b> <i>Mining Engineer.</i> 71 Broadway, New York.</p>	<p><b>Walker, Stanley M.,</b> <i>Mining Engineer.</i> Examinations, Management, Surveying, Machinery. 221-2 First National Bank Bldg., Denver, Colo.</p>
<p><b>Burlingame, Walter E.,</b> <i>Chemist and Assayer.</i> 1736-38 Lawrence Street, Denver, Colo.</p>	<p><b>Kyder, Frederick B.</b> <i>Engineer of Mines.</i> Geologist, Alaska Gastli- neau Mining Co. B. L. Thane Exploration Depart- ment. 904 Hobart Bldg., San Francisco, California</p>	<p><b>Waltman, W. D.,</b> General Manager, The Franco Wyoming Oil Company, Casper, Wyo.</p>
<p><b>Butler, G. Montague,</b> <i>Mining and Geological Engineer.</i> Dean College of Mines and Engineering, University of Arizona, Tucson. Examinations and problems involving persistence, change in character, and loss of ore.  Diamonds and other gems secured for Miners or their friends at re- duced rates.</p>	<p><b>Mallinckrodt, Philip H.</b> <i>Consulting Engineer and Registered Patent Attorney</i> 352 Garfield Avenue, Salt Lake City, Utah.</p>	<p><b>Wolf, Harry J.</b> <i>Mining Engineer.</i> First National Bank Bldg., Denver, Colo.</p>
<p><b>Coghill, Will H.,</b> <i>Professor of Metallurgy,</i> Oregon School of Mines, Corvallis, Ore.</p>	<p><b>Milliken, William B.</b> <i>Mining Engineer and Metallurgist.</i> 418 McPhee Building, Denver, Colo.</p>	

James E. Dick    Donald Dyrenforth    E. R. Ramsey

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# COLORADO SCHOOL OF MINES MAGAZINE

Vol. VII.

GOLDEN, COLO., APRIL, 1917.

No. 4



## Your Country Needs You!



### Line up with the Mines Dynamite Squad for the Defense and Honor of the United States of America.

**BE IT PEACE OR WAR, WE MUST GET TOGETHER AND PREPARE. SHOW THAT  
FAMOUS MINES FIGHTING SPIRIT, AND "WE'LL ALL STICK TOGETHER  
THRU RAIN OR SHINY WEATHER, FOR WE'RE GOING TO SEE THE  
WHOLE SHOW THRU."**

**INTERCOLLEGIATE INTELLIGENCE BU-  
REAU, COLORADO SCHOOL OF  
MINES BRANCH.**

Golden, Colo., March 21, 1917.

**To the Undergraduates, Ex-Mines Men,  
Alumni and Friends of the Colorado  
School of Mines.**

Gentlemen:

The Intercollegiate Intelligence Bureau has been organized to prepare for the government of the United States, at its request, the names of American college students and alumni having the characteristics and training specified in the request, and who would be willing to enter the service of the government in time of expected or actual war; and further, to do such other things as its organization may permit, when called upon by the national government.

The officers of the organization include a director, who is the chief executive and administrative officer; state directors, treasurer, secretary, and adjutants, one in each college, technical school, professional school, or university, appointed by the executive committee on the nomination of the chief executive of the institution.

The function of the adjutants shall be to keep themselves in a position to promptly furnish whatever information may be available in response to requests of the bureau. With this end in view the adjutant for the Colorado School of Mines has organized a National Intelligence Committee, including two undergraduates, two members of the Alumni Association, and six members of the faculty; and with the advice of the com-

mittee has prepared the accompanying questionnaire, which you are requested to fill in and return promptly.

Yours very truly,

**HARRY J. WOLF, Adjutant.**

The personnel of the committee is: Faculty, Harry J. Wolf, '03; Wm. J. Hazard, '97; R. S. Hawley, W. G. Haldane, C. C. Van Nuys and C. G. Dolman. Alumni, Harry J. Wolf, '03, and Orville Harrington, '98. Undergraduates, A. C. Kinsley and L. H. Van Burgh.

**To the Undergraduates, Ex-Mines Men,  
Alumni and Friends of the Colorado  
School of Mines.**

Please answer the following questions. If more space is required, write on the back of this sheet. Return promptly to Harry J. Wolf, Colorado School of Mines, Golden, Colorado:

1. Full name? .....
2. Telegraphic address? .....
3. Mail address? .....
4. Telephone number? .....
5. Place of birth? .....
6. Date of birth?.....
7. If not a citizen of the United States, state nationality? .....
8. Weight (stripped) in lbs.....
9. Height? .....ft. ....in.
10. Have you been active in athletic sports? .....
11. In what sports were you active?.....

12. Between what dates were you active in athletic sports? .....
13. What is the present state of your health? .....
14. Have you passed a medical examination for life insurance? .....
15. Date of last satisfactory medical examination? .....
16. Could you detach yourself from your business for an indefinite period if the government needed you in time of war? .....
17. Would you be willing to render military service in time of war?.....
18. Would you be willing to serve the United States government in time of war, according to your ability, and without reservation, if the government could use you to advantage?.....
19. Would you be willing to render military service to the United States government in case of actual or imminent invasion of this country by a foreign enemy? .....
20. Have you had military training?..... How long? .....
21. Was your military training in a high school cadet corps? .....
22. Have you attended a military school? .....
23. Have you served in the National Guard? .....
24. Have you served in the United States army? .....
25. Are you now enlisted in the government military service? .....
26. If now enlisted, in what branch of the service? .....
27. If now enlisted, what is your rank?.....
28. If you have had any other military training, what has it been?.....
29. What is your present occupation?.....
30. Have you had practical experience in an administrative capacity?.....; the erection of timber or steel structures? .....
31. installation of machinery? .....
32. use of explosives? .....
33. railroad construction? .....
34. electrical work? .....
35. manufacturing? .....
36. building military roads? .....
37. making and reading military maps? .....
38. photography? .....
39. wire telegraphy? .....
40. wireless telegraphy? .....
41. military signaling? .....
31. What is your specialty?.....
32. Are you an experienced chauffeur?.....
33. Are you a good swimmer?.....
34. Can you run small launches?.....
35. Have you any knowledge of navigation? .....
36. Can you adjust the parts of a car or launch? .....
37. Name the states of the United States in which you have traveled.....
38. Have you traveled in foreign countries? .....
39. Name the countries in which you have traveled .....
40. What foreign languages do you read at all? .....
41. What foreign languages do you read easily? .....
42. What foreign languages do you speak at all? .....
43. What foreign languages do you speak fluently? .....
44. Have you had any experience in the manufacture of chemicals?.....; explosives? .....
45. Have you had any experience in inspecting munitions of any sort ordered for the nations participating in the present war? .....
46. If an Ex-Mines man, during what years did you attend the School of Mines? .....
47. What suggestions have you to make as to how anything you know, or can do, might be useful to the government in time of war? .....

If you failed to receive a copy of these questions, send in your address and request. We will see that you are supplied. Don't forget that any friend of Mines is welcome to join the Dynamite Squad.

Golden, Colorado, April 3, 1917.

To the Undergraduates, Ex-Mines Men, Alumni and Friends of the Colorado School of Mines.

Fellow Students and Engineers:

Your response to the first circular letter and questionnaire issued by the Colorado School of Mines Branch of the Intercollegiate Bureau is very gratifying, and illustrates the genuine old "Mines Spirit." So many interesting letters have been received that it is almost impossible to write individual acknowledgements, so we take this opportunity to express our thanks for your prompt replies and hearty cooperation.

More than two hundred copies of the questionnaire have been received, properly filled out, during the first week following their issue. The bulk of the replies have been decidedly patriotic, and we are proud to report that not a single "pacifist" has been located among Mines men.

The questions relative to military service have been answered by "Yes," "Sure," "Certainly," "Gladly," with very few exceptions, and these exceptions are amply justified. It would certainly be beyond the intention and spirit of this Bureau to take advantage of some of the offers made by men who are known to have families and dependents.

The answers received to date are very interesting, not only on account of the various degrees of patriotic fervor reflected by



them, but on account of the great variety of experiences and abilities that have been set forth. It is evident that many of our men would make excellent officers, and it is equally apparent that a substantial number could render no better service than by staying right where they are, in view of the fact that they are efficient units of organizations engaged in the production of metals or supplies of great practical value to the government.

Many of our men are already enrolled in the Government military service, either in the Regular Army, National Guards, or Officers Reserve Corps. Numerous others have filed applications for commissions. Several offers have been received to render valuable assistance in gathering information for the Bureau, and we have even been assured that certain substantial military units, capable of active and efficient service in the field, could be recruited on short notice.

It is no surprise to learn that many Mines men have traveled extensively in the United States and foreign countries, and have the command of several languages.

The numerous responses coming in with every mail are being checked and classified, and, as necessity requires, we will approach you with further inquiries of a more specific nature and offer opportunities for more definite commitments.

We are sure that the Mines men are going to give a good account of themselves in the present national crisis, and that the "Mines Fighting Spirit" will reflect credit on the State, the School, and the Man.

Yours very truly,

Harry J. Wolf.

#### MINES STUDENTS WHO ENTER MILITARY SERVICE TO GET CREDIT.

Resolution adopted by the Faculty at a special meeting called Monday, April 2, 1917:

Resolved, That in recognition of the country's probable need of young engineers in the event of war, and anticipating the response which students of the Colorado School of Mines may be expected to make to a call for military service, the Faculty recommends to the Board of Trustees that such members of the Senior class as may be called into, or voluntarily enter the military service of, the United States, prior to the close of the current school year, shall be graduated and receive the degree of Engineer of Mines without formally completing the customary requirements for graduation, provided they can show passing grades at the time of entering military service.

Further, That such students other than Seniors who may thus enter military service of the United States prior to the close of the current school year, shall receive credit for courses already entered upon and partly completed, subject to their ability to show passing grades and to such future adjustment as may be necessary to insure them a proper knowledge of the courses thus credited.

#### MINES FACULTY OFFER SERVICES.

Faculty resolution adopted at a special meeting called for Monday, April 2, 1917:

We, the members of the Faculty of the Colorado School of Mines, in the present national crisis, offer our services to the Government of the United States in whatever capacities we may render efficient service, according to our individual ability.

(Signed by members of the Faculty.)

#### PREPARE!

Charles R. Barrett.

Why argue, brother, for peace or war?  
All things worth while must be battled for:  
And whether with fist or wit or blade,  
He battles best who is best arrayed;  
Nor waits misfortune's star-shell flare  
To light the warning:

Prepare! Prepare!

Why argue, brother, that all is well?  
What the future holds, no man can tell,  
But he who arms both his head and hand  
Serves best himself, his home, his land;  
Whether war or trade sounds the trumpet  
blare

That warns the unready:

Prepare! Prepare!

Why argue, brother, "Let well alone"?  
On the untilled field only weeds are grown.  
And a slothful ease neither fits a man  
For the march of peace, nor the battle's  
van:

His defeats are many, successes rare,  
Who scorns the warning:

Prepare! Prepare!

Why argue, brother, or dodge the fact?  
The weakest is ever the first attacked;  
The least prepared is the first to fall—  
And it matters not—the loss is small;

While the greatest things can be safely  
dare,

Who heeds the warning:

Prepare! Prepare!

#### MILITARY TRAINING AT MINES.

Arrangements have been completed for active military training. First Lieutenant Landis of the U. S. Army will come to the School Tuesdays and Thursdays, the third period, 9:50 to 10:45. All students will be required to take the training. It is probable three drill sergeants from the army will accompany Lieutenant Landis. At first trained men from the Engineering Company will assist in the drilling.

Maid: "I'm leaving this day week, mam, to work in the munitions factory."

Mistress: "Are you? Well, if you drop as many things there as you do here, you won't be there long."

When men grow virtuous in their old age they are merely making a sacrifice to God of the devil's leavings.—Swift.

# A Method of Classification for Filing of Mine Maps, Building Plans, Mechanical Drawings, Etc.

William J. Hallett, '05\*

In presenting the following system, it is not with the idea that any office with a good system of its own, should change, but that those having only a poorer system, or worse than none at all, might like to see this one. It has worked out in practice and given satisfaction, either to adapt it to their own needs or to use it as the foundation of a system of their own.

It is of course, understood that different headings will be necessary where different conditions are met with, and that those given here, while fitting this field, are but suggestions as far as any other field is concerned.

## General Headings or Subdivisions.

- 0-199 Underground Mine Maps.
- 200-399 Underground Profiles.
- 400-599 Surface Maps of Townsites, Mines, Etc.
- 600-799 Surface Profiles.
- 1000-1199 Proposed Location of Mines, Townsites, Railroads, Pipe Lines, Etc.
- 1200-1399 Squatters and Leases.
- 1400-1599 Borings and Sections of Seams.
- 1600-1799 Railroads, Pipe Lines, Mine Sidings, Etc., Approved or Built.
- 1800-1999 Standard Plans of Methods of Mining, Etc.
- 2000-2199 Plans of Buildings and Structures Exclusive of Foundations.
- 2200-2399 Foundation Plans.
- 2400-2599 Etc., Etc., Etc.
- 4600-4799 Specifications.
- 4800-4999 Contracts.
- 5000-5199 Engines, Hoists, Motors, Locomotives.
- 5200-5399 Boilers, Furnaces, Stacks, Etc.
- 5400-5599 Compressors.
- 5600-5799 Conveyors and Elevators.
- 5800-5999 Scales—Beams and Parts.
- 6000-6199 Generators, Dynamos, Switchboards, Etc.
- 6200-6399 Pipes, Valves, Fittings, Etc.
- 6400-6599 Fans and Blowers.
- Etc., Etc., Etc.

## Camp Headings or Supervisions.

- 0-9 Rock Springs.
- 10-19
- 20-29 Almy.
- 30-39 Twin Creeks.
- 40-49 Hanna.
- 50-59 Carbon.
- 60-69 Spring Valley.
- Etc., Etc., Etc.
- 180-189 Miscellaneous Union Pacific Coal Co.

\*Chief Engineer, Union Pacific Coal Co., Rock Springs, Wyoming.

- 190-199 Other Companies.
- 190 Other Companies in Uinta County.
- 191 Other Companies in Carbon County.
- 192 Other Companies in Sweetwater County.
- 193 Other Companies in All Other Counties in Wyoming.
- 194 Other Companies in Utah.
- 195 Other Companies in Colorado.
- 196 Other Companies in Montana.
- 197 Other Companies in Idaho.
- 198 Other Companies in Kansas.
- 199 Other Companies in All States.

## Map Headings or Subdivisions:

- 0.1 Mounted or Backed Paper.
- 0.2 Detail Paper.
- 0.3 Tracing Cloth.
- 0.4 Profile Paper.
- 0.5 Blue Print Paper.
- 0.6 White Prints, Photographs, Etc.
- 0.7 Manuscript, Etc.

## Second Decimal Gives Map NUM

Under the above classification, in intention that general maps, or mapping an entire camp, should be given number in each camp, and that the numbers be given the mines in their order. Thus it will be seen that there be more than nine mines in camp, or more than eighteen camps present headings would be inadequate, by changing the general headings to more than two hundred (200) units camp headings to include more than (10), the system can be extended infinitely.

As examples under the above system the following: 0.31, a General Map Springs, on tracing cloth and the filing made; 7.13, a Mine Map of Rock No. 7 Mine on mounted paper and the map of No. 7 Mine made on mounted paper; 420.35, a General Surface Map a tracing and the fifth one made; 1244.214, a map of squatters at Hanna No. 4, on detail paper and the fourteenth map in this division made on detail paper; 1244.78, the eighth lease issued in connection with Hanna No. 4, of which a manuscript copy is filed; 2064.321, a drawing, on tracing cloth, of a tippie, engine room, or some building erected at Spring Valley No. 4, and the twenty-first tracing made under this division; 5007.56, a blue print of an engine, hoist, motor or locomotive used in Rock Springs No. 7 Mine.

Looking at it from another angle; suppose that fire had destroyed the No. 7 Mine Tippie at Almy, and a new drawing was made for the rebuilding of the same. The

number given it would be gotten as follows: First, it would come under the 2000-2199 division, next it would have a number in the twenties, and as it is for No. 7 Mine, this would make it 27. Then, it is a tracing, therefore .3. This would make the number 2027.3 so far. Now look up the file for 2027.3 and see what the last number in this file is. Finding that it is 2027.324, the present tracing is given 2027.325.

A card is made out for each number and kept in a filing case, and on that card are placed, as well as the number, the title, date, place of filing, including tube, drawer, or shelf, and any other information that seems advisable.

A second system in satisfactory use in this district is as follows: The general headings are represented by the numbers 1, 2, 3, 4, etc., instead of 0-199, 200-399, 400-599, etc. The camp headings, map headings and map numbers are the same as in the first system, the difference being, that in this system the filing numbers are written with two decimal points instead of one.

For instance, the first example under the other system would read, according to this one, 1.0.31—1 for underground maps, 0 for a general map, 3 for a tracing, and 1 for the first one. The next would read 1.7.13; the next, 3.20.35, etc.

While this second system is practically inexhaustible as far as number of available headings is concerned, it has one bad failing: When clerks in the different departments are writing for prints and asking for them by number, the decimal point or points are often omitted, and the number is given as a continuous figure of six or seven places. Under that circumstance it is easier to replace one decimal point than it is two, and get the right print out.

While many may think that this will occur but seldom, if at all, they will be surprised at the number of times it does occur, especially if many prints are asked for by the outside camps and offices, as is the case here.

If any of the readers of this article would like any further information, the same will be cheerfully furnished upon request.

#### ASSAYING WITH A JITNEY CAMERA.

Pitchblende occurs in fissure veins in igneous rock, like granite, and is valued for its uranium and radium content. It is not found in sedimentary rocks. The little veins of pitchblende vary in thickness from that of a knifeblade to several inches. Usually occurs "bunchy" and associated with zinc blende, iron pyrite and galena.

It is pitch black, sometimes brownish with a grayish or greenish or olive green. The luster is dull, greasy, metallic to pitch like and the fracture is conchoidal; that is, shell like. It is brittle and about 5 or 6 in the scale of hardness. The specific gravity is about 8 to 9.8.

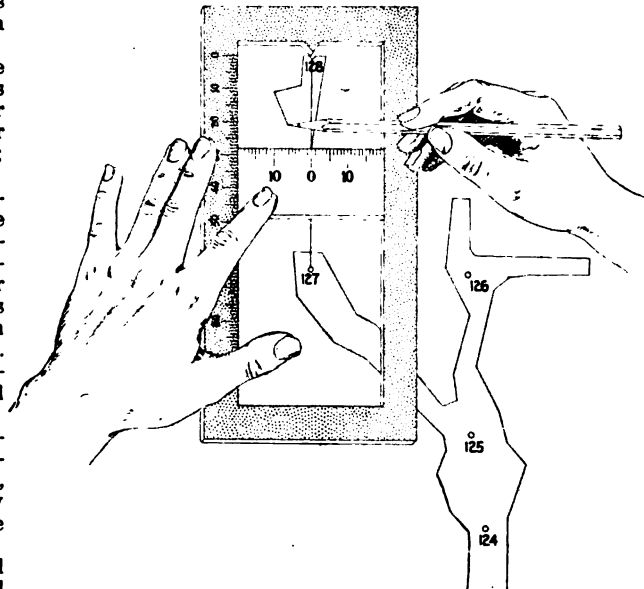
Test—Enclose a photographic plate in a piece of heavy black paper, to keep out the

light, and lay some small, flat metal object on the film side of the plate. Place the sample to be tested upon the metal and place the whole in a dark place for three days. Then develop the plate and if an image of the metal object is obtained the sample should be tested. Uranium and radium both emit penetrating rays.—R. L. Grider, '05, University Daily Kansan, March 5, 1917.

#### THE ZULCH OFFSET SCALE.

By William G. Zulch, '14.\*

The device shown in the sketch is intended for the rapid mapping of irregular lines, such as mine drifts. The construction of the scale is extremely simple. A frame is made of  $\frac{1}{4}$ -inch sheet iron on which a scale is glued or stamped. A movable scale of rectangular form is made from an old celluloid triangle to slide with in the iron frame.



Plotting Irregular Mine Workings on Map With the Zulch Offset Scale.

The course of the main traverse is first plotted (127 to 128 in the sketch), the 0 of the movable scale being over 127, and the distance to 128 being laid off on the fixed scale. The movable scale is then moved up to 0, and the corners of the drift are plotted from the movable scale. The notes for this read 3 feet to the right and 2 feet to the left at 128. The movable scale is then moved down to 9, and the note 2.5 feet right and left is plotted. These points are connected to form the outline of the drift. When any considerable amount of mine mapping is to be done, this scale will prove a time saver.—Engineering and Mining Journal, February 17, 1917.

\* Mine Engineer, Vindicator Consolidated Gold Mining Company, Independence, Colorado.

**PIKE'S PEAK AUTOMOBILE HIGHWAY.**

By A. E. Anderson, '04.

This remarkable road starts about 20 miles up Cascade Canon above Colorado Springs at an elevation of 8,000 feet, and climbs for 18 miles to the summit, an ele-

This road was built by private capital under the supervision of C. J. Toner, chief engineer. William Flick was the contractor.

Much of the work was done amidst snow and ice, which is always to be found near the summit of the mountain even through-



What the Surveyor Handed the Engineer.



The Finished Road.

vation of over 14,000 feet. The road is broad and smooth with no sharp curves and a clear view ahead of from 150 to 200 feet at all points.

The grades are as gradual as the contour of the mountain would permit. They range from 8 to 10 per cent.

out the summer. The high altitude is difficult to get labor because only the most robust men could work under the conditions confronting them. The completed highway is a monument of engineering skill, human severance and manly effort overcoming nature's obstacles. Summer heat at

and arctic cold in the spring, and fall nights describe the climatic conditions.

Du Pont Red Cross Extra Dynamite and Black Blasting Powder worked satisfactorily under the conditions and at all times; the explosives alone made the undertaking possible. Several carloads were used in the construction of the road, large portions of which were blasted out of solid rock.

It was also necessary to blast considerable snow and ice. Blasting powder was used on the snow and Red Cross Extra Dynamite on the ice.

The road has a rise of 6,000 feet in the 18 miles that it covers. It required two years to complete it and cost somewhat over \$200,000.

I consider it the most wonderful automobile road in America, and surely one worth a long trip to have the privilege of riding over it.

Illustration No. 1 gives a general idea of the conditions confronting the contractor when he began the work.

View No. 2 shows a completed section of the road near the top.—Dupont Magazine, November-December, 1916.

#### WAR DEPARTMENT EXAMINATIONS FOR POSITION OF SECOND LIEUTENANT, U. S. ARMY.

April 23 and July 23, 1917, examinations be held to fill vacancies as second lieutenant in the Cavalry, Field Artillery, Coast Artillery Corps and Infantry, from civil life. Candidates must be between 21 and 27 years of age when appointed.

The pay of second lieutenant is \$1,700 monthly, with 10 per cent increase for every year's service. Promotions will be very rapid for the next few years, at least.

Unmarried men not accepted as applicants. Ineligible graduates can be exempted from part of the mental examinations. Subjects for examination would be required to pass examinations in are: 1, General History; 2, Elementary Surveying; 3, Elementary French, German, or Spanish (as the applicant may elect), and in one of the following subjects (at the discretion of the applicant): Advanced English, French, German, Spanish, Analytical Geometry, Calculus (differential or integral), Military Art and Field Engineering, or Advanced Surveying. If interested, write to the Adjutant General's office, War Department, Washington, for General Orders No. 64, W. D. 1915, and application blanks for position of second lieutenant at once.

#### TRUSTEES REAPPOINTED.

James T. Smith and Frank G. Willis were reappointed to the School of Mines as trustees by Governor Gunter. His appointment confirmed the appointments made by Governor Carlson of the previous year. Mr. J. H. Baker and A. E. Carlton were also reappointed by the senate.

The fellow never gets to the front because it is too fast.

## Automobiles.

### GETTING READY FOR SPRING.

(By Prof. R. S. Hawley.)

#### Lubrication.

If your auto has been in winter quarters for several weeks or months a number of precautions should be taken before it is put into actual service. First, go over the oiling system, clean out all of the old grease and oil which is likely to be gummed up and supply new lubricant to every part. Some car owners operate their car during the winter as well as the summer, and in any case the above scheme should be followed at least once a year because the old oil and grease is bound to become dirty and this should be removed and the bearing supplied with fresh, clean oil or grease.

In lubricating the car do not overlook the springs. Although many pay no attention to oiling the springs, yet this is important, and a little precaution taken here may save a broken spring and repair bill later on. As the spring compresses the leaves slide over each other slightly and unless this action is perfectly free the load may be carried on one of the leaves, causing a tremendous overload at one point. When the car has been idle for some time the leaves of the springs are more likely to be rusted or stuck together than if the car is in constant use. Spread the leaves apart slightly and squirt a little oil over the surface. Oil and graphite mixed is a good combination.

Drain the crank case, pour in a gallon of kerosene and run the engine idle and slowly for a few minutes. This will cleanse the bearings thoroughly, remove dirt and particles of ground metal caused by friction and put the bearings in condition to receive the application of new engine oil. Kerosene will be thrown into the cylinder and will tend to loosen the gummy oil around the piston rings. Better compression will result. Drain out the kerosene and fill to the proper level with good engine oil, the best you can buy. This cleaning out of the crank case, of course, is not a matter that should be left until winter, but should be done every 600 or 1,000 miles for best results.

It would be better if the cleaning up process were done when the car is first put away, but this is likely to be neglected at that time and therefore must be done later.

#### Care of Tires.

The expense is about the biggest item in the actual operation of a car, and yet less attention is given to the care and repair of tires than to any other portion of the car.

If the car has been put up for some time and the casings were not removed from the rims, it is likely that they have practically rusted and stuck fast. It is more than likely that the inner tubes are like-

wise stuck in places to the casing. Before the car is put into operation the casings and inner tubes should be removed and carefully examined. Wash the rims with soap and then with gasoline. Dry carefully and thoroughly grease with soapstone or liquid preparations used for this purpose. Examine the casings for cuts and vulcanize the same. Rub the hand along the inside of the casing to ascertain whether a small tack may have buried itself in the casing and is invisible from the outside. Apply soapstone liberally to the inside of the casing, rubbing it in with the hand.

If there are glued patches on the inner tubes, remove these and repatch, or better still, vulcanize the puncture. A glued patch is almost certain to develop a leak after it has been on for some time. Vulcanizing is the only sure method for permanently repairing a puncture.

Test the valves for leakage. New valves cost but little and save a great deal of annoyance caused by the gradual leakage of air.

Every car operator should carry with him a small can of tread filler. Nothing shortens the life of the tire more than a bad cut which allows water and dirt to work in and rot the fibre. Tread filler is a soft, plastic material which can be worked into the cut and make a temporary and effective repair anywhere on the road. Vulcanizing can be done later when convenient. A can of tread filler will cost 25 to 30 cents, and will add hundreds of miles to the life of a tire. If it is known that the car will be stored for some weeks, it is better that the above precautions be taken then, but if not, this should certainly be done before the car is again put into operation if one wishes to get the most out of the tires.

#### Cleaning and Polishing.

If a machine stands idle awhile exposed to dust or wind or changes of temperature, the paint is likely to become dull and the metal tarnished. Any machine will gradually lose its lustre. If paint is badly worn or scratched, there is but one way to permanently restore its brightness, and that is by covering it completely with a coat of varnish. This is a difficult task for an unskilled workman, especially if he is without the proper facilities. Automobile paint or varnish is very heavy, and the slightest dust will mar its appearance. The wheels are most likely to become scratched and worn, and these should be painted once a year, if for no other reason than to protect them. Nearly any one can do a satisfactory job with the wheels.

To brighten up the car any good body polish will be found satisfactory. Care must be used to have the surface free from dust and dirt before applying polish. Rubbing the surface with a dusty cloth will leave fine scratches. Wash the car carefully and dry with a clean cloth without rubbing. Apply the polish with another cloth and polish with a dry chamolis skin or cheese cloth.

It must be kept in mind that protection from wind, rain, sun and dirt is the first precaution in keeping up the appearance of the car. A few days' exposure in a hot sun and wind will frequently ruin the finish, and no amount of polishing will ever restore its original lustre. Keep the machine protected as much as possible. In the garage a piece of canvas thrown over the seats keeps out the dust, and better still, a cover to fit over the entire machine is a very good investment.—Colorado Transcript.

#### RADIUM ELEMENT IS SENT FROM GOLDEN.

Bureau of Mines Sends Precious Substance to Hospitals in East.

Five hundred milligrams of radium element will be sent this month from the Golden branch of the United States Bureau of Mines, this in addition to four hundred milligrams sent about the first of the present month.

Dr. R. B. Moore, director of the Golden branch, states that the precious element will be sent direct to the Memorial Hospital at New York City and to the Dr. Howard Kelly Hospital at Baltimore.

In spite of the lack of a sufficient number of scientists, the Golden bureau has been accomplishing great things, and the indications are these accomplishments are to be greatly augmented.

A complete ore testing plant has just been completed in the basement of the laboratory building, and this is now in operation. It is so arranged that semi-commercial tests may be made on 500-pound lots of ore. Nothing but the rare metal bearing ores and ore carrying tungsten, molybdenum, etc., will be tested by the bureau. The plant is perfect in every detail for running through small quantities of ore.

Another very important movement now being taken up by the United States Bureau of Mines is its work teaching first aid and safety measures to miners of foreign nationalities.

In its effort to reach all of the million miners in the United States with its safety propaganda, the Bureau of Mines has started the issuance of miners' circulars in foreign languages. The first of a proposed series of circulars for the benefit of the foreign-born, containing first lessons in first aid to the injured, has just been issued in Italian, Polish and Slovak, and while these circulars are meant primarily for the miners, they contain information of such a general character as to make them helpful to any man of the three nationalities who works under any degree of hazard.

In order to make these circulars of educational value and to teach and encourage the foreigners to learn the English language, the foreign translation is given on one page and the English equivalent on the opposite page with the paragraphs numbered.

"The issuance of these circulars by the Bureau of Mines in foreign languages is not only an additional effort toward the safety

of the miners, but is also a step in the line of good citizenship," said Secretary of the Interior Lane. "We would all naturally prefer to encourage the miners to read English, but insofar as the Bureau of Mines is concerned, its first purpose is to get the miners to read what it publishes looking to the prevention of mine accidents.

"There is no possibility of making a good citizen out of a dead miner, and our first duty in behalf of good citizenship is to help prevent miners from being killed. The plan of the bureau in placing the English in parallel with the foreign language in these circulars will, however, encourage the alien miners to learn English at the same time they are reading in their own languages about the dangers of their work. These circulars will also have value to the children of these men in showing them the English equivalent to their father's tongue."

The circulars are free to those who write to the Bureau of Mines for them.

#### NEW ENGINEERING SOCIETY ORGANIZED.

At a convention held in El Paso, Texas, on March 8, 9, and 10, the Southwestern Society of Engineers was organized with more than one hundred charter members. Membership is open to civil, mechanical, mining, electrical, or chemical engineers, or architects or other persons belonging to a technical profession, who are not less than twenty-seven years of age and who has been in active practice of their profession for at least six years. Provision is also made for associated, honorary and affiliated members.

The great distance from centers of population makes it difficult for Southwestern engineers to attend meetings of the National Engineering organizations, so it is believed that the new society will fill a real need. It is planned to hold at least two conventions of the society each year for the reading and discussion of professional papers and for social intercourse.

At the first convention the following papers were read and discussed:

"The Purpose of Engineering Education," by Dean G. M. Butler, College of Mines and Engineering, University of Arizona.

"Some Lessons Taught the Mining Industry of the Southwest by Present Activities and Prices," by Gerald Sherman, mine superintendent of the Copper Queen Consolidated Mining Company, Bisbee, Arizona.

"Modern Highways and the Dividends They Pay," by J. L. Campbell, chief engineer of the E. P. & S. W. R. R.

"Engineering and National Defense," by Lieut. Col. M. L. Walker, Corps of Engineers, U. S. Army, chief engineer of the recent punitive expedition into Mexico.

The officers of the society are:

President—Dean A. F. Barnes, School of Engineering, New Mexico College of Agriculture and Mechanic Arts.

Vice President (for 2-year-term)—Dean G. M. Butler, College of Mines and Engineering, University of Arizona.

Vice President (for 1-year term)—Dean S. H. Worwell, Texas College of Mines.

Secretary—Forrest E. Baker, El Paso, Texas.

Treasurer—R. W. Goddard, Professor Electrical Engineering, N. M. College of Agriculture and Mechanic Arts.

Director (for 3-year term)—S. O. Andros, Albuquerque, New Mexico.

Director (for 2-year term)—J. N. Gladding, City Engineer, El Paso, Texas.

Director (for 2-year term)—D. B. Gillies, General Manager Carrigan-McKinney Company, Chihuahua.

Director (for 1-year term)—J. C. Ryan, County Engineer, Cochise County, Arizona.

Director (for 1-year term)—W. E. Robertson, El Paso, Texas.

#### Mines Men.

In addition to Dean G. M. Butler, '02, the following Mines men are charter members of the association: W. L. Beck, '14; C. T. Emrich, '09; T. H. Garnett, '11; E. E. Hand, Jr., '12; B. M. Johnson, '08; B. J. Latimer, '10; K. E. Neugebauer, '06; Oliver Powers, '03, and Paul Neer, ex-'09.

#### RUMORS GONE WILD.

Some people look at a faint suspicion so long that it takes outline for them, appears to be a fact, assumes huge proportions, and goes rolling off down hill, destroying whatever is in its path. These people may be perfectly sincere, but they are perfectly in the wrong.

Suspicions thus set in motion have but the tiniest chance of being founded on anything, yet they can do as much harm as a well supported charge and sometimes more.

Men in public life suffer the most from exaggerated suspicions. There are people in every community who delight in taking them up, spreading them and strengthening them. The facts are always available, but rarely referred to. A guess becomes certainty and hearsay becomes reliable testimony.

On the campus the damage which rumors can do is always apparent. They create factions, which have no place in university life, prevent united action and hinder progress. There is no particular instance at hand, but the tendency may be seen in many things.

If anyone harbors a suspicion he has a moral obligation to perform in seeking the facts before by an idle word starting a rumor which may get away from him and do great injury.—Washington Daily.

#### Horrors of Peace.

If Henry Ford is sincere in wanting to do the greatest good to the greatest number, he will put another spring under the back seat.—Lake County Register.

A mine—A hole in the ground with a liar on top.

# Colorado School of Mines Magazine

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K. S. FERGUSON.....'17 I. M. CHARLES.....'19  
D. R. LOCKE.....'18 FRED L. SERVISS.....'20

**ATHLETIC EDITOR.**

R. F. WHITE.....1918

**VOL. VII. APRIL, 1917. No. 4**

### YOU CAN DO YOUR PART

By sending in your questionnaire with the blanks all filled out. If you failed to receive a copy write for one. We will see that it is sent to you. See that we have your address correctly at all times. You will be told of other opportunities for service as the need develops. Incidentally one of the best ways to help and keep with the Mines Dynamite Squad through the stirring events of the next few years, at least, is to be sure you are a subscriber to the Magazine. There is no better way to keep in touch.

"For we've got to get together if we want to get ahead."

### SHALL WE CHANGE THE MAGAZINE?

As suggested by R. L. Grider, '05, in his recent letter which follows this? This is your Magazine, and we will do the best we can to give you what you want. If we decreased the top, bottom and right-hand margins, as he suggested, we could save enough on paper to pay for punching holes for binding. We could furnish good, serviceable, loose-leaf binders at from 25 to 50 cents each, depending on quantity ordered.

The hardest part of the change would be to make the pages come out just right, as Grider suggested they should.

However, if enough of the readers are in favor of the suggestions, and will agree to furnish articles or their private notes for publication, we will be glad to try it. It has always been our ambition to make the Magazine of more value through the

publication of such articles and notes, but we have not been able to get the articles and notes.

Will you furnish an article each year or send us your notes for publication? Write and tell us what you think of the suggested change, or suggest other possible improvements. We really would rather hear constructive criticism than praise. Do it now.

### PLAN FOR IMPROVING THE COLORADO SCHOOL OF MINES MAGAZINE.

March 26, 1917.

Pardon my taking this opportunity to make a few suggestions regarding the C. S. M. Magazine. It has been my practice for years to cut out the pages that I wish to file for reference. The result is that much time is lost in looking for the data required if the pages are not indexed and bound in some make-shift, unsightly fashion. Besides the collecting and binding, such as it is, means loss of much valuable time.

Many of the articles are valuable, and many of the Mines men, as well as myself. I trust, wish to preserve the important ones. To collect and cart a ton or so of magazines over the country is not the best practice in promoting a "wizard's" ideas of efficiency and economy, and to throw them away is wasteful and criminal. Again, many important articles are begun in the last column on a sheet and finished on sheets following. This makes it necessary to preserve one or more practically useless sheets, or else use the scissors and liquid glue or library paste freely.

In order to overcome these difficulties, I will suggest the following:

(1) Begin all long (one or more leaf) articles at the beginning of the leaf (on the odd-numbered page) and finish on as few sheets or leaves as possible to facilitate filing them for future use, to reduce weight and bulk to a minimum, to render indexing simple and effective, and to reduce cost of transportation of files. In other words, do not begin a two-paged article on an even numbered page, thereby requiring the use of two sheets instead of one.

(2) Fill in the balance of the unused page, where both pages of a leaf are not full, with short articles, scientific extracts, or data, etc., that will be valuable to any man's file.

(3) Punch three or four holes, preferably four, in the binding margin to facilitate loose-leaf binding. See enclosed specimen leaf.

(4) Reduce the top, bottom, and front margin to a minimum width (¼-inch to ½-inch, say), to reduce weight of paper. Leave back margin at present width to facilitate private binding. This will reduce the length of the magazine from top to bottom from 1 to 1½ inches, and the width from ¼ to ¾ inches. Strange as it may seem, I often take a ten-point carpenter's hand-saw and saw the top, bottom and front margins off my books., viz., on such books as Bowie's Hydraulic Mining to reduce the



bulk and freight. Wide margins are not beautiful to the traveler nor to the mining engineer, a firm believer of economy and simplicity.

(5) Have the mailing envelopes made to the exact size of the Magazine. These envelopes can then be used by all who care to do so, as filing envelopes for the sheets which are to be preserved. I am following this method at present. As soon as I have collected 50 or more sheets, I index and bind them. The envelopes should be made of a little heavier paper. However, they answer quite well.

(6) A cheap loose-leaf cardboard, cloth-covered, or stiff, gray canvas binding could be designed. Morocco binders are too expensive and fail to protect the subject-matter while in transit.

#### Advantages.

The advantages of such a publication will be intensely practical, portable, efficient, beneficial to the subscribers and effective in securing high class contributions. Many men who are using valuable private notes would have them published in order to secure more legible notes at a minimum cost. In this way many of the Mines men will be able to exchange notes and help each other build up a very valuable private library. In this manner the present-day practice will be made available through the co-operation of our men all over the world. Also graduates and undergraduates will be encouraged to practice writing articles for publication, and be privileged to study present practice rather than history. Mining textbooks are history by the time they are available.

The clipping envelope occupies no small part of an engineer's library. It is an unwieldy inefficient method and should be discarded. I have studied note collecting from many angles and have concluded that the one above outlined offers the best solution. Students and faculty members have been trying for years to land on some system of note-book keeping. The loose-leaf book seems best so far, but it is expensive and unprofitable. Notes once written in one's own writing are seldom used again. They are usually full of errors, poorly written, and hence useless to the authors as soon as cold. Comparatively little good has come from such a system, and I fail to see how the problem can be solved other than I have outlined.

The Lefax people have a system of note-keeping that is fairly good, but they are not benefiting the student. The student is not getting his money's worth and is getting no practice in writing for publication. All engineers must strengthen this element of their profession. They cannot afford to leave this work to others to derive profit at their expense.

Possibly the punching of the holes in the Magazine might add a little more cost to the publication, but I feel that not a single subscriber will hesitate to pay the additional

sum. In fact, all will be keen to subscribe for the publication in order to avail themselves of the valuable material and the superb possibility of getting their notes published free of cost.

Perhaps I am treading upon sacred ground, but I hope that I can aid you in clearing up this hazy, conflicting, expensive, inefficient problem. Why can we not bring about conditions which will break away from custom, install originality, and develop the people at large at minimum cost to them, as well as crown those directly connected with the publication with success.

Hoping that we can start something that will better conditions along the lines mentioned, and to receive a letter concerning this subject in the immediate future, I remain,

Very cordially,

RICHARD L. GRIDER, '05.

#### ENGINEERS RECRUITING.

**Captain Taylor Gets Orders to Bring Local Company Up to Full War Strength.**

Captain Joseph Taylor has received orders to at once begin recruiting the Golden company of Engineers up to war strength, 164 men. The company now has 51 enlisted men and three commissioned officers. Joseph Taylor is captain, with A. C. Kinsley as first lieutenant and L. R. VanBurgh as second lieutenant. The other first lieutenant is yet to be appointed. The new enlistment blanks have been received. All who sign will enlist as members of the United States National Guard for three years. Men between the ages of 18 and 45 are accepted.

Captain Taylor is confident, that when actual war is declared, he will have no trouble in filling his company up to full strength. The Engineer Company at Boulder has also received orders to recruit, and still another company of Engineers is to be formed in this State, making a full battalion.

Colorado will also be called upon to furnish two battalions of infantry, two separate companies of infantry, two batteries of field artillery, four troops of cavalry, signal corps, field hospital, recruited to war strength, which will aggregate 2,717 enlisted men and 71 officers, exclusive of the staff officers of the State administration.

#### This is Also True of Many Mine Repair Jobs.

Old Mrs. Clark to the District Visitor:

"Well, Miss, I've made these 'ere stockings last for fifteen years! I just knits new feet to 'em every winter, and new legs every other winter!"

Quite the cleverest thing so far said about the Chinese and Japanese situation was that the moment China, having been smitten on the one cheek offered to turn the other, the Christian nations raised a howl of indignation.—San Francisco Chronicle.

## COLLEGE NEWS

### SENIOR NOTES.

K. S. Ferguson.

A Senior trip of ten days' duration has been arranged. A party consisting of all the Seniors and a number of the professors will leave Golden May 6th for Victor. Ten days will be spent at Victor, Cripple Creek and Colorado Springs, returning to Golden May 16th. Finals week will be the week preceding the trip. Prof. Wolf should be given the credit for this trip. He has been in favor of its continuance from the first, and has worked with the class to obtain it.

The costume ball given by the Seniors March 23rd was well attended. The four fraternities gave house parties for the occasion.

On the 'Varsity baseball squad this season are Heitzman and Worth. This will make their fourth and last year as battery mates on the Mines nine.

It has been decreed in Economic Geology that all books close at 8:00 a. m. sharp. It has been further decreed that Butler stay out from behind the northeast post.

A Senior baseball team has been organized primarily for the purpose of humbling the ambitious young Juniors. The Juniors are entirely destitute of material, but will probably try to get nine men to stand around on the diamond. In direct contrast with this the Seniors have an abundance of experienced ball tossers, including Cheney, Small, Miller, Van Burgh, Murphy, Butler and Andrews. The batteries will consist of Sealey, Chan and Eisele. It must be conceded that Van Burgh isn't as good yet as he was several years ago, but he is fast rounding into condition.

The school as a whole is indebted to Dave Johnson of the Integral Club. We certainly have reason to appreciate his services.

Levis declares himself to be in favor of a broad engineering education rather than a detailed study of some one course. While there, are those who disagree with him, still he could find no one to argue the case with.

In the light of the present altercation with Germany, it is of interest to review the status of the Senior class on its military phase. All enlisted men in the student body at present are officers. Capt. Chester M. Knepper of the U. S. Navy is on reserve, Van Burgh is first lieutenant in the Engineer Corps, Thurstin is first sergeant, and Mewhlrter is quartermaster sergeant in the same company.

Cheney has also seen military service, but has retired from active army life.

When the Seniors realized the degrading effect of not wearing white collars, they set aside on hour one Thursday in which to repent. They wore their white collars and a few other things—other than usual.

Heitzman decided to himself that the plan was not worthy of consideration, but after going into executive session with the rest of the class, emerged from the bottom of the pile with altered ideas as to the correct attire for certain classes. It was lamentable that the class had to take drastic measures to make one of their own men take a little pride in his dress.

The Sigma Alpha Epsilon basketball team defeated the Sigma Nu basketball team at the close of the 'Varsity season. While the game was replete with sensational plays, still it must be conceded that Hofius (the only Senior in the game) was easily the star of the contest.

Mister John Hezakiah Winchell, Junior, has been buying smokes and drinks for all those who challenge him. While no formal announcement could be inveigled out of him, nevertheless he looks nervous and agitated. Bets are now 50-50 on whether Heitz or Hez will be first.

The Seniors have been taking turns spending week-ends at Idaho Springs in conjunction with their course in Mine Examinations. Upon their return complete reports are made on the mines assigned them. This course has just been added to the curriculum this semester. It also includes the making of an assay plan of a mine and from it determining the value of the ore reserves.

### JUNIOR NOTES.

D. R. Locke.

Considering this is the second month of Spring, it is becoming rather monotonous dodging snowballs, but we all hope for the best. Last month was a period of unusual happenings. Strange things were seen dangling from flagpoles and telegraph wires about Guggenheim Hall and the soft "pit-a-pat" of the gumshoe was heard in the land. As is usual, when any untoward event occurs, the Armory got the blame for the elevating of the replica of a certain well-known gentleman on the flagpole and an individual representing himself as "Gumshoe Charlie," but who we have absolute proof was none other than Sherlock Guck, the famous Artic Detective, who was employed by special arrangement with Capt. Katzenjammer and Mr. Rudy Dirks, appeared to confront the trembling culprits with their guilt and in a tear-stained voice to beg them for the sake of their aged parents, etc., to confess all. Certain virtuous young men from about the school, and especially those from the Armory, were called in to face a three- to five-hour quiz by this famous sleuth. However, it seemed, unfortunately, that the pangs of conscience were not seriously torturing them, and it was only with the greatest reluctance that they finally confessed—their innocence. "Gumshoe" seemed to have a general thirst for knowledge on all lines, inquiring as well upon sundry subjects, such as when and what would be Senior Day, what the Prospector was going to contain, and why Chao persistently wore overshoes in dry weather. So far, it is not

generally known just what amounts of knowledge were obtained by Mr. Guck's efforts.

The Prospector board, after many sleepless days and nights, and many wrinklins, finally succeeded in getting out the annual on time, and nobody need think it was a snap job, either. Ask Dave; it cost him a lot of money shaking "hosses" with the famished workers when they came forth at odd times from their sanctuary. There is no doubt that Dick and Snick both think it was a pretty good Board, too.

A few nights ago Mr. and Mrs. Reith entertained a small party of friends at a full dress dinner at their home. The guests included Messrs. Tongue, Copeland and E. W. Robinson. The guests arrived in their private limousine and were ushered to the door by their footman, "Rocky" Jones. Here they were met by the hostess and her charming daughter, who ushered them into the dining room, and called their host, who had crawled beneath the table under the impression they were coming in to wrinkle him. A sumptuous feast was now spread, and the guests, upon taking their departure, declared they had spent a most delightful evening.

The war spirit has pervaded the Mines, as it has all other schools, and compulsory drill will begun next week, provided all the students are not enlisted in the army by that time. The Faculty has decided that all men up to passing in their subjects will receive credit for this year's work if they are called out or enlist now for the war. Several of us are looking forward expectantly to this as a possible means of getting by this year. What horror of war could be worse than Mechanics quizzes or Bunse's Lithology quizzes, anyhow?

Last week "Doc" Roberts took a large party to Leyden, where they thoroughly examined two coal mines, Prof. Roberts carefully explaining their ventilation and the fires they had had meantime. It was a most interesting trip, and when it was over it was generally decided by the explorers that while they could understand how "Doc" Roberts could have walked as far as he had or how he could have talked as long as he did, how any man of his age could have done both at the same time, was entirely beyond them. Another interesting event incident to the trip was the initiation of Mr. J. Merrell Parker, our well-known Y. M. C. A. secretary, to the "Ancient Order of the Rubbed," the baptism being made with finest soft coal dust at the foot of No. 2 shaft. We feel sure Mr. Parker appreciated the honor of being initiated directly into the "Coal Dust Degree" of the order.

Innocent Junior—What's the hardest thing about skating when you're learning?  
Wise Senior—The ice.

It takes two to make a quarrel, and we seldom have any difficulty in finding the other one.

## FRESHMEN NEWS NOTES.

F. L. Serviss.

Dewey Dutton suffered a severe attack of appendicitis the latter part of the month. He was in a serious condition when he was taken to Denver for the operation. At the last report he was feeling fine and improving.

Houssels is sporting a bum ankle and a pair of crutches. Something has to suffer whenever a fat man falls.

As a means of adding impetus to the present patriotic movements, some young patriot started a Fourth of July celebration in one of the classes last week. One would not believe there was so much noise or smoke in a bunch of firecrackers.

After listening to Prof. Lucht tell the class of some of the wonders of the slide rule, Grimm wanted to know if it could be used in Descriptive Geometry for locating piercing points.

"Sleepy" Miller and "Batty" Bell had quite an argument one day last week. "Batty" lost his temper and started the fight; "Sleepy" lost his wind, and that finished the fight. It has not been made public whether a return bout will be staged or not, both managers refused to talk for publication.

Gallucci, one of the Freshmen representatives of Varsity basketball, received his letter. It seemed certain that more men would earn a letter, but in counting the time played, several fell short of the required 50 per cent of games. These men will be heard from next season.

One of our local papers, in reporting the Senior costume ball, stated that on that evening the Mines fellows acted as gentlemen, not rowdies, as one of the professors had stated. We wonder where it could have been that this editor ever saw them act other than gentlemen (students, not professors).

At the Junior prom of the Golden High School we noticed several Freshmen. Taking cognizance of the fact that they had to be invited by a High School girl, we wonder where they got their pull; we may not be jealous, but at any rate we are curious to know how they got there.

## Y. M. C. A. NOTES.

Last Thursday night, March 29, the Hi-Y Club adjourned its regular meeting and held a feed and stunt night. All forms of humor and antics were in order and every one had a great time inventing and executing stunts.

During the last month four of the series of five Sunday afternoon meetings to be held in the Y. M. C. A. have been conducted. The best speakers and musical talent available in Denver were secured for these Vesper services, and every meeting has been thoroughly enjoyed and well attended by the students and townspeople.

Everyone is looking forward to the next and last meeting, which is to be lead by Jim Goodheart of Denver.

Work has been started on the 1917-18 Hand Book, and it will probably go to press about May 1st.

# BASEBALL

**R. F. White, '18.**

Without exception this year's team consists of the same men as our last year's team, and although we took the cellar championship last season, the boys have played together for a long time, and are looking good for a clean-up in conference baseball this year.

This being the "year of the big snows" our practice has been interrupted every week, and we have lost the benefits of two practice games.

There are a number of promising recruits out who will doubly reinforce our battery and infield.

Sheriff Jones drops in once in a while to offer suggestions and his advice always "fits like a blister." Bert whipped the team into shape last year, and made a promising nine out of them. It is to be regretted that he cannot spend more time with them this year, for he knows their strong points and is the best director for their needs.

The first practice game shows the boys to be hitting hard, avoiding errors and fast on their feet.

**N. D. H. S., 1; Mines, 4.**

N. D. H.	Mines.
Reedy .....	1st B. .... Schneider
Liphitz .....	2nd B. .... Robinson
Goldburg .....	3rd B. .... Williams
Grant .....	S. S. .... Dickinson
Severini .....	P. .... Worth
Harvey .....	C. .... Heitzman
Elder .....	L. F. .... Putman
Sarafani .....	C. F. .... O'Neill
Monahan .....	R. F. .... Taylor

Subs—Denver—Sarafani for Severini.  
Mines—Bailey for Robinson; Pitser for Heitzman; Fushy for Worth; Garnet for Schneider.

Heitzman holds H. S. to 1 hit.

Mines gets 7 hits.

## Schedule, 1917.

- April 14—C. C. vs. C. S. M. at Colorado Springs.
- April 18—C. S. M. vs. D. U. at Denver.
- April 21—C. A. C. vs. Mines at Fort Collins;  
U. C. vs. C. C. at Boulder; C. S. M. vs. C. A. C. at Fort Collins.
- April 25—U. C. vs. Mines at Golden.
- April 28—C. C. vs. C. A. C. at Colorado Springs; U. C. vs. D. U. at Boulder; C. C. vs. C. A. C. at Colorado Springs.
- May 4—C. A. C. vs. U. C. at Fort Collins;  
U. C. vs. C. A. C. at Fort Collins.
- May 5—D. U. vs. C. C. at Denver.
- May 10—C. S. M. vs. C. C. at Golden.
- May 12—C. A. C. vs. D. U. at Fort Collins;  
U. C. vs. Mines at Boulder.
- May 16—C. S. M. vs. D. U. at Golden.
- May 18—D. U. vs. U. C. at Denver.

- May 19—C. A. C. vs. C. C. at Fort Collins.
- May 25—C. A. C. vs. D. U. at Denver; U. C. vs. C. C. at Colorado Springs.
- May 30—C. A. C. vs. U. C. at Boulder; D. U. vs. C. C. at Colorado Springs.

**Coultter to Captain Cagers.**

Letters and sweaters were awarded Thursday, March 23, to Taylor, Murphy, Hofius, Coultter, and Galluci of the Mines for basketball, and also to Krier, the manager. Coultter was elected to lead the next year's team. This is his second year of basketball.

**Track.**

Candidates for the Mines track team are out for early spring practice. Coach Carter is getting a line on the men to get them back in the work, as the Mines has been without a track team for several years.

A red-hot basketball game was played Friday, March 9th, between teams representing the Sigma Nu and the S. A. E. fraternities. The S. A. E. boys were victorious by the score of 23 to 14.

**MISCELLANEOUS.**

Arthur W. Stedman, '17, and a member of the Sigma Alpha Epsilon fraternity, has received orders to report to Fort Leavenworth to receive training for second lieutenancy in the United States army. He passed the examination some time ago, and will leave for Leavenworth early in April. He is a member of the Mines company of engineers.

A school garage is being built on the School of Mines campus near Chemistry hall.

A son was born about the middle of March to Prof. and Mrs. Otis, formerly of Golden, who now live in Washington.

Prof. J. C. Roberts is under the care of a specialist on account of recurring stomach disorder.

Victor C. Alderson has formed a partnership with John M. Baker, ex-'13, and Hamilton W. Baker, '11. The firm will be known as Alderson, Baker and Baker.

After watching for months in the hope of catching the sneak thief who has been stealing money from clothing in the Mines gym., the School of Mines boys were successful in their efforts when they caught a fellow student with the goods a couple of weeks ago. The thief confessed, and after getting a ducking in the swimming pool, he was advised to make himself scarce. He left Golden that night.

The world is not always held back by the badness of evil men; sometimes it is by the blindness and obstinacy of good men. Those who do not want the right to triumph at all are often no greater obstacles to progress than those who insist that there is no right way but their own.

# ALUMNI

## PERSONALS.

'88.

We have been unable to get in touch with Carl E. Ambrosius for the past two years. Can any of the men from Mexico tell us where he is or might be?

'89-'06.

Here are the names of older graduates whose addresses have been lost ever since we started the Magazine, and some for years before that. Can any one give us any information as to whether they are alive or not, or where they might be? Wm. H. Craigue, '89; Burt Cole, '92; Gilbert E. Jewel, '93; Edw. E. Rowe, '95; W. J. Atkinson, '96; Wm. J. Barescheer, '96; Enrique A. Schuman, '97; Frank R. Hamilton, '98; Oscar A. Lampe, '98; Fred G. Kelley, '99; W. H. Jackson, '01; Walter Christensen, '02; Geo. K. Taggart, '03; J. M. Garza-Aldape, '05; and Tiffany E. Stephenson, '06.

'92.

George K. Kimball, Jr., of Idaho Springs, visited in Golden March 16th. He says that mining is improving in Clear Creek and Gilpin Counties, and that with the high price of metals there is an incentive for increased development.

W. E. Hindry is lost again. What is his present address?

'93.

Wm. B. Milliken is in Austin, Texas. Address 207 W. 21st St.

'95.

A. L. Eaton, who is General Superintendent of the Chihuahua and Potosi Mining Corporation, has his office at 1206 Mills Bldg., El Paso, Texas.

'97.

Marshall D. Draper has left Denver, and his address is now Box 32, Baxter Springs, Kansas.

Harry E. Nelson has moved out of Los Angeles proper, and his address is now 1344 Fourth St., Riverside, Calif.

A. H. Buck has changed his residence to 1216 Race St., Denver, Colo. He is still with the Empire Zinc Co.

'99.

Fred C. Steinhauer, superintendent of parks for Denver, was on Lookout Mountain early in March, picking out a site for a camp for a gang of workmen who are employed in moving, by proxy, some of the mountain scenery to the Denver Zoo. The scenic gems are to be taken to Denver in the form of casts, which will be used in the bear pits at the City Park. The molds are equipped with a large quantity of gelatinous substance, which is laid upon the face of the cliffs and boulders of which replicas are desired. This cools at night and is removed early in the morning and the impression

taken in concrete. The exact coloration of the rocks will be duplicated by tinting.

Mail was returned some time ago from the address we had for Arthur R. Townsend. Where is he?

'00.

Lloyd Robey has accepted a position with the Chile Exploration Company at Chuquimata, Chile. He left Denver March 11th, going by way of New York.

Donald S. Giddings is chemist for the National Onion Salt Company. Address 11 West Hickory St., Chicago Heights, Ills.

'01.

Joseph M. Bradley, superintendent of the Dines and Shenandoah Mines near Silverton, Colo., has been conducting a series of concentration and flotation tests on ore from the Passi Flora Mine at Westcliffe, in the experimental plant of the School. The ore tested contains gold, silver, copper and iron.

Where is Andrew J. Sale?

'02.

Arthur H. Collbran, who has been in the States for several months, sailed from San Francisco on March 20th, en route to Yokohama, and thence on to Korea.

Oliver Powers is leasing at Lordsburg, New Mexico.

The addresses of both F. W. Lehmer and J. E. Bergh have been lost for some time. Where are they?

'03.

Parker Liddell's address is Box 8, R. F. D. No. 1, Reno, Nevada.

Geo. C. Foster's address has been lost for some time, and very recently mail addressed to Charles A. Liddell at Virginia City, Nevada, was returned. What information have you of either of these men.

'04.

Wm. D. Kilbourn if chief consulting engineer for the United States Smelting Company. His address is 250 Lexington Ave., New York City.

Chas. Adams' address has been missing from our lists for several years. Is he still alive?

'05.

Douglass Muir, from San Antonio, Texas, visited New York early in February. Muir has been investigating a property near Tucson, Arizona, and may take charge of it in the near future.

P. J. Lonergan has resigned as Professor of Mining in the Peking Government University, and is returning to the U. S. to resume active practice.

L. P. Pressler is at Saltillo, Coahuila, Mexico.

Evaristo Pardes and John B. Neville have been missing from our address files for some time. More recently mail addressed to E. F. Stoeckley has been returned. Where are they?

'06.

W. D. Abel has left Arizona, and his address is now Box 36, Santa Monica, Calif.

A. K. Gilbert is with the Ray Consolidated Copper Company at Ray, Arizona.

H. E. Nyberg called at the School on March 8th. He had to make a trip to his old home in Pueblo, Colo., from El Oro, Mexico, because of the death of his father. He returned to Mexico about the middle of March, where he is now assistant general manager of the Cia Minera Los Dos Estrellas, Apt. Num. 34, El Oro, Mexico.

Rush T. Sill of Los Angeles was in the Gold Reef district of California about the middle of March.

H. W. Aldrich, after working ten years for the Anaconda Copper Mining Company, resigned from the superintendency of the blast furnace department at Anaconda, to accept the position of general superintendent of the Ladysmith Corporation, Ltd., at Ladysmith, B. C., Canada. Box address 228.

'07.

A. G. Wolf was seriously injured on Friday, March 2nd, at Cripple Creek, while examining the Hoosier Mine. He was descending an old ladder just above the sixth level when the ladder pulled loose and he fell sixty feet to the sixth level, breaking thru two or three platforms on the way down. The timbering was old and rotten. Wolf received a compound fracture of the left tibia, and simple fracture of the left fibula. His right clavicle was also broken. He had lain for two hours before a doctor could be lowered by a rope to give him first aid dressing. It was eight hours after the accident before he was in the Red Cross Hospital at Victor and could get his fractures set. Fred Jones, '00, and his stretcher crew from the Portland Mine, hoisted him out the 600 feet with ropes. Wolf and his companion were alone in the mine. Wolf's companion was a much heavier man and had preceded him safely down the ladder. He had just stepped off the ladder into the sixth level when Wolf's ladder broke. He had considerable difficulty getting up the shaft to bring help. Wolf is doing nicely and expects to be out of the hospital soon.

Chas. A. Filteau resigned as manager of the St. Lawrence Talc Company at Natural Springs, N. Y., and is now manager of the National Mines, Ltd., at Cobalt, Ontario, Canada.

Mining on top of the ground often pays well also. P. D. Grommon, who is engaged in farming near Berthoud, Colorado, recently sold two carloads of sheep on the Denver market at record prices.

'08.

We have recently lost the address of Chas. A. Reno and Chas. D. Root. Do you know where they are?

'09.

We have lost the addresses of Louis Shafer, Wm. M. Lewis and Roy P. Curtis. Who knows where they are?

Harold C. Eddy is at 532 North Oxford Blvd., Los Angeles, California.

E. B. Wood is at Portland, Colo.

W. E. Canning, who has been engineer and Surveyor for the Granby Consolidated Mining, Smelting and Power Company at Anyox, B. C., Canada, is now at Oatman,

Arizona, looking at some mining property with a view of leasing. Box address 173.

E. J. Ristedt is engaged in experimental work for the Inspiration Copper Company. Address Box 100, Miami, Arizona.

'10.

Jean McCallum, superintendent of the Caribou Mines and Mills Company, operating near Cardinal, Colo., states that ore running up to \$126 a ton in silver, gold and copper has been opened on the ground. A vein three feet wide has been exposed, the ore carrying about 10 per cent copper. Copper has never been found in the district in quantity, and this find is being watched with interest by operators.

J. W. Whitehurst has resigned as general manager of the Candelaria Mines at San Dimas, Durango, Mexico, to recuperate. He is now at his home in Salida, Colorado.

W. P. Cary is now mill superintendent of the 1000-ton mill of the Consolidated Copper Mines Company at Kimberly, Nevada. Address care of the company. A son and heir to his fortune arrived on January 29th, of whom Cary writes: "He will make a dandy miner; in fact, can swear as good as I can already."

L. L. Pullen, who has been mill shift boss and mill superintendent for the Syndicate Mining Company at Aroroy, Masbate, P. I., for the past two years, has resigned, to take effect May first. He expects to arrive in Denver and Golden about June 15th. He is leaving the Philippines on account of his and his wife's health.

'11.

E. J. Dittus is at his Denver address, 1438 Franklin Street.

Walter J. Mayer called at the School March 21st while on his way East on a business trip for the Gold Reef Mine. His address is No. 3 Hicks Apartments, Salt Lake City, Utah, as most of his time is spent at the company's offices in that city.

Who can give us the address of Chas. O. Olsen?

M. V. Andre, Jr., is now flotation shift boss at the Broadwater Mill, Park City, Utah. Box address 487.

Robert E. Snow, who has been with the Tomboy at Smuggler, Colo., ever since he graduated, has resigned to accept the position of engineer and assayer for the Ellamar Mining Company at Ellamar, Alaska. He and his wife sailed from Seattle March 16th in company with L. L. Middelkamp, '05, who is general superintendent of the company. Snow's address is care of the company.

'12.

Where is Wilfred Fullerton, C. A. Rockwood and Chas. D. Heaton?

Ross R. May, who is with the Empire Zinc Company, will remain at Gilman, Colorado, for some time. Address care of the company.

Archer T. Spring's address is care of Cuban Mining Company, Bernaza 3, Havana, Cuba.

Donald R. MacKay is now at 315 Cedar St., Wallace, Idaho.

'13.

D. B. Gregg is mill foreman at the Red Signe Mill, Ferberite, Boulder Co., Colorado. Samuel E. Watson is laboratory assistant for the A. C. M. Co. Address 521 West 6th St., Anaconda, Montana.

Rastus S. Ransom, Jr., who has been with the James Ore Concentrator Co., at Newark, N. J., for some time, writes as follows: "I have a little news for you. A daughter was born to us on March 27th. She may not be able to go to the Mines, but she will be some rooter. I am leaving the middle of April for Portugal for the Lord Geoffrey Ores Co., Inc., to bring their six tungsten mills up to modern practice and work out a process for the separation of tungsten, tin and pyrite. I may have to design and build two more mills. F. W. Foote, Mines, '14, is going as my assistant, and leaves with me. Mrs. Ransom and our small daughter, Eleanor Bowne, are coming to Golden for the summer. My Portugal address will be care Lord Geoffrey Ores Co., Inc., Rua Serpa Pinto 93, Zizeu, Portugal. Kindly send the Magazine to me there."

C. A. Swanson, who has been with the American Zinc Co. at Denver for a number of years, has been transferred by that company to Platteville, Wisconsin. Swanson left for Wisconsin about the middle of March.

C. L. French is at the Norfolk Smelting Company, conducting experiments for the Research Corporation. His address is care Y. M. C. A., Portsmouth, Va.

Chas. N. Bronstein is now at his Denver address, 2925 W. Colfax Ave. Bronstein has been at Tooele, Utah, for several years. He expects to leave Denver for Chile in the near future.

H. C. Benner, James W. Dudgeon, Richard A. Leahy and Henry H. Forbes are among the missing. Who can send their addresses?

'14.

E. V. Graybeal, 1513 Second Ave., North, Great Falls, Mont.

Earle A. Strong of the Dorr Company is back in Denver, 812 Cooper Bldg.

John T. Turner and his bride were in Tucson, Arizona, about the middle of March. Turner may remain in or near Tucson.

We would like to have the address of Geo. J. Griswold, Jr., A. W. Smith, W. T. Yang and Y. L. Tsui.

John B. Johnson is assistant superintendent of the Aetna Chemical Co. Address Oakdale, Pa.

Mark U. Watrous is level boss for the Arizona Copper Company at Metcalf, Arizona. Box address 24.

'15.

Chas. F. Haselton is working for the same company, but at a different mine. His new address is care of the Verona Mining Co., Verona, Michigan.

Virginia Burbank, six and a fourth pounds, arrived at the home of Mr. and Mrs. Philip J. McGuire, Victor, Colorado, on February 24th.

H. W. Kaanta is superintendent of the flotation plant of the Bingham and New Haven Co., at Bingham, Utah.

M. O. Carlson, who has been assaying at the Tomboy, Smuggler, Colorado, has resigned to accept a position as metallurgical engineer with the Burma Mines, Ltd., at Nam Tu, Burma, India. Carlson left Denver the latter part of March.

'16.

Murray E. Garrison has received promotion with the East Butte Copper Mining Company, and in addition to his other duties is now accident statistician for the mine. His address is now care of the company, Box 1418, Butte, Montana.

Wayne A. Harrod, after a visit to Golden, went to Ray, Arizona, where he is in the engineering department of the Ray Consolidated Copper Company.

Frank A. Smith is engaged in general engineering work at the Lane Mill, Darwin, Inyo County, California.

Roy H. Miller, 1905 Third Ave., North, Great Falls, Montana, is still with the A. C. M. Co., but transferred from Anaconda to the new plant at Great Falls.

August H. Chatin is now at 410 West Eighth Street, Pueblo, Colorado.

Milton M. Levy did not go to Chile as he planned a couple of months ago, tho he may go later. He is with the Ray Consolidated Copper Company. Address care of the Engineering Department of the Company, Ray, Arizona.

#### RECENT ARTICLES BY MINES MEN.

"Prospecting Tin Lands in Malaya," by Wm. B. Middleton. Transactions of the Institute of Mining and Metallurgy, Vol. 24, 1914-1915. Pages 300 to 324.

The University Daily Kansan for March 5, 1917, was the Mining Edition, and a great many of the articles in it were from the pens of A. C. Terrill, '05, and R. L. Gridler, '05, who are in charge of the Mining Department of the University.

#### New A. I. M. E. Members.

Among the Mines men who recently joined the American Institute of Mining Engineers are H. E. Collbran, ex-'04; A. F. Duggleby, '15; H. C. Eddy, '09; C. L. French, '13; T. H. Garnett, '11, and H. D. Hunt, '09.

#### MINERS NEW GOAT.

The School of Mines has a new goat. In fact, we have had it since the close of the football season, but have been reticent concerning the fact for fear the animal might go the way of its predecessor, now secreted somewhere in the wilds of Boulder. After Colorado students stole the original goat under cover of darkness, the accustomed resting place of his goatship on the mantel at the Integral Club in the Mines remained vacant. So when Coach Allmendinger returned to Chicago after the season, he sent Dave Johnston, keeper of the club, a brand new goat. It stands but four inches high

and never was alive. It has been placed in the honor position held by its larger counterpart, and anyone who looks cross-eyed at the animal is investigated on suspicion of being from the University of Colorado.

**The Efficient Purchase and Utilization of Mine Supplies.**

This neat, hundred-page book by Hubert N. Stronck, '13, and John R. Billyard, '13, thoroughly and carefully covers an important branch of mine management, to which very little attention is given by many mine managers and superintendents.

The keynote of all modern scientific industrial management is efficiency, which means, briefly, "getting the best possible results from effort or money expended."

Stronck and Billyard tell you how to get "the best possible results" in the purchase and use of all kinds of mine supplies, how to buy, how to inspect and keep track of supplies, including office records and warehouse or storeroom plans, how to distribute and use supplies economically, how to train the employees to be economical and efficient with supplies, and how to best preserve and conserve tools, timbers, iron and steel work and cables, fuel, etc.

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Price, \$1.25 net. We will be glad to furnish you with a copy. Delivered in Golden or Denver, \$1.25. Postpaid anywhere else on earth (barring European war zone), \$1.35. Send for your copy NOW.

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THE COLORADO SCHOOL OF MINES  
ALUMNI ASSOCIATION,  
GOLDEN, COLORADO.

Turkey is going to hang the man who failed to kill the Sultan. Who says there is no justice in Turkey?—Philadelphia North American.

If the belligerents are bent on an exchange of asphyxiating gas, why not arrange a set-to between Parliament and the Reichstag?—Washington Post.

**NOTES ON ELECTRICITY AND MAGNETISM.**

This set of notes by C. C. Van Nuys, Professor of Physics, is really a textbook on the subject, and is so used by the students here. It is printed in uniform style with our other sets of notes, on regular size letter paper, 8½ by 11, punched, so that they may be placed in loose-leaf binders if desired. Printed on one side of the sheet only, leaving abundant room for additional notes, sketches, etc. There are sixty-nine sheets in the set, neatly bound in a tag-board cover and completely indexed. Price \$2.00, delivered anywhere.

You will find this set a valuable reference book on the subject. Send for a set now. Here is the Index:

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**Efficient Methods**

Rapid Methods of Technical Analysis, Frank D. Aller, '92..... 60c

The best and most efficient methods for all of the regular determinations. Aller was for many years chief chemist for the A. S. & R. Co. There is no better set of modern practical analytical methods printed. Every Mines man should have a copy.

Quantitative Analysis, C. D. Test..... 20c  
Used as text in Sophomore laboratory work.

Laboratory Notes, J. C. Bailar..... 30c  
Notes on Assaying, F. W. Traphagen.... 60c  
These notes accompany the lectures in Fire Assaying at the Colorado School of Mines.

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GOLDEN, COLORADO



# COLORADO SCHOOL OF MINES

## MAGAZINE

Vol. VII.

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No. 5

### Boiler Room Efficiency and Bonus System

Hubert N. Stronck, '13\*

#### STAFF INSTRUCTIONS.

##### Apparatus Required.

One CO<sub>2</sub> Gas Analyzer, for the purpose of determining the percentage of CO<sub>2</sub> in the samples of gas collected. A simple apparatus of this kind costs about \$25.00.

A Gas Collector for each boiler in operation. An apparatus of this kind costs about \$30.00. For bonus system work, the gas collector has many advantages over the combined collector and graphic recorder. For highest efficiency, it is necessary to keep a control record of each boiler. An automatic CO<sub>2</sub> and draft recorder costs about \$325.00, and to have one of these for each boiler would represent a considerable outlay of money and for practical purposes of the bonus system would be of no more value than the Gas Collector. It is often possible to equip all boilers in a plant with Collectors for less cost than to equip one with a Recorder. In connection with the bonus system, we are interested in Averages. By analyzing the gas of the Collector at the end of each shift, we get a fair average of the CO<sub>2</sub> for the entire shift, and it is on this average that the bonus is based.

A Draft Gage for each boiler in operation. Such a gage costs about \$10.50. After the amount of draft which gives highest CO<sub>2</sub> has been determined for each boiler, then the draft gage serves as an indicator to the firemen as to how near they are approaching this highest efficiency. A standard draft for each boiler should be determined, for although the boilers may be of the same make and type, there may be variations in the local conditions of each boiler.

##### Successive Steps in the Introduction of the Bonus.

The same requirements are necessary for the introduction of this bonus system as for our other bonus systems.

##### 1. Standardize conditions.

An analysis must be made of the present conditions of operation, and determining the points of waste. By means of the above apparatus, determine your present amount of CO<sub>2</sub>. Carefully examine all parts of the boiler and setting for possible leaks. Stop these. Make a careful study of the draft and surplus of air. Remember, that furnace is the most efficient which completely con-

sumes the combustible with the least surplus of air. Conditions of good practice usually show an air excess of 40%. The draft that will produce the highest percentage of CO<sub>2</sub> without CO and carry the load, is the draft to be employed. By thorough analysis, determine this draft, as shown by the gages, for each boiler, and call this the Standard Draft. It is this draft which the firemen will need to approach and hold, to make the greatest savings in fuel and to obtain the greatest amount of bonus. This standard of draft, however, has nothing to do with the calculation of the bonus, for the bonus is based on the CO<sub>2</sub> percentage, but this draft figure serves as a guide to the firemen.

2. Written, standard instructions. You must determine the best methods of boiler operation, and teach these to the workers. Issue these in writing, and thoroughly instruct the workers as to these methods. Show them frequently just how much fuel they saved by following these instructions, and how much they wasted by disregarding them. Show them that by following these it will mean less labor for them, but more money; but it means increased watchfulness on their part.

3. Introduce a bonus as an incentive to them to carefully follow these instructions and to exert themselves in the interest of efficiency.

##### Form of Bonus.

The bonus is based on the average amount of CO<sub>2</sub> per shift, as shown by the analysis of the gases gathered by the Gas Collectors for that shift.

This flue gas analysis serves to point out errors in furnace management, and serves as a check upon the furnace and the firemen, and maintains the efficiency structure.

A correct bonus system never fails to produce the most gratifying results. The most equitable bonus system is the one based on the CO<sub>2</sub> averages. It will not only interest the firemen to strive for economy, but by being able to earn more money, the labor turnover in the boiler plant will become a minimum.

Various methods have been used to determine the efficiency. The following have been used without good results for the reasons indicated:

1. Coal consumption.
2. Evaporation.

\*Member Benedict, Boyle & Stronck, Inc. Consulting Engineers, Peoples Gas Bldg., Chicago, Ill.

3. Factory output in relation to coal consumption.

The coal consumption depends upon:

1. Combustion efficiency.
2. Quality of fuel.
3. Efficiency of furnace.
4. Efficiency of boiler.
5. Co-ordination of furnace and boiler.
6. Physical conditions of each.
7. Efficiency in use of steam.
8. Efficiency in distribution of steam.
9. Efficiency of engines, generators and factory machinery.

10. The load on the power plant.

The evaporation per pound of coal burned, and coal costs per unit of factory output, depends upon the same factors as for coal consumption.

It is impossible to measure out equitable bonuses to firemen by the above three methods, because it is impossible to definitely measure and fix responsibility by these methods of measurement. The firemen may blame the coal, the boilers, the load or the wastes in the plant. Also it would require a great deal of testing apparatus, time, bookkeeping and other expense.

The plant must be operated with the equipment it possesses. The firemen or engineers are not responsible for the equipment; they did not select it. If the equipment is in bad physical condition, the firemen as a rule cannot be held responsible. If steam is wasted in the plant, the firemen are not responsible. If the load varies, the firemen are not responsible. They are not to blame as to the quality of the fuel furnished them.

The firemen are responsible for the combustion efficiency, and this is based on CO<sub>2</sub> contents of the gases. All of the factors which tend to complicate the question of responsibility for combustion efficiency may be eliminated in the following manner:

1. The boilers and furnaces should first be placed in a good state of repair, particular attention being given to the brick work and baffles. There should be no excuse for soot and scale. The Inspector of Maintenance should make a daily investigation as to the physical state of affairs and submit a signed report covering this.
2. Select the coal that is best adapted for the furnace and the general conditions affecting the plant.
3. When the equipment is in a good condition, and proper daily care of same is insured, then a standard of combustion efficiency may be established.

In fixing the standard, determine the following:

1. How thick the fuel should be carried on the grates.
2. What draft to use for normal loads and how the draft should be varied to take care of changes in the load.
3. Methods of firing or of operating the stokers to avoid faults in the fuel bed, and to keep the fuel constantly at the right depth upon the grates.

4. Proper methods of using the fire tools, particularly the slice-bar.

5. Proper methods of cleaning the fires.

6. Proper methods of banking fires.

Following the above study, it is necessary to instruct each fireman and be sure that he understands the instructions.

When you have correct conditions of combustion, then you can determine the maximum amount of CO<sub>2</sub> produced when all conditions are right and kept right. This is your maximum point of your bonus, and your standard. Like all other standards, this point must be carefully determined.

By a study of the labor market, determine how much extra money you must pay your firemen in order that they will exert themselves to such an extent which will produce this standard of CO<sub>2</sub>. You will also want to know what the savings in dollars of fuel will be at this combustion efficiency. Knowing your former CO<sub>2</sub> average, you can approximate this from the tables attached. Or you can measure the coal consumed and compare with the former records. If the savings are high, the client may be willing to pay a higher bonus to his men; that is, give them a larger share of the savings affected.

If your savings are high, you can arrange a bonus schedule whereby each worker receives 50 cents per shift bonus when the Standard is reached during that shift. Work a schedule on a sliding scale, in much the same manner as our Waste Elimination Bonus. Example:

If the standard CO<sub>2</sub> is 12%, use a table like this (assume 50 cents per man, per shift, for standard is a sufficient inducement in this case):

	Per Cent CO <sub>2</sub>	Bonus
	13.0	\$0.60
	12.5	.55
Standard =	12.0	.50
	11.5	.45
	11.0	.40
	10.5	.35
	10.0	.30
	9.5	.25
	9.0	.20
	etc.	etc.

Another method which you may use, but which is not as strongly recommended as the above, is by dividing some percentage of the value of the fuel saved per week or month among the crew. The amount of this percentage depends upon what the money value will be. In all cases, it must be large enough to act as a "pull."

The first method is much more definite, and wherever possible should be used.

In order to keep the men interested, post the daily results on a bulletin board, and at the end of the month, pay the highest man an additional bonus, such as \$2.00 or \$3.00. This feature is important, and will not only keep up the interest, but will produce a contest among the men.

The daily record of operation should show:

Date.  
 Shifts.  
 Names and pay number.  
 Coal consumed.  
 Ash.  
 CO<sub>2</sub>.  
 Draft.  
 Stack temperature.  
 Feed water temperature entering.  
 Feed water temperature leaving.  
 Water evaporated.  
 Remarks.  
 Signature of Operating Engineer.

**Fuel Losses.**

Per Cent CO <sub>2</sub>	Per Cent Air Excess	Per Cent Fuel Loss	Per Cent Preventable Loss
15	38	12	0
14	47.8	13	1
13	59.2	14	2
12	72.5	15	3
11	88.1	16	4
10	107.0	18	6
9	130.0	20	8
8	158.7	23	11
7	195.7	26	14
6	245.0	30	18
5	314.0	36	24
4	417.0	45	33
3	590.0	60	48
2	935.0	90	78
1	1970.0	..	..

**EXTRACTS FROM A TYPICAL INVESTIGATION.**

**Boiler Report.**

The following report covers the condition in which we found your boilers and our suggestions for their improvement.

The principal causes of fuel loss are:

1. Improper condition of boiler setting.
2. Improper care of boilers.
3. Use of excess air.

There are a number of air leaks through all the boiler settings and especially about the "blow holes" and metal work. The flames from the furnace can be seen through some of the defective blow holes and at others the draft is sufficient to snuff out a candle flame.

The boiler setting should be carefully gone over and every possible chance of an air leak tested with a candle flame.

The brick work on top of the boiler should be tested as well as at any other points. The cracks should be calked with something which will not dry and fall out.

A good material may be made by mixing cotton waste with a thin mixture of fire clay. The waste should be pulled apart, so that all the fibres will be covered with clay. Drive the waste in the cracks with a calking tool made of wood. Fill the cracks full and drive the calking material in tight. All cracks about the boiler setting should be calked, no matter where you may think they lead to, a crevice about any stay beam may lead to the furnace.

In going over the brick work the setting about the blow holes and blow-off pipes

must also be made as near air tight as possible. Several of the blow-hole doors should have new packing.

The boiler doors are in very bad condition. They are warped and broken, the catches will not hold them in place. They are supposed to keep the cold air away from the headers, but they do not do it.

The air going through the doors is not only bad for efficiency, but also for the boiler headers.

The doors are now being held, in as near the proper position as their condition permits, by means of rods used as brakes.

The boilers are not being given the proper care to obtain the best efficiency.

The tubes are not being blown out at regular intervals, and when they are blown it is only partly done, as can be shown by opening some of the blow doors. Several of the blow holes were found nearly full of soot, which indicates that they are not being used for the purpose they were intended.

To blow the soot from one place to another doesn't help much.

The combustion chambers are not kept clean.

In non-conducting properties, soot has been proved to be five times as effective as asbestos. Soot on the tubes means a marked difference in your fuel consumption.

Soot not only lowers the efficiency of the furnace, but will bake on the tubes and is liable to cause serious results due to the corrosive action of the sulphur baked on with it. The loss is not so much in the soot that goes up the chimney. It is in the soot that sticks to the boiler.

Soot is always an evidence of improper combustion and the best designed furnaces will at times suffer from improper combustion and produce smoke and soot. Hence it is imperative that provisions be made for frequently cleaning the tubes and other heating surfaces.

It is almost impossible to remove all of the soot with hand blowers; however, as much should be accomplished by this method as possible until such time that the management deem it advisable to equip the boilers with permanent soot blowers.

With such an installation it is possible to effectively sweep every square inch of heating surface and to blow the passes of the boiler progressively, thereby forcing all the soot from the boiler to the chimney.

With such an installation the blow holes can be permanently closed, thereby doing away with blow-hole air leaks.

The inside of the boiler tubes are not cleaned at any particular time.

Boiler No. 2 is being cleaned today with the turbine cleaner. The fireman says it is the first time it has been cleaned since last March. Boiler tubes are made as thin as safety will permit in order to transmit the heat to the water as rapidly as possible. The conductivity of steel is about five times that of the scale on the tubes. A thirty-second of an inch scale lessens the factor of con-

ductivity to the same extent as that of doubling the thickness of the tube.

If one boiler could be thoroughly cleaned every Sunday and the turbine run through the tubes it would mean that each boiler would get cleaned every four weeks. This would keep the boilers in good shape and undoubtedly result in the saving of enough fuel to justify the extra labor.

Probably the greatest fuel loss is due to excess air.

Excess draft increases your fuel waste in several ways. It increases the rate at which you burn the coal without a commensurate increase in the rate of evaporation. The heat of some of the extra coal that you burn is carried into the stack by the excess draft. The velocity of the gases is increased and the boiler has less time to absorb the heat.

That furnace is most efficient which completely consumes the combustible with the least surplus of air.

Flue gas analysis answers every question bearing upon the furnace efficiency.

The fuel bed must be of a thickness sufficient to carry the boiler load and then the draft regulated to give the largest amount of CO<sub>2</sub>. When this has once been determined all the fireman has to do is to keep the fires even, the air leaks out, and keep the proper draft constant.

In the under feed stokers the coked fuel above supplies the heat and the air jets from the fan the necessary oxygen.

Stokers of this type produce the best efficiency when they are operated with as little vacuum as possible in the fire box. With the chimney pulling and the forced draft pushing, the efficiency will be low.

**A TYPICAL CO<sub>2</sub> TEST.**

Boiler No. 4—Murphy Stoker.

Time	Draft	CO <sub>2</sub>
9:35	21	7.4
9:45	12	5.8
9:55	15	9.0
10:05	12	4.4
10:20	14	7.4
10:30	19	12.0
10:50	13	5.2
11:00	12	4.6
11:10	17	11.0
11:20	15	7.0
11:30	14	5.8
11:40	13	7.0
11:50	14	9.0
1:10	15	9.0
1:20	12	5.6
1:30	18	8.5
1:40	16	8.
3:30	12	7.6
Total .....	264	134.3
Average .....	14.65	7.46

Excess air, 181%.  
Preventable fuel loss, 11.7%.

The following formula may be used in computing the excess air from the CO<sub>2</sub>.

$$20.7 \div \text{CO}_2 \text{ percentage} \\ \text{CO}_2 \text{ percentage} \times 100 = \text{excess air.}$$

The fireman is not entirely responsible for the physical condition of your boiler room. He takes the boilers in the condition he finds them and feels that it is his duty to keep up the steam.

He hasn't time to calk settings and look after other details of the plant and give his fires the proper attention.

The condition of the boiler room shows that either there has not been sufficient help there to keep it in the proper condition or the man directly in charge of the boiler room has been neglecting his duties as far as that part of his work goes.

In order to bring the boiler room up to efficient co-operating conditions we would advise that an extra man be placed on each shift whose duties will be to blow the boilers with the help of the fireman.

Keep the combustible chambers clean.

Look for and calk all leaks about the boiler setting.

Look after all steam leaks about the boiler and pump room and help in maintaining a neat and orderly boiler plant. It may be that this extra man will not be necessary during the warm months, but it seems something must be done along this line in order to bring the boiler room to its proper condition.

Before the best results will ever be secured in the boiler room someone must be put directly in charge of the room who knows what should and should not be done, and who will see that firemen act accordingly.

Walking through the boiler room once or twice a day is not sufficient.

The firemen admit that they are wasting coal and that the boiler room is in a bad condition, but they claim under the circumstances they can't do any better.

Their feeling towards the Company is good, and if some one is put in charge of the boiler room who will co-operate with them and show them ways and means of improvement we believe it will mean a large cut in the coal pile.

In order to secure these results and insure the management that the boiler room is securing the proper attention a daily record of maintenance should be made out and turned in to the Superintendent of Maintenance and Construction each day by the head fireman.

If this is done at least part of your trouble with soot and scale, with broken baffles or with leaks in the brick work will be done away with and the proper up-keep will be assured, and it will not be assured until they are done.

If these suggestions are followed and the firemen kept interested in the work by means of a bonus system it should put your boiler plant in first-class condition.

When the boiler and furnaces are in proper condition the efficiency of the men in charge of the furnaces is a close measure of the efficiency with which the steam is generated.

The CO<sub>2</sub> analysis should be made by some responsible party at the end of each shift. The CO<sub>2</sub> could be noted on the boiler room report and the bonus handed by the bonus clerk in the same manner that he handles the other bonus.

The average CO<sub>2</sub> for each shift should be posted on a bulletin board as soon as the analysis is made. The men can then tell what their bonus is, and it should create a rivalry between the two shifts.

A small piece of black board would answer this purpose.

**TYPICAL INSTRUCTIONS TO FIREMEN.**

**Boiler Room.**

It will be the duty of the firemen to maintain a boiler pressure of 125 pounds on each boiler. He shall maintain a draft and fuel bed thickness on each of the boilers as follows:

Boiler No.	Draft	Fuel Bd.
1		
2		
3		
4		

These drafts and fuel bed thicknesses have been found to give the largest amount of CO<sub>2</sub>.

By following these instructions you will handle less coal and ashes and receive the largest bonus.

Skillful firing, like anything else that is skillful, requires thought and attention to detail.

When the liquid in the draft gauge moves to the left of the proper draft point there are holes in your fire or the fires are burning thin. When it moves to the right the fires are too thick or getting dirty. The stokers should be regulated according to the reading on the draft gauge.

Much of the waste in the ash pit is due to the improper use of fire tools.

A slice bar is made to slice the fuel away from the grates and to cause the fine ashes to fall through the graters. Do not use it to mix the ash with the incandescent fire, when this is done the ash fuses and causes clinkers.

In cleaning the fires they should be allowed to burn well down. Do not use the large hoe in cleaning fires, remove the clinkers by means of the two-prong hook.

The hoe pulls too much of the coke out of the furnace, which results in considerable fuel loss and lowers your CO<sub>2</sub>.

The fireman must pay particular attention to the condition of the boiler and furnace at all times.

All air leaks about the setting and doors must be avoided in order to bring the furnace efficiency to a point where your bonus will be large. Any repairs to the boilers or furnaces which cannot be made by the firemen must be reported, at once, in writing to the Superintendent of Maintenance.

The firemen on the day shift shall blow the soot from the tubes of each boiler every

day and the night shift shall clean the combustion chamber every night.

The boiler shall be cleaned on the inside and the turbine cleaner run through the tubes at such times as designated by the Superintendent of Maintenance.

The firemen shall have charge of the blower in connection with the stokers and the stoker regulators. It will be part of his duty to keep these running properly or report any troubles which he cannot remedy. Also the engine on the Murphy Stoker.

It shall be the duty of the firemen to look after and keep the feed water pump in good operating condition.

The feed water shall be maintained at a temperature not less than 200°.

The ash holes in front of the furnaces must be kept closed when not in use.

The steam gauges must be kept clean and the steam cocks in proper condition.

The boiler room should be kept in a clean and orderly condition. For running and maintaining the boiler room in an efficient manner each fireman will be paid a bonus according to the average test of the CO<sub>2</sub> of all the boilers for his shift. The bonus will be paid according to the following table:

Per Cent CO <sub>2</sub>	Bonus, Cents
13.	50
12.5	40
12	35
11.5	30
11	26
10.5	22
10	18
9.5	15
9	12
8.5	10
8	8
7.5	6
7	5

A large per cent of CO<sub>2</sub> can only be obtained by paying close attention to the furnace and firing it properly at all times.

**COMMENCEMENT ADDRESS.**

**"Mining, the Great Adventure."**

T. A. Rickard, editor of the Mining and Scientific Press, of San Francisco, will deliver the Commencement Address at the Colorado School of Mines, May 25. Mr. Rickard has been intimately connected with mining operations in all parts of the globe, and probably knows more about operations in foreign countries than any expert. Of late years Mr. Rickard has devoted his time to scientific writing and is recognized as one of the ablest editors in the mining field.

The subject of his address will be "Mining, the Great Adventure".

**MEETING OF THE AMERICAN INSTITUTE OF CHEMICAL ENGINEERS.**

The ninth semi-annual meeting of the American Institute of Chemical Engineers will be held in Buffalo, N. Y., June 20-23.

### THE MILLION-DOLLAR MAN.

By Floyd W. Parsons, in *Coal Age*,  
April 7, 1917.

This is a true story. It is the romance of the youngest of America's "Captains of Industry." It is the story of a poor boy grown rich—not in an hour by a lucky strike, but by toiling day and night for seventeen years. Even when hope ran high, back in those college days at Lehigh, it is doubtful if Gene Grace looked out of the classroom windows at the long line of smoky buildings below and dreamed that in a short period of time he would be president of "Bethlehem." Yet, if he did, it is a dream more than come true, for Bethlehem steel today is a giant compared with the doubtful concern Charlie Schwab bought for less than eight million dollars in 1901. Back in those college days at Lehigh, Gene Grace, with his brother "Gator," lived in a little hall bedroom, not far from the University. They lived there not only because they could work better when isolated from the others, but because the Grace boys couldn't afford to live in the clubhouse with their fraternity brothers. In spite of Gene's good fortune in gaining two years' free tuition through his excellent scholarship, he owed the college one year's tuition on graduating. Settlement of this debt was the use he made of his first earnings. Today he is a trustee of the University that extended him credit as a student. If you see Lehigh play football, you are likely to sit in that section of the fine concrete stadium presented to the college by Gene Grace.

Some have said Gene is a lucky fellow, but those who know him do not attribute any of his success to chance. There wasn't any romance or glamor attached to his first meeting with Charlie Schwab, the master of Bethlehem, back in 1904. Gene was superintendent of yards and had to oversee the switching of the big boss' private car. Schwab noticed the thoroughness and the systematic effort of the young man hanging onto the rear of his car, and Gene was marked for future observation.

Did Schwab make a mistake? Evidently he doesn't think so, for he has said President Grace's services were cheap at better than a million dollars last year. Arch Johnston, vice-president, blue ribbon salesman and special ambassador of Charlie Schwab to the crowned heads of Europe, says Gene earned all he got; and he added that he got it in real money, not the kind they pass on the stage. Arch ought to know something about the validity of those bonus checks, for last year he himself landed a lump sum that looked well in six figures.

Many men have invested incomes exceeding that of young Grace, but I doubt if anyone in the country is being paid higher wages for ability alone than Bethlehem's president. I asked several of the vice-presidents at Bethlehem to explain the rapid rise to power of President Grace. Their answers condensed are interesting. One said: "He never loses his head. I have been as-

sociated with him from the beginning, and I have yet to see him lose control through anger. He may be mad all through, but he won't show it. He is a glutton for work—never stops. However, his chief quality is his ability to inspire confidence. Those associated with him are never left in doubt as to plans and policies. He doesn't wobble." Another vice-president attributed Mr. Grace's success, above all else, to "good judgment." He said: "You can always get a decision from the Bethlehem president, and you can get it now, except in rare cases where additional information is asked for. He does not hesitate to take chances on being right, and when it comes to picking winners, he is uncanny. He has intuition reinforced by deep analysis, and is always outthinking his job."

Still another vice-president believed Mr. Grace's predominant business virtue is his never-wavering sense of justice. He is human all through and has been able to create a feeling of security on the part of the rank and file in the works. The lowliest boss in the plant knows that if "E. G." decides against him, the decision was based on a fair consideration of all sides of the problem, and the sting of losing is removed when it is known absolute justice prevailed.

I managed to corner Mr. Grace at his New York office—he comes over to the big town two or three days each week. I had to fit in between a couple of French committees and several other important looking foreigners, so that I lost no time in getting down to brass tacks. "To what do you attribute your success?" I asked. His reply was instantaneous: "Two things—concentration and integrity. I give 100 per cent. attention to each matter that comes before me. I banish all else from my mind but the single problem in hand. When I am debating battleships, they alone occupy my thoughts; fifteen minutes later I have my mind on steel rails or something foreign to war, and then my entire attention, not part of it, is devoted to that subject. Concentration makes a mediocre man brilliant; dividing one's attention makes an unusual man seem stupid.

"Integrity is a prime essential to real success. A crook can pile up money, but riches are not important without honor and the respect of your associates. I always keep my word and never promise what I can't fulfill.

"I insist that none of our men make a contract that the company can't live up to fully. Any salesman discovered making an agreement in which is inserted a clause giving the company a loophole to escape from so filling the contract, will be given ten minutes' notice. That's understood by all, and so far I haven't had to enforce the threat. Never refuse to shoulder responsibility. It is less discreditable to make an error than to be afraid to try. If a man can be right 51 per cent. of the time, he will succeed. Do not temporize. If you are going to say 'No,' say it now. Don't build false hopes. A man can respect and appre-

ciate the fellow who doesn't agree with him, and says so; but he has good excuse to hate the man who procrastinates and thereby misleads him. Some men fail to build up understudies. Through ignorance or fear, they prepare no one in their department to succeed them. Such men are not only blocking their own further advancement, but they are laying the foundation for early dismissal and ultimate failure in their profession."

Right here I ventured the question: "Your company is famous for its bonus system; what do you think of the plan?" "Fine!" said Mr. Grace. "Every company should endeavor to so provide for its men that they will not have to worry about financial affairs in their home. Once a man knows his family is provided for, he can give undivided, enthusiastic attention to his work. Worry more often than inability causes inefficiency.

"We pay our bonuses monthly, shortly after the salary checks are sent out. This causes each employee to be constantly keyed up to the highest possible pitch of efficiency. Payment is made for the work on which that particular individual was engaged, and no other. This applies to each worker in the organization, except the executive officers, whose work covers the entire company and who must, therefore, be paid on the general results. Salesmen working on the bonus plan are paid, not on the tonnage they sell, but on the profits that result to the company from the sales they make. This discourages price-cutting to secure business and encourages the exercise of the salesman's maximum efforts to obtain the best prices the market will afford."

I asked Mr. Grace to outline the Bethlehem policy of selecting men for advancement. He said: "We make our big bosses from the little men in the company; that is, we aim never to go outside our own organization to get a man to fill a position. Mr. Schwab, when he came to Bethlehem, selected fifteen men to take charge of the company's operations. Only one of these fifteen officers and directors was brought in from another company. We believe that the sure way to kill initiative and throttle the enthusiasm of our faithful men is to fill our important positions with strangers from other companies. If a man isn't worth advancing, he isn't worth keeping." Asked as to his ambitions for Bethlehem, Mr. Grace replied, "The sky is the limit. We are now planning to spend more than \$100,000,000 on improvements and enlargements. Our thoughts are running to the days after the war, and we expect to be as well prepared to manufacture implements of peace as we were to produce munitions of war. We don't any of us at Bethlehem believe much in luck. We think that foresight based on common sense is the real key to success for a corporation or an individual."

"What about the curtailment of profits on munitions for the government, now that the United States has entered the war?" "We are not worrying about the treatment

Uncle Sam will deal out to us," said Mr. Grace. "The government is becoming more and more a partner in our business, as it is in all the rest of the nation's industries. Don't forget that federal taxes on corporation earnings today are far greater than in past years. We expect to be allowed a fair profit on all we produce, but Mr. Schwab and the other owners of the property have no unpatriotic desire to grow rich at the expense of our nation through the misfortunes of war. We have already offered to make armor-plate for the government at its own price, and in our recent bids on the new battle cruisers we offered to leave the determination of the percentage of profit to the government itself. Since the war started, we have adhered in our charges to the United States government to the basis of prices established before the war began."

The foregoing are the chief thoughts Mr. Grace left in my mind. After my talk with him and my investigations of Bethlehem, I am ready to join those who believe Charles M. Schwab stands alone as a judge of men. In these serious days of world reconstruction, the greatest gift "C. M."—as the boys at the works call the master of Bethlehem—can give to his country is the services of Gene Grace and the clever young men who surround him.

At Bethlehem is the greatest ordnance plant in the world. It is 50 per cent. larger than the monster Krupp works in Germany. The Bethlehem plant now can produce nearly four times as many munitions in a month as could be turned out in a year by the entire ability of the United States prior to the war. In 1915 Bethlehem employed 23,000 men; today more than 70,000 are in its service. In 1915 the total payroll was less than \$23,000,000; in 1916 it was more than \$72,000,000. Schwab says that every man and machine will be available to the government the minute they are needed.

The Bethlehem corporation is building fully one-third of all the ships now under construction in this country. Besides battleships, submarines, etc., it is completing one 10,000-ton, fully equipped merchant vessel every week. But—and here's the rub—more than one-half of all the ships building in the United States today are for foreign owners. The American merchant marine in the past two years has shown an increase of about 1,000,000 gross tons. However, if present conditions and restrictions apply to ships flying the American flag after the war, American owners will again transfer their vessels to foreign registry.

Briefly, these are the facts concerning our big national war plant, located in a quaint Dutch town named after the birthplace of the "Prince of Peace." Every man, woman and child in this great republic is safer for the brains and efforts of Gene Grace, the lean, energetic leader of 70,000 brawny workers equally skilled in the production of implements of peace or weapons of war.

As I left him he smiled and said: "After all, playing the game in business isn't any

different from the way we used to play baseball on the Varsity at college. The fundamentals and the rules are both quite the same. If you remember, it wasn't the fellows who did something spectacular once every year who could be depended upon in a pinch. The average every-day plugger is far better than the player who knocks the ball over the fence once in a season and strikes out every other time he bats.

"Making a hit is only a start on the long journey home. It avails but little to get on first and then get caught napping. And when you get on base, there's no way to score unless your team-mates do some good, safe hitting. Moral: It takes earnest co-operation to win in business, just as it does in baseball."

#### INTERCOLLEGIATE INTELLIGENCE BUREAU, C. S. M. BRANCH.

To May 1, 1917, replies to the questionnaire have been received from:—

Alumni .....	314
Ex-Mines Men .....	92
Students .....	50
Faculty .....	7

Total ..... 463

All favorable but one.

Data is being compiled for more systematic presentation later.

#### COMMENCEMENT.

Commencement exercises will be held May 25th this year. The Alumni will hold a luncheon at the Gym at 12:30 p. m. Exercises at 2:00 p. m., followed by a reception at the Integral Club. There will be no Junior Prom in the evening.

Honorary degrees will be conferred upon H. W. Hardinge and W. G. Swart. Mr. Hardinge is president and general manager of the Hardinge Conical Mill Company, of New York City, and is an engineer of wide reputation. He attended the Colorado School of Mines about thirty years ago for a short time. Mr. Swart is a mining and metallurgical engineer with extensive iron interests in Duluth, Minn.

#### MILITARY DRILL.

With Captain Mueller of the regular army in charge, regular military drill at the School of Mines began Thursday, April 5th. Among the Mines upper classmen who are preparing to take examination for officers in the regular army are: S. A. Mewhirter, T. H. Andrews, A. C. Levis, Robert Higgins, E. W. Robinson, E. J. Dickinson, Fitch Robertson, A. L. Miller, R. R. Oliveros, N. E. Maxwell, K. S. Ferguson, W. H. Williams, L. G. Eisele, J. H. Winchell, S. S. Small, C. C. Taylor, J. A. Poulin, R. J. Mechim, R. N. Weaver and K. W. Reynolds.

#### BUT SUPPOSE!

"I am in favor of peace at any price."  
"Yes," replied the pessimist; "but suppose you wake up some morning and find you haven't got the price?" —Washington Star.

#### PLAIN ENOUGH.

Written Expressly for Coal Age by  
Berton Braley.

When the prehistoric caveman lived and  
struggled, long ago,  
He was strong for independence as he wan-  
dered to and fro,  
If he had a neighbor handy he would tear  
him limb from limb,  
And the thought of social meetings never  
much appealed to him;  
'Till one day a wiser caveman—sort of  
prophet, priest and scribe,  
Pointed out the simple merits of assem-  
bling in a tribe:  
"Let us work and fight as brothers, with our  
strength combined," he said,  
"For we've got to get together if we want  
to get ahead."

So the caveman took his counsel, which is  
ample reason why  
They were done with being cavemen as the  
centuries went by,  
For the tribe became a kingdom which in  
turn became a state,  
As men learned to know the meaning of the  
word "Co-operate."  
They co-operated badly—they don't do it  
well today—  
But at least it proved much better than the  
caveman's clumsy way;  
They were on the road to progress, and their  
leaders wisely said:  
"You have got to get together if you want  
to get ahead!"

Man is slow to learn his lesson, but we're  
learning, bit by bit,  
That the way to grow and flourish is to use  
our strength and wit,  
Not to battle with each other, but to help  
each other on,  
That the paths may seem the smoother  
which we have trod upon,  
Though at times there is reversion to the  
days of fang and claw,  
We are slowly—aye, but surely—coming to  
the higher law,  
When we'll cease to brawl and bicker and  
we'll work as one, instead,  
For we've got to get together if we want to  
get ahead.

Adman, Editor and Printer, here's a word or  
two for you,  
Farmer, Middleman, Consumer, Miner, Ope-  
rator, too;  
Those who work with brain and muscle,  
those who buy and those who sell,  
If you hope to thrive and prosper in the  
world wherein you dwell,  
You must learn co-operation, you must cease  
to work alone,  
(Why, the caveman stopped that nonsense,  
just the minute he was "shown").  
Join your forces, be united; for the word is  
truly said,  
"You have got to get together if you want  
to get ahead!"



## Freshman, Sophomore and Junior Classes Leave School.

SENIORS COMPLETE WORK, BUT ONLY A FEW OF THE FOREIGN STUDENTS  
IN THE THREE LOWER CLASSES REMAIN IN SCHOOL.

Here is what happened, as nearly as can be determined by careful investigation: Monday, April 23rd, was Senior Day. Senior Day at Mines was established in 1912. By custom since then it is considered the Students' Day. The Senior class dresses up in costumes, breaks up the classes, usually "try" some professor, have a baseball game with the faculty in the afternoon, and have a general good time. There has been more or less drinking on Senior Day for the past few years, at least.

This year a number of Seniors started drinking early, and several showed it. The Sophomores had a "keg" party in the morning, and practically every member helped get away with the contents. As many of the class were not used to wet goods, many of the class were feeling rather lively by the time the Faculty-Senior ball game commenced.

The Sophomores stuck together at the game and started "wrinkling" each other or anyone available. Someone suggested one of the instructors who was handy, and the suggestion was promptly and efficiently acted upon.

Some other member of the faculty reported this wrinkling at a meeting Monday evening to discuss the wrinkling and other excesses of the students. Other meetings were held Tuesday and Wednesday before definite action was taken. As a result of these faculty meetings five students were suspended for one year. One Senior and one Sophomore for intoxication and three Sophomores for the wrinkling of the instructor. Several other students were reprimanded.

The suspensions were announced on Thursday, and brought forth immediate protest from the student body as they felt the punishment was too severe and was unfair, as ten or twelve took part in the wrinkling and fully as many were as intoxicated or nearly so as the two suspended.

When the wrinkling of the instructor was under discussion in the faculty, the question was asked as to whether or not professors had ever been wrinkled previously. No one spoke up, and one who had been wrinkled on several occasions denied it when asked directly. As a matter of fact, more than one of the present faculty has been wrinkled.

Each class held a separate meeting and all decided to protest against the punishment meted out. Later a mass meeting was held and it was decided that the three lower classes would quit school as individuals; that is, ask for their credits and leave if the suspensions were not modified. The Seniors wanted to take the same action, but as they only had a few more lectures to at-

tend before examinations, and the trip, the lower classes would not allow the Seniors to join them and delay or jeopardize their graduation after four years of work.

A committee of thirteen—four Seniors and three from each of the other classes—was selected to see if they could secure any reconsideration of the penalties by the faculty or board of trustees. The board was in session, and the student committee tried to meet with the board, but was given the impression by the president that the board had refused to meet them, though none of the members of the board knew there was any trouble brewing until after the meeting adjourned.

In the afternoon a notice was sent around to the classes announcing an assembly at eight the following morning. The students decided not to go to the assembly, but later their committee persuaded them to go.

Friday morning at the assembly most of the students refused to accept the slips that are handed out at assembly meetings for signature in order to check attendance. Some accepted them from force of habit, but tore them up later. The president addressed the meeting, accused the students of being defiant, but assumed a very evident defiant attitude himself, and promptly "got in bad" with the entire student body. He stated that because of the growing excesses of Senior Day that future permission to celebrate it would be denied; that the question of the punishment of the five students had been thoroughly discussed by the faculty before action was taken, and that it was then merely a question of who was running the school as he saw it, and indicated that he felt sure the faculty would not modify the punishment, or even reconsider the matter at all while the student body remained out of classes.

The student body remained after the president finished talking, and decided to retain their original stand, but to wait until Monday morning before final action in order to give their committee a chance to present the students' side of the case to the board of trustees, which was to meet at nine that morning (Friday).

The board and the student committee of thirteen were together all the rest of the morning, and while the board declined to take any definite action, believing it best to leave all authority as to discipline in the hands of the faculty, they requested the students to reopen negotiations with the faculty and recommended that the faculty reconsider the case. The suggestion was also made that both the faculty and student committee were too large to carry on satisfactory negotiations. As a result of this last suggestion the students reduced their committee

to three—two Juniors and one Sophomore. This committee of three conferred with a committee of three from the faculty Friday and Saturday, but the conference did not get anywhere, and the faculty declined to reconsider the action originally taken.

Sunday a committee of Golden citizens organized and tried in a friendly manner to help. Monday morning at the student mass meeting this committee finally persuaded the students to give them twenty-four hours longer to work for a settlement, time to interview the Governor, and to see if anything could be accomplished. The student body finally decided to do this, though many thought such delay would be construed by the faculty as an indication of "backing down" on the students' part.

This citizens' committee interviewed the Governor, other state officials, members of the board of trustees and others interested in the School. As a result the Governor called for a meeting of the board of trustees for Tuesday and secured the attendance of Mr. A. E. Carleton for that meeting. Mr. Carleton had been appointed to the board six or eight months before, but had never previously attended a board meeting. Mr. Whitaker, '98, of the board, was out of town, and could not get to the meeting. The committee also secured the verbal promise of at least two of the four members of board available that the board would take action that would insure the suspended students a chance to complete their work this year.

The citizens' committee so reported to the student body Tuesday morning and urged the students to return to their classes, taking the five suspended students with them, pending action of the board.

After considerable argument the students unanimously agreed to do this and give their committee, the board of trustees and the faculty until 7:30 that evening to settle the matter.

The net result of the day was that one of the board members had a change of heart, and went back on his word to the citizens' committee, the board declining by a three to one vote to take any definite action, referring the matter back to the faculty and the faculty declined to reconsider.

That evening the students voted to abide by their previous decision and to leave the school. If there was a reconstruction of the administration and faculty by next Fall that they would all return. If not, that they would go elsewhere to complete their education.

With one exception the Seniors voted with the rest to show their approval of the students' action. By common consent the Seniors were expected to complete what little work they had remaining. The foreign students were advised to complete this year's work, and then remain away next year if no changes were made in administration; also that any students who wished to do so could complete reports, drawings, or laboratory work wherever this could be

done within a few days, and thus secure credit in full for such work.

The foreign students offered to quit with the rest, and one of them did do so. The rest—four in number—are now attending classes.

Wednesday, Thursday, Friday and Saturday a few underclass men worked on drawings, reports, etc., and two freshmen attended classes with the four foreign students. These two freshmen were ordered to attend by their parents, but they were finally able to persuade their parents to allow them to quit and they did not report at classes the next Monday, May 7th.

Wednesday evening, May 2nd, a few alumni met in P. M. McHugh's office, 812 Cooper Building, Denver, and privately discussed the situation. Then on Thursday at four in the afternoon, a regular meeting of the association was held at the same place. This meeting was called by the President, Harry J. Wolf, '03; nearly thirty graduates were present and thoroughly discussed the question, finally adjourning until the next evening at five, after appointing a temporary committee to let the students know the alumni were trying to devise some settlement, and to urge all the students possible to remain around a few days to see if anything could be done.

Thursday evening the students held a farewell dance at Marble Hall in Denver, to take the place of the Junior Prom.

Friday, May 4th, the faculty passed a resolution to the effect that all students who returned to the School on or before the opening day next September would be given full credit for all work done up to the time of leaving this semester, and that all possible opportunity be given to make up or finish work, that, under happier circumstances, would have been completed this semester. Most of the work lost this year can be recovered next year during the regular semester.

Friday evening the Alumni Association elected a committee of three—A. F. Hewitt, '05; Walter E. Burlingame, '01, and Earle A. Strong, '14, fully empowered to do anything they could to settle the matter now, and if that proved impossible, to thoroughly investigate the matter and report back to the association, not later than the regular annual meeting, May 26th. This committee soon discovered that nothing they could possibly do would clear up the immediate trouble and are devoting their entire time and energies to a thorough investigation.

This is how the matter stands as we go to press May 9th, and unless the board of trustees takes some radical action at their regular meeting May 10th, there is little probability of change in the immediate future.

We have a well equipped School and a large enough faculty for several hundred students, with at present only about four

students. We print below a statement by President Parmelee and one from the student committee:

**To the Alumni of the Colorado School of Mines:**

We are again confronted with one of those unfortunate situations in the School arising from a revolt of the students against an action of the faculty. That action consisted in suspending five students for reasons which were deemed sufficient, viz., intoxication, and hazing an instructor. There is no doubt as to the facts; the sole problem lies in the administration of discipline.

The situation has been particularly acute and has developed unfortunate bitterness in some quarters. Personally I have endeavored to keep my vision clear as to the main issue, and not allow personal prejudice or any other side issue to complicate things. We were face to face with facts that required attention and discipline. We imposed penalties, and the action was resented to the extent of a threatened strike unless the five men were reinstated.

It is not denied that the students had a right to protest against the penalties or even seek to have them modified, but any such right was lost when they formulated demands and threatened to leave unless these were granted. I take it that operating engineers will perceive plainly that it would have been intolerable to treat with students under such conditions, and that we would have merited condemnation if we had done so. At no time was there any opportunity to treat on any other basis than the reinstatement of the five suspended students, and this demand had to be met before the student body would return to classes. It seems incredible that such a proposition could be presented, or that its acceptance could have been dreamed of.

It is my candid opinion that matters were not improved by the friendly attempts at conciliation made by citizens of Golden. The trustees sought a way out of the trouble, but found a definite obstacle in the nature and tenor of the students' demands. The board found no other alternative than to support the jurisdiction and authority of the faculty, and the Governor has declared himself in accord with the constituted authorities, although he deeply regrets the incident.

I am informed that the Alumni Association is now to consider the situation with a view to seeing what can be done. I have sought the best advice on that same question, and can see no other course than to go straight ahead and work the problem out in the light of what may happen.

Every selfish personal interest would dictate that we yield to the demands; but I submit we are not confronted with a question of personal expediency, but of principle. There should be no doubt as to whether the authorities or the students are to run the School. If the authorities are incompetent they should be removed, but they should not be overridden.

I conclude with the assurance that we have no personal animosity in our attitude; that we are deeply sensible of our responsibility and are not afraid to accept it; and that we feel justified in asking the support of all fair-minded and right-thinking alumni.

H. C. Parmelee, President.

**Statement From the Students of the Colorado School of Mines Concerning the Recent Trouble.**

This trouble is the climax of a series of misunderstandings between the students on one side and the president and faculty on the other side. This climax was brought to a head by the celebration of Senior Day, at which time the Sophomores had a keg party in the forenoon. In the afternoon there was a ball game between the faculty and Seniors, at which time the Sophomores were doing considerable wrinking among themselves, and at the suggestion of one of their number they wrinkled an instructor. There was no premeditation on their part. It was not intended as an assault, but merely a boyish prank. In the case of the Senior who was suspended for intoxication, his actions were the same as about one-half of the Senior class. It was impossible for the faculty to be ignorant of the other guilty members of the class.

We do not believe that these men are innocent, but that they must be disciplined. We believe that the penalty was entirely too severe, and was not of the same degree that was and has been maintained this year and in former years. It is well known to the faculty members that drinking has existed among the students for several years, especially on Senior Day, but nothing has been said or done about it except this Fall when one man was expelled for prolonged drunkenness and other immoral conduct. We believe that discipline could be administered to these men, which would allow them to remain in school and would be equally as effective as suspending them for one year.

The students are not attempting to govern the school or dictate its policies, and realize that discipline must be maintained, but that it must be of such a nature that it will be just to both students and faculty.

After five days of endeavor to reach an agreement on the part of the student committee, the student body to a man voted to quit, feeling that the unrest and dissatisfaction that has existed since the beginning of the year would continue, and that it would be a waste of time to stay in the institution. The students sincerely hope that matters will be readjusted before the beginning of next year, insuring fair treatment and consideration, and feel that their act will bring about a reconstruction that will be beneficial to the institution.

The Student Committee:

H. G. Schnelder,  
F. E. O'Neill,  
L. D. Mulford.

# Colorado School of Mines Magazine

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*Editor and Manager Colorado School of Mines Magazine; Manager of Capability Exchange.*

Address all communications to the Assistant Secretary and Treasurer, Golden, Colorado. Make all checks payable to the Assistant Treasurer.

**CLASS EDITORS.**

K. S. FERGUSON....'17 I. M. CHARLES....'19  
 D. R. LOCKE.....'18 FRED L. SERVISSE....'20

**ATHLETIC EDITOR.**

R. F. WHITE.....1918

**VOL. VII. MAY, 1917. No. 5**

**GET TOGETHER.**

Now, then, fellow graduates and all friends of the Colorado School of Mines, let's GET TOGETHER and see if we can settle this and settle it RIGHT. This has been developing for the past five or six years at least, and the changes made in that time have only made things worse. Let's have peace, REAL, PERMANENT PEACE, based on right and justice, even if we have to fight for it.

This issue was delayed in hope some settlement of the internal troubles could be reached in time for this number. Commencement will be held, as announced, on May 25th, also the alumni reunion in Golden at the Gym on May 25th, at 12:30 p. m. Come back and investigate a bit for yourself.

There will be no Junior Prom.

Of course, the regular annual meeting and banquet of the Alumni Association will be held, as announced, at the Denver Athletic Club in Denver, May 26th, at 7:30 p. m.

Angels may preserve fools and drunkards who take chances, but do you care to qualify?

Experience is the best school, but some of us never get beyond the kindergarten stage.

Justice ought to be as cheap as the dew, but half the time it costs more to get than it is worth.

# Senior Day Bulletin

WEATHER—Dark and gloomy for some, bright and cheerful for others.

**THE SENIOR SNOOZE**

Published at Golden, Colo., by the Secular Order of Night Riders.

**SNORE EXTRA.**

**Mines Seniors Go Suddenly Nuts.**

**All Plead Temporary Insanity.**

On the morning of April 23 an aggregation of the most learned, studious, illustrious, well conducted, energetic, gentlemanly, embryo muckers that ever held a tea cup or recovered from an overdose of rat poison, suddenly became temporarily unbalanced in that portion of the cerebellum that has been an unresisting passage between the right and left or left and right ears, for the copious, undiluted, unadulterated, misrepresented Bull, that has sought that the line of least resistance for the last four, five or six years, in the cacydillie halls grouped around the midnight gallowes. Headed by the Sturdinciple band a la Discord, they besieged the various temples of mental torture, leaving riot and ruin in their wake. Yea, worse than the ruthless retreats of the German army, were the unmerciful and lawless outrages committed.

**Notorious Cast of the Most Degenerated Scum that Has Infected the Downy Campus or Leached a Parasitic Existence From the Puny Carcass of the Colorado School of Mines.**

**See Them—Hear Them—Smell Them.**

**Outlaws, Bandits, Thugs.**

And a Few Minus Engineers, Including a Few of the Children's Favorites. Gyp, the Blood; Lefty Looie, The Clutching Hand, 'Frisco Kate, Wilhelm Der Kaiser, Etc., Etc.

**Don't Give the Elephant a Chew! Great Program.**

1. Grand march.
  - a. Breaking up slumbering gatherings.
  - b. Seizure of plotters.
2. Assembling at the Synagogue.
3. Playful and health acquiring sports.

(Owing to the unstudatic spirit of a few of our dear slave-drivers and having only one more week in which to finish up, we must necessarily be short and sweet not having time to prepare. We are going to bust up classes anyhow, so.....)

## FRESHMAN NEWS NOTES.

F. L. Serviss.

Owing to the present conditions, ye scribe cannot complain that news is scarce, oh, no! but still there is a rigid censorship imposed by the "powers that be," that is responsible for the length of this column. But why complain? We had our picture took, but never published; we have bought every paper since we were photographed, but nary a foty did we see; but we did see a likeness of one of our teachers in the Denver Yellow Jacket. Where does he get the pull? Is it because he is good to look upon?

Dewey Dutton is back on the job, or was, until diplomatic relations were abolished. He is a little pale, but none the worse for wear. All are glad to see him on the job again, and wish him luck.

Grimm, the "Fatty Arbuckle" of the Freshmen, committed, or attempted to commit, suicide in English. On being interviewed, he refused to say that his affinity had gone off with a handsomer man, thus driving him to his action. Some declared that Grimm, firmly believing in the Persian proverb that 'no one loveth a fat man,' determined to end it all, but it was later discovered that the reason for his despondency was that he had been suspended from the Traffic Force without cause. He is now fully recovered, but declares he will sooner or later finish the job.

Something must have crawled in the Chem. building and died lately. Odors from certain lecture rooms testify that it is a rotten shame. Several students were overcome, and it looked as if it would be necessary to send for Doc Roberts and his helmet crew to revive them.

Miss Davis is quoted as follows: "Why, sure I am in favor of a spring vacation. My spirit is clamoring to be unleashed and gambol among the flowerlets and little butterflies and other little buglets. It is my desire to dance and in every way testify my joy of springtime." The next day it snowed, and she has changed her mind. But she has a new fad now; that is, posing for newspaper photographers and even the movie camera; she is very willing, and insists that it be put on the front page. When told to look pleasant she replies: "I never look any other way, sir, so please shoot!"

Some freshman is quoted as telling Sherwood that an angle is a two-sided triangle, and that parallel lines are the same distance apart all the way, and do not meet unless you bend them, also geometry teaches us to bisect angles. Prof. Dolman says some one told him that gender shows whether a man is masculine, feminine or neuter, and that the feminine of Bull is Mrs. Bull.

Get the hook, this is too much!"

Just one more then we shall quit. Scene: The Sherwood home.

"Does your husband play sluff for money, Mrs. Sherwood?"

"No, George doesn't; but most of the men he plays with do, though."

## CAPTAIN KNEPPER IS CALLED TO COLORS.

Captain Chester M. Knepper, '17, retired United States navy officer, who has made his home in Golden for nearly two years, received orders April 10th to rejoin the service, and left April 11th to report for duty.

His orders were to go to the great Bethlehem steel works at South Bethlehem, Penn., as inspector of engineering material for the navy.

Captain Knepper served the U. S. navy for thirty-three years. He was graduated from the naval academy in the class of 1880, and has served on every style of craft in the navy.

He retired in 1913 and he and his wife went abroad. They were in France when the war broke out, and soon after that started for the United States. Mrs. Knepper died on the way across the Atlantic and was buried at sea. Captain Knepper had often heard of the Colorado School of Mines, and he came to Golden and registered as a student in the junior class. He will receive his degree as a mining engineer Commencement Day, May 25th.

During the Spanish-American war Captain Knepper saw service with Dewey's fleet at Manila, he being in command of the Isle de Cuba there. He also saw service in Cuban waters during the Spanish-American war and during the Cuban insurrection. At that time he was on the torpedo boat McKee.

## MISCELLANEOUS.

Captain Will C. Bryan, former athletic trainer, has been appointed captain and quartermaster on the staff of Adjutant General Baldwin.

Prof. J. C. Roberts, who has been teaching first aid at Leyden coal camp, tendered his class a banquet and general good time at the camp, Friday, April 27.

Professor Ralph R. Knowles, instructor in electrical and mechanical engineering and mining at the School of Mines, has tendered his resignation to the board, to take effect the beginning of the next school year.

Professor C. D. Test was called to Lafayette, Ind., Saturday, April 21st, on account of the death of his father, Dr. E. Test. Dr. Test held the chair of mathematics at Purdue University for a number of years.

The Athletic Association has established a new towel system at the gymnasium that is a great convenience to the students. Each student is furnished with clean towels by the association, instead of being compelled to bring his own towel with him, as heretofore.

## Phillips Family Is Patriotic.

Dr. William B. Phillips, former president of the School of Mines, writes that he has enlisted in the Texas Home Guard and that Mrs. Phillips has joined the Red Cross society. Their son, Lawrence, is a member of the Golden Engineer corps, and will probably be called.

## BASEBALL

Denver University and Colorado College dropped all spring athletics and cancelled all their schedules.

Mines, Aggies and Colorado University had a conference and arranged a new spring schedule for athletics. The severing of diplomatic relations between the Mines students and the faculty has now busted this schedule as far as Mines is concerned, at least.

Here is the schedule as it was arranged:

April 21—Mines nine vs. C. A. C. at Golden.

April 25—Colorado nine vs. Mines at Golden.

April 28—Mines vs. C. A. C. at Fort Collins; baseball and track.

May 1—Colorado nine vs. Mines at Boulder.

May 4—Colorado nine vs. C. C. at Fort Collins.

May 12—Colorado vs. C. A. C. at Boulder; baseball and track.

### MINES 7—WEST DENVER HIGH SCHOOL 0.

Friday, April 7th, Mines and West Denver High School played a practice game in Golden with the above score.

### MINES 8—AGGIES 9.

In a sixteen inning game, the Aggies defeated the Mines in Golden Saturday, April 21st, by a score of 9 to 8. The score was tied at 5 to 5 from the sixth inning until the sixteenth, when the Aggies drove in 4 runs and the Mines 3. O'Neill and Schneider gained batting honors for the Mines.

### MINES 2—U. OF C. 4.

Wednesday, April 25th, the University of Colorado nine defeated Mines by the above score on our own grounds.

The game was unsensational, and no runs were scored by either team after the sixth inning. Mines succeeded in getting the bases full on several occasions, thereby greatly encouraging the rooters, but consistently failed to score at such times.

Bad weather and the internal troubles at the School made this the last game of the season so far as Mines is concerned.

### ATHLETIC MANAGERS.

Student managers for next year's athletic teams were elected at a meeting of the Athletic Association, April 5th.

Football—J. J. Mahoney.

Basketball—R. Krepps.

Baseball—G. T. Johnson.

Track—Ted Sundquist.

Mahoney, a star halfback, was so seriously injured in play last fall, that he is permanently out of the game, except in a managerial capacity.

## ALUMNI

### ANNUAL MEETING AND BANQUET.

Don't forget the Annual Meeting and Banquet of the Alumni Association at the Denver Athletic Club, Denver, Colorado, at 7:30 p. m., Saturday, May 26th.

### PERSONALS.

'92.

W. E. Hindry is lost again. What is his present address?

'93.

We gave the wrong change of address last month for W. B. Milliken. Milliken's wife and family are spending their vacation in Austin, Texas, but Milliken is still in Denver, his address is 418 McPhee Building, Denver, Colorado.

'94.

Geo. M. Post is temporarily at East Las Vegas, New Mexico, engaged in a paving contract, but his address will remain 2344 Julian St., Denver, Colorado.

H. H. Atkins' address is 222 North Seventeenth Street, Muskogee, Oklahoma.

'95.

Herbert E. Merryman's address is 312 West Gay St., Warrenburg, Mo.

'97.

Robert Nye is at Nevada City, California.

'98.

Fred Johnston, who was recently transferred to the East Helena, Montana plant of the A. S. & R. Co., has been appointed superintendent of the Arkansas Valley Smelter at Leadville, Colorado, and has returned to that city. When Johnston left Leadville for Montana a few months ago, he had been Assistant Superintendent of the Arkansas Valley Smelter for a number of years.

Oscar A. Lampe is mill and cyanide Superintendent of the Guanajuato Consolidated M. & M. Co., Guanajuato, Gto, Mexico. His El Paso address is 3020 White Oaks Street.

P. H. Bertschy is at York, Montana.

'99.

Mail was returned some time ago from the address we had for Arthur R. Townsend. Where is he?

'01.

K. C. Parrish's address is 1418 Howard St., Roger Park, Chicago, Ill.

'02.

C. O. Moss has changed his address to Coachella, California, where he is now engaged in growing dates.

Lavern J. Charles is Assistant State Highway Engineer, Santa Fe, New Mexico.

C. T. Barron is manager of the Norfolk Smelting Company, West Norfolk, Virginia.

The addresses of both F. W. Lehmer and J. E. Bergh have been lost for some time. Where are they?

'03.

**Makes Remarkable Survey.**

The Central City Observer tells of a very difficult piece of surveying completed by Walter Funk, a graduate of the School of Mines, by which the Argo tunnel was connected with the Prize mine shaft. It was necessary for Mr. Funk to begin at the bottom of the Prize shaft and survey to the surface, thence across the hills to the Grand Army shaft, down same to the workings connecting with the Gunnell workings, through such drifts to the Gunnell upraise, thence down it to the workings connecting with the Argo tunnel and thence through the Argo tunnel to the Prize drift and in that drift to the Prize upraise and thence up 600 feet to where the Prize crosscut would commence for the tunnel connection. Most of these old workings were in dangerous condition, with drifts caved in and contained accumulated and falling water, in addition to other dangers and difficulties.

Geo. C. Foster's address has been lost for some time, and very recently mail addressed to Charles A. Liddell at Virginia City, Nevada, was returned. What information have you of either of these men.

Betty Ellen Wells arrived at the home of Mr. and Mrs. Frank B. Wells, Tempe, Arizona, on April 2, 1917; weight, nine pounds.

W. A. Sloan is now Chief Chemist for the United Verde Extension Mining Company. Address Box 660, Jerome, Arizona.

'04.

Chas. Adams' address has been missing from our lists for several years. Is he still alive?

'05.

A. P. Busey, Jr., who is Manager for the Penn Mining Company, Campo Seco, California, was in San Francisco on business the latter part of April.

L. B. Eames expects to leave his home in Pueblo for South Africa in the near future. Definite address in Africa will be given later.

T. R. Hunt is on his way home from South America. He expected to arrive in Panama on May 2nd. His address in this country is his permanent one, 2941 West Denver Place, Denver, Colo.

Frank J. Reinhard paid an official visit to the Colorado Chi Chapter of the Sigma Alpha Epsilon fraternity at Boulder the latter part of April. Reinhard is province president of the fraternity.

Evaristo Pardes and John B. Neville have been missing from our address files for some time. More recently mail addressed to E. F. Stoeckley has been returned. Where are they?

Douglas Muir, Box 552, La Jolla, Calif.

J. J. Cory's Denver address is now 1642 Detroit Street.

'06.

Thomas L. Chapman, who is returning to the United States from Ecuador for a vacation, expects to arrive in Denver about the second week of May, where his address will be 708 East First Avenue.

**ALUMNI LUNCHEON.**

Don't forget the Alumni Luncheon at Golden on Commencement Day, May 25th, at 12:30. Luncheon free, but please let the Assistant Secretary know as early as possible that you will attend so proper arrangements can be made.

Charles W. Harkison has left Atlanta, Idaho, and his address is now 1520 Franklin Street, Boise, Idaho.

Max Ball of the U. S. Bureau of Mines at Washington, D. C., successfully underwent an operation for appendicitis at Garfield Hospital in Washington on April 17th.

'07.

W. E. Canning has accepted a position with the Kennicott Copper Company at Latouche, Alaska. Address care of the company.

E. W. Isom visited the School and Golden, Monday, April 9th. Isom is now with the Sinclair Oil & Refining Company, headquarters in Chicago, as assistant to the president. Isom has five refineries under his direction and is building three more. Chicago address is 923 Conway Building.

Albert Wolf, who was badly injured at Victor last month, is recovering rapidly and will soon be on his feet again.

Pierce Barker, who was chief chemist at the Washoe Reduction Works of Anaconda Copper Mining Company, has been promoted to the position of Superintendent of the blast furnace department left vacant by the resignation of H. W. Aldrich, '06.

'08.

B. M. Johnson's address is now Parker, Arizona.

Percy Jones is at Arlington, Arizona.

We have recently lost the address of Chas. A. Reno and Chas. D. Root. Do you know where they are?

'09.

A. F. Hallett is now at his permanent address, Montrose, Colorado.

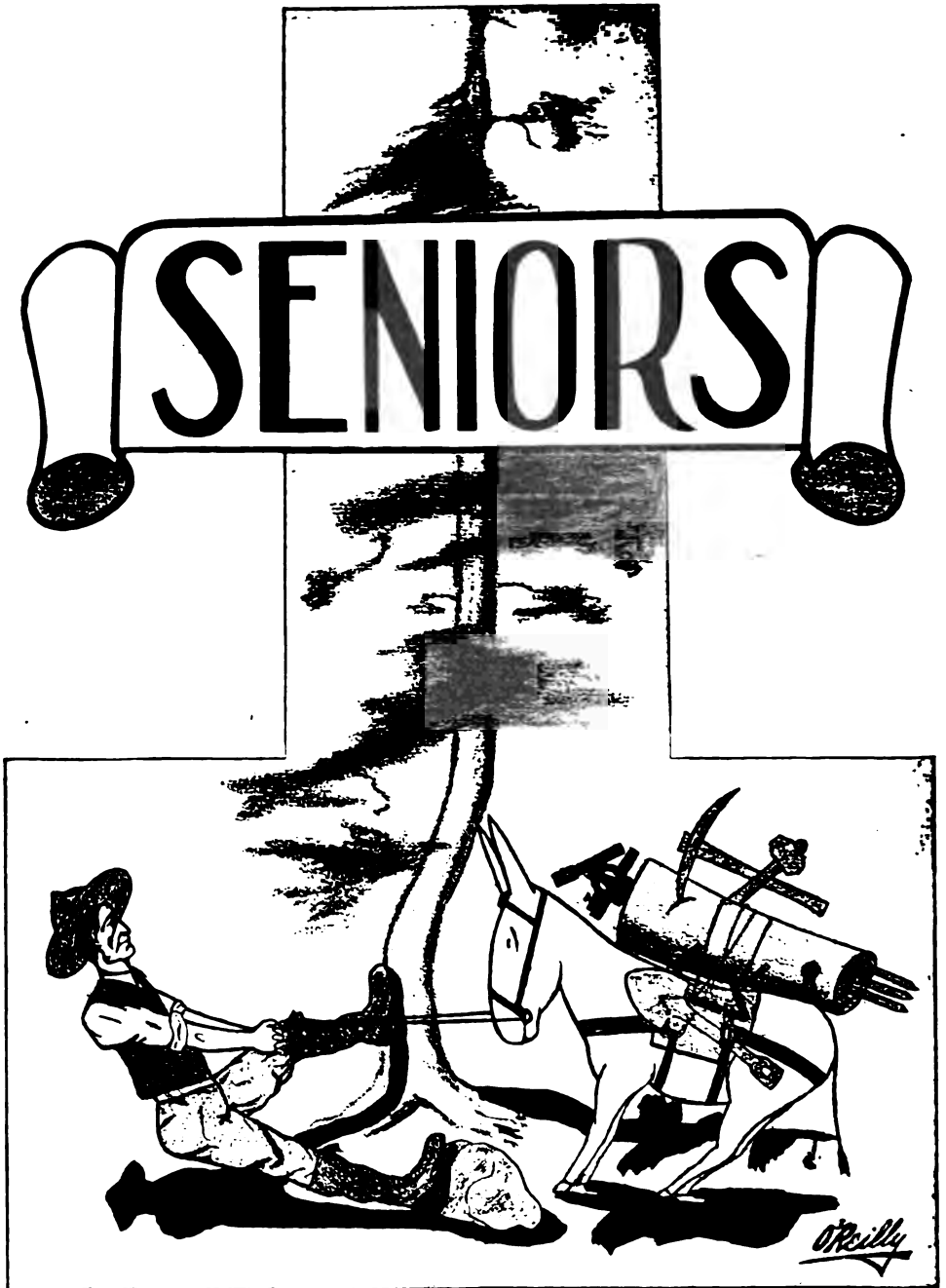
We have lost the addresses of Louis Shafer, Wm. M. Lewis and Roy P. Curtis. Who knows where they are?

**Eastern Talc Company**

Rochester, Vt., May 1, 1917.

You will doubtless register surprise when you note the enclosed check for \$5.00. For this sum I wish to subscribe to the Magazine (sent to above address); to rejoin the Alumni Association, and to get credit for the rest where it will do the most good. This will help my conscience, and maybe buy more paper for the Magazine, which in turn will help the paper manufacturers, who, on their part, will buy more talc to put into their paper, thereby increasing the business of the Eastern Talc Company, and incidentally giving me more to do in producing the same and possibly increasing my future purchasing power for more Magazine.

I am now and expect to be for some time in Rochester, Vermont, connected with the



Cartoon from 1917 Prospector.



above company, the largest individual talc producer, I believe, in the world. We have several mines and mills in this district, and are producing more talc than most people know exists. Most miners have had experience with various kinds of talc, of one scent or another, but few probably chase it to its native haunts for its own sake. It is used chiefly for a filler in making paper, but is also used to a great extent in manufacturing rubber, and in innumerable other processes, down to the ever-popular one of making babies and chorus ladies smooth.

If a short article would be of any interest to the Dynamiters I could probably one-finger it out on the typewriter, provided, of course, the government did not censor it first or conscript the author.

Best wishes to the Miners and may they do their share to make the kaiser look like he had struck a missed hole.

Very sincerely,

Eugene C. Brooks.

'10.

S. M. Soupcoff is with the A. S. & R. Co. office at 618 McIntyre Bldg., Salt Lake City, Utah.

K. P. Campbell has returned to Mexico where his address is Cia. Met. Nac., Matehuala, S. L. P., Mexico. He reports that conditions are somewhat improved and the money situation better. Gold and silver coin in circulation. Prices higher than formerly.

R. J. Farrar is Mill Superintendent for the Copper State Mining Company at Copper Creek, Arizona. Address care of the company.

'11.

R. V. Thurston's address is Box 100, Miami, Arizona.

Robert E. Snow is returning to the States from Ellamar, Alaska.

Thomas H. Garnett is now Superintendent of the Kelly Mines of the Empire Zinc Company at Kelly, New Mexico. Address care of the Company.

Who can give us the address of Chas. O. Olsen?

'12.

Edwin E. Hand, Jr. is now at Parker, Arizona.

Alan Kissock and Miss Ethel Brinkerhoff were married Wednesday, April 18th, at Richmond, Virginia. The couple will be at home after the tenth of May at 944 North Fourth Avenue, Tuscon, Arizona.

C. D. Grier, writes from Treadwell, Alaska, stating that the recent flooding of the Treadwell Mine by the sea has put an end to all operations excepting one small mine cut off from the others.

Where is Wilfred Fullerton, C. A. Rockwood and Chas. D. Heaton?

Albert T. Mertes and Miss Charlotte Shane were married in Denver Tuesday, April 24th. They are living in Denver.

'13.

James W. Dudgeon's address is 939 W. Granite Street, Butte, Mont.

Daniel E. Gregg is with the New Gaudaloupe Mines, San Jose, California.

S. P. Warren called at the School April 10th, on his way west for a mine examination trip. Later in the month he expected to examine some properties in Oklahoma before returning to Joplin, Missouri.

Herman W. Hugo's address is now room 16 Heartsease, Oakes Home, 2825 West 32nd Avenue, Denver, Colorado.

John R. Davis, who has been in Mogollon, New Mexico, has resigned his position there, and his future address will be 3937 Quitman St., Denver, Colorado, until further notice.

Benedict, Boyle & Stronck, Efficiency Engineers of Chicago, are acting as consulting engineers with the installation of Scientific Management at the Denver Rock Drill Works, and H. N. Stronck visits Denver nearly every month to keep in touch with the progress of the work.

J. C. Williams' address in Denver is Apartment 6, 1760 Franklin Street. A daughter, Elizabeth Jane, arrived at his home February 12, 1917.

Irving A. Chapman, 42 Broadway, New York City.

Mail addressed to H. M. Cronin at Pearce, Arizona, has been returned. Can you send us his address?

#### ALUMNI LUNCHEON.

Don't forget the Alumni Luncheon at Golden on Commencement Day, May 25th, at 12:30. Luncheon free, but please let the Assistant Secretary know as early as possible that you will attend so proper arrangements can be made.

'14.

Arnold A. Bowhay, Jr., is at 249 Effie Street, Fresno, California.

O. A. Fischer is now with the Pecos Mines Company at Valley Ranch, New Mexico. Address care of the company.

Karl L. Koelker's address is 702 Pearl St., Joplin, Missouri.

Robert R. Harper, 306 Fleming Building, Des Moines, Iowa.

James W. Pearce is now with the Pittsburg-Idaho Company, Ltd., at Gilmore, Idaho. Address care of the company.

Earle A. Strong's home address in Denver is 24 East 14th Avenue.

Mark U. Watrous' address is now care of the Balakalava Consolidated Copper Company, Coram, California.

Lemuel K. Taylor, Standard Oil Company of New York, Shanghai, China.

We would like to have the address of Geo. J. Griswold, Jr., A. W. Smith, W. T. Yang and Y. L. Tsui.

'15.

Alfred H. Bebee, Box 185, Cripple Creek, Colorado.

Breese Rosette has returned to his old position with the Judge Mining and Smelting Company, at Park City, Utah. Address Box A.

David C. Dodge, Jr. visited the school April 27th and attended the Mines-U. of C. baseball game that afternoon.

V. C. Olson was down from Leadville for a short vacation with his fraternity in Golden.

Samuel J. Burris was a Golden visitor the latter part of April. Dodge, Olson and Burris are preparing for examinations in the U. S. Officers Reserve Corps.

J. N. Teets has left Red Cliff, Colorado, and is now at 1021 East 19th Ave., Denver. '16.

Hunyet Lee has finished his work at Columbia University, and has returned to the Orient, where his address will be care Lay Lan Sim, Toko, Passar, Baroe, Batavia, Java, D. E. I.

Frank J. Wiebelt has left Montana and mail will reach him thru his permanent address, Arvada, Colorado. Wiebelt is expecting to go to South America, either to Chile or Peru.

U. H. Berthier has accepted a position with the Compania de Minerales y Metales, S. A., Monterrey, Mexico.

R. M. Fullaway, 102 South Central Ave., Eagle Rock City, Los Angeles, California.

#### EXECUTIVE COMMITTEE MEETING.

Executive Committee of the Alumni Association met in the offices of the President, 1023 First National Bank Building, Denver, for the appointment of a Nominating Committee and to make arrangements for the Annual Meeting and Banquet. It was decided to hold the Annual Meeting and Banquet, Saturday evening, May 26th, at the Denver Athletic Club.

It was also decided that we would have an Alumni luncheon and reunion in Golden on Commencement Day, May 25th, at 12:30. Luncheon will be served at the Gymnasium and will be free to all Alumni who attend. The Nominating Committee met later in the week and prepared the ballots, which have been sent to all the Alumni.

#### ANNUAL MEETING AND BANQUET.

Don't forget the Annual Meeting and Banquet of the Alumni Association at the Denver Athletic Club, Denver, Colorado, at 7:30 p. m., Saturday, May 26th.

#### RECENT ARTICLES BY MINES MEN.

"The Tredinnick-Pattinson Process." William E. Newnam, '96. Bulletin of the American Institute of Mining Engineers, May, 1917. Pages 749 to 775.

"Prospecting Tin Lands in Malaya," by Wm. B. Middleton. Transactions of the Institute of Mining and Metallurgy, Vol. 24, 1914-1915. Pages 300 to 324.

The University Daily Kansan for March 5, 1917, was the Mining Edition, and a great many of the articles in it were from the pens of A. C. Terrill, '05, and R. L. Grider, '05, who are in charge of the Mining Department of the University.

Retribution is something we expect will eventually overtake other people.

#### AN HISTORICAL SKETCH OF THE DEVELOPMENT OF THE SLIDE RULE.

Theme in English, 230.

Of the many instruments for minimizing the labor of mathematical calculation, the slide rule has probably attained the greatest popularity. The uses of the slide rule have greatly broadened since the day of its invention, and today its uses and applications are being taught in our technical schools.

The development of the slide rule has been accomplished, step by step, by the perseverance of such advanced mathematicians as Segner, Mannheim, Mehmke, and the eminent Sir Isaac Newton; such physicists as Lambert, Young and Everett; such practical engineers as Coggeshall, Thatcher and Tower.

And yet the history of this instrument has been neglected, or so laxly treated, that grave inaccuracies occur in regard to its early history, and but few of its admirers know the inventor of the first slide rule.

The history of the slide rule began shortly after the invention of logarithms by John Napier, in 1614. It was Edmund Gunter, in 1620, then professor of astronomy at Gresham College, London, who took the first step toward constructing a slide rule. His invention was a logarithmic "line of numbers" on which proportions were worked. The proportions were not with respect to the numbers, but with respect to their logarithms. These lines were mounted, with other lines representing the logarithms of trigonometric functions, on a scale, and the whole called Gunter's Scale.

Gunter's Scale is frequently erroneously referred to as Gunter's Slide Rule. The first slide rule proper was, however, not invented until ten years later by John Wingate, of London.

The rule Wingate invented, according to the best account, was of a single sliding part, with one line of logarithms sliding beside another logarithmic line from which the proportions could be obtained.

In 1632, two years after Wingate had invented the straight edge slide rule, William Forster, a pupil of Oughtred, and a teacher of mathematics in London, obtained the consent of Oughtred to publish the latter's notes, and the description of his "Circle or Ring, with another movable circle upon it." This in all its essential features was the same as the circular slide rule of the present time.

According to Forster's account of a conversation with Oughtred, the latter had invented the Circular Slide Rule and also a straight edge one, similar to Wingate's some thirty years before. This is very improbable, however, as logarithms had not yet been invented.

The advantages to be derived from the slide rules mentioned must have seemed quite sufficient at that time, for no attempt was made to enlarge the field of their usefulness, or improve the rules in any way, until 1672, when Partridge invented the

"slide" as we have it today. Hunt and Everad also contributed in some ways to the uses and adaptations of the slide rule. Everad it is, to whom we are indebted for the invention of a logarithmic line.

From this time forward, however, the development of the slide rule seems to have demanded more popular attention, and we immediately see a broadening effect in the invention by Coggeshall of a slide rule for the measurement of timber, stonework, and vessels. This rule seems to have been the first ever devised for special purposes, and enjoyed great popularity as late as 1874.

It is not generally known that Sir Isaac Newton discovered how the slide rule could be used in solving for roots of algebraic equations, but such is the case. In his work with the slide rule he suggested the use of a "runner," but the idea was not incorporated in any of the slide rules at that time; in fact, not until 1775, one hundred years later.

The type of rule used by Sir Isaac was really an improved Gunter's Scale, and not a slide rule properly speaking, but since that time slide rules have been constructed which perform those and other intricate algebraic operations.

It is quite remarkable that we owe the principles and developments of the slide rule almost wholly to England. Later France gave the world some important developments, but to English tenacity and perseverance we must give the credit, for all the fundamental principles were worked out in England.

One of the great strides forward in the application of logarithms, as used in the slide rule, was made in the early part of the nineteenth century by Peter M. Roget, M. D., of London. To him we owe the "log log" scale on the improved slide rules of today, by which perplexing problems in involution and evolution may be solved.

About the middle of the nineteenth century a French artillery officer, then only nineteen years old, invented the straight edge slide rule, after which all modern rules in common use are patterned. This officer was Amedee Mannheim, and his rules are everywhere known as Mannheim Rules. This rule was not adopted in the United States until about 1880, but since that time it has gained universal distinction. There are other rules of as simple construction and manipulation, but they are not in use in the United States. The French are now using a rule which is constructed along lines suggested by Beghin and Cherepashinskii, two of the earlier writers on the slide rule. Mannheim, however, has given the world a rule which is quite sufficient for all ordinary needs, and which is mathematically as correct as a three-place table of logarithms.

Some credit is due to American inventors for the development of the slide rule, and more especially that phase of development which deals with specializing and the finer points. More slide rules for special purposes have been invented in the United

States than in any part of Europe, and we have the distinction of having had one of the world's most accurate slide rules invented in this country. The inventor was E. Thatcher. His rule attains the accuracy of a five place table of logarithms. This invention is the most important single contribution to the design of slide rules made in America. Thatcher's rule is of the cylindrical type.

The present popularity of the Mannheim type of slide rule in this country should not deter inventors from striving for a more convenient, more accurate, and more compact type to replace it. The history of the development of the slide rule has shown that no one man is capable of inventing a rule elegant enough in all details, and of such wide range in its application as to stand the test of time.

American engineers, however, with their wonderfully fertile brains, and great adaptability, should be able to give the world a slide rule that will be the height of simplicity and accuracy, and more practical than any of the rules in use at the present time.

F. A. BROWN, '18.

## NOW READY

### THE EFFICIENT PURCHASE AND UTILIZATION OF MINE SUPPLIES.

By Hubert N. Stronck, E. M., Mem. A. I. M. E., and John R. Billyard, E. M., Mining Engineer.

This book describes in detail the entire subject from purchasing to use, stress being laid on systems for large operating companies, with simplified methods for smaller concerns. Many illustrations and suggestions are also given.

You will be interested in this book, and we would suggest that you send for your copy today. The authors gathered the material from observations and notes, and from articles which have appeared in technical magazines and books on the Science of Management.

97 pages, 5 x 7½, illustrated. Cloth, \$1.25 net.

Colorado School of Mines Magazine,  
Golden, Colorado.

### ASSAY OFFICE FOR SALE.

Mostly tungsten; some gold and silver. Both metals should boom this summer. If so, the buyer should make price asked back in one month. \$300 cash required. Will teach buyer tungsten assay.

Box 341, Nederland, Colorado.

### Another "Dry" One.

Sandy—"D'ye know the lassie standin' there in the car?"

Angus—"Yes."

Sandy—"Introduce me."

Angus—"Wait. She's no' paid her fare yet."

**A GENTLE HINT.**

The talk turned on the value of an occasional gentle hint in securing one's share of this world's goods. After two or three anecdotes had been related, the Old Timer came forward with his contribution.

Back in the days of the Marsac Mill at Park City, since dismantled, there was an old Irishman—named Pat, of course—employed there. And in the course of events he was taken sick and was laid up for a considerable time for repairs. When he got around again he was given his old place in the leaching department and went about his work in a half-hearted way, always with a weather eye out for the "boss." After a few

hours, the latter, who was a genial sort of a chap, came along. Pat hailed him with: "Sure, an' I dreamed about ye last night, Billy."

"Is that so, Pat? And what did you dream?"

"Sure, an' I dreamed I was workin' away here, when ye come along, an' ye stopped, an' yez sez: 'Take it aisy, Pat; take it aisy.'"

Did it work? Of course it did. Billy told him to take it easy.

—Salt Lake Mining Review.

Diplomacy is the art of getting what you want without fighting for it.

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## NEW "FROM THE RAILS UP"

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# COLORADO SCHOOL OF MINES

## MAGAZINE

Vol. VII.

GOLDEN, COLO., JUNE, 1917.

No. 6

### Notes on Mine Surveying Methods at the Mason Valley Mines Company, Mason, Nevada.

By Albert G. Wolf, '07, formerly Chief Mine Engineer.

**Transit:** Practically all the mine surveying was done with the No. 4 Burger & Sons transit, a light-weight model, having a 4-inch horizontal circle with double and opposite verniers reading to minutes, and with two rows of figures from 0 to 360, reading in opposite directions, a complete vertical circle graduated in quadrants and with an aluminum guard, inverting eye-piece, a magnetic needle, and interchangeable, auxiliary top or side telescope. In addition to the regular horizontal and vertical cross hairs, there were two stadia hairs and four diagonal lines forming a square with points on the horizontal and vertical lines. This latter figure is excellent for centering the sun in taking a direct solar observation for the meridian. A considerably larger transit was used in much of the mineral land surveying, and a level in certain construction work.

**Tripod:** A light-weight tripod, corresponding with the transit, and with extension legs, was used.

**Tapes:** Tapes used were a 300-ft. steel tape, graduated to feet only, a 100-ft. steel tape in leather pocket case and graduated to one-hundredths of a foot, a 25-ft. steel tape in a similar case and graduated to one-hundredths of a foot, graduations beginning at the end, for side notes, and a short pocket tape with spring reel, graduated to one-hundredths of a foot, for measurements of less than one foot on the 300-ft. tape. This latter combination was used chiefly in outside work.

**Plumb Bobs:** Two sizes were used, a 9-oz. bob for underground mine surveying, and a 14-oz. bob for outside work in windy weather. An extra bob with a flat-topped neck for fore and back sights underground was also used. Braided waterproof fish line was used on these bobs. For shaft plumbing a specially constructed pair of winged, steel bobs 9-in. high, 6-in. wide and weighing 11-lb. each, with No. 20 copper wire, were used. These bobs were described in the *Engineering & Mining Journal* of October 18, 1913.

#### FIELD WORK.

**Party:** The party consisted of the instrumentman and one helper. If necessity required an extra fore- or back-sight man in

workman was pressed into service for the time being.

**Meridian:** The meridian at any property was always originally determined by direct solar observation, and carried underground by traverse through adits, or with the aid of the top telescope or plumb lines in shaft workings. In determining the meridian, a prismatic eye-piece with colored glass slide was used. Base lines were established at convenient places on the surface, for example, at the Mason valley mine nails in two patent corners served as one base line. The center of co-ordinates was marked on the ground by a center-punch mark in the end of a piece of steel, the steel being driven 6-in. below the surface to protect it. Lines from this point to one of the patent corners or else the first station inside the nearby adit also served as base lines.

**Stations:** Underground stations wherever possible were in plugs driven into holes in the roof. A plug was always cut about an inch shorter than the hole, and then driven up flush with the rock face. It is then far less liable to be disturbed, and if the plug touched the bottom, it would probably work loose. The exact points were marked by screw eyes, and all stations were numbered, the numbers being stamped with steel dies on small rectangles of sheet zinc and the tags tacked to the plug faces. Station numbers indicated the levels they were on, for example: 11 was station No. 1 on the first level; 25, station No. 5 on the second level; 417, station No. 17, on the fourth level, etc. This system was everywhere adhered to. Any new station was given the next number in order for that mine level, no matter where the station was placed on the level. In some cases, of course, it was not possible to have plugs in the roof due to high backs, timbers, etc. The stations were then finishing nails in ties or screw eyes in roof timbers. Such stations were rarely used after the initial line was carried through the mine workings, but if necessary to use them in future work, they were always checked.

**Traversing:** The instrument was set up under a station, the horizontal vernier set at 0, and the vertical cross hair set on the back sight with the lower motion. The angle to the front sight was then turned off

surveying a raise or stope, the nearest from right to left, and the complete angle read even if over 180 degrees, the horizontal cross hair was set on the top of the plumb bob neck, the vertical angle read, the height of instrument (from horizontal instrument axis to station) and the height of point (from top of plumb bob neck to fore sight station) measured. Other measurements taken were from floor to roof at set-up station, called height of back (HB), and the distances to the walls from the instrument (R and L). These measurements gave the azimuth between two stations, their relative and actual elevations and the size of the opening of the station. In shaft level-stations and other large openings sufficient side shots were always taken to permit accurate plotting.

Traverses were carried through inclined winzes and raises or shallow vertical ones with the top telescope; deep vertical shafts were plumbed with two wires and the azimuth taken off by triangulation. In this method it is preferable to set up close to the wires, say 10-ft. from the nearer one, and almost in line with the wires, making a small horizontal angle at the instrument, for the error in azimuth due to any error in measuring the angle or the distance between the wires is then much less than would be the case if the triangle made by the wires and instrument were more nearly an isosceles triangle. (For a complete discussion of the errors involved in triangulating from two plumb wires, see *Engineering and Mining Journal*, Dec. 12, 1914.)

In lighting the back and fore sights, the definition of the transit described above was so clear that on short sights it was only necessary to hold a candle behind the plumb line and a hand behind the candle. On longer shots, a thin piece of paper between the light and string served the purpose. On very long sights it was necessary to illuminate the cross hairs by holding a candle to one side and in front of the telescope. Such sights, however, were infrequently made and are not advisable.

**Stope Surveys:** The methods of stope surveying varied somewhat with the system of stoping employed. At the Mason Valley mine all stoping was done by the shrinkage system, and the object of the survey was to get the general shape and size of the stope at the level of the broken ore. This survey made it possible to calculate the amount of broken ore in the stope from month to month, and by taking into consideration the space between broken ore and stope back, the unbroken ore to the next level could also be estimated, and this estimate checked against that determined by the original estimate of unbroken ore less ore extracted. The method was as follows: A permanent point was kept at the bottom of each manway, and up one of these manways, preferably at one end of a stope, a line was carried each survey. This was necessary as the manways were always being built higher and no stations would last for a month in a stope. From

the point at the top of the manways tape was stretched along the middle of the stope and the course of the tape taken with a Brunton. Every 10-ft. along this tape a measurement was made at right angles to it out to each wall. This was done by three men; the instrument man would follow the center tape, a second helper would take the zero end of a second tape along one wall, and the regular helper the rest of the tape along the other wall. With all three walking along together it was a simple matter for the instrument man to line the other two men in at right angles to the center tape, read the measurement on the cross tape at the center tape and then have the helper call his measurement. As the floor of a stope, following along the length of it, was a series of relatively level stretches and then pitches at various angles, it was necessary to make note of these points of change of slope and measure the slopes with a Brunton. Where possible, of course, the line was carried to a manway at the opposite end of the stope from the beginning of the survey and a tie made to another level station for a check. The notes were easily recorded on the right-hand page of the field book, the vertical, red center line representing the center tape in the stope and the cross lines the 10-ft. lines. The widths were written in and notes made on the side of the page of points of change of slope, etc. The cross-hatched sheet made it a simple matter to at once sketch in the outline of the stope, positions of manways and other important features.

**Raise and Shaft Surveys:** Short slope-raise connections were frequently made with the Brunton alone after the initial and final points of the raise were determined. Longer incline raises were kept in alignment by transit stations in the back. An incline raise was started at the proper slope by placing the Brunton on the "stoper" and leaning it to the proper angle to drill the lifters. Once the raise was fairly well started, the machine man could hardly go wrong on the slope angle. In sinking incline shafts, points were set on line in the back and points on the slope in the sides. It is far more difficult to keep an incline shaft on the same vertical angle than it is an incline raise.

#### OFFICE WORK.

**Notes:** All field notes were copied from the field books into an office book. The latter was a loose-leaf book, the leaves being 12 by 18-in. and printed in a special form as shown in the accompanying illustration. Calculations were then made for bearing, horizontal and vertical distances, co-ordinates, etc., and the results entered in the book. The spaces in the column marked HI were divided in two horizontally and in the upper half the height of instrument was written, and in the lower half the height of point. The spaces in the column marked Vertical Distance were also divided in the same way, and in the upper half was written the difference in elevation between the

STATION	Ht.	Horizontal Angle	Bearing	Inclined Distance	Vertical Angle	Horizontal Distance	Height Feet	Vertical Distance	LATITUDE		DEPARTURE		Total Latitude	Total Departure	REMARKS
									North	South	East	West			

two stations indicated and in the lower half the total elevation of the station. For the latter it would be more convenient to have a separate column marked "Vertical Co-ordinates."

The space marked "Remarks" was used for side notes and sketches. The office note book, then, contained all the information necessary to plot stations and workings on plans and vertical sections. Other advantages of this form are that new leaves can be added for each level or mine as needed, and all notes of any working kept together, and it is also possible to keep a separate set of notes in a fire-proof vault.

Calculating: Office calculating was done with Vega logarithmic tables, either by two persons separately for check or by the same man twice, preferably the former. Another check was obtained when the stations were plotted by rectangular co-ordinates and checked by bearing and distance. I might here call attention to the rule for calculating azimuths of courses set forth in Underhill's Mineral Land Surveying: To the angle from the backsight (always turned in the same direction), add 180 degrees, if less than 180 degrees; subtract 180 degrees if over 180 degrees; add sum to azimuth of last course, and subtract 360 degrees if necessary. The result is the azimuth of the new course.

Maps: Three forms of maps were used pfor the Mason Valley mine, the largest property of the company, in addition to the sections and mine model. The maps were the general mine plan, assay plans of each level separately and monthly stope plans. The mine plan was drawn to a scale of 1-in. equals 30-ft. This was first drawn on detail paper and kept up to date. Once a month the tracing was brought up to date and prints made for the general office. As the mine workings were very irregular, no intelligible system of numbering crosscuts and drifts or workings that might be either was possible, so some other system of describing the locations of workings had to be devised. To accomplish this the map was divided into 100-ft. squares running north and south, east and west, and commencing at the origin of co-ordinates. The bounda-

ries were assumed to extend vertically, dividing the workings into blocks, these blocks being designated by numbers. Any portion of the mine workings could be spoken of by level and block number and be located at once. Stopes were also called by the numbers of the blocks in which they started, and while a stope almost always ran out of the block in which it started, the original number was retained. The block lines on the map also assisted in plotting.

A plan of each stope was made once a month to a scale of 1 in. to 10-ft. On these plans were shown the stope outlines with level workings below, manways, chutes, elevations, block lines, survey stations, etc.; also estimated tonnages of broken and unbroken ore.

Assay plans were made of the various levels on the same scale as the general mine plan and were brought up to date monthly.

In addition to the above plans a longitudinal projection of all the mine workings to the scale of 30-ft. to 1-in. was made once every two months. This was excellent for showing the stoped and unstoped areas and certain geological features.

Vertical cross sections of the mine workings 50-ft. apart in important areas, and 100-ft. apart in areas of lesser importance to the scale of 1 in. = 30 ft. were made on detail paper and kept up to date monthly. The sections showed the surface and geological features and the vertical block-boundaries as well as the mine workings. The sections also formed the basis of a mine model; they were traced on glass plate and the plates set up vertically in a frame at the proper distance apart. Underneath the sections a copy of the mine plan was placed. Besides showing the workings actually cut, some of the more important winzes and raises falling between the sections were projected upon the nearest section, the projection being shown in dotted lines. A glance at the underlying plan would show the exact location of such a winze or raise. The glass plates used were of such size as to show sections 700-ft. wide by 900-ft. in vertical extent. The marking on the glass was done with different shades

of Higgins inks and with water colors, the glass first being cleaned with alcohol. A crow-quill pen was used to apply the ink and a brush for the water colors. It might be well to mention here that for such a purpose, the best grade of window glass must be used in order that no flaws or waves obstruct the view through the many plates. The whole model was kept covered with a black-cloth hood to keep out dust and discourage flies, as the latter would actually eat the paint.

In projecting incline raises on vertical sections a handy formula to use is the following:  $\tan x = \frac{\tan a}{\cos b}$ , where  $x$  is the angle

made by the raise with the horizontal on the vertical plane of projection,  $a$  the true angle of inclination and  $b$  the angle between the plane of projection and the vertical plane of the raise.

Papers used in mapping were "Duplex" detail paper, "Imperial" tracing cloth and "Columbia" rapid blue print paper, all from Keuffel & Esser Co., New York.

**Use and Care of Instrument:** The following are a few notes on the use and care of the transit, and other points gleaned from experience. In using a transit first see that the instrument is screwed tightly to the tripod, and that the leveling screws are all turned to the same length; the latter precaution may save the time of a second set-up. In setting up under a station make sure the plug is tight, then bring the horizontal plate as nearly horizontal and the center of the instrument as nearly under the bob as possible by using only the extension legs of the tripod before touching the leveling screws. Then, when the leveling screws are used, the center-point of the instrument will be thrown only a short distance from under the plumb bob, this distance being corrected with the shifting head. See that the top tripod-leg screws are just tight enough. If they are loose there will be lost motion, causing errors; if too tight, the legs will bind when folded in. When returning the instrument to the office, if it is left on the tripod, cover the objective with the cap provided for that purpose, loosen all the clamps and cover the instrument with the gossamer hood furnished with transits. This same hood should be waterproof and should be placed over the transit when out in a storm. In dusty mine workings, the transit gets very dirty, particularly the leveling screws and their cups. The screws are most readily cleaned with a small brush, a stiff tooth brush is best. A small wooden wedge is convenient for removing candle grease and mud from the instrument with a minimum of scratching. It is sometimes necessary to tighten or loosen the telescope slide. To tighten the slide, run the telescope out, loosen the set screw in the telescope-slide screw and turn the telescope-slide screw a sufficient amount to the right to bring about the desired tightening of movement, then bring the set-screw down tight again. To loosen the slide, reverse the above opera-

tion. A convenient and safe way of carrying a transit up and down ladders is to fold the legs of the tripod and shorten them as far as possible, then pass a piece of rope or fuse through two tripod legs just under the instrument and over one shoulder and under the opposite arm, pulling the transit close to the body in front. Both hands are then free for climbing and the instrument is in no danger of being bumped. In making short vertical climbs the transit can be held by one thumb under the tripod head, leaving the fingers of that hand free to hook the ladder rungs.

**COLORADO SCHOOL OF MINES BRANCH INTERCOLLEGIATE INTELLIGENCE BUREAU.**

Report May 31, 1917.

Enrollment:	
Alumni .....	349
Ex-Mines men .....	97
Students .....	50
Faculty .....	7
Total .....	503

Many have inquired for fuller information as to what will be required of men who turn in their records to the bureau, when or whether they will be called into the U. S. service, and other questions too varied and numerous to mention.

All we know is that the School was requested by the government to obtain the information requested on the blanks sent out. The authorities are apparently too busy with matters of more immediate moment to inform us just what they expect to do with the information submitted, or what will be expected of men who send in the information.

We assume that the object was to obtain records of the technical men of the country, showing their capabilities, experience and willingness to serve. Much for the same reason the Alumni Association has collected the records of Mines men in the Capability Exchange.

As we get more definite or specific information we will keep you informed either through the Magazine or by letter.

**NEW U. S. BUREAU OF MINES RESCUE CAR.**

One of the new United States mine rescue cars was in Golden several days the latter part of May, taking on the equipment which had been stored here with Dr. J. C. Roberts since the old car was dismantled here last winter. The new car left Tuesday, May 22nd, on its first regular tour of the district for the purpose of training men in first aid and mine rescue work. It is in charge of Mining Engineer Herberts, with Mr. Chisholm as mine foreman. The car is a great improvement over the old No. 1 car, which was a familiar sight in Golden. It is constructed entirely of steel, and has many new appliances.



# Forty-third Annual Commencement of the Colorado School of Mines

Friday, May 25, 1917.

## PROGRAM.

- Coronation March—"Aida" .....Verdi  
Lohmann's Orchestra
- Invocation .....Rev. J. B. Youngblood  
Melody in F.....Rubenstein  
Lohmann's Orchestra
- Address—"Mining, the Great Adventure"  
.....Mr. T. A. Rickard
- Quartette—"Rigoletto" ..... Donizetti  
Lohmann's Orchestra
- Conferring of Degrees  
President Howard C. Parmelee
- Caressing Butterfly .....Barthelemy  
Lohmann's Orchestra
- Benediction .....Rev. W. D. Waller
- March—"Stars and Stripes".....Sousa  
Lohmann's Orchestra

## CLASS OF 1917.

The Degree of E. M. (Engineer of Mines),  
is conferred upon the following:

- †Thaddeus H. Andrews  
Albert Kay Chan  
George Morris Cheney  
Yung Kwang Chiang  
Roscoe H. Clarke  
Lincoln Ehnbohm
- \*Kenneth Sears Ferguson  
George Goldfain  
Mearle Garman Heitzman
- †Robert Higgins  
Max Travis Hofus  
Kwei Lun Hsueh
- \*Chester M. Knepper  
†Alfred Conrow Levis  
Norman Eyre Maxwell
- \*Sydney A. Mewhirter  
†Alvah Lawrence Miller  
Harold Ellsworth Munn
- †William Joseph Murphy
- \*Reginald Phillips Oliveros  
Fred Charles Sealey
- \*Sidney Smith Small
- \*Robert A. Thurstin
- \*Lisle Reed Van Burgh
- †John Hezekiah Winchell, Jr.
- †Lee Kennedy Worth  
Poa-Chiang Yuan

\*In the military service of the United States.

†Candidates for commissions in Officers Reserve Corps.

The Honorary Degree of E. M. (Engineer of  
Mines), is conferred upon:

Hal W. Hardinge      Walter Goodwin Swart

The Harry J. Wolf gold medal for high  
scholastic attainment was awarded to Max  
Travis Hofus.

This was the first presentation of the  
Wolf Medal, a cut of which is given here.  
The medal is made in the form of a charm,



and is of solid gold about one inch in diameter. A raised edge on the face of the charm will protect the lettering and the school shield. The charm is very beautiful and certainly will be prized by any graduate fortunate enough to win it.

T. A. Rickard's address, "Mining, the Great Adventure," was one of the most interesting commencement addresses ever delivered at the Colorado School of Mines. He related most entertainingly tales of the romantic search for "The Golden Fleece" in all parts of the world, through both ancient and modern time.

Gold has been the lure that has led civilization to the farthest corners of the earth. Mr. Rickard's address will be printed as a number of the Quarterly in the near future, and will be distributed to the Alumni and any others who request it.

After the exercises the usual pleasant reception was held at the Integral Club in the Gymnasium.

In the evening the School gave a dance to take the place of the Junior Prom.

## COLLEGE MEN WILL BE NEEDED.

Must Help Develop Resources During and  
After the War.

At a recent conference of educators held in Washington, D. C., the foremost question under consideration was how the colleges and the universities of the country can best serve in the present crisis. It was made very clear that the United States should avoid an error committed by England and France in allowing young men from 16 to 20 years of age to stop school and engage in military or industrial pursuits, because in removing such young men from educational institutions we are handicapping our chances of development after the war, when trained men will be specially needed.

It is the concensus of opinion of college and university presidents throughout the United States that a special effort should be made to keep as many men in college

as possible, but particularly to encourage young high-school graduates to enter college this fall. Engineering schools are particularly interested, because engineering training is of paramount importance in industrial development. Mining engineering is an important profession, because both during and after the war the United States will need to develop its mineral resources to the highest extent in order to supply domestic and foreign needs. For this reason the Colorado School of Mines is making special effort to have the largest freshmen class in the history of the school, and high school principals and superintendents throughout the State are being urged to induce young men to lay plans for a college career.

#### MINES MEN NOT COAXED TO ARIZONA. Dean of Arizona U. Says Statements Made Here Were Absolutely False.

At the time of the recent trouble between the students and faculty of the School of Mines, there were persistent rumors to the effect that the University of Arizona had offered to accept the students from Golden, with or without credits from the local school. G. Montague Butler, dean of the college of mines and engineering of the Arizona institution, has written The Transcript, asking that these statements be denied.

Professor Butler is a graduate of the Golden school, and for ten years was a member of the faculty here. "No one could be more loyal to the Golden School than I am," writes Professor Butler, "and I should be the last man in the world to do anything which could hurt the Colorado School of Mines in any way."

Professor Butler apparently believes the trouble here was a "strike," while, as a matter of fact, it was not a strike. The boys merely left school when the suspended ones were not taken back, and nearly all of the students asked for and received their credits.

In explaining the attitude of his institution, Professor Butler further writes:

"Before learning that there was any trouble at Golden I received several telegrams from students there asking if they could enter this institution at the present time, take the final examinations at the end of this semester, and receive credit for the courses in which they passed satisfactory examinations. One student stated specifically that he could bring an honorable dismissal from Golden. After consultation with the faculty, I telegraphed them to the effect that we had no regulations which would prevent them from attending classes during the remainder of the semester as visitors, and taking the final examinations, provided they could bring honorable dismissals from Golden. I expressed the opinion, however, that such action would be unwise in view of the difficulty of passing a satisfactory examination in courses of which the major portion had been taken in another institution. I also telegraphed President

Parmelee, of the Colorado School of Mines informing him of the messages that had reached me, and of the nature of my replies to them.

"Subsequently, I learned of the strike at Golden, and received telegrams from other students asking if they would be accepted as students of this institution. Those making this inquiry included one or two of the men suspended and several seniors. I replied that the seniors could not possibly graduate this year in view of the fact that we have a regulation requiring attendance in this institution for at least one year before a degree can be conferred. In every case I stated that we could do nothing for any one unless he brought an honorable dismissal from Golden, and advised against coming here this late in the semester, even though such an honorable dismissal could be obtained.

"I believe that from what has been said it should be plain to everyone that not only is it wholly untrue that we invited the strikers to come here, but that it is also untrue that we gave any encouragement to those who inquired if such action would be permitted."—The Colorado Transcript, May 3, 1917.

#### STATE SCHOLARSHIPS OFFERED.

School of Mines to Give Free Tuition to  
One Student from Each State.

As part of a campaign to secure a larger increase in attendance at the Colorado School of Mines next fall, the board of trustees has authorized the president to offer a free scholarship to each State of the Union. These are offered in addition to the scholarships already offered in foreign countries. The latter were offered with a view to cementing more friendly relations with Central and South America, but the present scholarships are offered in an effort to induce a greater attendance at the school from the United States, so that we may have a larger number of mining engineers available for development work after the war is over.

The scholarships are being offered through the State Superintendents of Public Instruction, who may designate the recipient in any way consistent with securing a good scholar who really intends to study mining engineering. The recipient will be exempt from the annual tuition fee of \$150 per annum, and certain other course fees amounting to \$40 per annum, or a total of \$200 per annum. While this is a marked departure from the usual custom, it indicates the spirit with which the educational institutions are endeavoring to do their part in the present crisis.

#### Valuation.

"You say that dog has a pedigree?"

"Yes."

"How much is he worth?"

"Well, the dog is worth about twenty cents, but the pedigree is valued at over one hundred dollars.

## General Notes on Central America

C. Erb Wuensch, '14.

Mineral San Sabastian, Salvador, C. A.,  
April 27, 1917.

It has occurred to me that at this time when Latin America is the cynosure of many interested in mining and other business ventures in foreign fields, that some general notes on Central America as well as personal experiences and impressions might be of interest. A great many people, especially the younger members of the mining profession, who are seeking their fortunes, are prone to believe that a remote place, the further away the more attractive it is, offers more possibilities for the acquirement of sudden riches than does a place closer at home. This is in part true, for certainly one who is especially trained has a better chance of finding a mine, to observe an agricultural or business opportunity in these countries where the bulk of the population is illiterate and indolent, than he has in a country where the greater portion of the people are educated and competition keen. But from other points of view, which those initiated into these countries can appreciate, the "El Dorado", in whatever field of endeavor it may lie, will lose a great portion of its attractiveness as soon as active operation is contemplated. There are so many pitfalls to overcome, and so many sacrifices to make that often one loses heart. But to him, who has the courage and is willing to strive hard, there are many opportunities awaiting development.

Information concerning these countries on subjects which would be sought after, by those for whom these notes are intended, is not plentiful. The Pan American Union at Washington, D. C., issues a catalogue which contains a very complete bibliography of the books and magazine articles on Latin American Republics.

Other sources of information are: United States Consular reports and bulletins, monthly statements of Bureau of Statistics, treaties and publications issued by the governments of the individual republics. The latter will be in Spanish. A word of warning might not go amiss. The Latin American writers are very diplomatic and are apt to be inaccurate and flattering in discussing features which, if the truth were told, would be derogatory.

The topography of Central America is of the same general type as that of all Spanish America. The mountains rise up close to the western coast, leaving but a scant margin of level land between them and the shore. The whole eastern slope is a broad, low and marshy plain. The unhealthy conditions due to this form of topography accounts for the scarcity of population along this coast. (Excepting in Nica-

ragua and Costa Rica, correctly speaking, we should say North and South coasts.) This portion has, since the days the English Buccaneers first visited it, been known as the Mosquito Shore. The bulk of the population lives on the west slope and on the high central plateaus. Such cities as Guatemala City, Tegucigalpa, Honduras, and San José de Costa Rica, which are situated on this high central plateau, have a cool and healthful climate. The narrow strip along the west shore, as well as the east coast, is hot and humid.

There are but two seasons in the year, summer and winter, or better stated, the dry and rainy seasons. The eastern slope has considerable more rain than the rest of the country. In general, it might be said that the dry season commences early in November and continues until May, then there are occasional showers for a month, and from June until October it rains almost every day. It is a strange phenomenon that it usually rains toward evening or during the night, unless a tempest is in progress, when it may rain continually for days. The rains are important factors to be considered because of their bearing upon overland communication and the crops.

Perhaps the population from the viewpoint of those interested in Central America, in the capacity of an investor, is of paramount importance. When the Conquistadors, the Spanish conquerors of Latin America, Pedro Alvarado and the other lieutenants of Cortes, entered Central America from Mexico in 1522, they brought with them a number of peons or native laborers, and others of a low social order. These, together with the native Indians and the negroes who came over from the West Indies, were the ancestors of almost the entire population of the present day. There have been occasional influxes of foreigners, but never enough to materially affect the balance of the race. Such whites as are in the country today constitute the very small class of merchants, planters and professional men. The intermarriage and constant association of Spaniards, negroes and Indians has resulted in forming the conglomeration of mongrels, which we find today. From the whites and negroes came the "mulattoes"; from the whites and Indians the "Ladinos," which constitute the bulk of the present-day population; from the negroes and Indians came the "Sambos," who form the greater part of the population of the Mosquito coast. Besides these, there is an intermingling of mongolians and natives of the present day. It is surprising of the number of whites, especially Germans, who have intermarried with the natives of the higher class. In addition attention might be called to the influx of

white blood into these races during such periods as the construction of the Vanderbilt Transit Company's Railway in Nicaragua in 1855; the Panama Canal, and the various other periods of construction, in which unusual numbers of whites were engaged. The white foreigners referred to in the latter instance usually do not intermarry, but merely live with the natives. Americans would blush with shame if they knew what low standards of morals, the majority of their fellowmen who live in these countries, adopt. So in the future, if foreign immigration to these countries should increase, we might expect a modified race.

According to A. H. Keane, the proportion of foreigners to natives is as follows: Salvador, 1-40; Guatamala, 1-130; Nicaragua, 1-250. The total population of Central America, exclusive of Panama, was in 1900—3,488,383. Of this number approximately only 50,000 were white, the remainder being Ladinos, Mulattoes and Indians. (Monthly Bulletins Bureau of Statistics, United States Treasury Department, Series 1901-1902.)

Lest what has been said concerning the bulk of the population should leave a false impression, it is no more than an act of justice to pay tribute where tribute is due. Though the bulk of the population live in the state of abject poverty, and for the most part know nothing of the simplest comforts and advantages of civilization, the members of the higher social class are very well accustomed to all the modern comforts; they possess broad educations and are exceedingly polite and hospitable. In the latter respects they put the average American to shame. The people of this class segregate in the larger cities of the republics. They have beautiful homes, public buildings, parks and substantial institutions. Even the environs of these cities, be they farms, plantations, sugar-mills, or small communities, show the result of their immediate influence. These people have created a demand for the niceties of civilization, be it in rural or civic life, and they get it. As we get away from their realm, we cannot help but be impressed with the contrast. The towns are little better than thatched or tiled roof adobe villages, the farms are unkept, all signs of civilization are lacking. We step back to primeval days when man lived by hunting and provided for all his simple wants himself. The small settlements and ranches encountered in the interior are nothing but thatched reed or adobe huts with a lot of pigs and naked children running around as though they were kin.

The products of the country are varied. They are coffee, sugar, bananas, dye-woods, hardwoods, balsam, indigo, henequen (plant from whose fibre, rope and gunnysacks are manufactured), hides, rubber and the precious metals, gold and silver. There are some zinc deposits in Eastern Guatemala and Northern Honduras; some antimony in

Western Honduras and some manganese in Costa Rica.

Of the 700 odd miles of railroad in Central America, a woefully inadequate mileage for a country so productive, United States capital practically operates all of them even though the governments are nominally the owners. (Bull. Int. Bureau Am. Republics.) Likewise with the external transportation all of the regular steamship lines are operated by American capital. On the Pacific side the Pacific Mail is the principal line, whereas the United Fruit Line is the leading line on the East Coast. Some of the other more important lines are the Ward Line, Grace Line, Pacific Steam Navigation Line, and before the war the Cosmos and Hamburg American Lines. Besides these there are a great many stray steamers, which call very irregularly. Since the European War is being waged Central America has suffered from uncertain steamship service just as have other countries. Any attempt to quote freight rates would be folly. The rates at present are abnormally high, and in normal times it would be equally impossible, because the rate varies so irregularly for various classes of goods. Two systems of rating are in vogue—one according to weight, and the other according to volume. The steamship company has the option as to under which rating the goods shall be sent. Railroad rates are not as exorbitant as we might expect.

Perhaps the most expedient method of showing the status of business conditions in Central America will be to briefly outline how intimately connected it is to the general features above presented and to some others, in addition. If we but review the history of Central America's foreign trade, with the purpose of determining why it has been only of recent years that the United States has played the important part in Central American trade, that she should have, because of her superior geographical position (it is only since the late "80s" that the United States has awakened to her opportunities in Central America), we will find that four important factors are intimately involved with any advancement or retrogression on her part. These factors are: First, conditions in the United States; 2nd, European influence in Central America; 3rd, conditions in Europe; and fourth, political, social and commercial conditions in Central America. Notice that the first three factors might well be grouped under the heading of "External Conditions," and the fourth "Internal Conditions."

To facilitate time I will discuss the four factors previously enumerated under the two above-mentioned headings. It is very noticeable that invariably any advancement made by the United States in Central American foreign trade was due more to a lack of interest shown by the part of Europe than to any efforts of her own. That Europeans, especially Germans, English and French, should have been so influential in Central America is worthy of our notice and careful study. Europeans, through

their trade relations with their colonies in Africa and India, have learned how to deal with people in tropical and semi-tropical countries. They know how to cater to their desires for gaudy colors and cheap wares; they know the terms of credit that are necessary in dealing with these people; and, above all, they know how to pack goods for shipment to hot, damp countries with their primitive methods of transportation. Americans on the other hand have been stubbornly ignorant of the importance of these considerations.

The United States Government has appreciated the gravity of the faults of her merchants and manufacturers, and has from time to time sent commissions to Central America to make investigations. That these commissions have been successful in awakening the Americans to their shortcomings is evidenced by the fact that today practically the only import in which the United States does not excel is manufactured cotton goods. Do not infer from this, however, that the American is supreme. He still has much to learn from the European. These commissions have suggested various sorts of reciprocal trade treaties. Invariably these have resulted in failure because the wants of the great bulk of the population are so simple in lieu of their property. They have also pointed out the necessity of establishing branches of American banks; the importance of a more elaborate consular system; government subsidation of merchant marine in order to improve and cheapen external exportation; the necessity of better and lighter packing because of the faulty existing system of levying import duties (in these countries, with the exception of British Honduras, where the ad valorem system is used, the specific duties are levied upon the gross weight of goods, including weight of packing. In addition, several fees and surtaxes are added as light-erage, dockage, transit, agents' fee and municipal imposts), and to withstand the abuse in transportation; and the imperativeness of manufacturers giving more liberal credits to their Latin-American customers. (Those wishing more complete information should consult United States government publications mentioned under "Sources of Information.")

American manufacturers and merchants have been so absorbed at home in the development of their own resources that they gave little serious thought toward the development of Latin America. Europeans, on the other hand, have always been compelled to look for new fields. Now that the United States is in possession of the Panama Canal considerable attention is drawn toward realizing all of its commercial possibilities. Americans are now seriously bent on taking an active part in the development of Central America, which is their right as well as duty in lieu of their superior geographical position, and of the already tremendous impetus they have given the commerce of these countries by constructing the Panama Canal. The American being "green" in deal-

ing with these countries, can do well to study the tactics of the more experienced European. Americans insist upon using the mails to carry on their business. They fail to appreciate how uncertain and erratic the mail service is with these countries, especially should their communications be with interior cities. (Cities along the trans-country railroads in Guatamala, Costa Rica and Panama receive mail in from four to six days from New Orleans. From New York two days longer to Panama. In cities removed from the railroad it takes from ten days to twenty days on the average, but frequently longer. Often it takes a month or more, especially during the rainy season when the rivers are unfordable). The American manufacturers make a practice of sending a "drummer" to make a general campaign of their customers every year. Unfortunately for the "drummer" these people cannot be "drummed." American firms do not seem to realize the necessity of long credits. He is narrow, he insists on using home methods where they are not in favor. His motto of "quick returns and small profits" will not work. (It is gratifying to an American to see a Singer Sewing Machine in almost every native hut, be it ever so humble. This is a striking example of what results one American Company has achieved through the use of the "installment plan.") In addition, American firms will ignore shipping instructions, which to them might seem foolish, whereas such refusing to obey directions will often cause his customer much delay and expense. The result will be hatred for American firms. Europeans, on the other hand, establish branch offices or have especially trained agents in Central America who are invested with the power to carry on the business for their firms as they see fit. They live amongst the people; join their clubs; know their whims, desires and needs; learn their language and customs; and often-times intermarry. The result is they gain their customer's confidence; and, being on the spot, they are thoroughly conversant with conditions. Should a customer need money to carry on his business they will advance him the necessary money by taking a mortgage on his property or unharvested crops. At the close of the loan, the harvest invariably reverts to the agent, and thence finds its way to Europe. The interest earned on money thus advanced frequently is as high as twenty-five per cent. They also extend liberal time to their customers in which to pay for their goods. (Usually four, six and even nine months' time at 6 per cent., whereas American firms prefer to draw against bill of lading at sight or within thirty days, so that often payment is demanded before the goods are received.) You may also rest assured that they never invoke the wrath of their customers by improperly packing or sending goods. It is thus easy to be seen that the European, especially the German, is our most serious rival, for he is at the source of the real profits. He is the middleman in Central America.

Undoubtedly the internal conditions of Central America have been the most potent in retarding her development. The unfavorable political, social, commercial and natural features have prevented the American from hitherto having taken the interest they should have. The United States had too many undeveloped resources and possibilities without the attendant risks prevalent in Central America. In an article of this character it is impossible to even briefly sketch these circumstances. The political unrest, the changing policy of one administration to another; the ease with which a revolution is propagated, and the character of their governments have been serious defects. Though these countries are called Republics, they do not have any bond of sympathy with ours. They had better be called oligarchies. But what else could we expect in a country where the bulk of the population is illiterate? Human nature the world over is struggling for superiority. All life is but a fight for the survival of the fittest. Fortunately, however, those in power are realizing that the secret of the greatness of nations lies in the character and quality of their people—not of a few, but of the bulk. It is gratifying to see that these governments are awakening to their shortcomings, and that a great many of their recent laws show the result of American influence. In 1907 there was established a Central American Court of Justice in Cartago, Costa Rica, to which Guatemala, Salvador, Honduras, Nicaragua and Costa Rica pledged themselves. Let us hope it doesn't suffer the same fate as the Hague. Excellent sanitary laws, compulsory educational, child labor, and other civic laws have been recently enacted. American intervention has done much to suppress political unrest in Nicaragua. The governments are making more favorable mining laws to induce foreign capital to assist in the development of their resources. In short, political reformation is at hand. From what has previously been said about the bulk of the people it is evident that it will take considerable time to disseminate knowledge and overcome old stagnating traditions, and customs.

Mention has been often made to the lack of good harbors in Central America. In most of the parts, steamships must anchor out in the open roadstead and transfer their cargoes into lighters. The seaport towns are little better than villages. Likewise the inadequate mileage of railroads, and lack of good roads has seriously hampered commerce. Reference has previously been made to the import duties. The export and import duties are the largest source of revenue that the governments have. It is consequently no wonder that they are abnormally high. (The governments also derive income from the various concessions they have granted foreign companies, such as mining, fruit and lumber companies.) The monetary system is also a defect in the commercial field. In some of the republics the currency is ever fluctuating in value.

(Exchange rate compared to gold is as follows: Panama, 2-1; Costa Rica, 2.15-1 (varies slightly); Nicaragua, 1-1; Honduras, 2.50-1 (varies); Salvador, 2.60-1 (varies); Guatemala, 40.00-1 (very variable); British Honduras, 1-1). The shortage of silver coins badly cripples business transactions. Everybody holds fast to the silver. In order to exchange paper money for silver, as much as 25 per cent is often charged. (Companies employing a large number of men are compelled to issue private currency of small denominations to enable them to pay their labor.) The large amount of American capital invested in these countries has introduced large amounts of United States currency. Even though not officially the currency of the country, the merchants have tacitly accepted it. It is amusing to see with what eagerness the merchants accept United States currency. Business in Central America would be quite demoralized were it not for the presence of United States currency in ever increasing amounts. There are splendid opportunities for American banks in Central America. (I have heard of men borrowing money at 6 per cent in the United States and loaning it at not less than 12 per cent in certain Central American cities.)

One more defect might be mentioned. Central American governments do not realize the importance and value of accurate statistics. These would be as invaluable to themselves as they would be to a foreign investor. Latin Americans might do well to study Roger W. Babson's "Business Barometers for Forecasting Conditions."

Thus far I have dealt only with generalities, in hope that they might enable those who are not familiar with Central America to form a general conception of conditions. Let me now emphasize the factors which will be involved in the exploitation of the mineral resources.

We hear a great deal about the mineral resources of Latin America, but it is never very definite or satisfying. If you were to ask any engineer who has examined mines or prospects in Central America for his opinion of its mining future he would reply in somewhat the following manner: "The great majority of prospects have so little work done on them and the outcrop and surface was so inaccessible, that I was invariably unable to form an opinion. Of those upon which I was able to form some sort of an opinion they were either too small or too low grade to warrant exploitation under existing conditions. There are numerous properties, that if more thoroughly developed, would undoubtedly prove to be mines. It is no place for a poor man, abundant capital is needed."

Any properties that have assumed the proportions of small mines have usually very attractive histories, especially if they are owned by people of some means, and to most of these people any hole in the ground is a mine. This is especially so should they get some high assays. The one high assay out of one hundred valueless ones is the

only one that is given any weight. It's always the highest assay that you hear about. As a result they will ask a ridiculously large price for what might be a fair prospect. Or when you arrive at the mine, usually after a long and tiresome journey, you will find that the richest portion was caved to keep out "high-graders," or else it is inaccessible because of water. Fortunately this is not always the case. There are a great many prospects in the hands of people who are anxious to have capital develop them. Reasonable terms can be made, especially if you have engaged a representative who is skillful in winning the owners' confidence. Wonders can be accomplished by means of the personal equation.

As has elsewhere been alluded, the governments realize the imperativeness of favorable mining regulations, so as to induce foreign capital. Honduras recently passed a new code of mining laws which is certain to stimulate mining. Salvador reformed hers in the Congress of April, 1917. She has separated the mineral from the surface rights. It is necessary to purchase a concession from the government. Applying for a concession is analogous to obtaining a corporation charter, except that the president grants it and that there is no standard. The number, character and cost of the stipulated privileges varies with the skill of the representative negotiating with the "powers that be." The concession may grant a monopoly, but usually it only grants such privileges as to import machinery and supplies exempt of duty; recognition, protection, water rights, and others that you may desire. Of course, the cost of a concession is often enormous.

Many a property has been rejected because of the frame of mind of the engineer. It is easy to see that this is a real factor. Imagine yourself traveling mule-back for days over dusty roads in the hot tropical sun with here and there almost impassable mudholes, which do not dry up from one rainy season to the next; you pass through native villages of the type that have already been described; you halt for lunch or to sleep at a native hut, so that you can procure food for your mules. And would you believe it, that frequently you cannot buy food for your animals because they are afraid that they will run short? Imagine this in as prolific a country as this. The natives are, however, very hospitable and will invariably turn their hut over to you. It is necessary to bring canned food with you, unless you have degenerated sufficiently so that you can subsist on "tortillas, frijoles and platanos (corncakes, beans and bananas), and be happy. Your hammock is slung under the porch, and during the night the dear little fleas and hogs insist on keeping you company. Finally you arrive at a mine which is, more frequently than not, insufficiently developed or the surface indications so obscured by vegetation, that you cannot collect sufficient data to enable you to gain a true conception of its value. Here you are miles from the source

of supplies, rain six months in the year, poor or no roads, poor labor and in a foreign country. Can you blame an engineer for saying: "The thunder with it, life is too short?"

But be these conditions as they may, companies have found valuable deposits. They have introduced foreign labor to act as leaders, imported machinery, and in a few years established attractive camps, and have realized handsome profits. Others have failed. The keynote of success has invariably been, first, skillful and careful preliminary investigation, with enough development to have sufficient data upon which to plan future operations; and, second, sufficient capital to properly work, develop and overcome difficulties in the future.

If Central America's mineral resources are to be developed, efficient scientific exploration must be used. There is an attractive field for companies who will more thoroughly develop some of the favorable prospects. They must bear in mind the above two factors necessary for success. I will outline what seems to me the most efficient method of procedure. Several parties of two men each—a geologist and an assistant—should be assigned to definite regions upon which previous information has been obtained. They should be equipped with a portable assay outfit, sufficient instruments for making rough reconnaissance surveys, and enough good food and supplies to make them comfortable. If careful work is expected you must not overlook the importance of the latter. They should have with them two natives, who are familiar with the country to act as guides as well as to take care of the mules and packs. The portable assay outfit is preferable to being troubled with packing samples great distances. Besides, it is invaluable to know, while at the property, the assay values of the various classes of ore, if only approximately. Its advantages are evident. These preliminary examinations will classify the properties examined. Those that warrant a further examination should be carefully investigated. This investigation should cover all the essentials as terms of purchase or option, concession from government, preliminary tests on ore to determine the probable metallurgical treatment, water supply, accessibility and transportation facilities, and any other information which will be necessary before commencing development.

If the property still looks favorable after this investigation it is ready for development. Companies should appreciate the value of the time element. Good men realize that life is too short to wait for the slow progress of hand drilling by unskilled labor. The necessary geological information should be obtained as rapidly as is practical. Diamond drills and prospecting drills especially designed for portability should be used for the purposes. A little more money spent now in obtaining more elaborate information as to the geological structure, size of the deposit, possibility of further development, character of ore in

depth and probability of water will be invaluable for efficiently planning future operations and construction. Should the property not confirm the expectations, but still should a smaller profit be possible of realization, the future operations and construction can be designed accordingly. And lastly, should the property prove worthless, that information will have been obtained in the cheapest, most rapid and efficient method possible.

This sort of procedure eliminates losses incurred by constructing mills unsuited to the deposit in regard to method of treatment and capacity. To be sure, drilling methods have serious drawbacks in developing pocket-deposits, and will have to be supplemented by mining methods.

When "the" mine has been found, and you are to commence operations, you will be confronted by many problems peculiar to the country. The question of power will be one of these. Wood invariably is abundant for fuel, but its cost will be ever-increasing the longer you operate, because of the greater distance it will have to be hauled. If by chance the mine is comparatively close to the coast or to a railroad, it may be possible to change over to oil once the cost of wood becomes excessive. Except in a few localities, notably in Nicaragua, will water power be available throughout the entire year. Water power during nine months of the year, ample for small plants, is very frequently feasible. During the remaining three months of the year steam can be used, or, if it is a small mine, it may be advisable to shut down the mill and confine all attention to development in the mine. The mill labor can be used to make camp improvements or road repairs.

Because of the erratic steamship service and other attendant difficulties in securing supplies, particularly in the case of breakdowns, I wish to emphasize the importance of including in the surface equipment, well equipped shops. These should include a small foundry, as well as the usual machine shop equipment. It is surprising how man can improvise in the case of an emergency. When one considers how long it would take to replace a broken part, the importance of this equipment is evident.

I wish to emphasize, as forcefully as possible, the importance of the influence of the rates on transportation. All efforts should be concentrated on the construction of roads so that all heavy parts of machinery can be hauled to the mine before the rainy season commences. Once the rains begin it will be impossible to get the heavy parts to the site. I know of one case where failure to heed this condition meant a delay of one year.

A word of warning might also be sounded as to the importance of selecting an able staff of white men. They should be interviewed if possible, before they sail. In any event, have them realize what to expect and what qualifications you require before they go. This will prevent sending unquali-

fied men to the mine, or having men arrive at the property and find conditions not agreeable. The result will be they will either "hang on" to fulfill their contract, or else you may find it advisable to send them out. In order to retain the efficiency of your men it is necessary to give them plenty of wholesome food, healthful and comfortable accommodations. If the men become dissatisfied or sick through this cause the company is the loser. At best the monotony of the isolation is degenerating. Unless you furnish healthful recreation, less beneficial pastimes are likely to be adopted.

A great many people have an erroneous conception of the fertility of Central America. It is true that there is an exuberance of vegetation, but not of vegetables. Because of the abundance of a lizard-like animal called the "garroba" and various insects, it is difficult to raise vegetables. The extreme aridity of the dry season and the lack of irrigation are also serious obstacles. These, however, can be overcome by building a ditch around the farm in order to prevent pests from crossing and by proper irrigation and cultivation. When you consider that canned goods such as tomatoes, for example, cost from sixty to eighty cents a can (gold), (because of the duties), the practicability of the garden becomes apparent.

From what has elsewhere been told about the type of the natives, you can realize that they will need considerable training before they will be serviceable. They have no propensities towards mining or machinery, but are given more to agricultural and pastoral occupations. It is pitiful as well as amusing to see a lot of natives introduced to the profession of a hand driller. They would hit their hand more frequently than the drill. A wheelbarrow, car, pick and shovel are strangers to them, unless the mine happens to be situated in a mining region or near a city. But by practicing the old virtue—patience—they can be developed into servicable workmen, but of low efficiency. (The average wage per day (gold) for various classes of labor averages about as follows: Unskilled, 30c to 75c; miners, machinemen, timbermen, 50c to \$1.50; mechanics, carpenters, etc., \$1.00 to \$2.50. The variation is dependent upon the rate of exchange. Where the exchange is 1-1, higher rates prevail.) The Salvadorens have the reputation of being the most efficient.

Generations of primitive influence, indolence, and lack of educational and industrial opportunities have made the average native of the peon class a character devoid of ambition. "He toils not, neither does he spin." All he cares about is to have enough to subsist on. The morrow will take care of itself. He doesn't believe in worrying about it. They have been given up as almost hopeless tasks. To judge them as thusly, as is often done, is rank injustice. The fact that those of the better class, and some of those of the poorer class around the larger cities and mines have displayed



admirable traits proves the rule that they all have ambition and ability. Dead though it may seem, yet it is but dormant. We all inherit certain traits and characteristics, but we are more largely the products of our environment. We assume the condition which is most natural. As we become more intelligent and wealthy our standard of living rises; what once was a luxury becomes a necessity. So with these people; through generations of indolence, poverty and oppression, they have degenerated to their present condition. If we had been subjected to like circumstances we would today be no different. But I maintain that as hopeless as they may seem, as ungrateful as they may be, that they nevertheless are susceptible to reformation. By bettering their living conditions and surroundings; making education compulsory; creating pride and rivalry; abolishing drunkenness—their worst curse—we will raise their standard of living. What though it does cost a company in possession of a valuable mineral deposit a larger initial expenditure to bring about those reforms? They will, by the time the mine is "worked out," have been repaid this extra capital invested, not only in dollars, but in having the satisfaction of knowing that they have left conditions better than they found them. This will invoke the scorn of the greedy and the mockery of those who have operated under the existing conditions, and who can cite innumerable instances of the folly of any method but the rule of "instilling the fear of the gringo" (foreigners), into their souls. I have seen and heard so much of child labor in mines, poverty, suffering, ignorance and hatred for the gringo because of his bullying, that I make this appeal that managements who may operate in these countries in the future might adopt the principles of social service which so many large and successful corporations in the United States have deemed so wise. Disheartening experiences must be expected. But by assuming the attitude of a parent towards her children, wonderful results can be achieved. Mentally they have but the minds of children. Many naturally are mean and incorrigible, but these must be weeded out. Adults will be especially obstinate, but the members of the growing generation will be most favorable material. Their present condition is not the result of a day's influence; therefore, results must be likewise gradual. Moving pictures, teaching elements of citizenship, sanitation and thrift in schools, and firmness will be potent factors in bringing about this reformation.

In conclusion, I wish to commend the policy which certain American schools have adopted of offering scholarships to Latin American students. This will attract some of the brilliant minds of Latin America to our institutions. When they again return to their native lands they will be partial to us. During their college days they will have learned our customs and appreciate our sincere interest in Latin America.

These individuals, better than any other type, can bring about most efficiently a reformation, both of internal and external conditions, and create a more thorough mutual understanding between Latin Americans and Americans.

#### CERTAIN METALS NEEDED.

School of Mines to Assist Prospectors in Determining Those Now Wanted By Government.

The war is developing certain metal needs in the United States which offer an opportunity for prospectors and miners who may know of new mineral deposits. Chief among the needed metals are molybdenum, uranium, vanadium, manganese, platinum and nickel. Among the non-metallic minerals there is a great demand for clear, colorless fluorspar.

The identification service of the Colorado School of Mines is at the disposal of prospectors who may discover minerals unknown to them. Samples sent to the school at Golden will be identified free of charge. If valuable minerals are thus discovered they will be reported to the prospector and the proper federal authorities will be advised of his name and address. Citizens of Colorado are urged to make use of this service for their own advantage, as well as assistance to the federal government.

#### MISCELLANEOUS.

Dr. W. G. Haldane recently made an investigation of a sulphur proposition near Thermopolis, Wyo.

Dr. J. C. Roberts assisted in the government investigation of the recent mine disaster at Hastings.

The Gymnasium has been turned over for the use of the soldiers who are quartered at the Golden Armory.

Professor Victor Zeigler left the latter part of May for Douglas, Wyo., where he will be engaged in geological field work during the summer.

Fred G. Carter, director of athletics, left the latter part of May for Chicago. He will engage in medical work there with the intention of enlisting in the medical corps of the U. S. army for service in Europe.

Prof. G. A. Mullenburg, formerly of the School of Mines, was visiting friends in Golden the first week in June. He is now on the faculty of the Missouri School of Mines, and will spend the summer in Colorado in geological work with the State Geological Survey.

R. R. Knowles, who has resigned from the faculty, will travel through Northern Colorado and Southern Wyoming on a business trip for a machinery house in Denver during the early part of June. When he returns from this trip he will go to the Cripple Creek district where he will wreck a large plant and ship it to the southern part of the State.

# Colorado School of Mines Magazine

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## TRUSTEES' MEETING.

The Board of Trustees held a meeting Wednesday morning, June 6th, with a full board present. It was generally expected that action would be taken at that meeting that would settle the trouble at the School, at least temporarily. We delayed the make-up of this issue several days in the hope that we would have definite news to convey of the Board's decisions. While some understanding may have been reached by the Board, the only official action taken was to adjourn the meeting until June 16th.

## BASEBALL.

### Boulder Wins Championship.

By defeating the Aggies at baseball Saturday, May 13th, the University of Colorado won the championship of the conference, under rather unique circumstances. Only three games were played by the winners, two of the games being with the Aggies. At the time of the declaration of war, the Tigers, D. U. and Utah decided to forego athletic competition, and the Miners, Aggies and Boulder then formed a triangular league. The walk-out at the Mines left the Aggies and Boulder as the only contenders for the pennant.

## WHO GOT THE WRONG OVERCOAT AT THE ALUMNI BANQUET.

T. R. Hunt, '05, got some one else's overcoat at the Alumni Banquet May 26. Hunt's address is 2941 Denver Place, Denver, Colo. Please return his and get yours.

Mistakes are stepping-stones upon which some people step upward and some downward.

# ALUMNI

## ALUMNI LUNCHEON.

About thirty Alumni attended the luncheon at the Gymnasium on Commencement Day, May 26th. A number of the Seniors attended and got acquainted with the older graduates present. Among the graduates attending were a number who had come from considerable distances. P. J. Lonergan had recently returned to the States from Peking, China; T. R. Hunt from Argentina; and T. L. Chapman from Ecuador; Andrew Weiss came from Nebraska; Loyal W. Trumbull, State Geologist for Wyoming, was down from Cheyenne, and H. N. Stronck came from Chicago to attend Commencement and the Annual Meeting of the Association.

## ANNUAL BANQUET AND MEETING.

The Twenty-third Annual Banquet and Meeting of the Association of the Alumni of the Colorado School of Mines was held at the Denver Athletic Club, Denver, Saturday evening, May 26, 1917. Fifty-six graduates and two ex-Mines men sat down at the tables. This is what we had. Are you not sorry you did not attend?

Menu—Radishes, Mixed Olives, Nuts, Oxtail Soup, Fried Soft-Shell Crabs (Sauce Tartare), Saratoga Chips, Broiled Squab Chicken (D. A. C.), Fruit Salad, Frozen Egg-nog, Assorted Cakes, Demi Tasse, Cigars, Cigarettes.

Toasts — "Ethics," Wm. B. Milliken; "Short Circuits," Wm. J. Hazard; "Gum Shoeing," Arthur F. Hewitt; "Aviation," Albert G. Wolf. Harry J. Wolf, President.

Of course, Lohmann furnished the music while everybody sang.

The retiring president, Harry J. Wolf, was very entertaining in his introductions of the speakers. Several of the tables were much affected by his soulful rending or rendering of "Sixteen Men on a Dead Man's Chest, Yo, ho! and a Bottle of Rum," especially over the last few words of each verse. Milliken gave us some good advice, but never did tell us how he got away with that \$90,000. Happy preached quite a sermon on "Short Circuits," and incidentally quoted the original Ford joke which he found in the Old Testament. He nearly shocked some of us by one of his excellent definitions of a "short circuit." Art Hewitt told how it felt to be a detective in Golden, and A. G. Wolf told how it felt to fall a hundred feet or so and then spend some time in the hospital.

After the toasts the committee selected to canvass the ballots cast for the new officers, reported as follows: For President, James H. Steele, 120; Axel E. Anderson, 53; for Vice-President, Louis Cohen, 62; John G. May, 108; John Tait Milliken, 1.

For secretary, Henry P. Nagel, 97; Donald Dyrenforth, 76. For Treasurer, Arthur H. Buck, 121; Mearle W. Wilkinson, 54; Orville Harrington, 1. For Member Executive Committee, Edwin H. Platt, 109; Robert M. Keeney, 59; Harry J. Wolf, 1. Steele, May, Nagel, Buck and Platt were declared elected.

Then the meeting got down to business and argued about the trouble at the School until 2:30 Sunday morning. No one left until the meeting adjourned. This will indicate how interested we were. Everyone admitted that affairs at the old School were in bad shape, but there were widely differing opinions as to just who or what was to blame for the situation. Some blamed the students, others the president, the faculty, the trustees, members of the faculty, individual trustees, or the policy, or, rather, lack of, policy at the School. Many tried to argue on "discipline," though no one questioned the right and duty of the faculty or president to maintain discipline.

The following resolutions were finally adopted.

1. Resolved, That the Alumni Association commend the action of the Board of Trustees, the President and the Faculty in maintaining discipline at the Colorado School of Mines.

2. Resolved, That a committee of five be appointed to confer with the proper authorities for the purpose of taking the necessary action toward the reorganization and up-building of the Colorado School of Mines.

3. Resolved, That the Alumni Association recommend to its Executive Committee that \$1,000 of the Association funds be invested in Liberty Loan bonds of the United States in honor of the students and alumni of the Colorado School of Mines who have enlisted in the military service of the government. It was also moved that messages of sympathy and good wishes be sent, with flowers, to John M. Pendery, who is in the Minnequa Hospital at Pueblo, and to Herman W. Hugo, who is at the Oakes Home, Denver.

The following graduates attended the Annual Meeting and Banquet. Members of the class of 1917 were guests of the Association:

Class of 1893—Wm. B. Milliken; 1895—Edw. P. Arthur, Jr., Lewis B. Skinner, Geo. A. Kennedy; 1897—Wm. J. Hazard, Arthur H. Buck, A. H. Roller; 1898—Orville Harrington; 1899—Andrew Weiss; 1900—C. C. Malmstrom; 1901—W. E. Burlingame, J. W. Johnson, Geo. B. Clark, W. P. Simpson, John G. May, Geo. O. Marrs; 1902—R. B. Paul; 1903—H. J. Wolf, Walter A. Funk; 1904—Loyal W. Trumbull, Axel E. Anderson; 1905—T. R. Hunt, Frank J. Reinhard, Arthur F. Hewitt; 1906—Thos. L. Chapman; 1907—A. G. Wolf; 1908—Jesse T. Boyd, A. J. Weinig; 1909—T. D. Benjovsky; 1910—R. M. Keeney, H. M. Showman, J. B. Carman; 1912—D. L. Beck, H. M. Roberts; 1913—J. C. Williams, Geo. J. Artsten, H. N. Stronck, Chas. A. Swanson, Peter A. Young; 1914—Earle A.

Strong, E. F. Baker; 1915—A. C. Daman, Samuel J. Burris; 1917—A. C. Lewis, R. P. Oliveros, L. K. Worth, W. J. Murphy; Geo. Goldfain, R. H. Clarke, G. M. Cheney, Norman E. Maxwell, F. C. Sealey, M. G. Heitzman, Robert Higgins, H. E. Munn, L. R. Van Burgh.

#### EXECUTIVE COMMITTEE MEETING.

A meeting of the new Executive Committee was held in R. B. Paul's office the evening of June 4th. Members present were James H. Steele, president; Arthur H. Buck, Treasurer; R. B. Paul, Edwin H. Platt and the assistant secretary and treasurer, Orville Harrington. Absent, John G. May, vice-president; Henry P. Nagel, secretary, and Dan Harrington.

The committee authorized the assistant secretary and treasurer to apply for a \$1,000 Liberty Loan bond, and if allotted us, to sell the bonds we now have to raise sufficient money to pay for the Liberty Bond.

The following standing committees were selected:

Athletic Committee—D. L. Beck, J. T. Boyd, E. J. Dittus, chairman; P. A. Young and A. F. Hewitt.

Educational Committee—J. M. Kleff, Geo. M. Post, Edw. P. Arthur, Jr., chairman; H. H. Utley and R. M. Keeney.

#### PERSONALS.

'97.

J. Norman McLeod is engaged in buying tungsten ore for the Smith-Emery Company of San Francisco, Calif. His address is Box 365, Atolia, Calif.

'98.

Orvil R. Whitaker is the proud father of another son born Decoration Day, May 30th. Weight, ten pounds.

'00.

Amos Slater's office address is 445-6 Henry Bldg., Seattle, Wash.

'01.

Wm. P. Simpson has taken the place of Mr. Leonard in the firm of Leonard & Root. The name is now Root & Simpson, Assayers & Metallurgical Chemists, 1744 Broadway, Denver, Colo.

J. W. Johnson has returned to Denver, where he is Deputy State Engineer. His address is State Engineer's Office, State Capitol, Denver, Colo.

Andrew J. Sale, of Los Angeles, was recently in San Francisco and has gone to Battle Mountain, Nevada.

'02.

A. H. Collbran's permanent address is Box 182, care J. B. Farish, Esq., San Mateo, Calif. Collbran is director of the Seoul Mining Co. All mail at present should be addressed to him care J. Bribosia, Esq., Belgian Consul General, Seoul, Chosen, Korea.

'03.

W. A. Sloan has returned to his home at 212 North Louise St., Glendale, Calif., owing to the strike at Jerome, Ariz. When the

strike is settled it is probable that Sloan will return to Jerome, where he is Chief Chemist for the United Verde Extension Mining Co., Box 660, Jerome, Ariz.

Robert F. McElvenny is now manager of the Garfield Plant of the A. S. & R. Co. at Garfield, Utah.

Wm. B. Rhodes has gone down into Mexico for a short trip to look over a property there.

May 9, 1917.

I am always glad to get the Magazine, as it interests me to read of the doings of the old timers, and it is often, too, that I get information that is of value from the articles. Keep right on sending it.

In your last issue, under Personals, '04, you ask for Chas. Adams' address. You must have mislaid my last letter. In it I mentioned that Charlie (Spike) is employed in the Engineering Department of the L. A. and Salt Lake R. R. here in Los Angeles. I see him frequently.

It will be of interest to you to know that "Spike" E. W. Merwin, of Los Angeles City Harbor Department, has passed the ex. and will go to the Officers' Training Camp at San Francisco. I tried, but could not get by the M.D. May have better luck next time. However, am drilling with companies here.

"Sunny Jim" Frank Wells, Tempe, Ariz., is the proud father of a daughter, born about a month ago.

I'm glad to hear that the Dynamiters are to the fore in patriotic spirit and effort. Go to it and stay in front, as always.

Grider's article on changes in the Magazine was a good one and furnished food for thought, even though I do not agree with all he proposed.

As far as decreasing the border lines is concerned, well and good; it is cheaper, and hurts no one.

As to the scheme of beginning articles at the top of the page, it might be feasible for the main article or two, but am of the opinion that the typographer would suffer much mental anguish and difficulty in arranging the whole issue in that manner.

Unless it was intended to file Magazine articles only in a loose leaf, and that of single design, the holes punched in margin for filing would fit about one time in four, necessitating more holes and unsightliness. Let each individual punch his own.

It is true that the picked-up notes, or cut-out articles are the most valuable part of the engineer's library, but it must be borne in mind that there are just about as many systems and wants and compilations of "most useful data" as there are engineers. Since no one obtains articles exclusively from any one publication, then, in order to standardize, we must either make all publishers print in the same shape, or else make our own copies all alike, by typewriter, etc. or else use the envelope system of a set of loose-leaf covers, one for each sort of Magazine. Inasmuch as we often find articles on the same subject in

different places, and because of the bulk, the set of covers does not commend itself. Personally I prefer the copying system, except for the time required, or, better, copying the vital points or formulae, with note of the article, and the filing of the article itself in envelope, properly indexed. The method of indexing the copies may be optional with the individual.

Finally, with particular reference to the C. S. M. Magazine, I do not think you could do better in the arrangement than at present, considering the purpose of it. You are not publishing a technical monthly, even if there are valuable articles of that nature therein. The Magazine is essentially a clearing house for the members of Mines to give and receive news and ideas and have a monthly chat. One or two good technical numbers is fine, especially if contributed by members; the Alumni Personals keep you acquainted, and the miscellaneous bits furnish life and interest. We can get all the real solid stuff we can assimilate in the general Engineering Magazines. Let us have a little of the cake and sweets in our Alma Mater paper.

Sincerely, and with best wishes,

Wm. C. Wattles.

'04.

Charles Adams' address is care L. A. & Salt Lake R. R., Los Angeles, Calif.

'05.

E. M. Smith is in the contracting business. His address is now Mallott, Wash.

W. E. Ryan is Superintendent of the Victorator Cons. G. M. Co., at Independence, Colo.

Alfred S. Lewis' address is Box 954, Phoenix, Ariz.

Fred Ford Flint and Miss Ina Margret Harris were married at the home of the bride's parents, Mr. and Mrs. H. G. Harris, at Grover, Colorado, on Tuesday, May 22, 1917. The newly married couple are at home, R. F. D. No. 1, Greeley, Colorado.

'06.

George H. Heitz is now at 214 West 9th St., Leadville, Colo.

'07.

Thos. P. Ellis, 924 Eighth St., San Diego, Calif.

'08.

Byron M. Johnson has left Parker, Ariz., and is now with the Lake Valley Mines Co., Lake Valley, New Mexico.

Robert M. Wheeler's address is 1021 First National Bank Bldg., Denver, Colo.

'09.

W. E. Canning, who is with the Kenne-cott Mining Company, is at Kenne-cott, Alaska, instead of Latouche, as announced in the May issue.

C. B. Hull is returning to Denver, where his address will be 135 West Maple St.

E. B. Wood, Colorado Portland Cement Co., Portland, Colorado.

Robert I. Kirchman, Box 147, Silver City, New Mexico.

Donald O. Russell is now an officer in the British engineer corps in France. He has

served three years in the trenches in the very heart of the theater of war in Europe, constructing new works almost up to the firing line. The constant dampness of the trenches has given him rheumatism to such an extent that he has been "invalided out" on that account. He expects to go back as soon as he is well.

M. E. Bunger is now Superintendent and Engineer for the Model Irrigation & Land Company at Model, Colo.

'10.

J. W. Whitehurst is now General Manager of the Equity Creede Mining Company, at Creede, Colorado. Address care of the company.

G. M. Lee, Box 440, Grand Forks, B. C., Canada.

F. A. Goodale is still with the You Bet Mining Co., but his address is now Box 146, Colfax, Calif.

'11.

John V. Harvey left Minas de Matahambre, Cuba, in April for Sioux City, Iowa, where he was married on May 5th to Miss Marguerite Abbott of that city. After the wedding he and his bride returned to Minas de Matahambre, where Harvey has a good position under D. F. McCormick, '10.

Emory M. Marshall is now in training for the Officers' Reserve Corps. His address will be care N. B. Laughlin, Santa Fe, N. Mex.

Hamilton W. Baker, of the firm of Alderson, Baker & Baker, has an office in the Falk Building, Boise, Idaho.

Frederick Engle is now at his permanent address, 2308 Quitman St., Denver, Colo.

A romance which began in America will have its culmination in Japan when the marriage of Walter W. Barnett, at present mining engineer for the Seoul Mining Company, Tul Mu Chung, Chosen, Korea, and Miss Lottie Burnell of Seattle will take place, the day that the steamer that sails from Seattle on June 3 reaches Yokohama, at which port Mr. Barnett will meet his fiancé and his mother, Mrs. W. H. Barnett, who will accompany the young woman on the journey.

R. H. Shaw is now at 1302 South 11th St., East, Salt Lake City, Utah.

'12.

W. G. Ramlow and Miss Pearl Glaum, of St. Paul, Minn., were married at noon, April 18, 1917, at St. Paul, Minn. They are now at home to their many friends at the Cleveland Mine, Silver City, N. M., where Mr. Ramlow is engineer for the Empire Zinc Co.

Mr. E. S. Geary has changed his street address in Salt Lake City, Utah, to 1337 E. 8th Street, South.

A. W. Harris, who was with the Labarthe Company, is now in the Wells Fargo Bldg., San Francisco, Calif.

Charles D. Heaton, Cedar, Colo.

Donald Dyrenforth, 2568 Birch St., Denver, Colo.

Archer T. Spring, who recently returned to the States from Cuba, is staying at the Kappa Sigma House in Golden for the pres-

ent. Spring expects to apply for an examination in the Officers' Reserve Corps.

'13.

H. C. Price has recently returned to his position in charge of the Oxide Plant for the Bartlesville Zinc Company, after a two months' business trip through the East. He was in New York most of the time, but also visited Langeloth, Pa., Philadelphia, Trenton, and Washington, D. C.

D. B. Gregg is now at Belmont, Nevada.

Mearle W. Wilkinson is with the Western Chemical Co., Denver, Colo.

Irving A. Chapman is coxswain (able bodied seaman) on board U. S. S. P-41. His permanent address is 354 Delphi Street, Brooklyn, N. Y.

W. J. Eaton has accepted a position with the Compania Minera de Penoles, Ojuela, Mexico.

R. A. Leahy, Commercial Hotel, Bonne Terre, Mo.

'14.

G. G. Griswold, Jr., is with the Timber Butte M. Co., Butte, Mont.

John H. Turner is assistant chief engineer for the New Cornelia Copper Co. at Ajo, Arizona. Box address 131.

Carl L. Klatt has been offered a commission in the hospital corps of the U. S. Army. Klatt is at Warren, Arizona, with the Calumet & Arizona Mining Co.

'15.

Mr. G. H. Van Dorp is now training at Fort Riley to take an examination as engineer officer. His address will be 1115 Polk St., Topeka, Kan.

A. S. Walter, 945 5th Ave., Durango, Colo.

D. W. Butner, care Spanish-American Iron Co., Daiquiri, Oriente, Cuba.

J. J. Cadot is with the Hardinge Conical Mill Company, Newhouse Building, Salt Lake City, Utah.

Chuquicamata, Chile,

Dear Classmates: April 18, 1917.

A few words concerning Chuquicamata and the Chile Exploration Company may be of interest to some of the Miners.

Chuquicamata is situated about 140 miles inland by rail at the foot of a range of hills of the Andes Mountains, and on the edge of the desert which contains the famous Chilean nitrate beds. The altitude is 10,000 feet. There is no vegetation of any kind, as there is no water. It seldom rains or snows, but the climate is very good; in fact, it is much like that of Golden minus the rain and snow.

The property of the Chile Exploration Company is very interesting from several points of view. It is the largest copper property in the world, and is several times larger than the Utah Copper property at Bingham, Utah. It has been estimated that there is ore enough to keep the company supplied for 41 years operating at a capacity of 40,000 tons a day. There are both steam and electric shovel operations and underground workings. The ore mined at present averages 1½ per cent copper.

Churn drills are used in prospecting the property and also for breaking ground.

Another interesting feature is the blasting of the benches for the shovels. A system of drifts are run in the ore to be broken, and these are filled with 150 to 250 tons of black powder, which is set off by electric primers placed in 10 to 15 tons of dynamite. In this way several million tons of ore are broken at a time.

The method of treating the ore is quite different from that of the large plants in the States. After leaving the crushers the ore is put into tanks of a capacity of 10,000 tons each and leached. The company has its own acid plant here for supplying the acid. The solution containing the copper is then dechloridized and sent to the precipitating tanks, where it is precipitated by electrolysis. Thus a very pure grade of copper is produced. The smelter takes care of the sulphide ores.

The electrical power plant is at Tocopilla on the coast, and it is a steam plant using oil-burning boilers. The power is transmitted here at 100,000 volts.

Construction is now under way for quadrupling the plant. The present capacity is 10,000 tons of ore a day. A new water pipe line is being constructed to Bolivia, a distance of 80 miles. Plans for a company railroad to the coast are being made. With all of these things under way there is a field for men of nearly every profession, and especially for engineers.

At present the accommodations for the employees are fair. The company is doing everything possible to better the conditions. A new club house is being built, which will contain a swimming pool, billiard and pool tables, reading and writing rooms, and a library. Horses are very common here, and we have a race-track and betting is not prohibited. Improvements in the men's quarters are being made all the time. Several houses to accommodate 8 to 16 men each have lately been completed, and these are operated as messes, so that the employees are comfortably situated.

This note is very brief, but I trust that it will be of some value to any who are interested in South America. Very truly,

Charles A. Rogers, '15.

'16.

U. H. Berthier, Compania Minera Paloma, y Cabrillas, S. A., Higuera Coahuila, Mex. August H. Chatin has left Pueblo and is now at Tooele, Utah.

Charles B. Gauthier and his wife have returned to Colorado from Blackwell, Okla. Their address will be 617 1st Ave., Denver, Colo. Mr. Gauthier will be assistant to Dr. Fleck with the Research Chemical Co., of Denver.

VanDyne Howbert has been recommended for commission as second lieutenant in the Engineer Corps of the United States Regulars, and will be at the Engineer Training Camp, Fort Riley, Kansas, until June 15th. His permanent address is 22 E. Espanola St., Colorado Springs, Colorado.

Mr. Charles R. Vorck's address after June 15th will be Box 670, Salt Lake City, Utah.

'17.

T. H. Andrews, Walsenburg, Colo.  
Robert Higgins, care R. H. Higgins, Capitol Bldg., Denver, Colo.



Sidney A. Mewhirter.

Sydney A. Mewhirter and Miss Marguerite Brown of Denver were married Friday, May 11th, in Denver. Soon after the ceremony Mewhirter left for the training camp at Fort Riley, Kansas. After his period of training there he will become an officer in the engineer corps of the United States Army.

A. K. Chan was called home to San Francisco May 21st by the serious illness of his father. His San Francisco address is 701½ Jackson Street.

K. L. Hsueh left Golden for a trip to Boston.



Mearle G. Heitzman.

Mearle G. Heitzman and Miss Eleanor Agnes Fraser were married at the home of the bride's parents Saturday, June 2nd. Heitzman and Miss Fraser were schoolmates at the East Denver High School. The young couple are now at Alma, Colo., where Heitzman is engineer for the London mine.

Norman E. Maxwell, Silverton, Colo.  
Sydney A. Mewhirter, U. S. Army Reserve  
Corps, Fort Riley, Kan.

R. A. Thurstin, U. S. Reserve Corps, Fort  
Riley, Kan.

L. R. Van Burgh, 127 S. Humboldt St.,  
Denver, Colo.

J. H. Winchell, Jr., 4285 Federal Blvd.,  
Denver, Colo.

L. K. Worth, 728 Colorado Ave., Colorado  
Springs, Colo.

George M. Cheney, Williamstown, Mass.

A. L. Miller will take a month's vacation  
in New York, where his address will be 839  
Carroll St., Brooklyn.

Kenneth S. Ferguson is at the Marine  
Barracks, Mare Island, Vallejo, Calif., tak-  
ing training for commission in the U. S.  
Marine Corps.

R. P. Oliveros has accepted a position in  
the Engineering Department of the Golden  
Consolidated Mining Co., at Goldfield, Nev.

Fred C. Sealey has taken a position as  
assistant geologist for the Producers Oil  
Co. in Wyoming. He expects to leave for  
Casper June 10th.

#### MINES NIGHT SCHOOL AT LEYDEN.

With a very enjoyable entertainment, the  
Mines Y. M. C. A. closed its night school  
at Leyden, Friday, May 18th. The entertain-  
ment was given by sixteen students with  
mandolins, guitars, flute, violins and ban-  
jos. Finding no piano at the boarding house  
where the entertainment was to be given,  
the boys went to the pool shack and bor-  
rowed one there, carrying it four hundred  
yards to the boarding house. Considerable  
enjoyment was added by a real Scotch bag-  
piper and sword dancer from the camp. The  
boarding house was packed and everybody  
had a great time.

#### U. S. BUREAU OF MINES.

R. B. Moore, in charge of the Golden sta-  
tion of the bureau of mines, states that the  
laboratory is practically completed. The  
whole laboratory is planned to handle any  
rare metal ore involving any of the follow-  
ing treatments: fusing, roasting, reducing,  
leaching with any acid dilute or concentrated  
leaching with any alkali or salt solution.  
Any amount of ore from fifty to 500 pounds  
can be handled. In addition, there are two  
small leaching outfits; one for acids and one  
for alkalis, whereby five to ten pounds of  
ore can be tested.

#### RECENT ARTICLES BY MINES MEN.

"Five Years of Metallurgical Progress."  
Francis A. Thomson, '04. Mining and Sci-  
entific Press, May 12, 1917, pages 654 to 656.

Most of the slips occur after the cup has  
been to the lips.

You never can tell. Lots of people who  
are in the swim have some difficulty in keep-  
ing their heads above water.

#### EX-MINES PERSONALS.

'10.

Lucius S. Wells, 1811 Lowell St., Butte,  
Mont.

'14.

David H. Orr is working with the Arizona  
Copper Co., Morenci, Ariz.

'11.

Walter J. Mayer writes that he attended  
the wedding of Bertram Grant to a Philadel-



Bertram Grant.

phia girl in April on the evening of Grant's  
departure to Great Falls, Montana, where he  
has a job with the Anaconda Copper Co.  
Quoting from Mayer's letter: "Was his best  
man and whistled the 'Mining Engineer' for  
him to keep his knees from quaking before  
he started down the Matrimonial Isle!"

'15.

A. L. Lee is with the Homestead-Iron  
Dyke Mines Co., Inc., at Homestead, Ore.

'16.

Francis H. Breene was married Thurs-  
day, April 19th, to Miss Bessie Wreford  
Springer at Detroit, Michigan. The young  
couple will be at home to their friends at  
349 East Larned St.

'17.

Norman I. Stotz has graduated from Le-  
high University and is now in the Metallur-  
gical Department of the Detroit Steel Pro-  
ducts Company. His address is 433 Warren  
Avenue, West, Detroit, Michigan.

'18.

Dorsey E. Mayhugh's address is R. F. D.  
No. 2, St. Catharine, Mo.

Walter T. O'Reilley was successful in  
passing the examinations for entrance to  
West Point and left for there early in June.

Alvah C. Starkey visited friends in Golden  
the first week in June. He was on his way  
to Great Falls, Montana, where he has ac-  
cepted a position with the Anaconda Min-  
ing Co. He has just graduated from the  
School of Mines at Rolla, Missouri.

'19.

I. M. Charles expects to join the U. S.  
Marine Corps, and is now in training at the  
U. S. Marine Barracks at Mare Island, Val-  
lejo, California.

## "SYSTEMITIS."

Oh, isn't it great to be "up-to-date"  
And live in this year of grace,  
With a system and place for everything,  
Though nobody knows the place?

We've an index card for each thing to do,  
And for everything under the sun;  
It takes so long to fill out the cards,  
We never get anything done.

We've loose-leaf ledgers for saving time—  
It's staggering to think of the cost;  
But half of our time is spent each day  
Hunting for leaves that are lost.

It's sectional this, and sectional that  
(We'll soon have sectional legs);  
I dreamt last night that I made a meal  
Of sectional ham and eggs.

I dreamt I lived in a sectional house  
And rode a sectional "hoss,"  
And drew my pay in sections from  
A section "sectional boss."

Oh, isn't it great to be "up-to-date"  
And live in this year of grace,  
With a system and place for everything  
Though nobody knows the place?  
—Exchange.

Every man pays for what he gets in some  
kind of coin.

## A LA KNEIPP.

The art of reproving impertinence is practiced in its perfection by women more frequently than by men. The Cincinnati Enquirer tells this story of the experience of a young man who was taking a walking trip in Scotland:

One day, on a quiet road, he met a young woman, tall and comely, who walked barefooted. The traveler was surprised; and in an honest quest for information, he stopped her to ask:

"Do all the people go barefooted?"  
"Some of them do," she answered, with dignity. "The rest mind their own business."

## DOING HIS EMPLOYER'S WORK.

"Young man," said the old merchant sternly, "I caught you kissing the typewriter when I returned to the office this morning. What have you to say, sir?"

"Why," replied his bright clerk, "you told me to attend to all your duties in your absence."—Philadelphia Press.

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Equipment of mining engineer's office.  
Transits and drawing instruments.  
Address for particulars

Box 46

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Enable realization of important economies in coal cutting costs—

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# COLORADO SCHOOL OF MINES

## MAGAZINE

Vol. VII.

GOLDEN, COLO., JULY, 1917.

No. 7

### The Pis Pis Mining District, Nicaragua

Harvey Mathews, '13\*

The Pis Pis mining district of Nicaragua is located on the eastern side of the country about ninety miles from the Atlantic Coast and about forty miles from the Nicaragua-Honduras boundary line.

Large low-grade, gold-bearing veins are characteristic of the district. Some one of the various ledges has been worked for twenty years. Values, if present, generally commencing at grass roots. The mills at first used only amalgamation, later amalgamation and cyaniding of the tailings, and now the new mills are all-slime cyanide plants. The gold is very finely divided and goes into solution readily.

There are two routes from the coast. Cape Gracias a Dios the port of entry for one, and Bluefields for the other. The trip from Cape Gracias means four or five days up the Wanks River in a gasoline boat to Waspoock Mouth, a three to ten days' trip up the Waspoock and Pis Pis Rivers, in a paddle boat to San Pedro, a native settlement, and a ride of an hour or two on mule back to the various mines. At night the tired traveler has had to sleep in the boat or in one of the Indian villages. In these native houses the family pig may use your hammock for a scratching block. Otherwise there will be no extraordinary happenings.

By way of Bluefields there are twenty hours of slow torture on board a sailing schooner going up the coast from Bluefields to Prinzapulca, a two days' trip in a gasoline boat up the Prinzapulca and Ban Bana Rivers to Tunky, and a six or eight-hour ride in a very small paddle boat, and then two hours on a mule to San Pedro.

The Bluefields way is generally considered the best. There are hotels in that city for transients and fair accommodations at the various stopping places. In any event, one must carry a grub box, bedding, mosquito bar, and either hammock or folding cot. The grub box should be well stocked. A flood or an accident may cause a delay of days or even weeks.

The district is rather rough and heavily wooded. Elevation is between 750 and 1,000 feet. The days are rather warm, but the nights are always cool. A blanket is needed every night of the year.

There is very little sickness. Malaria is the most common, and generally the existing cases are brought in from other sections. There are no house flies and but few mosquitos. A small sand fly about the size of a gnat and the industrious, much-cussed red chigger cause the most annoyance.

A good water supply is easily obtained, either by storage tanks for rain or by piping one of the numerous creeks to the desired place.

Most of the supplies and provisions are imported from the States in oil cloth bags, cans, and tinned-lined cases. Freight and duty are high. In many cases they amount to more than the first cost. Tobacco is the worst. A pound jar of Prince Albert costs as much here as does a box of good cigars in the States.

Many American and a large variety of native vegetables will grow and give a good yield, if they receive the necessary cultivation. At present the supply is only a small percentage of the demand. Beef, such as it is, is always plentiful.

The year is divided into two seasons. The wet from June to February, and the dry from February to June. The following data collected by Mr. R. B. Stanford, formerly resident manager of the Siempre Viva, and afterwards of the Bonanza Mine, shows the conditions very well.

Average Monthly Rainfall in Inches, 1913 to 1917.	Yearly Rainfall in Inches, 1905 to 1917
January ..... 8.27	1905 ..... 130
February ..... 3.85	1906 ..... 124
March ..... 3.59	1907 ..... 134
April ..... 6.29	1908 ..... 144
May ..... 9.53	1909 ..... 122
June ..... 15.64	1910 ..... 136
July ..... 16.43	1911 ..... 150
August ..... 13.75	1912 ..... 100
September ..... 12.99	1913 ..... 154
October ..... 13.73	1914 ..... 122
November ..... 11.56	1915 ..... 128
December ..... 11.45	1916 ..... 104
Average rainfall .....	129

Prospecting is rather difficult. Float has often traveled some distance from the ledge and the tangle of vines and trees prevent one seeing more than a few feet in any direction. Rotted vegetation, from a few

\*Superintendent Cyanide Plant, Bonanza Mine.

inches to several feet thick, covers the ground. The rains take an unholy joy in filling up a trench just about the time it is nearing the bottom of the surface soil. It is evident that all prospecting should be done during the dry season if possible.

Mining claims must be rectangular in shape, and the area of each not to exceed 5 hectares, a little over twelve acres. General shape of a claim is 328 by 1,640 feet.

To secure a claim it must first be denounced and provisionally measured. The denouncement notice must be published in the newspapers of the district. If after ninety days the denouncement has not been contested, a definite title can be obtained. The claim must then be surveyed by a competent man, and boundary lines plainly marked. After title is granted it must be registered at Managua, the capital of the country.

Claims are held by the payment of a yearly tax of \$2.00 per hectare, or \$0.83 per acre. Failure to pay taxes will cause the owner to lose the property, and it may be sold at public auction. The delinquent owner has the option of purchase by the payment of the back taxes plus a fine of 100 per cent.

Timber claims, mill and power sites seldom contain more than 100 hectares, and are leased from the government at a yearly rate of \$0.80 per hectare.

Within four kilometers of a known ledge only one claim can be denounced at a time. More than four kilometers away, for first denouncement a person may denounce three claims. After that only one at a time.

Water falls may be denounced to furnish power for claims already denounced.

Operating properties must also pay an export tax of \$0.55 per gross ounce of bullion exported. Afterwards they receive a refund corresponding to the number of ounces silver and base metals present. This refund is based on the mint certificates of the bullion.

The native labor is either Spanish or Indian. The Spaniard is neither better nor worse than others of his race in Mexico and other Central American countries. Most of the Indians are young men who only work intermittently. Six months, or perhaps a year at the mines, and then two or three months at their homes. Most of them take their holiday either at Christmas or Good Friday. They are industrious and quiet. Where they are given task work their work will compare very favorably with the common labor of the States.

The district is without roads, railroads, telephones, or telegraph. At present there is a weekly mail service, the cost of which from the coast to the mines is paid by the mining companies. An adequate transportation system would mean the opening up of the country in general and the working of many properties that are now too low grade to be worked at a profit.

When a man becomes thoroughly contented he has outlived his usefulness.

## A QUICK DETERMINATION OF TUNGSTEN IN SCHEELITE.

Walter J. Eaton, '13.

The only thing new in this method is the equipment and operation. Most determinations of WO<sub>3</sub> take considerable time and elaborate equipment.

This method gives results that are sufficiently accurate to control mill operations on the ore here (Bishop, California), a mixture of garnet, epidote, lime and quartz with about 1 per cent scheelite.

The regular mill head and tail samples and dried and one 100 grams weighed out and panned in a small frying pan. The concentrate from this is dried and weighed, then reduced to a pulp as fine as flour (this is important) in a hand motor. One gram of this pulp is put in a three-inch porcelain dish, and about 40 c.c. of C. P. HCL is added, and a stirring rod. This dish is now put on a sand bath over a gasoline stove. Stir often. When this has evaporated slowly to about 10 cc. one cc. of C. P. HNO<sub>3</sub> is added and the assay taken to dryness.

When dry the assay is set off the sand bath, about 50 cc. of one to one HCL is added, and the assay filtered. Hold the sand back in the dish; do not dump into the filter paper, as it is easier to wash in the dish. Wash with about 150 cc. of HCL water (about 1 to 10). Wash down the edges of the porcelain dish with ammonia, about 10 cc. The tungstic acid will go into solution. Weigh up a 2-inch porcelain dish, put it under the filter and pour the ammonia from the 3-inch dish through the filter paper into it. Wash the original dish with hot one-to-one ammonia, about 10 cc., and add this to filter paper. When this is all through, wash filter paper with hot one-to-one ammonia, about 10 cc.

This makes about 30 cc. of ammonia in the small weighed dish. Set this back on the sand bath and evaporate to dryness. Take an ordinary plumbers' blow torch and burn off the ammonia, holding the weighed dish with a pair of iron tongs. Burn to a bright yellow, taking care not to let the heat at the start be so great that the assay will "spit." This "spitting" can be avoided by starting the heat near the top of the dish and gradually working down. Weigh up as WO<sub>3</sub> when cool.

For concentrate use five-tenths grams. The results are uniformly low when checked by fusion method.

This Method	Concentrate Results	
	Fusion	
61.0	64.87	3.87
63.5	66.68	3.18

A rug containing \$35,000 worth of radium recently arrived in Golden from Pittsburgh. A container holding \$50,000 worth of the radium was broken and the precious element spilled into the rug. Only about \$15,000 could be recovered, and the rug was sent to Golden that the remainder might be extracted.

# Colorado School of Mines Magazine

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*Editor and Manager Colorado School of Mines Magazine; Manager of Capability Exchange.*

Address all communications to the Assistant Secretary and Treasurer, Golden, Colorado. Make all checks payable to the Assistant Treasurer.

VOL. VII. JULY, 1917. No. 7

## "COLORADO SCHOOL OF MINES."

Under this head T. A. Rickard, editor of the Mining and Scientific Press, printed in the June 16th issue of that journal a two column article (pages 824 and 825), on the recent trouble at the School that is so full of misstatements and untruths that we can not let it go uncorrected.

Near the beginning of the article, Mr. Rickard states, "We have taken pains to ascertain the facts, hoping that our unbiased comment may interest the Alumni of the school and also the profession at large."

Mr. Rickard was in Golden a short time on Commencement Day, when he delivered an excellent address entitled "Mining the Great Adventure." On his own statement, "The students returned to their homes. At the commencement, on May 25th, only the graduating seniors were present, besides the alumni and general public," yet he pretends later in the article to quote the students. We will quote a number of Mr. Rickard's alleged "facts" and misstatements and to the best of our ability, follow each of them by the real fact or real truth without expressing our own opinions, leaving it to the judgment of the reader whether or not Mr. Rickard's "comment" was "unbiased" or not.

"The students were more unruly than usual, the police court verdict of 'drunk and disorderly' being adequately descriptive". None of the students were arrested, there was no "police court verdict of 'drunk and disorderly' ". Probably Mr. Rickard did not mean this statement to be taken literally, but we know some of his readers did take it that way and that that a number of the students were arrested. There is difference of opinion as to whether or not "the students were more unruly than usual". There is much testimony that they were not.

Members of the faculty *have* been wrinkled on previous occasions. Many professors and even the president have been interested spectators of "wrinklings" of students without making any protest against such practices. However, no one denies that on this Senior Day ten to fifteen Sophomores assisted in "wrinkling" an instructor after having wrinkled nearly everyone else close at hand. Three of the ten or fifteen engaged were suspended for one year. Two of the three were among the quietest students in the school, excellent students and had never been in trouble before. The principle reasons why the students "returned to their homes" was because they considered it unjust to punish three for an act committed by ten or fifteen and that all the acts with which the suspended men were accused had been committed on previous "Senior Days" without reprimand or punishment.

Quoting "A committee of local citizens—at Golden, where the School is established—interfered and called upon the Governor of the State to take a hand. He sent a trustee that he had appointed eight months previously, Mr. A. E. Carlton, who had not attended a board meeting up to that time. Mr. Carlton assumed an intelligent attitude, but immediately thereafter he resigned."

Mr. Carlton was appointed by the previous Governor to take Mr. Parmelee's place on the board of trustees when Mr. Parmelee became president of the School. Mr. Carlton's appointment had been made when the legislature was not in session and had not been confirmed by the senate. Governor Gunter, the present governor, recommended Mr. Carlton's appointment and the senate confirmed it. Then Mr. Carlton sent in a letter of resignation pleading lack of time to attend the meetings. When this "local committee" (which had made every possible effort to secure some settlement with the students, president and faculty before appealing to the governor) waited on Governor Gunter, he persuaded Mr. Carlton to attend and help straighten out the trouble. Mr. Carlton did attend and was present at the meeting when the board recommended that the faculty reconsider the case. Mr. Carlton did *not* "immediately thereafter" resign, instead he "immediately thereafter" withdrew his letter of resignation and has attended every subsequent meeting held by the board. Incidentally, the "committee of local citizens" included one alumnus of the School.

Mr. Rickard then severely criticised three members of the board as incompetent. It is useless to discuss this, as competence or incompetence of such officials is seldom provable by facts and is usually a matter of individual opinion or prejudice. However, Mr. Rickard continued to misstate and to omit facts in regard to the trustees.

"One of them is a reporter on a Denver paper, a man as unfit—" etc. Now this member's title with the Denver paper mentioned is "Mining Editor", and he has held

the position of managing editor. Of course being an editor might make him "unfit" as a board member. Mr. Rickard ought to know. Furthermore, this man has been a member of the board of trustees of the Colorado School of Mines continuously for forty-three years, ever since the School was organized. Both Republican and Democratic governors have regularly reappointed him. As far as we can find out, no one has ever made any protest to his appointment during all these years.

"Another trustee is a small banker at Golden, also without special qualification." This trustee has regularly been appointed treasurer for the School by all the boards of trustees during the past fifteen or twenty years and during that time has probably been in closer touch with all of the affairs of the School than any other man in the state.

"The third is a banker and financier, already mentioned, one of the big men of Colorado, a clever and energetic man, but so immersed in his own affairs that he has no time to attend to his duties as a trustee." As we stated before this trustee is now giving sufficient of his time "to attend to his duties as trustee". One of the favorite American pastimes is to assert that any official who does something with which you do not agree, is "unfit to hold the office."

"The two other trustees are unexceptionable, both being graduates of the School". One of the two, Mr. O. R. Whitaker, is a graduate, but the other, Mr. F. G. Willis, never attended the school.

Speaking of the students, "They had the cheek to say that they would return 'when the faculty would promise to work in harmony' with them". Please note where Mr. Rickard placed his quotation marks and then entirely changed the meaning by adding "with them". *Not quoted.*

It is possible some individual student may have made the remark that he would return when there was "a faculty that would work in harmony", or that "would promise to work in harmony," but it is absolutely untrue that the students as a body or any one representing the student body made any such statement as that they would return "when the faculty would promise to work in harmony with them".

As a matter of fact the students left school as individuals and did *not* leave any demands or conditions that must be met before they would return.

In brief, here is an outline of what the students did thru the so-called "strike":

When the "suspensions" were announced separate classes held meetings. Protests were made to the president against what the students considered the unfairness of the punishment. They were informed that the matter had been thoroly considered by the faculty and that no changes in the punishment would be considered. The students then held a mass meeting and agreed to ask for their credits and quit school as individ-

uals in protest. The seniors voted to join the other three classes but the lower classes would not allow this and insisted that the seniors finish up the little work they had to do and graduate.

Later in the meeting some felt that the board of trustees should be given a chance to act before leaving and they persuaded the rest to agree to this. The board recommended that the faculty reconsider the matter. The faculty refused to modify the punishment. The students then requested their credits individually but were persuaded by the "committee of local citizens" to remain around a few days and later to return to their classes in a body so that they could be treated with by the board of trustees and faculty as students and not as "strikers". However, the board consistently refused to overrule the faculty in matters of discipline and as the faculty refused to consider any change in the punishment, the students finally left. This action was unanimous. The seniors completed their work as agreed upon. Five foreign government students offered to quit with the rest but were advised by the student body to remain and complete the year's work. Two students attended classes for a day or so but were finally convinced by argument that they should quit also. There was not a single instance of physical persuasion or even threat of physical violence. Where students could clean up the semester's laboratory or drawing work by a few days more work they were advised to do so. A few took advantage of this and led some poorly informed professors to believe the students were not unanimous. There never was a more peaceful "strike".

Basing the analogy on the absolutely false assumption that the students were demanding that the faculty be in subservience to them, Mr. Rickard then compared the "strike" to one in 1903 at Telluride where the strikers drove "the Smuggler-Union miners, by the free use of bullets, out of the bullion workings", and a State official reported to the Governor that the strikers were "in peaceful possession of the mine".

There might have been a little point to his analogy if he had reversed it, for unquestionably the faculty were left "in peaceful possession" of the School.

Every member of the board of trustees and most of the alumni know what is the matter with the Colorado School of Mines. Many unprejudiced outside engineers suspect the trouble. Unfortunately misinformation and that inherent prejudice against "strikers", when you are not doing the striking, coupled with honest difference of opinion as to *just how* to go about correcting the trouble, led to a division among the close friends of the school. It is to be sincerely hoped that these differences of opinion will be forgotten and that *all of the friends* of the school will *unite* with the trustees and alumni in the "reorganization and upbuilding of the Colorado School of Mines".

REPORT OF THE ASSISTANT SECRETARY-TREASURER FOR THE YEAR ENDING DECEMBER 31, 1916.

FINANCIAL STATEMENT

Dr.	Magazine	Cr.
.....	Subscriptions .....	\$ 621.98
.....	Advertisements .....	1,075.45
\$ 321.35	Stenographer .....	.....
44.47	Miscellaneous .....	.10
107.00	Postage and Stationery.. ..	.....
1,104.80	Printing .....	.....
<hr/>		
\$1,577.62		\$1,697.53
		1,577.62

Cash profit 1916..... 119.21

Outstanding accounts, Jan. 1, 1917:

Advertisements .....\$147.80  
Subscriptions ..... 280.25

---

\$428.05

Capability Exchange

\$ 703.17	Lecture Notes and outside subscriptions, books, etc. ....	\$ 448.68
321.35	Stenographer .....	.....
162.63	Miscellaneous .....	51.05
32.50	Fees .....	524.75
18.10	Printing, postage and stationery .....	.....

---

\$1,237.75  
1,024.48

\$ 213.27 Cash loss 1916.

Outstanding accounts Jan. 1, 1917:

Fees .....\$487.55  
Lecture Notes ..... 402.65

---

\$890.20

Total outstanding accounts Jan. 1, 1917:

Magazine .....\$428.05  
Capability Exchange.... 890.20

---

\$1,318.25

These outstanding accounts are practically all collectible. Any doubtful accounts are dropped from our financial statement. The \$402.65 Lecture Notes, Capability Exchange account, is the cost price of our stock of notes on hand January 1, 1917:

Capability Exchange cash loss (apparent), 1916 .....\$213.27  
Magazine cash profit, 1916... 119.91

---

Net cash loss Magazine and Capability Exchange, 1916....\$ 93.36

This net cash loss for 1916 is really not a loss, as it was occasioned by the publishing of two sets of notes late in December, at the cost of \$326.85. Based upon our experience with previous sets of notes, these notes will ultimately be disposed of at a fair profit on the investment.

Dr.	Alumni Association	Cr.
.....	Annual dues .....	\$ 486.95
\$ 136.50	Printing, postage and stationery .....	.....
240.00	Salary, Assistant Secretary - Treasurer, Life Memberships .....	239.85
159.80	Miscellaneous .....	38.21
107.00	Banquets .....	52.50
.....	Interest and discount .....	65.76
.....	A. A. profits, 1915, account Magazine and Capability Exchange ...	.13
<hr/>		
\$ 643.30		\$ 883.40
		643.30

Alumni net profit, 1916.\$ 240.10

Alumni balance Jan. 1, 1916.. 1,166.73

Alumni net prof. Jan. 1, 1916. 240.10

---

Alumni balance Jan. 1, 1917..\$1,406.83

SUMMARY, JANUARY 1, 1917.

Liabilities

Alumni Association balance Jan. 1, 1917 .....	\$1,406.83
Titsworth Fund .....	357.70
Credit Account balance.....	190.81
<hr/>	
	\$1,955.34

Assets

Two bonds held by International Trust Co. ....	\$ 997.00
Notes outstanding, Titsworth Fund.	140.00
1916 profits advanced, Assistant Secretary-Treasurer .....	683.94
Net loss (apparent), Magazine and Capability Exchange, 1916.....	93.36
Cash on hand Jan. 1, 1917.....	41.04
<hr/>	
	1,955.34

Salary Assistant Secretary-Treasurer

Received from Alumni Association.\$	240.00
Received from School of Mines.....	250.00
1916 profit advanced.....	683.94
<hr/>	
	\$1,173.94

Due Assistant Secretary-Treasurer, 1916 accounts before profits are shared with Alumni Association. 326.06

---

\$1,500.00

Orville Harrington,

Asst. Secretary-Treasurer.

Approved and signed by:

John Gross,  
Secretary.

Sidney B. Tyler,  
Treasurer.

May 21, 1917.

A mine is a hole in which you pour money and pour money and pour money and out of which you pump water and pump water and pump water.

## The Association of the Alumni of the Colorado School of Mines.

### ORGANIZATION.

The Association of the Alumni was organized June 7, 1895.

The Constitution and By-Laws were framed by a committee from the Class of '95 and adopted at a special meeting held the same evening just before the First Banquet at the Windsor Hotel, Denver.

### OFFICERS.

Elected May, 1917.

James H. Steele, '00, President.  
John G. May, '01, Vice-President.  
Henry P. Nagel, Jr., '04, Secretary.  
Arthur H. Buck, '97, Treasurer.

### Executive Committee.

Russell B. Paul, '02.....Term expires 1918  
Daniel Harrington, '00...Term expires 1919  
Edwin H. Platt, '00.....Term expires 1920

Orville Harrington, '98...Asst. Sec'y-Treas.  
Editor and Manager of the Colorado School of Mines Magazine; Manager of the Capability Exchange.

### BOARD OF TRUSTEES.

One of the members of the Board is a member of the Association: Orvil R. Whitaker, '98, Vice-President.

### CONSTITUTION.

#### ARTICLE I.

##### Name and Object.

Section 1. The name of this Association shall be "The Association of the Alumni of the Colorado School of Mines."

Sec. 2. The object shall be, the cultivation of friendship, acquaintance, mutual aid, and the elevation of the reputation and standard of the Alma Mater.

#### ARTICLE II.

##### Membership.

Section 1. Any person holding a degree from the Colorado School of Mines may become a member upon the payment of the initiation fee to the Treasurer.

Sec. 2. All members must be of good moral character and in good standing professionally.

#### ARTICLE III.

##### Officers.

Section 1. There shall be a President, a Vice-President, a Secretary, and a Treasurer. There shall also be an Executive Committee, consisting of the above officers, and three other members.

##### Election.

Sec. 2. The President, Vice-President, Secretary and Treasurer shall be elected at regular annual meetings, for a term of one

year, and the three remaining members of the Executive Committee as follows, viz: One for three years, one for two years, and one for one year, and thereafter these members shall be elected for a term of three years. Vacancies occurring during the year shall be filled by the Executive Committee.

#### ARTICLE IV.

##### Meetings.

Section 1. Regular annual meetings shall be held each year, on the day following the commencement exercises, unless otherwise provided by the Executive Committee.

#### ARTICLE V.

##### Emergency Clause.

Section 1. This Constitution may be changed or amended by a two-thirds vote of all votes cast on the question, personally or by letter, provided that notice of change or amendment shall have been sent to every member whose address is known, at least one month before the counting of the votes. The Secretary may collect votes by letter, and the vote shall be canvassed by the Executive Committee.

Sec. 2. A proposed amendment to the Constitution shall be submitted to the Association in the following manner:

A petition containing the proposed amendment in full and signed by at least fifty (50) members of the Association shall be sent to the Assistant Secretary for publication in the Colorado School of Mines Magazine at least one month before the ballots are cast.

The Assistant Secretary will publish the petition in full and arguments submitted by members for or against the proposed amendment.

The proposed amendment will be submitted to the Association for a vote on the regular annual ballot unless the Executive Committee deems it advisable to order the amendment submitted at a special election.

#### BY - LAWS.

#### ARTICLE I.

##### Rules of Order.

Section 1. The meetings of this Association shall be governed by Roberts' Rules of Order, except where the same conflicts with the Constitution and By-Laws of this Association.

#### ARTICLE II.

##### Quorum.

Section 1. A quorum shall consist of twenty members, who may be represented by proxy, provided that at least ten members are present in person.

#### ARTICLE III.

##### Duties of Officers.

Section 1. Duties of President:  
The duties of the President shall be to preside at all meetings, announce business,

put all motions, decide tie votes on questions of order, and appoint Local Committees. He shall also be chairman of the Executive Committee.

**Sec. 2. Duties of Vice-President:**

The duties of the Vice-President shall be that of President in his absence or inability to act.

**Sec. 3. Duties of Secretary:**

The Secretary shall keep a record of the proceedings of the Association and shall publish and distribute an annual pamphlet containing the Constitution and By-Laws, his report, the report of the Treasurer, the report of the Standing Committees, together with a list of the officers and members of the Association, and any other papers of interest to the Alumni.

The Secretary shall, upon the presentation of a proper bill, make out a regular numbered voucher or warrant on the Treasurer, for the necessary amount. In case of dispute in regard to a bill presented for payment it shall be referred to the Executive Committee.

**Sec. 4. Duties of Treasurer:**

The Treasurer shall collect all dues and take charge of all moneys. He shall keep a record of the finances of the Association and shall make a report to the Association at its annual meeting. This report shall also be delivered to the Secretary for publication in the annual pamphlet. The Treasurer shall pay out money only when a regular voucher or warrant bearing the signature of the Secretary, is presented. In case of dispute in regard to paying a bill, it shall be referred to the Executive Committee.

**Sec. 5. Duties of the Executive Committee:**

The Executive Committee shall elect the Standing Committees, audit the Treasurer's report, act as final authority in determining the expense of the Association, and arrange for annual dinners.

The Executive Committee may call special meetings of the Association when it is deemed necessary, and may employ an assistant secretary and assistant treasurer at Golden to act as manager of the Capability Exchange, managing editor of the Colorado School of Mines Magazine, and fulfill the duties of the secretary and treasurer as provided for in Sections 3 and 4 of this Article, under such restrictions as the Executive Committee may impose. While an assistant secretary and treasurer is employed the Secretary and Treasurer shall act as auditors and examine and audit the books, accounts and reports of the assistant secretary and treasurer at least once a year, certify to the accounts and reports, if found correct, and report the result of their examination to the Executive Committee.

The Colorado School of Mines Magazine will be the official organ of the Association, and in it will be printed the reports provided for in the By-Laws as they may be submitted. The number containing the an-

nual reports of the Secretary and the Treasurer will also contain the Constitution and By-Laws of the Association, and will be considered as the annual pamphlet provided for in Section 3 of this Article.

The Executive Committee shall have full control of the assistant secretary and treasurer, and decide all fundamental points in the conduct of the Colorado School of Mines Magazine and the Capability Exchange.

**ARTICLE IV.**

**Election of Officers.**

Section 1. The officers of the Association shall be elected by a majority of all votes cast. Votes must be cast either by ballot or by letter.

**ARTICLE V.**

**Special Meetings.**

Section 1. Special meetings shall be called as provided for in Article III, Section 5, of the By-Laws, or by petition signed by at least ten members.

**ARTICLE VI.**

**Annual Dinners.**

Section 1. The Annual Dinner shall be held on the same date as the Annual Meeting, unless otherwise provided by the Executive Committee.

**ARTICLE VII.**

**Initiation Fees and Dues.**

Section 1. Initiation Fees: The initiation fee of this Association shall be fifty cents.

Sec. 2. The dues shall be one dollar and fifty cents (\$1.50) per calendar year, payable to the Treasurer or the Assistant Secretary and Treasurer of the Association, before the first day of June.

Notice of dues shall be sent to each member, whose address is known, on or before the first day of February, and if the dues of any member shall remain unpaid by the last day of April a second notice shall be sent him, and if such dues remain unpaid on June 1st his name shall be stricken from the roll and he shall not be considered in good standing.

Should he desire to again become a member, he may do so upon payment of the initiation fee and the dues for the current year.

A new graduate of the Colorado School of Mines may become a member of the Association any time during the first six months after receiving his degree, upon the payment of the initiation fee and seventy-five (75) cents as dues for the remainder of that calendar year, unless the graduate was, as an undergraduate, registered with the Capability Exchange, in which case his registration fee will be credited upon graduation as initiation fee and dues for that year.

Sec. 3. A life membership in the Association may be obtained by any member in good standing upon paying to the Treasurer

the sum of fifteen dollars (\$15.00) and by maintaining the good moral character and professional standing required of ordinary members.

#### ARTICLE VIII.

##### Standing Committees.

Section 1. There shall be the following standing committees: Committee on Nominations, Committee on Athletics, and Committee on Instruction.

Sec. 2. The Committee on Nominations shall consist of five members, not officers of the Association, whose duty shall be to receive nominations from members for President, Vice-President, Secretary and Treasurer, and for members of the Executive Committee, and announce the same by written notices to each member one month before the annual meeting.

Sec. 3. The Committee on Athletics shall consist of five members, whose duty shall be to keep a record of the proceedings of the athletics of the Alma Mater, and encourage the same when in their power.

Sec. 4. The Committee on Instruction shall consist of five members, whose duty shall be to investigate the course of study followed at the Colorado School of Mines, and make a report of the same at the annual meeting of the Association.

#### ARTICLE IX.

##### Emergency Clause.

Section 1. These By-Laws may be changed or amended by a two-thirds vote of all votes cast on the question, either personally or by letter, provided that notice of the change or amendment shall have been sent to every member, whose address is known, at least one month before the counting of the votes. The Secretary may collect votes by letter, and the vote shall be canvassed by the Executive Committee.

Sec. 2. A proposed amendment to the By-Laws shall be submitted to the Association in the following manner:

A petition containing the proposed amendment in full and signed by at least fifty (50) members of the Association shall be sent to the Assistant Secretary for publication in the Colorado School of Mines Magazine at least one month before the ballots are cast.

The Assistant Secretary will publish the petition in full and arguments submitted by members for or against the proposed amendment.

The proposed amendment will be submitted to the Association for a vote on the regular annual ballot unless the Executive Committee deems it advisable to order the amendment submitted at a special election.

#### ALUMNI PIN.

The Alumni Pin is patented and can only be obtained by an order from the Secretary or Assistant Secretary, Golden, Colo.

The Pin is made by A. J. Stark & Company, 711 Sixteenth Street, Denver, Colo.

#### ALUMNI, COLORADO SCHOOL OF MINES.

Where two addresses are given, the first is the permanent, or home address. If you know of any mistakes or changes in the addresses or occupation given, please notify the Assistant Secretary, Golden, Colo., and keep him informed of all future changes. Please see that your addresses are correct on our lists and send us your permanent address, if not given in this list.

Membership in the Alumni Association is shown in parentheses after the names.

- Abel, Walter D., '06 (annual).  
Box 36, Santa Monica, Calif.
- Adami, Charles J., '99 (life).  
General Supt. St. Joseph Lead Co., General Manager, Doe Run Lead Co., Bonne Terre, Mo.
- Adams, Charles, '04 (non-member).  
Care L. A. & Salt Lake R. R., Los Angeles, Calif.
- Adams, Wilbur E., '00. Deceased.
- Aillinger, Walter J., '13 (non-member).  
1580 Lowell Blvd., Denver, Colo.  
Oatman, Ariz.
- Aldrich, Harold W., '06 (annual).  
437 Mountain Ave., Boulder, Colo.  
Gen. Supt. Ladysmith Sm. Corp., Ltd., Box 228, Ladysmith, B. C., Canada.
- Allen, Carl A., '05 (annual).  
1012 Steele St., Denver, Colo.  
Mining Engineer, U. S. Bureau of Mines.  
In charge of Mine Rescue Car No. 5.
- Allen, Maynard C., '06 (life).  
Engr., St. Joseph Lead Co., Box 502, Bonne Terre, Mo.
- Aller, Frank D., '92 (life).  
Agent A. S. & R. Co., Casilla 35, Antofagasta, Chile, South America.
- Ambrosius, Carl E., '88 (non-member).  
Where is he?
- Anderson, Axel E., '04 (life).  
2245 Gilpin St., Denver, Colo.  
Technical Division, E. I. Du Pont de Nemours & Co., 900 Central Savings Bank Bldg., Denver, Colo.
- Anderson, Neil A., '02 (non-member).  
County Surveyor, Irrigation Engineer, Thornton, Idaho.
- Andre, Morris V., Jr., '11 (Life).  
1125 S. Market St., Wichita, Kan.  
Shift Boss, Flotation Broadwater Mill, Box 487, Park City, Utah.
- Andrews, Earle D., '12 (annual).  
221 Elm St., Waterloo, Iowa.  
Care Ray Cons. Copper Co., Ray Ariz.
- Andrews, Thaddeus H., '17 (non-member).  
Care Dr. D. Andrews, Walsenburg, Colo.
- Arfaten, George J., '13 (annual).  
3705 Wolf St., Denver, Colo.
- Armington, H. C., '07 (life).  
3973 La Salle Ave., Los Angeles, Calif.  
Office Address, 649 Pacific Electric Bldg., Los Angeles, Calif.
- Arthur, Charles S., '13 (life).  
Consulting and Safety Engineer, 800 Central Savings Bank Bldg., Denver, Colo.



- Arthur, Edward P., Jr., '95 (annual).**  
Mining Engineer and U. S. Mineral Surveyor, Box 584, Cripple Creek, Colo.
- Atkins, Horace H., Jr., '94 (annual).**  
222 N. 17th St., Muskogee, Okla.  
Manager, The Prairie Oil & Gas Co., Muskogee, Okla.
- Atkinson, W. J., '96 (non-member).**  
Do you know his address?
- Atwater, Maxwell W., '01 (life).**  
Manager, Zinc Concentrator, Basin, Mont.
- Austin, Arthur, '05. (Deceased.)**
- Badger, Herbert E., '02 (non-member).**  
920 Ninth Ave., Greeley, Colo.
- Badgley, Charles W., '06 (life).**  
1321 East 12th Ave., Denver, Colo.  
Care El Paso Smelting Works, El Paso, Texas.
- Bailey, E. W., '05 (non-member).**  
309 McPhee Bldg., Denver, Colo.
- Baker, Erwin Frank, '14 (non-member).**  
3221 Franklin St., Denver, Colo.
- Baker, Hamilton W., '11 (life).**  
1043 Emerson St., Denver, Colo.  
Falk Bldg., Boise, Idaho.
- Ball, Byron E., '13 (non-member).**  
Care Edwin Ball, T. C. I. & R. R. Co., Birmingham, Ala. 924 S. 19th St., Birmingham, Ala.
- Ball, Louis R., '00 (life).**  
Mining Engineer and Moving Picture Director, 4525 Prospect Ave., Hollywood, Calif.  
292 East Bellevue St., Pasadena, Calif.
- Ball, Max W., '06 (annual).**  
Geologist, Roxana Petroleum Corp., Cheyenne, Wyo.
- Ballagh, J. Courtenay, '10 (annual).**  
General Manager Southwestern Wrecking Co., 115 So. Durango St., El Paso, Tex.
- Banks, Leon M., '12 (annual).**  
Box 301, Metcalf, Ariz.
- Barbour, Percy P., '98 (life).**  
Mining Engineer, Box 236, Idaho Springs, Colo.
- Barenscheer, William J., '96 (non-member).**  
Address lost.
- Barker, Franklin E., '06 (non-member).**  
Professor, Government Pei Yang University, Tientsin, China.
- Barker, Pierce, '07 (non-member).**  
10th and Lindley Ave., Logan Sta., Philadelphia, Pa.  
New Reduction Works, Anaconda Copper M. Co., 500 Maple St., Anaconda, Mont.
- Barnes, Corrin, '96 (non-member).**  
Goldfield, Nevada.
- Barnett, Walter W., '11 (annual).**  
636 Josephine St., Denver, Colo.  
Care Seoul Mining Co., Tul Mt Chung, Whang Hai Province, Chosen, Korea.
- Barney, H. A., '14 (non-member).**  
Florida, Canca, Colombia, S. A.
- Barron, Chauncey T., '02 (non-member).**  
Supt. Norfolk Smelting Co., West Norfolk, Va.
- Bartholomew, Tracy, '06 (life).**  
Mgr. Rico Tropical Fruit Co., Garrochales, Porto Rico.
- Bastanchury, G. A., '07 (life).**  
Fullerton, Calif.
- Beall, Alpheus Benjamin, Jr., '15 (annual).**  
Care A. B. Beall, Box 354, Sioux City, Ia.  
Engineer, U. P. Coal Co., Box 659, Rock Springs, Wyo.
- Bebee, Alfred Henry, '15 (annual).**  
400 Main St., Cripple Creek, Colo.  
Box 185, Cripple Creek, Colo.
- Beck, Daniel L., '12 (life).**  
452 Elati St., Denver, Colo.  
Alma, Colo.
- Beck, W. Lloyd, '14 (annual).**  
452 Elati St., Denver, Colo.
- Beeler, Henry C., '96 (life).**  
Mining Engineer, 254 Coronado Bldg., Denver, Colo.
- Bell, Charles N., '06 (life).**  
General Supt. Smuggler Union Mining Co., Telluride, Colo.
- Bellam, Henry L., '89 (non-member).**  
Assayer, Box 686, Reno, Nev.
- Benjovsky, T. D., '09 (life).**  
Del Norte, Colo.  
Mine Supt., U. S. Gold Corp., Sugar Loaf, Colo.
- Benwell, George A., Jr., '00. Deceased.**
- Benner, Howard C., '13 (annual).**  
617 Cuyahoga Bldg., Cleveland, Ohio.  
814 West Mercury St., Butte, Mont.
- Bergh, John E., '02 (non-member).**  
Address lost.
- Berry, Albert, '05 (non-member).**  
Leadville, Colo.  
Supt., Bridgeport Land Co., Bridgeport, Wash.
- Berthier, Ulysses H., '16 (life).**  
Care A. Steiner, 1738 Carrollton Ave., New Orleans, La.  
Compania Minera Paloma y Cabrillas, S. A., Higuera, Coahuila, Mex.
- Berthoud, Capt. E. L. Deceased.**
- Bertschy, Perry H., '98 (annual).**  
Helena, Mont.
- Bicknell, Harold L., '16 (non-member).**  
324 North Grove Ave., Oak Park, Ill.  
Hennessey Annex, Butte, Mont.
- Bigley, Arthur C., '13 (non-member).**  
Box 665, Golden, Colo.  
Engr. Dept., Anaconda Copper M. Co., care Leonard Hotel, Butte, Mont.
- Billyard, John R. H. H., '13 (non-member).**  
Care J. H. W. Billyard, Casilla 866, Valparaiso, Chill, S. A.
- Bishop, Raymond, '01. Deceased.**
- Bisland, John B., '13. Deceased.**
- Blackburn, Ward, '08 (life).**  
Care Ingersoll-Rand Co., 1036 Union Oil Bldg., Los Angeles, Calif.
- Blaurock, Carl A., '16 (annual).**  
Gold and Silver Refining, 2530 W. 37th Ave., Denver, Colo.
- Block, Gary E., '08 (life).**  
Engineer, Ellsworth-Klanor Construction Co., 309 W. Webster Ave., Pittsburg, Kan.
- Blow, A. A., Hon. E. M., '01 (annual).**  
Holeton Nat. Bank Bldg., Knoxville, Tenn.
- Blum, Sidney, '11 (annual).**  
1922 Grand Ave., Pueblo, Colo.  
Assayer and Chemist, A. S. & R. Co., Omaha Plant, Flatiron Hotel, Omaha, Neb.

- Blumenthal, Emil E., '98 (non-member).  
Granite Bimetallic Co., Phillipsburg, Mont.
- Bolam, Albert E., '15 (annual).  
Winnemucca, Nev.  
Box 237, Metcalf, Ariz.
- Bowie, James W., '94. Deceased.
- Bowhay, Arnold A., Jr., '14 (annual).  
2143 High St., Denver, Colo.  
249 Effie St., Fresno, Calif.
- Bowman, Frank C., '01 (non-member).  
General Manager, New Reliance G. M. Co.,  
Deadwood, So. Dakota.
- Bowman, Reginald G., '11 (non-member).  
309 C. St., N. W., Washington, D. C.  
Chief of Research Dept., International  
Smelting Co., Box 384, Tooele, Utah.
- Boyd, Jesse T., '08 (life).  
1115 Race St., Denver, Colo.  
Supt. Empire Zinc Co. Mines, Redcliffe,  
and Empire Zinc Co., Gilman, Colo.
- Boyle, Willis J., Jr., '12 (annual).  
1657 Orange St., Los Angeles, Calif.
- Bradford, Albert H., '09 (life).  
Placentia, Orange Co., Calif.
- Bradford, Julius S., '10 (life).  
1646 Arapahoe St., Denver, Colo.  
General Supt., Chiksan M. Co., Chiksan,  
Chosen, Korea.
- Bradley, Joseph M., '01 (life).  
Box 356, Florence, Colo.
- Brandow, Glen A., '15 (non-member).  
Care Leonard Hotel, Butte, Mont.
- Brandt, A. R., '07 (life).  
820 Elati St., Denver, Colo.
- Breed, Charles F., '01 (non-member).  
Care Mrs. Chas. Stocking, 5120 So. Park  
Ave., Chicago, Ill.
- Bregman, Adolph, '14 (non-member).  
Draftsman, Nichols Copper Co., 16 W. 65th  
St., New York City.
- Brenneman, Frederick G., '16 (annual).  
Pottsville, Pa.
- Briber, Frank E., '16 (annual).  
201 S. Logan St., Denver, Colo.  
Engineering Office, Utah Cons. Mining Co.,  
care Highland Boy Mine, Bingham, Utah.
- Brinker, Arthur C., '01 (life).  
Gen. Mgr., The Buena Tierra Mining Co.,  
Ltd., 1209 Mills Bldg., El Paso, Tex.
- Brinker, Albert W., '08. Deceased.
- Bronstein, Charles N., '13 (annual).  
2925 W. Colfax Ave., Denver, Colo.
- Brooke, Lionel, '14 (annual).  
Goffs, Calif.  
Care Minas del Tajo Rosario, Sinaloa,  
Mexico.
- Brooks, Eugene C., '09 (annual).  
38 Lincoln St., Boston, Mass.  
Supt. Eastern Talc Co., Rochester, Vt.
- Brousseau, A. Ringgold, '14 (non-member).  
1413 Peters Ave., New Orleans, La.
- Brown, C. Leroy, '08 (annual).  
Box 295, Golden, Colo.  
Supt., Colorado Tungsten Co., Sugar Loaf,  
Colo.
- Brown, John B., '06 (life).  
Allis Chalmers Mfg. Co., 732 Salisbury  
House, London Wall, London E. C.,  
England.
- Brown, Norton H., '92 (life).  
General Supt., Topeka Cons. Mines Co.,  
Frontenac Cons. Mines, Ltd., Central  
City, Colo.
- Brown, R. L., '05 (non-member).  
Professor of Mining and Geology, Ala-  
bama Polytechnic Institute, Box "O,"  
Auburn, Ala.
- Brown, Samuel R., Jr., '11 (annual).  
Box 246, Montrose, Colo.  
Mill Supt., Plymouth Cons. Gold Mines,  
Ltd., Plymouth, Calif.
- Brown, Walter R., '10 (non-member).  
966 12th St., Oakland, Calif.  
San Pedro, N. Mexico.
- Bruce, Harry F., '00 (life).  
Supt. Spearhead Gold Mining Co., Reor-  
ganized, Box 765, Goldfield, Nev.
- Bruce, James L., '01 (annual).  
Manager, Butte & Superior Mining Co.,  
Box 1708, Butte, Mont.
- Bruce, Stuart S., '99 (non-member).  
Address lost.
- Bruderlin, Emil J., '10 (annual).  
1276 Emerson St., Denver, Colo.  
Ohio & Colorado Smelting Co., Box 346,  
Salida, Colo.
- Brugger, Melvin, '14 (annual).  
Care Columbus State Bank, Columbus,  
Neb.  
Care Forminiere Mission, Kasal, Tshi-  
kapa, Congo Belge, W. Africa (via Boma  
and Luebo).
- Brunel, Frank P., '12 (non-member).  
Chemist, Ajo Cons. Copper Co., Consult-  
ing Engineer, South Cornelia Copper Co.,  
Mitchell & Brunel, Consulting Mining  
Engineers and Brokers, Ajo, Ariz.
- Brunel, Rene L., '06 (non-member).  
Golden, Colo.
- Bryan, Russell R., '08 (annual).  
Hotchkiss, Colo.
- Bucher, John W., '02 (non-member).  
4267 Boulevard F, Denver, Colo.  
Chief Engineer, Colorado Iron Works, 33d  
and Wynkoop St., Denver, Colo.
- Buck, Arthur H., '97 (annual).  
1216 Race St., Denver, Colo.  
Engineer, Empire Zinc Co., 703 Symes  
Bldg., Denver, Colo.
- Budrow, William B., '92 (life).  
Mining Engineer, Calle Hidalgo 725, Gua-  
dalajara, Jalisco, Mexico.
- Buell, Arthur W., '08 (life).  
R. F. D. No. 3, Fort Smith, Ark.
- Bulkley, Frank, Hon. E. M., '98 (annual).  
Mining Engineer, 850 Equitable Bldg.,  
Denver, Colo.
- Bumsted, Edward J., '01 (non-member).  
Address lost.
- Bunger, Milne E., '09 (annual).  
4128 W. 32d Ave., Denver, Colo.  
Supt. Model Irrigation Co., Model, Colo.
- Burgess, Charles W., '09 (non-member).  
142 W. Cedar Ave., Denver, Colo.  
General Supt., Baltic Mines of Missouri,  
717 W. 3d St., Webb City, Mo.
- Burlingame, Walter E., '01 (life).  
Chemist and Assayer, Box 628, 1736 Law-  
rence St., Denver, Colo.

- Burns, Jay J., '16 (annual).  
812 Elk St., Franklin, Pa.  
Care Vernon Mining Co., Ironton, Colo.
- Burris, Samuel James, Jr., '15 (annual).  
1827 Grand Ave., Pueblo, Colo.  
Incas Mine, Hesperus, Colo.
- Busey, A. P., Jr., '05 (life).  
Care Dr. A. P. Busey, Ridge, Colo.  
General Manager, Penn Mining Co., Campo Seco, Calaveras Co., Calif.
- Bussey, Edwin E., '97 (non-member).  
2608 Blvd. F, Denver, Colo.  
Mine Boss, Alaska-Juneau M. Co., Box 564, Juneau, Alaska.
- Butler, G. Montague, '02 (annual).  
Dean, College of Mines and Engineering, University of Arizona, Tucson, Ariz.
- Butner, Daniel Worth, '15 (annual).  
812 E. Cache La Poudre St., Colorado Springs, Colo.  
Care Spanish American Iron Co., Daiquiri, Oriente, Cuba.
- Cadot, John Julius, '15 (non-member).  
301 19th Ave., Columbus, Ohio.  
Care Hardinge Conical Mill Co., Newhouse Bldg., Salt Lake City, Utah.
- Cain, Louis S., '13 (annual).  
1554 Marion St., Denver, Colo.  
Engineer Dept. of Public Works, No. 21 Cressaty's, Honolulu, T. H.
- Callahan, Thomas Wood, '14 (annual).  
Cia Real del Monte y Pachuca, Pachuca Hidalgo, Mexico.
- Calvert, Clarence E., '12 (non-member).  
15 Hennessy Annex, Butte, Mont.
- Campbell, Kent P., '10 (annual).  
1005 14th St., Boulder, Colo.  
Care Cia Met. Nac., Matehuala, S. L. P., Mexico.
- Canning, Herbert A., '97. Deceased.
- Canning, Walter E., '09 (annual).  
Care W. H. Beggs, 2235 California St., Denver, Colo.  
Kennecott, Alaska.
- Carlson, Monroe Oliver, '15 (annual).  
1760 S. Logan Ave., Denver, Colo.  
Met. and Min. Engineer, Burma Mines, Ltd., Nam Tu, Burma, India.
- Carman, John B., '10 (annual).  
1154 Corona St., Denver, Colo.  
1112 Mills Bldg., El Paso, Tex.
- Carney, Hugh J., '04 (life).  
Lessee, Ouray, Colo.
- Carpenter, Cranston H., '09 (non-member).  
Box 224 Checotah, Okla.
- Carpenter, Paul H., '10 (non-member).  
494 State St., Sharon, Pa.  
Ohio Copper Co., Lark, Utah.
- Carper, Armistead F., '14 (non-member).  
212 Boston Bldg., Denver, Colo.  
Supt. Sun Dial G. M. Co., Oatman, Ariz.
- Carstarphen, F. C., '05 (life).  
Tramway Engineer, Am. Steel and Wire Co., 233 Ardmore Ave., Trenton, N. J.
- Cary, Webster P., '10 (life).  
1515 E. 8th Ave., Denver, Colo.  
Supt. of Mill, Consolidated Copper Mines Co., Kimberly, Nev.
- Chamberlin, W. O., '05 (life).  
Sullivan, Colo.  
Landscape Architect, H. M. Chamberlin & Son, 615 Central Savings Bank Bldg., Denver, Colo.
- Chan, Albert K., '17 (non-member).  
Care Mr. Chen Lain, 701½ Jackson St., San Francisco, Calif.  
Box 704, Golden, Colo.
- Chandler, John W., Jr., '01. Deceased.
- Chapman, Irving A., '13 (non-member).  
354 Adelphi St., Brooklyn, N. Y.  
Coxswain, U. S. S. P. 41.
- Chapman, Thomas L., '06 (annual).  
708 East First Ave., Denver, Colo.
- Charles, Lavern J., '02 (life).  
566 High St., Denver, Colo.
- Chatin, August H., '16 (annual).  
Walsenburg, Colo.  
Tooele, Utah.
- Chedaey, William R., '08 (life).  
1414 Gaylord St., Denver, Colo.  
607 West College Ave., State College, Penn.  
Asst. Professor of Mining, Pennsylvania State College.
- Chen, Fan, '16 (non-member).  
Care "The Science," Shanghai, China.  
Care of Y. L. Tseng, Box 732, Golden, Colo.
- Chen, Ye-Fah, '14 (non-member).  
Pingshiang Colliery, Pingshiang, China.
- Cheney, George M., '17 (annual).  
Williamstown, Mass.
- Cheng, Dah-Chun, '14 (non-member).  
Care World Chinese Students' Federation, Shanghai, China.
- Chiang, Y. K., '17 (annual).  
Care U. Y. Yen, 2015 California St., Washington, D. C.  
Box 695, Golden, Colo.
- Christensen, Walter, '02 (non-member).  
Address lost.
- Church, Myron J., '98. Deceased.
- Clapp, Leroy P., '09 (non-member).  
Domain Rd., South Yarra, Melbourne, Australia.
- Clark, George B., '01 (life).  
Colorado and Wyoming R. R. Co., 615 Boston Bldg, Denver, Colo.
- Clark, Louis F., '14 (annual).  
418 Union Ave., S. E., Grand Rapids, Mich.  
Chemist Andes Copper Co., care Jorge Laurrien, Casilla 230, Antofagasta, Chile, South America.
- Clark, Winfred N., '98 (annual).  
Supt., Arkansas Valley Railway, Light and Power Co., Canon City, Colo.
- Clarke Roscoe H., '17 (annual).  
Address lost temporarily.
- Clausen, Samuel J., Jr., '11 (annual).  
Clear Lake, Iowa.  
Care Mexican Candelaria Co., 614 Crocker Bldg., San Francisco, Calif.
- Cline, Seymour F., '08 (non-member).  
603 Hurlbut Ave., Detroit, Mich.  
Buyer, Hudson Motor Car Co., Detroit, Mich.
- Coghill, Will H., '03 (annual).  
Metallurgist, Federal Bureau of Mines, Seattle, Wash.

- Cohen, Louis, '97 (life).  
228 W. Irvington Place, Denver, Colo.  
Mining Engineer, 229 First Nat'l Bank  
Bldg., Denver, Colo.
- Colburn, Clare L., '07 (annual).  
Allen & Colburn, 530 Equitable Bldg.,  
Denver, Colo.  
Overton, Nevada.
- Cole, Burt, '92 (non-member).  
Please send in his address, if you know it.
- Coleman, R. Prewitt, '03. Deceased.
- Collbran, Arthur H., '02 (life).  
Manager, Suan Mine, Pyeng Yang, Korea.  
Care J. Bribosia, Esq., Belgian Consul  
General, Seoul, Chosen, Korea.
- Collins, Phillip M., '93 (non-member).  
Care American Flotation Co., Silverton,  
Colo.
- Collins, Shrive B., '01 (non-member).  
Mining Engineer, Amethyst P. O., Creede,  
Colo.
- Comstock, Charles W., '90 (non-member).  
1005 First Nat'l Bank Bldg., Denver, Colo.
- Copeland, Clarence E., '13. Deceased.
- Corry, Arthur V., '98 (life).  
Mining Engineer, Box 23, Butte, Mont.  
Member Harper, Macdonald & Co.
- Corson, N. G., '07 (non-member).  
Del Norte, Colo.  
Mining Engineer, Creede, Colo.
- Cory, J. J., '05 (annual).  
1642 Detroit St., Denver, Colo.  
Instructor, West Denver High School.
- Cowperthwaite, Edward W., '13 (annual).  
Coal Creek, Colo.  
Box 784, Warren, Ariz.
- Cox, Augustus D., '03 (annual).  
427 Roberts St., Reno Nevada.
- Cox, W. Ray, '02 (life).  
Hillsdale, Multnomah Co., Oregon.  
Mineral Inspector, U. S. General Land  
Office, 310 Custom House, Portland, Ore.
- Craig, Allan E., '14 (non-member).  
665 Delaware St., Denver, Colo.  
1426 Evans St., Butte, Mont.
- Craigue, William H., '89 (non-member).  
What is his address?
- Cramer, Curtis P., '99 (non-member).  
Santa Rita, N. Mex.
- Crampton, Theo. H. M., '14 (annual).  
Octave, Ariz.
- Cronin, Harry M., '13 (annual).  
1218 Kalamath St., Denver, Colo.  
Pearce, Ariz.
- Crow, Wade L., '01. Deceased.
- Crowe, Thomas B., '00 (life).  
Mill Supt., Victor Mill Dept., The Port-  
land G. M. Co., Victor, Colo.
- Crutcher, Ernest R., '14 (non-member).  
949 F St., Salida, Colo.  
Box 176, Park City, Utah.
- Cuno, A. F., '05. Deceased.
- Currens, Warren W., '12 (non-member).  
1000 Corona St., Denver, Colo.  
Chemist, Ray Con. Copper Co., Box 101,  
Ray, Ariz.
- Curtis, Roy P., '09 (non-member).  
Broadway, Newburgh, N. Y.
- Daman, C. J., '13. Deceased.
- Daman, Arthur Chester, '15 (annual).  
2215 East 25th Ave., Denver, Colo.  
The Stearns-Roger Mfg. Co., 1720 Cali-  
fornia St., Denver, Colo.
- D'Arcy, R. L., '05 (non-member).  
Rifle, Colo.  
Oatman, Ariz.
- Dauth, Herman, '13 (non-member).  
710 E. 25th Ave., Denver, Colo.  
Exploration Engineer, Tonopah Placers  
Co., Box 214, Breckenridge, Colo.
- Davenport, John, '12 (annual).  
1 Menlo St., Brighton, Mass.  
Asst. Supt. Virginia Smelting Co., West  
Norfolk, Va.
- Davey, William R., '98. Deceased.
- Davis, Carl R., '95 (life).  
General Manager, Brakpan Mines Ltd.,  
Box 3, Brakpan, Transvaal, So. Africa.
- Davis, Gilbert L., '99 (life).  
U. S. Reclamation Service, Saco, Mont.
- Davis, Gilmore Sherwin, '15 (annual).  
The O. L. Davis Lumber Co., Trinidad,  
Colo.  
Care Empire-Arizona Copper Co., Parker,  
Ariz.
- Davis, John R., '13 (annual).  
4329 Ames St., Denver, Colo.
- De Camp, W. Val., '08 (non-member).  
Supt., Blue Bell Mine, Mayer, Ariz.
- De Cou, Ralph E., '01 (non-member).  
Cherry Creek, Nev.
- De Sollar, Tenney C., '04 (annual).  
Chief Engineer, Quincy Mining Co., Box  
45, Hancock, Mich.
- Dick, James E., '12 (annual).  
Office Address, 1023 First Nat'l Bank Bldg.,  
Denver, Colo.  
Manager, Akron Mine, White Pine, Colo.
- Divinney, George V., '03. Deceased.
- Dilts, Ira J., '08 (life).  
Chemist and Engineer, U. S. Portland Ce-  
ment Co., Concrete, Colo.
- Dittus, Edward J., '11 (annual).  
1438 Franklin St., Denver, Colo.
- Dockery, L. A., '95. Deceased.
- Dodge, David C., Jr., '15 (annual).  
861 Humboldt St., Denver, Colo.  
U. S. Army.
- Dollison, James E., '98 (life).  
Surveyor and Proprietor, Alma Assay Of-  
fice, Alma, Colo.
- Douglas, William C., '11 (non-member).  
676 W. 8th St., Plainsfield, N. J.  
Shift Boss., Jumbo Mine, Kennecott Cop-  
per Co., Kennecott, Alaska.
- Dove, Dean R., '13 (annual).  
529 E. 17th Ave., Denver, Colo.  
Chief Chemist, Magna Plant, Utah Copper  
Co., Box 42, Magna, Utah.
- Dow, William G., '06 (life).  
109 E. Alameda Ave., Denver, Colo.
- Downer, Roger H., '01 (annual).  
Downer Bros., Assayers and Chemists,  
Box 175, Goldfield, Nev.
- Downes, Frank A., '13 (annual).  
Assayer, Aurora Cons. Mines Co., Aurora,  
Nev.

- Doyle, Donald B.**, '09 (non-member).  
201 N. Crag St., Pittsburg, Pa.  
Societe Internationale Forestiere et Mini-  
ere du Congo, Tshikapa, Kasal District  
Belgian Congo.
- Draper, Marshall D.**, '97 (life).  
213 Boston Bldg., Denver, Colo.  
Box 32, Baxter Springs, Kansas.
- Drescher, Frank M.**, '00 (life).  
Craig, Colo.
- Dudgeon, James W.**, '13 (annual).  
1352 Lafayette St., Denver, Colo.  
Research Dept. B. & S. M. Co., 939 W.  
Granite St., Butte, Mont.
- Duer, C. L.**, '05 (non-member).  
1427 E. 29th Ave., Denver, Colo.
- Duggleby, Alfred Francis**, '15 (annual).  
R. R. No. 1, Davenport, Iowa.  
Supt. of Mines, Juragua Iron Co., Box 383,  
Santiago de Cuba, Cuba.
- Dunkle, Fred W.**, '03. Deceased.
- Dunlevy, Forrest S.**, '08 (non-member).  
1821 E. 31st Ave., Denver, Colo.  
Price, Utah.
- DuReil, Charles T.**, '95 (life).  
3867 Harvard Blvd., Los Angeles, Calif.  
Consulting Engineer, Imperial Reduction  
Co., Homewood Mining Co. and St. Paul  
Montana Mining Co.
- Dwelle, Jesse E.**, '96. Deceased.
- Dyer, Charles E.**, '10 (annual).  
Golden, Colo.  
Assistant Chief Engineer, Ray Cons. Cop-  
per Co., Box 215, Ray, Ariz.
- Dyrenforth, Donald**, '12 (annual).  
2568 Birch St., Denver, Colo.  
1023 First Nat'l Bank Bldg., Denver, Colo.
- Eames, L. B.**, '05 (annual).  
3009 High St., Pueblo, Colo.
- East, John H., Jr.**, '10 (annual).  
1510 Glenarm St., Denver, Colo.  
Safety Engineer, Chile Exploration Co.,  
Chuquicamata, Chile, S. A.
- Eaton, Albert L.**, '95 (non-member).  
General Superintendent, Chihuahua and  
Potosi Mining Corp., 1206 Mills Bldg.,  
El Paso, Texas.
- Eaton, Walter J.**, '13 (annual).  
Care Santa Ana Furniture Co., Santa Ana,  
Calif.  
Care Compania Minera de Penoles, Ojuela,  
Coahuila, Mexico.
- Eddy, Harold C.**, '09 (annual).  
532 N. Oxford Blvd., Los Angeles, Calif.
- Ehle, Mark, Jr.**, '01 (life).  
Consulting Engineer, Arcadia, Calif.
- Ehnbom, Lincoln**, '17 (non-member).  
2503 E. 3rd Ave., Denver, Colo.
- Ehrich, Walter L.**, '02 (annual).  
Secretary and Treasurer, Ehrich Galleries,  
30 W. 70th St., New York, N. Y.
- Elder, Robert B.**, '06 (annual).  
Metallurgist, Chiksan Mines, Chosen,  
Korea.
- Ellis, T. P.**, '07 (annual).  
4034 Ibis St., San Diego, Cal.  
Chief Assistant Engineer, Vulcan Land  
and Water Co., 924 8th St., Box 1412, San  
Diego, Calif.
- Ellis, William W.**, '02 (non-member).  
748 Monroe St., Denver, Colo.
- Ellsworth, Alfred C.**, '08 (life).  
Vice President and Secretary Ellsworth-  
Klanor Coal Co., Globe Bldg., Pittsburg,  
Kan.
- Emeis, Walter A.**, '04 (non-member).  
Emeis Mfg. Co., Magneto Experts, 217-221  
Iowa St., Davenport, Iowa.
- Emens, Ray B.**, '07 (annual).  
124 N. 3d St., Victor, Colo.  
Assistant Engineer, Portland G. M. Co., 519  
Granite Ave., Victor, Colo.
- Emrich, Clarence T.**, '09 (annual).  
Chief Chemist, Old Dominion Copper Min-  
ing & Smelting Co., Box 1163, Globe,  
Ariz.
- Emrich, Horace H.**, '03. Deceased.
- Emrich, Jay L.**, '12 (non-member).  
3221 Franklin St., Denver, Colo.  
Chief Chemist, Durango Plant, A. S. & R.  
Co., 800 Seventh Ave., Durango, Colo.
- Engle, Frederick**, '11 (annual).  
2308 Quitman St., Denver, Colo.  
Care Burma Mines, Ltd., Nam Tu, North-  
ern Shan States, Burma, India.
- Enriquez, Edwardo W.**, '09 (life).  
Independencia 277, Chihuahua, Chih., Mex.  
Care Cusi Mexicana Mining Co., Cusi-  
huachic, Chih., Mex.
- Erickson, Guy W.**, '12 (non-member).  
Ouray, Colo.  
Georgetown, Calif.
- Espinosa E., Miguel**, '14 (non-member).  
604 S. 6th St., Champaign, Ill.
- Essig, Benjamin Clark**, '15 (annual).  
Golden, Colo.  
Professor of Mining, Oklahoma School of  
Mines, Wilburton, Okla.
- Estes, Frank M., Jr.**, '02 (non-member).  
714 Mills Bldg., El Paso, Texas.  
Care A. S. & R. Co., Casilla 2, Valparaiso,  
Chile, S. A.
- Evans, Henry R.**, '00 (non-member).  
City Engineer, Williston, N. D.
- Evans, Willis W.**, '08. Deceased.
- Everest, Herbert A.**, '06 (annual).  
511 E. 10th St., Oklahoma City, Okla.  
Mine Supt., Russellville, Arkansas.
- Ewing, Charles R.**, '00 (life).  
U. S. Mineral Surveyor, Del Norte, Colo.
- Eye, Clyde M.**, '95 (life).  
1012 Sahwatch St., Colorado Springs, Colo.  
Benguet Cons. M. Co., Bagulo, Prov. of  
Benguet, P. I.
- Farnam, Lynn C.**, '09 (non-member).  
President, Farnam Bros. Co., General Con-  
tractors, 938 Plymouth Bldg., Minne-  
apolis, Minn.
- Farrar, Russell J.**, '10 (annual).  
Salem, Ore.  
Mill Supt., Copper State Mining Co., Cop-  
per Creek, Ariz.
- Fay, Charles H.**, '13 (non-member).  
325 Reilly Ave., Wyoming, Ohio.  
Engineer, Hanover Mines, Empire Zinc  
Co., Hanover, N. Mex.
- Fay, Herbert M.**, '13 (annual).  
Engineer, Tuolumne Copper M. Co., Room  
401 Leonard Hotel, Butte, Mont.
- Febles, John C.**, '97 (non-member).  
Chemist, Anaconda Copper Mining Co.,  
Box 105, Butte, Mont.

- Ferguson, Kenneth S.**, '17 (annual).  
2233 Eudora St., Denver, Colo.  
Marine Barracks, Mare Island, Vallejo, Calif.
- Field, Edmund M.**, '12 (life).  
2522 Gladstone Blvd., Kansas City, Mo.  
107 Keith & Perry Bldg., Kansas City, Mo.
- Field, Fred M.**, '95 (life).  
2118 Crenshaw Blvd., Los Angeles, Calif.
- Fillius, Lee L.**, '04 (non-member).  
Barter Springs, Kansas.
- Filteau, C. A.**, '07 (life).  
Supt., National Mines, Ltd., Cobalt, Ontario, Canada.
- Finigan, William H.**, '06 (annual).  
6323 Waterman Ave., St. Louis, Mo.  
MacGowan & Finigan Cord Co., 42 Gay Bldg., St. Louis, Mo.
- Fischer, Oscar A.**, '14 (annual).  
Care F. J. Zuttermeister, 5918 Race Ave., Chicago, Ill.  
Pecos Mines Co., Valley Ranch, N. Mex.
- Fitz Gerald, Ronald P.**, '10 (annual).  
Assayer and Mining Engineer, 108½ N. Main St., Roswell, N. M.
- Fleming, William L.**, '03 (annual).  
Mining Engineer, 50 Broad St., New York, N. Y.
- Flinn, Alfred R.**, '13 (annual).  
1715 E. Superior St., Duluth, Minn.  
Mining Engineer, Empire Zinc Co., 228 E. 9th St., Leadville, Colo.
- Flint, F. F.**, '05 (non-member).  
R. F. D. No. 4, Greeley, Colo.
- Floyd, John A.**, '88. Deceased.
- Foo, Shu**, '14 (non-member).  
Care World Chinese Students' Federation, Shanghai, China.
- Foote, Frederick W.**, '14 (annual).  
80 Broadway, New York, N. Y.  
Dios Mining Corp., Rua Serpa Pinto 93, Viseu, Portugal.
- Forbes, Henry H.**, '13 (non-member).  
Address lost.
- Ford, Homer D.**, '05 (annual).  
290 S. Grant St., Denver, Colo.  
Supt., Gilson Asphaltum Co., Watson, Utah.
- Foster, George C.**, '03 (non-member).  
Where is he?
- Franck, Albert C.**, '04 (life).  
Box 136, San Diego, Calif.  
Secretary and Treasurer, Citrus Soap Co., San Diego, Calif.
- Franck, Robert P.**, '04 (annual).  
Civil Engineer, 3825 4th St., San Diego, Calif.
- Frank, Harry L.**, '01. Deceased.
- Frank, Morton E.**, '06 (annual).  
Purchasing Agent, Stratford Hotel Co., Stratford Hotel, Jackson St. and Michigan Ave., Chicago, Ill.
- Frankel, Jacob M.**, '13 (annual).  
628 3rd Ave., New York, N. Y.  
Secretary to General Supt. of Mines, Arizona Copper Co., Box 493, Morenci, Ariz.
- Frazer, Verne**, '12 (annual).  
Moweaqua, Ill.  
Engineer, Seoul Mining Co., Holkol, Chosen, Korea.
- Freeland, William H.**, '06. Deceased.
- French, Burr J.**, '08 (non-member).  
Chief Engineer, Cinco Minas Co., Magdalena, Jalisco, Mexico.
- French, Clare L.**, '13 (annual).  
Chemist, Research Corp. of N. Y., Care Y. M. C. A., Portsmouth, Va.
- French, Sidney W.**, '08 (annual).  
2525 Elm St., Denver, Colo.  
Assayer, Gold Road Mines Co., Gold Road, Ariz.
- Frey, Carl E.**, '13 (non-member).  
1019 Rood Ave., Grand Junction, Colo.  
Tooele, Utah.
- Frick, Frederick F.**, '08 (non-member).  
203 East Main St., Peru, Ind.  
Anaconda Copper Mining Co., 306 Hickory St., Anaconda, Mont.
- Friedhoff, W. H.**, '07 (life).  
Mineral Examiner, U. S. Forest Reserve, San Francisco, Calif.
- Fry, Louis D.**, '03 (life).  
Box 1358, Bisbee, Ariz.
- Fullaway, Richard M.**, '16 (non-member).  
102 S. Central Ave., Eagle Rock City, Los Angeles, Calif.
- Fullerton, Wilfred**, '12 (non-member).  
1208 Sherman St., Denver, Colo.
- Funk, Walter A.**, '03 (annual).  
Mining Engineer, U. S. Mineral Surveyor, Idaho Springs, Colo.
- Galligan, John T.**, '11. Deceased.
- Gardner, John I.**, '06. Deceased.
- Garnett, Thomas H.**, '11 (annual).  
1315 Court St., Pueblo, Colo.  
Supt., San Xavier Mine, Empire Zinc Co., Bin Q, Tucson, Ariz.
- Garrison, Murray E.**, '16 (annual).  
Golden, Colo.  
Care East Butte Mining Co., Box 1418, Butte, Mont.
- Garza Aldape, J. M.**, '05 (non-member).  
Apartado 225, Torreon, Coah., Mexico.  
(Address doubtful).
- Gaul, John C.**, '12 (non-member).  
1111 Diamond St., Butte, Mont.  
Foreman, Berkeley Mine, Anaconda Copper Mining Co.
- Gauthier, Charles B.**, '16 (annual).  
344 24th St., Detroit, Mich.  
617 First Ave., Denver, Colo.
- Geary, E. S.**, '12 (annual).  
1220 S. Sherman St., Denver, Colo.  
1337 East 8th South, Salt Lake City, Utah.
- Geary, Richard E.**, '09 (annual).  
643 Holly St., Portland, Ore.  
1106 N. W. Bank Bldg., Portland, Ore.
- Gehrman, Charles A.**, '86 (life).  
Who knows Gehrman's address?
- Geib, Karl V.**, '11 (annual).  
1055 Mariposa St., Denver, Colo.
- Geisel, C. R.**, '07 (non-member).  
2714 E. 13th Ave., Denver, Colo.  
Engineer, Denver Union Water Co.
- Geringer, George T.**, '10 (annual).  
3485 Colerain Ave., Cincinnati, Ohio.  
Care G. B. Wicks, 216 Masonic Bldg., Manila, P. I.
- Giddings, Donald S.**, '00 (non-member).  
Chemist, Union Salt Co., 11 West Hickory St., Chicago Heights, Ill.

- Gilbert, Arthur K., '06 (annual).  
Care Ray Cons. Co., Ray, Ariz.
- Gilbert, William J., '06 (non-member).  
Exchange Manager, Mountain States T. & T. Co., Box 7, Brighton, Colo.
- Glasgow, Charles M., '10 (non-member).  
4536 Westminster Place, St. Louis, Mo.  
Supt., Kelley Mine, Empire Zinc Co., Kelly, N. Mex.
- Goe, Harold H., '08 (non-member).  
Supt., Brick Dept., Anaconda Copper Mining Co., Anaconda, Mont.
- Golden, J. P., '07 (non-member).  
Register, Land Office, O'Neill, Nebr.
- Goldfain, George, '17 (annual).  
2733 W. 13th Ave., Denver, Colo.
- Goodale, F. A., '10 (annual).  
Engineer and Surveyor, You Bet Mining Co., Dutch Flat, Calif.
- Goodale, Stephen L., '04 (life).  
317 N. Craig St., Pittsburgh, Pa.  
Professor of Metallurgy, School of Mines, University of Pittsburgh, Pittsburgh, Pa.
- Gordon, John G., Jr., '06 (non-member).  
Chief Engineer, Layne & Bowler Pump Co., 909 Harvard Blvd., Los Angeles, Calif.
- Gow, P. A. '07 (life).  
Manager, Tuolumne Copper Mining Co., Butte, Mont.
- Gow, Thomas T., '14 (annual).  
Tongchiapo, Chihhsia, Tengchow, Shantung, China.
- Graham, Allan H., '15 (annual).  
Ottawa, Ohio.  
Burma Mines Co., Ltd., Nam Tu, Burma, India.
- Grant, Lester S., '99 (life).  
General Manager, Jumper California Gold Mines Co., Stent, Calif.
- Gray, Latimer D., '95 (non-member).  
Prop., Chandler Ice Co., Chandler, Okla.
- Graybeal, Edward V., '14 (annual).  
Care J. A. Wilcoxson, DeBeque, Colo.  
1513 Second Ave., North, Great Falls, Mont.
- Greensfelder, Nelson S., '12 (annual).  
116 N. Woodlawn Ave., Kirkwood, Mo.
- Greenwood, John Harold, '15 (annual).  
531 First Ave., Salt Lake City, Utah.  
Care Utah Metal and Tunnel Co., Bingham Canyon, Utah.
- Gregg, Daniel B., '13 (life).  
706 Provident Bank Bldg., Cincinnati, O.  
Belmont, Nev.
- Greve, E. E., '05 (life).  
206 Bayne Ave., Bellevue, Pa.
- Grider, R. L., '05 (life).  
534 14th St., Eugene, Ore.  
Mining Dept., University of Kansas, 1136 Tennessee St., Lawrence, Kan.
- Grier, Charles D., '12 (annual).  
Care G. G. Hutcheson, Esq., 1031 Bidwell St., Vancouver, B. C., Can.  
Accountant, Cyanide Plant Alaska-Treadwell G. M. Co., Douglas, Alaska.
- Griffith, John R., '09 (life).  
151 Archer Place, Denver, Colo.  
Research Engineer, Norton Co., Worcester, Mass.
- Grigsby, Gail G., '14 (annual).  
4328 Vrain St., Denver, Colo.  
Platteville, Colo.
- Griswold, George G., '96 (life).  
Supt., Smelting & Lead Refinery, care A. S. & R. Co. 106 High St., Perth Amboy, New Jersey.
- Griswold, George G., Jr., '14 (non-member).  
Timber Butte M. Co., Butte, Mont.
- Grommon, Philo D., '07 (life).  
Berthoud, Colo.
- Gross, John, '97 (life).  
Box 43, Georgetown, Colo.
- Gross, LeRoy M., '14 (non-member).  
Engineer, Aetna Explosives Co., 431 Riverside Drive New York, N. Y.
- Hager, E. T., '12 (annual).  
517 So. St. Andrews Place, Los Angeles, Calif.
- Hale, General Irving, Hon., '05 (non-member).  
Gen. Mgr., General Electric Co., First National Bank Bldg., Denver, Colo.
- Hallett, Alfred F., '09 (life).  
1083 Ogden St., Denver, Colo.  
Montrose, Colo.
- Hallett, R. L., '05 (annual).  
Chemist, National Lead Co., 129 York St., Brooklyn, N. Y.
- Hallett, William J., '05 (non-member).  
Chief Engineer, U. P. Coal Co., Rock Springs, Wyo.
- Hamilton, Frank R., '98 (non-member).  
Where is he?
- Hamilton, William J., '09 (life).  
Care Mrs. H. B. Payne, R. F. D. No. 31, Santa Barbara, Calif.  
Assistant Smelter Supt., Granby Con. M. S. & P. Co., Ltd., Anyox, B. C., Canada.
- Hammen, Charles W., '14 (non-member).  
2219 Dayton St., Chicago, Ill.
- Hammond, Herbert R., Jr., '13 (non-member).  
1444 Newport St., Denver, Colo.
- Hammond, John Hays, Hon., '09 (annual).  
Mining Engineer, 71 Broadway, New York, N. Y.
- Hammond, William L., '09 (non-member).  
Treasurer, Saguache County.  
Box 53, Saguache, Colo.
- Hand, Edwin E., Jr., '12 (annual).  
210 Newport Ave., Long Beach, Calif.  
Parker, Ariz.
- Hansen, Charles L., '09 (life).  
Orange Grower, Box 19, R. F. D. No. 1, Fullerton, Calif.
- Harkison, Charles W., '06 (annual).  
1520 Franklin St., Boise, Idaho.
- Harper, Robert R., '14 (non-member).  
306 Fleming Bldg., Des Moines, Iowa.
- Harrington, Charles L., '12 (annual).  
Lathrop, Mo.  
Mgr. Overall Mining Co., Dove Creek, Colo.
- Harrington, Daniel, '00 (life).  
U. S. Bureau of Mines, Montana School of Mines, Butte, Mont.
- Harrington, Orville, '98 (life).  
1485 South University St., Denver, Colo.  
Assistant Secretary, etc., C. S. M. Alumni Association, Golden, Colo.

- Harris, Arnold W.**, '12 (annual).  
Wells Fargo Bldg., San Francisco, Calif.
- Harris, Frank B.**, '13 (annual).  
Box 32 Tyrone, N. Mex.
- Harris, Morrison**, '08 (life).  
Overbrook, Pa.
- Harris, Willard F.**, '01. Deceased.
- Harrison, Thomas S.**, '08 (life).  
306 International Trust Bldg., Denver, Colo.
- Harrod, Wayne Allen**, '16 (annual).  
634 E. Washington St., Fort Wayne, Ind.  
Care Eng. Dept., Ray Cons. Copper Co., Ray, Ariz.
- Hartzell, Lester J.**, '95 (life).  
Professor of Chemistry, Montana School of Mines, Butte, Mont.
- Harvey, John V.**, '11 (annual).  
Box 254, 1201 18th St., Sioux City, Iowa.  
Care Minas de Matahambre, Prov. Pinar del Rio, Cuba.
- Haselton, Charles Farnsworth**, '15 (annual).  
283 Park Ave., River Forest, Ill.  
Care Verona Mining Co., Verona, Mich.
- Hawley, R. H.**, '93 (annual).  
Smelter Supt., Magna Plant, Garfield, Utah.
- Hayden, Wallace H.**, '14 (annual).  
207 Washington Ave., Batavia, N. Y.  
520 Jeannette St., Wilkensburg, Pa.
- Hazard, William J.**, '97 (life).  
Professor of Electrical Engineering, Colorado State School of Mines, Box 246, Golden, Colo.
- Heatley, F. Eugene**, '15 (annual).  
1407 E. Colfax Ave., Denver, Colo.  
Care Minas de Matahambre, Prov. Pinar del Rio, Cuba.
- Heaton, Charles D.**, '12 (non-member).  
Cedar, Colo.
- Heinrichs, Walter E.**, '13 (annual).  
1318 Lancaster Ave., Swissvale, Pa.  
Engineer, Nevada Cons. Copper Co., Box 353, Ruth, Nev.
- Heitz, George H.**, '06 (annual).  
214 W. 9th St., Leadville, Colo.
- Heitzman, Mearle G.**, '17 (annual).  
1352 Lafayette St., Denver, Colo.  
Alma, Colo.
- Hensley, James H., Jr.**, '06 (annual).  
1620 E. 13th St., Denver, Colo.  
Mining Engineer, Miami Copper Co., Box 100, Miami, Ariz.
- Herres, Otto, Jr.**, '11 (annual).  
1728 Race St., Denver, Colo.  
Assistant Engineer, Utah Fuel Co., Castle Gate, Utah.
- Hewitt, A. F.**, '05 (life).  
Contracting Engineer, 1250 Pearl St., Denver, Colo.
- Hlester, Arthur J.**, '12 (annual).  
1340 Garfield St., Denver, Colo.  
Empire Zinc Co., 703 Symes Bldg., Denver, Colo.
- Higgins, Robert**, '17 (annual).  
1433 Josephine St., Denver, Colo.  
Box 402, Tooele, Utah.
- Hill, Charles R.**, '12 (life).  
Care Livingston Platt, 2 Rector St., New York, N. Y.  
Breckenridge, Colo.
- Hill, Frank C.**, '04 (life).  
General Inspector, Utah Fuel Co. Somerset, Colo.
- Hills, Leon P.**, '08 (non-member).  
Soulsbyville, Calif.
- Hiladale, Paul**, '12 (non-member).  
Sauk Centre, Minn.  
Wellington Mines Co., Breckenridge, Colo.
- Hilton, Howard J.**, '10 (non-member).  
2470 W. 32d Ave., Denver, Colo.  
Salesman and Member, Hilton & Peck, Manufacturers Agents, Box 1023, Phoenix, Ariz.
- Hindry, Willis E.**, '92 (non-member).  
Address lost.
- Hinman, Dale Durkee**, '15 (non-member).  
Austin, Colo.  
Second Lieutenant, U. S. Coast Artillery, Fortress Monroe, Va.
- Ho, Chieh**, '13 (annual).  
Professor of Mining and Metallurgy, Government University, Peking, China.
- Hodgson, Arthur R.**, '99 (life).  
Granby Cons. M., S. & P. Co., Anyox, B. C., Can.
- Hoffius, Max J.**, '17 (annual).  
Belize, British Honduras, C. A.  
S. A. E. House, Golden, Colo.
- Hollis, D. D.**, '07. Deceased.
- Hornbein, Julius**, '05 (annual).  
Mineral Inspector, U. S. Land Office, 322 Federal Bldg., Salt Lake City, Utah.
- Howat, A. M.**, '07 (non-member).  
Supt. of Mines, Mokelumne Mines Co., Mokelumne Hill, Calif.
- Howbert, Van Dyne**, '16.  
22 E. Espanola St., Colorado Springs, Colo.  
Engineer U. S. Training Camp, Ft. Riley, Kansas.
- Hoyt, George F.**, '96. Deceased.
- Hsueh, Kwei L.**, '17 (annual).  
Care W. Y. Chin., Box 144, Inst. of Technology, Cambridge, Mass.
- Hu, Shih-hung**, '16 (annual).  
Kiukiang, China.  
Hartley Hall, Columbia University, New York, N. Y.
- Hubbard, John V.**, '10 (annual).  
1234 W. Kinzie St., Chicago, Ill.  
Horticulturist, Box 227, Grass Valley, Calif.
- Hudson, Waller C.**, '13 (non-member).  
Care B. F. Hudson, Lancaster, Ky.  
South American Dev. Co., Box 665, Guayaquil, Ecuador, So. America.
- Hughes, Earle E.**, '12 (annual).  
1365 Steele St., Denver, Colo.  
Flotation Engineer, Empire Zinc Co., 515 River St., Canon City, Colo.
- Hugo, Herman W.**, '13 (annual).  
1819 Ruckle St., Indianapolis, Ind.  
Oakes Home, Heartease, 2825 W. 32nd Ave., Denver, Colo.
- Hull, Cecil B.**, '09 (annual).  
135 West Maple St., Denver, Colo.  
Engineering Dept., Butte & Superior Mining Co., Room 401 Leonard Hotel, Butte, Mont.



- Hunt, Harry D., '09 (annual).  
2126 E. Lombard St., Baltimore, Md.  
Chemist, Miami Copper Co., Box 100, Miami, Ariz.
- Hunt, T. R., '05 (life).  
2941 Denver Place, Denver, Colo.
- Huntington, Walter C., '12 (annual).  
2328 Hooker St., Denver, Colo.  
Idaho Springs, Colo.
- Hutton, Meritt, '14 (life).  
2223 Gilpin St., Denver, Colo.  
Chief Engineer, Rembrandt, Peale Interests, St. Benedict, Pa.
- Hyder, C. A., '05 (non-member).  
3151 W. 24th Ave., Denver, Colo.  
Hyder & Hyder, Mining Engineers, Nacozari, Son., Mex., via Douglas, Ariz.
- Hyder, Frederick B., '03 (non-member).  
904 Hobart Bldg., San Francisco, Calif.
- Ickis, Harry M., '02. Deceased.
- Ingersoll, Julius C., Jr., '06 (life).  
3131 E. 4th Ave., Denver, Colo.  
Telluride, Colo.
- Ingols, James A., '98 (life).  
Mining and Civil Engineer, Milford, Utah.
- Ireland, Carrol B., '08 (life).  
R. F. D. No. 3, Box 12 G, San Diego, Calif.
- Isom, E. W., '07 (life).  
Asst. to Pres. Sinclair, Cudahy Refining Co., 923 Conway Bldg., Chicago, Ill.
- Iwai, Kyosuke, '09 (life).  
Omigawa-Machi, Katori-gori, Chibaken, Japan.  
Care Yusenji Copper Mine, Takeuchi Mining Co., Ltd., Kokubumura, Nomigori, Ishikawaken, Japan.
- Izett, Glenn, '03 (non-member).  
2750 S. Grant St., Denver, Colo.
- Jackson, Walter H., '01 (non-member).  
Address lost.
- Jacques, Henry L., '08 (annual).  
Box 337, San Fernando, Cal.  
Supt. of Construction, Los Angeles Public Service, City of Los Angeles, Water Dept.
- Jarvis, Dr. Royal P., '97 (non-member).  
Chief Chemist, Cananea Cons. Copper Co., probably Jerome, Ariz.
- Jewel, Gilbert E., '93 (non-member).  
Please send in his address, if known.
- Johnson, Byron M., '08 (annual).  
Lake Valley Mines Co., Lake Valley, New Mexico.
- Johnson, Edward W., '91 (non-member).  
University Club, Salt Lake City, Utah.
- Johnson, Gilbert, Jr., '99. Deceased.
- Johnson, John B., '14 (non-member).  
R. F. D. No. 2, Wheeling, W. Va.  
Oakdale, Pa.
- Johnson, Junius W., '01 (life).  
State Engineer's Office, State Capitol, Denver, Colo.
- Johnson, Lafayette G., '04 (non-member).  
Mining Supt., Federal Lead Co., Flat River, Mo.
- Johnston, Fred, '98 (annual).  
Supt. A. V. Smelter, Leadville, Colo.
- Jones, Edward B., '00 (non-member).  
Mining Engineer, Lehi, Utah.
- Jones, Ernest F., '10 (annual).  
Engineering Dept., Burro Mtn. Copper Co., Box 8, Tyrone, N. Mex.
- Jones, Frank H., '98 (annual).  
Wendell, Idaho, R. F. D.  
St. Joseph Lead Co., Box 585, Bonne Terre, Mo.
- Jones, Mrs. F. H., '98 (non-member).  
(Florence Hazel Caldwell), Wendell, Ida., R. F. D.
- Jones, Fred, '00 (life).  
Mining Engineer, Portland Gold Mining Co., Victor, Colo.
- Jones, Percy, Jr., '08 (life).  
R. F. D. No. 2, Tucson, Ariz.  
Arlington, Ariz.
- Jones, Vincent K., '10 (annual).  
Consulting Hydraulic Engineer, First National Bank Bldg., East Las Vegas, N. Mex.
- Jones, W. A., Jr., '08 (non-member).  
Ware Neck, Gloucester Co., Virginia.  
2200 Park Ave., Richmond, Va.
- Juchem, Harold H., '10 (annual).  
Arvada, Colo.  
Cyanide Mill Supt., Aguacate Mines, San Mateo, San Juan, Costa Rico, C. A.
- Kaanta, Henry W., '15 (annual).  
Care Bingham-New Haven, Bingham, Utah.
- Keeney, Robert M., '10 (annual).  
Somerville, Conn., Box 97.  
603 Symes Bldg., Denver, Colo.
- Kell, Wayne S., '06 (non-member).  
Professor of Mining, Georgia School of Technology, Atlanta, Ga.
- Kelley, Fred G., '99 (non-member).  
Can anyone tell us where he is?
- Kelley, William A., '97 (life).  
1272 Columbine St., Denver, Colo.  
134 E. Washington St., Springfield, Ohio.
- Kelso, Duane C., '10 (annual).  
618 S. Pennsylvania St., Denver, Colo.  
Gold Hill, Boulder Co., Colo.
- Kennedy, George A., '95 (life).  
2741 Federal Blvd., Denver, Colo.  
Mining Engineer, Western Chemical Mfg. Co., Denver, Colo.
- Kenner, Alvin R., '07. Deceased.
- Kerr, Victor E., '00 (annual).  
Surveyor, Bureau of Lands, Manila, P. I.
- Kilbourn, Burwell N., '13 (non-member).  
1124 Court St., Pueblo, Colo.  
Assayer, A. S. & R. Co., Murray, Utah.
- Kilbourn, William D., '04 (annual).  
1124 Court St., Pueblo, Colo.  
Chief Consulting Engineer, U. S. Smelter Co., 250 Lexington Ave., New York, N. Y.
- Kilgour, Hamilton, '08 (life).  
R. E. Office, 12 Duke St., Chelmsford, Essex, England.
- Kimball, George K., '92 (life).  
Owner, Manager, Old Town M. & S. Co., The Lamartine Mines, Mgr., I. D. L. Co., Idaho Springs, Colo.
- Kimball, Harlow M., '04 (non-member).  
Architect, 358 Harper Ave., Hollywood, Calif.
- Kimball, Joseph S., '92 (non-member).  
Box 376, Central City, Colo.

- King, Henry E., '03 (non-member).**  
Honolulu, H. I.
- Kingman, Jerry, '88. Deceased.**
- Kirchman, Robert I., '09 (annual).**  
916 North Park Ave., Austin Station, Chicago, Ill.  
Box 147, Silver City, New Mexico.
- Kissock, Alan, '12 (annual).**  
71 Wall St., New York, N. Y.  
General Manager Molybdenum Products Co., 944 N. 4th Ave., Tucson, Ariz.
- Klatt, Carl L., '14 (non-member).**  
Address lost.
- Kleff, J. M., '06 (life).**  
Mining Engineer, Platt & Kleff, Box 895, Leadville, Colo.
- Knepper, C. M., '17.**  
19 West Main St., Somerset, Pa.  
Bethlehem, Pa. (Retired Captain U. S. Army).
- Knight, Hal G., '08 (non-member).**  
Manager, The Glacier Creek G. M. Co., Porcupine, Alaska, via Haines.
- Knight, R. E., '07 (non-member).**  
Assistant Cashier, Alliance National Bank, City Engineer, Alliance, Nebr., County Engineer, Box Butte Co., Nebr., Alliance Nat'l Bank Bldg., Alliance, Nebr.
- Knowles, Benjamin W., '08 (life).**  
1320 Detroit St., Denver, Colo.  
Engineer, Daly Reduction Co., Ltd., Hedley, B. C., Canada.
- Koch, William F., '11 (annual).**  
539 Oakdale Ave., Chicago, Ill.  
Salesman, Hercules Powder Co., 1020 Kearns Bldg., Salt Lake City, Utah.
- Koelker, Karl L., '14 (non-member).**  
1710 Cherry St., Toledo, Ohio.  
702 Pearl St., Joplin, Mo.
- Koerner, Albert J., '06 (life).**  
Secretary and Treasurer, Koenitzer Tanning Co., 2215 So. Michigan Ave., Saginaw, W. Side, Mich.
- Kraemer, Edward L., '98. Deceased.**
- Krohn, Arthur, '14 (annual).**  
1457 Leland Ave., Chicago, Ill.  
Temp., care H. A. Everest, Russellville, Ark.
- Krueger, Geo. S., '07 (annual).**  
612 Kimbark St., Longmont, Colo.  
Mine Supt., Judge M. and Smelting Co., Park City, Utah.
- Kruger, Herman A., '09 (annual).**  
Zelza, Los Angeles Co., Calif.  
General Mine Supt., care Doe Run Lead Co., Rivermines, Mo.
- Krumm, Samuel Z., '14 (non-member).**  
975 S. High St., Columbus, Ohio.  
Testing Dept., A. C. M. Co., 520 Birch St., Anaconda, Mont.
- Lampe, Oscar A., '98 (non-member).**  
3012 White Oak St., El Paso, Texas.
- Langrall, Charles A., '08 (annual).**  
Mechanical Engineer, Atlantic Can Co., 312 Oakdale Rd., Roland Park, Md.
- Lannon, F. P., Jr., '07 (life).**  
320 E. 2nd St., Pueblo, Colo.  
U. S. Zinc Co., Sand Springs, Okla.
- Lannon, James A., '11 (annual).**  
1024 North Main St., Pueblo, Colo.  
General Supt., Atlas Mining & Smelting Co., Sneffels, Ouray Co., Colo.
- Larison, E. L., '05 (non-member).**  
Supt., Acid Plant, A. S. & R. Co., Garfield, Utah.
- Larsh, Walter S., '04 (life).**  
Supt., Underground Mines, Nevada Cons. Copper Co., Ruth, Nev.
- Latimer, Bertrand J., '10 (non-member).**  
210 San Francisco St., El Paso, Texas.
- Laughlin, Samuel W., '10 (life).**  
Rockville, Mo.  
Leasing, Ely, Nev.
- Laurance, Bert M., '11 (non-member).**  
1206 D St., San Bernardino, Calif.  
Box 522, Tonopah, Nev.
- Lavender, Harrison M., '16 (non-member).**  
Address lost.
- Leahy, Richard A., '13 (annual).**  
32 Whitwell Rd., Southsea Hants, Eng.  
Commercial Hotel, Bonne Terre, Mo.
- Lee, Frank W., Jr., '11 (non-member).**  
3447 Bryant St., Denver, Colo.
- Lee, George M., '10 (annual).**  
Chemist, Granby Con. M., S. & P. Co., Ltd., Grand Forks, B. C., Can., Box 440.
- Lee, Hunyet, '16 (annual).**  
Care Lay Lan Sim, Toko, Passar, Baroe, Batavia, Java.  
Hartley Hall, Columbia Univ., New York City.
- Lee, Ping, '14 (non-member).**  
World Chinese Students Federation, Shanghai, China.
- Lee, Robert P., '05. Deceased.**
- Lee, Wallace, '04 (annual).**  
Box 1567, Tulsa, Okla.
- Leeke, Dana W., '10 (annual).**  
Upland, Calif.  
Seoul Mining Co., Holkol, Whang Hai Province, Korea.
- Lehmer, Frank W., '02 (non-member).**  
1822 Emmett St., Omaha, Nebr.  
Cuatolapam, Vera Cruz, Mexico.  
(Mexican address uncertain.)
- Lemke, Carl A., '00 (annual).**  
283 F St., Salt Lake City, Utah.  
Supt. of Concentrating Dept., U. S. Smelting Co., Midvale, Utah.
- Lennox, Luther W., '05 (non-member).**  
339 N. Nevada Avenue, Colorado Springs, Colo.  
Asst. Supt., Portland G. M. Co., Mill Dept., Victor, Colo.
- Lerchen, F. H., '97 (non-member).**  
Eagle Rock, Calif.
- Lesh, Herbert B., '10 (non-member).**  
Suite 1014, 111 Broadway, New York, N. Y.  
Cerro de Pasco Co., Cerro de Pasco, Peru, S. A.
- Leshner, Carl E., '08 (non-member).**  
Geologist, U. S. Geological Survey, Washington, D. C.
- Levis, Alfred C., '17 (annual).**  
3407 Clifton Ave., Baltimore, Md.

- Levy, Archibald L., '06 (life).**  
3233 Vernon Ave., Chicago, Ill.  
Manager, Great Western Sm. & Ref. Co.,  
Box 278, Seattle, Wash.
- Levy, Milton M., '16 (annual).**  
525 Cache la Poudre St., Colorado  
Springs, Colo.  
Engineer Dept., Ray Cons. Copper Co.,  
Ray, Ariz.
- Lewis, Alfred S., '05 (non-member).**  
1575 Pennsylvania St., Denver, Colo.  
Box 954, Phoenix, Ariz.
- Lewis, Frank E., '01 (annual).**  
1007 South Race St., Denver, Colo.  
314 W. Gold St., Butte, Mont.
- Lewis, William B., '92 (life).**  
President, The Oakdale Coal Co., 40 Wall  
St., New York, N. Y.
- Lewis, William M., '09 (non-member).**  
Where is Lewis?
- Libby, James L., '06 (life).**  
709 E. 21st St., Cheyenne, Wyo.  
Supt., Lion Coal Co., Lion, Wyo., via Rock  
Springs.
- Liddell, Charles A., '03 (non-member).**  
412 Nicollet Ave., Minneapolis, Minn.  
640 Victoria Court, San Leandro, Calif.
- Liddell, Parker, '03 (annual).**  
412 Nicollet Ave., Minneapolis, Minn.  
Box 8, R. F. D. No. 1, Reno, Nev.
- Light, Victor A., '13 (non-member).**  
Arvada, Colo.  
Care Tom Reed Mine, Oatman, Ariz.
- Limbach, Edmund C., '95. Deceased.**
- Link, Karl G., '08 (life).**  
1641 Gaylord St., Denver, Colo.  
Danby (via Goffs), Calif.
- Litchfield, Rufus E., '14 (non-member).**  
14 Arlington St., Fitchburg, Mass.  
Platteville, Wis.
- Llteras, J. Manuel, '16 (annual).**  
Box 364, Antioch, Neb.
- Logue, N. W., '97 (non-member).**  
A. S. & R. Co., Hayden, Ariz.
- Lonergan, P. Jay, Jr., '05 (annual).**  
1337 York St., Denver, Colo.
- Lorah, Bela J., '88. Deceased.**
- Lovering, Ira G., '01 (annual).**  
4148 E. 19th Ave., Denver, Colo.  
Care Copper Queen Mine, 1045 9th St.,  
Douglas, Ariz.
- Lowell, James B., '08 (life).**  
18 Stoneland Rd., Worcester, Mass.  
Supt. Geo. A. Fuller Co. of Boston, Mass.
- Lucy, Frank Allen, '01. Deceased.**
- Lucy, Richard W., '98 (life).**  
1127 Bannock St., Denver, Colo.  
R. 23, D. & R. G. Depot, Salt Lake City,  
Utah.
- Luke, Russell P., '14 (annual).**  
Care J. E. Jenkins, Coal Exchange Bldg.,  
Wilkes Barre, Pa.  
Care Burma Mines, Ltd., Nam Tu, Burma,  
India.
- MacGregor, George H., '97 (life).**  
Terrebonne, Ore.
- MacKay, Donald R., '12 (annual).**  
2227 W. 34th Ave., Denver, Colo.  
315 Cedar St., Wallace, Idaho.
- MacNeill, Neil M., '14 (annual).**  
Plum Bush, Colo.  
U. S. Army.
- Magenau, William, '98. Deceased.**
- Malmstrom, C. C., '00 (life).**  
1054 Monroe St., Denver, Colo.  
Assistant Assayer, U. S. Mint, Denver.
- Marrs, George O., '01 (life).**  
1632 York St., Denver, Colo.  
Attorney at Law, 223 Ernest & Cranmer  
Bldg., Denver, Colo.
- Marshall, Emory M., '11 (annual).**  
Care M. B. Laughlin, Santa Fe, N. Mex.  
U. S. Army.
- Martin, J. A., '07 (life).**  
Asst. Engr., care Kennecott Copper Co.,  
Beatson Plant, Latouche, Alaska.
- Martinez, Fidel, '13 (annual).**  
Matamoros 262, Monterrey, N. L., Mexico.  
Assistant Metallurgical Engineer, Chino  
Copper Co., Box 156, Hurley, N. Mex.
- Matheson, Kenneth H., '11 (life).**  
Hugo, Colo.  
Supt., San Marcos Mine, Sabana Grande,  
Honduras, C. A.
- Mathews, Harvey, '13 (annual).**  
Supt. Cyanide Plant,  
Bluefields, Nicaragua, C. A., Care Bonanza  
Mine, N. C. & L. Co., Prinzapalca, Nic.
- Matteson, Wallace G., '11 (annual).**  
1120 Pearl St., Denver, Colo.  
The Texas Co., Box 1735, Houston, Texas.
- Maxwell, Fred A. G., '95 (life).**  
Consulting Metallurgist, General Mining &  
Finance Corp., Box 1242, Johannesburg,  
South Africa.
- Maxwell, Norman E., '17 (annual).**  
Silverton, Colo.
- May, Andrew J., Jr., '12 (non-member).**  
Care E. R. Burks, Tazewell, Va.  
Breckenridge, Colo.
- May, Arthur L., '11 (annual).**  
Manager, Crichton-Curl Enamel Co., El-  
wood City, Pa.  
Address, Box 535, Beaver Falls, Pa.
- May, John G., '01 (annual).**  
Mining Engineer, Oxford Hotel, Denver.
- May, Ross R., '12 (non-member).**  
2232 Vine St., Denver, Colo.  
Care Empire Zinc Co., Gilman, Colo.
- Mayer, Walter J., '11 (annual).**  
Manager, Utah Exploration & M. Co., No.  
3 Hicks Apts., Salt Lake City, Utah.
- Maynard, Rea E., '96 (life).**  
Manager, General Pipe Line Company of  
California, Chief Engineer, General Pe-  
troleum Co.  
419 South Commonwealth Ave., Los An-  
geles, Calif.
- McCallum, Jean, '10 (annual).**  
3775 Osceola St., Denver, Colo.  
Supt. of Mines and Mills, Caribou Mines &  
Mill Co., Caribou, Colo.
- McCart, Robert, Jr., '05 (life).**  
Arlington Heights, Fort Worth, Texas.  
Gen. Mgr., Inde. G. M. Co., 222 Mills Bldg.,  
El Paso, Texas.

- McCormick, David F.**, '10 (annual).  
716 W. Cypress St., San Antonio, Texas.  
Supt. and Chief Engineer, Minas de Mata-  
hambre, Prov. Pinar del Rio, Cuba.
- McDaniel, Alexander K.**, '01 (life).  
50 W. 4th Ave., Denver, Colo.  
Consulting Engineer, American Zinc, Lead  
& Sm. Co., Wisconsin Zinc Co., Dutch  
Sweeney M. Co., Oceanic Quicksilver  
Co., Black Iron M. Co., 1218 Foster Bldg.,  
Denver, Colo.
- McDermutt, Grace C. U.**, '03 (non-member).  
(Mrs. Barry Mulligan.)  
Kensington, Md.
- McDonald, Jesse F.**, Hon. (annual).  
1151 Logan St., Denver, Colo.  
Manager, Down Town Mines Co., 129 W.  
8th St., Leadville, Colo.
- McElvenny, Robert F.**, '03 (non-member).  
General Superintendent Garfield Plant, A.  
S. & R. Co., Garfield, Utah.
- McGregor, M. S.**, '13 (annual).  
1615 Bath St., Santa Barbara, Calif.  
McGregor & Sons, County Distributors  
Firestone Tires, Auto Supplies, etc., 1215  
State St., Santa Barbara, Cal.
- McGuire, Philip Jenner**, '15 (non-member).  
555 Humboldt St., Denver, Colo.  
108 E. Carr St., Cripple Creek, Colo.
- McHugh, Philip M.**, '11 (annual).  
Sales Manager The Dorr Co., 812 Cooper  
Bldg., Denver, Colo.
- McKay, Glover S.**, '10 (annual).  
Townsend, Mont.  
Mine Supt. Mex. Candelaria Co., 614  
Crocker Bldg., San Francisco, Calif.
- McKnight, Hugh S.**, '15 (annual).  
853 11th St., Douglas, Ariz.  
Mine Sampler, Seoul M. Co., Tul Mi  
Chung, Whang Hai Province, Korea.
- McLeod, J. N.**, '97 (annual).  
1809 Wilshire Blvd., Santa Monica, Calif.  
Box 365, Atollia, Calif.
- McMahan, Charles H.**, '92 (life).  
Mining Engr., 1217 Adams St., Denver.  
Kirkland, Ariz.
- McNicholas, Frederick S.**, '14 (annual).  
Care Buena Vista M. Co., Bernaza 3, Ha-  
vana, Cuba.
- Medell, William S.**, '95 (non-member).  
No. 1, Union Square, New York, N. Y.
- Merryman, Herbert E.**, '95 (annual).  
312 West Gay St., Warrensburg, Mo.
- Mertes, Albert T.**, '12 (annual).  
319 W. 8th St., Traverse City, Mich.  
Chemist, Chemical Products Co., 725 Grant  
St., Denver, Colo.
- Merwin, E. W.**, '03 (non-member).  
Civil Engineer, Los Angeles Harbor, R.  
17, City Hall, San Pedro, Calif.
- Mewhirter, Sydney A.**, '17 (non-member).  
U. S. Army Reserve Corps, Fort Riley,  
Kansas.
- Middelkamp, L. L.**, '05 (annual).  
Superintendent, Ellamar Mining Co., Ella-  
mar, Alaska.
- Middleton, William B.**, '83 (life).  
Care Netherlands Trading Society Bank,  
Penang, F. M. S.  
Ipoh, Perak, F. M. S., via China.
- Millard, Frank W.**, '01 (life).  
Mining Engineer, Ely, Nev.
- Miller, Alvah L.**, '17 (annual).  
839 Carroll St., Brooklyn, N. Y.
- Miller, De Mont G.**, '09 (non-member).  
3533 So. Flower St., Los Angeles, Calif.  
Engineer, Layne, Bowler Corp., 1818 Dra-  
cena St., Bakersfield, Calif.
- Miller, Roy H.**, '16 (annual).  
1107 Rudd Ave., Canon City, Colo.  
1905 Third Ave., North, Great Falls, Mont.
- Milliken, John Tait**, '96 (annual).  
1615 N. Cascade, Colorado Springs, Colo.  
Consulting, Mining and Metallurgical En-  
gineer, 408 Exchange National Bank,  
Colorado Springs, Colo.
- Milliken, William B.**, '93 (life).  
1133 Race St., Denver, Colo.  
Mining and Metallurgical Engineer, 418  
McPhee Bldg., Denver, Colo.
- Minister, Howard L.**, '16 (non-member).  
701 Harrison Ave., Canon City, Colo.  
3029 E. Tenth Ave., Denver, Colo.  
Empire Zinc Co., 703 Symes Bldg., Den-  
ver, Colo.
- Mitchell, George B.**, '96 (life).  
Contractor and Engineer, New Birks Bldg.,  
Montreal, P. Q., Can.
- Montrose, James F.**, '02 (non-member).  
2556 Eudora St., Denver, Colo.  
Montrose & Son, 1640 Market St., Denver,  
Colo.
- Moore, C. A.**, '12 (non-member).  
1113 Harrison Ave., Canon City, Colo.  
Empire Zinc Co., Kelly, N. Mex.
- Moore, C. F.**, '07. Deceased.
- Moore, George P.**, '07 (life).  
Care S. A. E. Herman, Winsted, Conn.
- Moses, Percival S.**, '14 (non-member).  
Care C. F. Moses, Mgr. Mutual Life Ins.  
Co., Savannah, Ga.  
Care Foriniere Mission, Kasai, Tshikapa,  
Congo, Belge, Africa, via Boma and Lu-  
ebo.
- Moss, Cleveland O.**, '02 (non-member).  
Coachella, Calif.
- Moynahan, Ambrose E.**, '00 (non-member).  
State Inspector of Mines, District No. 3,  
Alma, Colo.
- Muir, David R.**, '99 (life).  
Manager, Goldroad Mines Co., and The  
Needles M. & Sm. Co., Goldroad, Ariz.
- Muir, Douglas**, '05 (non-member).  
Superintendent, Guanajuato Reduction &  
Mines Co., 615 Hays St., San Antonio,  
Texas.  
Box 552 La Jolla, Calif.
- Munn, Harold E.**, '17 (annual).  
1805 Ford St., Golden, Colo.
- Murch, Clarence H.**, '08. Deceased.
- Murchison, E. H.**, '12 (annual).  
Arvada, Colo.  
Engr., Yak Mining Co., Vendome Hotel,  
Leadville, Colo.
- Murphy, William J.**, '17 (annual).  
32 Lebanon St., Springfield, Mass.  
U. S. Army.
- Myers, John F.**, '13 (annual).  
6710 Fennimore St., Pittsburgh, Pa.  
Flotation Engineer, Empire Zinc Co.,  
Canon City, Colo.

- Nagel, Frank J.**, '03 (annual).  
Care H. P. Nagel, Sr., 734 Gilpin St., Denver, Colo.  
Mining Engineer, Cia Minera de Penoles, S. A., 1008 Mills Bldg., El Paso, Tex.
- Nagel, Henry P., Jr.**, '04 (annual).  
Supt., Vindicator Con. G. M. Co., Independence, Colo.
- Nance, William H.**, '96 (non-member).  
Assayer, Ohio and Colo. Smelter, Box 178, Salda, Colo.
- Neiswender, Chester B.**, '13 (annual).  
1110 S. Hoover St., Los Angeles, Calif.  
1534 W. 7th St., Los Angeles, Calif.
- Nelson, H. E.**, '97 (annual).  
1344 4th St., Riverside, Calif.
- Neugebauer, Karl E.**, '06 (life).  
Chemist, C. F. & I. Co., 201 S. Union Ave., Pueblo, Colo.
- Neville, J. B., Jr.**, '05 (non-member).  
Where is Neville?
- Newnam, William E.**, '96 (annual).  
Supt., Collinsville Plant, St. Louis Sm. & Ref. Co., Collinsville, Ill.
- Nicolson, George W.**, '00 (non-member).  
3023 Hobart Blvd., Los Angeles, Cal.
- Nieman, Earl F.**, '13 (non-member).  
606 Hearst Bldg., Chicago, Ill.  
Resident Manager, Harmony Mines Co., Salmon City, Idaho.
- Nolan, Philip E.**, '13 (annual).  
Care Mrs. J. J. Arrey, 516 S. Van Buren St., Green Bay, Wis.  
Nevada-Douglas Cons. Copper Co., Ludwig, Nev.
- Norman, J. E.**, '98 (non-member).  
302 Exchange Bldg., Denver, Colo.  
R. F. D. No. 1, Box 15, Broomfield, Colo.
- Norton, A. C.**, '07 (annual).  
The Norton Engineering Co., 2046 Vine St., Denver, Colo.
- Nyberg, H. E.**, '06 (life).  
203 Court St., Pueblo, Colo.  
Asst. General Mgr., Compania Minera "Las Dos Estrellas," Apt. Num. 34, El Oro, Mexico.
- Nye, Robert**, '97 (annual).  
Nevada City, Calif.
- O'Byrne, Joseph F.**, '05 (annual).  
Care James Dysort, Attorney at Law, Elko, Nev.  
31 Amherst Ave., Jamaica, L. I., N. Y.
- Oliveros, Reginald P.**, '17 (annual).  
Engineering Dept. Golden Con. M. Co., Goldfield, Nev.
- Olsen, Charles O.**, '11 (non-member).  
Address lost; where is he?
- Olson, VanCleave Arthur**, '15 (annual).  
Leadville, Colo.
- Oram, Charles F.**, '13 (non-member).  
Box 431, Golden, Colo.  
136 E. 8th St., Leadville, Colo.
- Osborne, Arthur H.**, '93. Deceased.
- Page, Lawrence C.**, '08 (non-member).  
H. L. Page & Co., Inc., 123 Bank St., Norfolk, Va.
- Page, Walter Chatfield**, '15 (annual).  
Grand Junction, Colo.  
Research Dept., International Smelting Co., Box 498, Tooele, Utah.
- Paisgrove, Harry G.**, '03 (annual).  
4147 Stuart St., Denver, Colo.
- Paredes, Evaristo**, '05 (non-member).  
General Manager, La Prieta Mining Co., Cosala, Sinaloa, Mexico.  
(Address doubtful.)
- Parker, James H.**, '95 (non-member).  
First Natl Bank Bldg., El Paso, Texas.
- Parker, Nathan H.**, '16 (annual).  
402 E. 7th St., Trinidad, Colo.  
Box 306, Morenci, Ariz.
- Parke, George A.**, '06 (annual).  
3347 Boulevard F, Denver, Colo.  
U. S. Land Office, Mineral Examiner, Box 1091, Juneau, Alaska.
- Parrish, Karl C.**, '01 (life).  
1418 Howard St., Rogers Park, Chicago, Ill.
- Parsons, F. H.**, '07 (non-member).  
661 E. 23rd St., Paterson, N. J.  
Olalla, B. C., Can.
- Parsons, Horace F.**, '03 (non-member).  
Care W. H. Curry, Box 91, Golden, Colo.  
Box 761, Orlando, Fla.
- Patrick, William B.**, '09 (non-member).  
R. F. D. No. 1, Littleton, Colo.
- Patterson, S. B., Jr.**, '06 (annual).  
Assistant General Manager, The Spanish-American Iron Co., Juragua Iron Co., Felton, Cuba.
- Paul, Russell B.**, '02 (annual).  
2212 Birch St., Denver, Colo.  
Mining Engineer, Empire Zinc Co., 703 Symes Bldg., Denver, Colo.
- Paul, William H.**, '96 (life).  
"Paulhurst," Littleton, Colo.  
Consulting Mining Engineer, Alotepeque Mines, Concepcion, Guatemala, C. A.
- Pearce, James W.**, '14 (annual).  
Care Pittsburgh-Idaho Co., Ltd., Gilmore, Idaho.
- Pendery, John M.**, '00 (annual).  
Mining Engineer, 136 W. 7th St., Leadville, Colo.
- Peregrine, William D.**, '13 (annual).  
200 S. Marion St., Denver, Colo.  
Care Tomboy Mine, Smuggler, Colo.
- Perkins, Alfred E.**, '10 (non-member).  
Western Mgr., Colonial Steel Co., 222 First Nat'l Bank Bldg., Denver, Colo.
- Pfeiffer, G. N.**, '05 (life).  
Care O. J. Heely, St. Libory, Ill.  
Asst. Engr., Utah Fuel Co., Castle Gate, Utah.
- Phelps, Harlow D.**, '10 (annual).  
1231 Grant Ave., Denver, Colo.  
Care Darwin Development Co., Darwin, Inyo Co., Calif.
- Phelps, W. B.**, '07 (non-member).  
912-920 E. 3rd St., Los Angeles, Calif.
- Pilger, Newton W.**, '06 (life).  
General Merchant, Anchorage, Alaska.
- Pittman, Frank L.**, '14 (non-member).  
3756 N. 28th St., Tacoma, Wash.  
1022 W. Granite St., Butte, Mont.
- Place, J. Sterling**, '13 (annual).  
23 Snyder St., Orange, N. J.  
Cia Estanifera de Llallagua, Llallagua, Bolivia, S. A.

- Platt, Edwin H., '00 (life).**  
Mining Engineer, 208 Colo. Natl Bank Bldg., Denver, Colo.
- Post, George M., '94 (life).**  
Engineering and Contracting, 2344 Julian St., Denver, Colo.
- Powell, George F., '97 (life).**  
4624 Gramercy Place, Los Angeles, Calif.
- Powers, Oliver, '02 (life).**  
Care H. C. Meadows, Lawton, Okla. Lordsburg, N. Mex.
- Pray, Milton A., '08 (non-member).**  
Wadsworth, Nev.
- Pray, Winfred A., '01 (non-member).**  
Box 426, Fernley, Nev.
- Préssler, L. P., '05 (annual).**  
Las Cruces, N. Mex.
- Price, Harold C., '13 (annual).**  
"The Beacon," 1803 Calvert St., Washington, D. C.  
In charge of Oxide Plant, Bartlesville Zinc Co., Box 871, Bartlesville, Okla.
- Price, Lyttleton, '00 (life).**  
General Engineering and California Oil, 1616 W. 25th St., Los Angeles, Calif.
- Prier, Truman D., '04 (life).**  
Engineer, Conrey Placer Mining Co., Ruby, Mont.
- Prior, Charles E., '13 (annual).**  
25 Madison Ave., New York, N. Y. U. S. Army.
- Prout, John, '00 (life).**  
Golden, Colo.
- Pullen, Lester L., '10 (life).**  
1407 E. Colfax Ave., Denver, Colo.
- Purdy, Irvine A., '10 (non-member).**  
Care Leonard Hotel, Butte, Mont.
- Putnam, George B., '05. Deceased.**
- Quayle, Theodore W., '07 (annual).**  
844 S. Washington St., Denver, Colo.  
Night Mine Foreman, Burro Mt. Copper Co., Tyrone, N. Mex.
- Rabb, E. M., '05 (non-member).**  
3535 W. 24th Ave., Denver, Colo.  
Manager Tom Reed Gold Mines Co., Oatman, Ariz.
- Ralph, Walter H., '16 (annual).**  
Casilla 1156, Valparaiso, Chili, S. A. Box 226, Bisbee, Ariz.
- Rambo, W. C. J., '09 (life).**  
1448 DeKalb St., Norristown, Pa.
- Ramlow, W. G., '12 (annual).**  
716 Rondo St., St. Paul, Minn.  
Engineer, Empire Zinc Co., Cleveland Mine, Silver City, N. Mex.
- Ramsey, E. R., '12 (annual).**  
2373 Albion St., Denver, Colo.  
Sales Engineer, The Dorr Co., 820 Cooper Bldg., Denver, Colo.
- Ransom, Rastus S., Jr., '13 (annual).**  
Golden, Colo.  
Care Lord Geoffery Ores Co., Inc., Rua Serpa Pinto 93, Viseu, Portugal (until November).
- Rath, C. M., '05 (annual).**  
306 International Trust Bldg., Denver, Colo.  
Geologist, Western Exploration Co., Box 91, Douglas, Wyo.
- Reinhard, Frank J., '05 (annual).**  
Golden, Colo.
- Reno, Charles A., '08 (non-member).**  
Manitou, Colo.  
Magna Copper Co., Superior, Ariz.
- Reno, Horace T., '02 (non-member).**  
1257 Monroe St., Denver, Colo.  
430 Century Bldg., Denver, Colo.
- Rhodes, William B., '03 (life).**  
Golden, Colo.
- Rich, Joseph U. G., '08 (life).**  
511 2nd Ave., South, Nashville, Tenn.  
American Syrup and Preserving Co., Nashville, Tenn.
- Richards, E. R., '05 (non-member).**  
1006 Hobart Bldg., San Francisco, Calif.  
Manager, Childers Leasing Co., Box 51, Midvale, Utah.
- Richards, John V., '02 (annual).**  
Mining Engineer, 1024 Old National Bank Bldg., Spokane, Wash.
- Richardson, Allan S., '12 (annual).**  
143 Metcalf Ave., Montreal, Can.  
Research Dept., Anaconda Copper M. Co., Room 401, Leonard Hotel, Butte, Mont.
- Ripley, George C., '06 (life).**  
832 Lafayette St., Denver, Colo.  
Foreman, Electrolytic Zinc Plant, Anaconda Copper Mining Co., Great Falls, Mont.
- Rising, Arthur F., '99. Deceased.**
- Ristedt, Ernest J., '09 (annual).**  
1589 Steele St., Denver, Colo.  
Experimental Work, Inspiration Copper Co., Box 100, Miami, Ariz.
- Roberts, Henry M., '12 (annual).**  
1471 High St., Denver, Colo.  
Sec'y J. Fred Roberts Construction Co., 314 Tramway Bldg., Denver, Colo.
- Roberts, Keith, '15 (annual).**  
709 Reaper Block, Chicago, Ill.  
Care of Dome Mine, South Porcupine, Ontario, Canada.
- Robey, Lloyd, '00 (life).**  
1045 So. Ogden St., Denver, Colo.  
Chile Exploration Co., Chuquicamata, Chile, So. Amer.
- Robinson, George P., '04 (annual).**  
911 E. 14th Ave., Denver, Colo.  
Assistant Supt. of Smelter, A. S. & R., Sasco, Ariz.
- Rockwood, Carl A., '12 (non-member).**  
Box 416, Granville, Ohio.
- Rodriguez, J. C., '98 (non-member).**  
6a de Hidalgo 2, Apartado 87, Saltillo, Coah, Mexico.
- Rogers, Charles Arthur, '15 (annual).**  
Box 395, Salida, Colo.  
Chile Exploration Co., Chuquicamata, Chile, S. A.
- Roller, Arthur H., '97 (annual).**  
500 Fillmore St., Denver, Colo.  
Mining and Metallurgical Engineer, 214 Equitable Bldg., Denver, Colo.
- Root, Charles D., '08 (non-member).**  
1127 Cook St., Denver, Colo.
- Rosette, Breese, '15 (annual).**  
109 N. Cordova St., Alhambra, Calif.  
Box A, Park City, Utah.

- Ross, George M., '07. Deceased.
- Rowe, Charles E., '02 (life).  
1928 E. 14th Ave., Denver, Colo.  
Associate Professor of Drawing, University of Texas.  
1711 Rio Grande St., Austin, Texas.
- Rowe, Edward E., '95 (non-member).  
Where is he?
- Royer, Frank W., '99 (non-member).  
Consulting and Mining Engineer, 322 Cons. Realty Bldg., Los Angeles, Calif.
- Rudd, Arthur H., '00 (non-member).  
County Surveyor, Joseph, Ore.
- Rusman, Benjamin A., '13 (annual).  
1019 Lincoln St., Denver, Colo.  
Chemist, International Smelting Co., Box 322, Tooele, Utah.
- Russell, Donald O., '09 (life).  
Kuala Lumpur, Selangor, Federated Malay States.  
English Army, somewhere in France.
- Ryan, W. E., '05 (life).  
Vindicator Cons. Gold Mining Co., Independence, Colo.
- Sackett, Blair L., '09 (annual).  
Care Clarence Sackett, 738 Broad St., Newark, N. J.  
Ch. Testing Engr., International Sm. Co., Box 140, Tooele, Utah.
- Saint Dizier, Julius L., '94 (annual).  
Metallurgical Accountant, International Smelting Co., Box 1521, Miami, Ariz.
- Sale, Andrew J., '01 (non-member).  
Address lost.
- Sandusky, Samuel C., '08 (annual).  
Salida, Colo.  
Engineer, Gemini M. Co., Eureka, Utah.
- Saxton, Frank B., '12 (life).  
Asst. Engineer, Vindicator Cons. G. M. Co., 611 Victor Ave., Victor, Colo.
- Shafer, Louis, '09 (non-member).  
Mining Engineer, Silverton, Colo.
- Scheble, Max C., '01 (annual).  
Box 135, Eagle Pass, Texas.
- Schellenberg, Gustave W., '12 (non-member).  
4235 Wood St., Wheeling, W. Va.  
919½ 21st St., Sacramento, Calif.
- Schlereth, C. Q., '06 (life).  
911 Mariposa St., Denver, Colo.  
Supt. of Mines, Cia Minera de Penoles, S. A., Apartado 251, Monterrey, Mexico.
- Schneider, August W., '11 (annual).  
Mine Foreman, Hazelton Coal Co., R. R. No. 2, Coalgate, Okla.
- Schneider, George W., '94 (life).  
529-534 Symes Bldg., Denver, Colo.  
Gen. Mgr., Bolivia Gold Exploration Co., Sorata, Bolivia, S. A.
- Schuman, Enrique A., '97 (non-member).  
Has anyone the least idea where he is?
- Sealey, Fred C., '17 (annual).  
881 So. Emerson St., Denver, Colo.  
Geological Dept., Wyoming Oil Producing Co., headquarters at Casper, Wyo.
- Shaver, F. J., '07 (non-member).  
San Jacinto, Calif.
- Shaw, Ralph H., '11 (annual).  
1121 Browning Ave., Salt Lake City, Utah.  
916 Georgia St., Los Angeles, Calif.
- Sherman, Scott H., '04 (annual).  
Supt., Christmas Mine, A. S. & R. Co., Christmas, Ariz.
- Shetler, Waverly, '95. Deceased.
- Showman, Harry M., '10 (annual).  
339 Bannock St., Denver, Colo.  
Assistant Professor Civil Engineering, C. S. M., Golden, Colo.
- Sill, Rush T., '06 (non-member).  
Consulting Mining Engineer, Sill & Sill, 512 Hollingsworth Bldg., Los Angeles, Calif.
- Silver, Leopold, '10. Deceased.
- Simon, William Wayne, '15 (annual).  
Florence, Colo.  
Assayer and Chemist, Magma Copper Co., Superior, Ariz.
- Simpson, William P., '01 (non-member).  
Root & Simpson, Assayers and Chemists, 1744 Broadway, Denver, Colo.
- Skavlem, Henry G., '10 (annual).  
157 Prospect Ave., Janesville, Wis.  
Supt., Canadian M. & F. Co., Ltd., Timmins, Ontario, Can.
- Skinner, Lewis B., '95 (life).  
Vice-President and General Manager, Western Chemical Mfg. Co., Denver, Colo.
- Slater, Amos, '00 (life).  
Mining Engineer, 445 Henry Bldg., Seattle, Wash.
- Sloan, W. A., '03 (annual).  
212 N. Louise St., Glendale, Calif.
- Small, Harvey B., '01 (life).  
Manager Guamoco Mining Co., care Olimpo del Valle, Mangangue, Rep. of Colombia, So. Amer.
- Small, Sidney S., '17 (non-member).  
634 17th St., Denver, Colo.  
U. S. Coast Artillery, Fortress Monroe, Va.
- Smith, Albert W., '14 (annual).  
Rolling Mill Foreman, Youngstown Sheet & Tube Co., 212 Warren Ave., Youngstown, Ohio.
- Smith, C. Dupree, '91 (life).  
Boulder, Colo.
- Smith, Claude H., '00. Deceased.
- Smith, E. M., '05 (non-member).  
Contracting Engineer, Smith Construction Co., Ohanogan, Wash.
- Smith, Frank A., '16 (annual).  
279 10th St., San Pedro, Cal.  
Engineer, Lane Mine, Darwin, Inyo Co., Calif.
- Smith, Harry C., '98. Deceased.
- Smith, Howard C., '13 (annual).  
Box 445, Cripple Creek, Colo.  
Care Ray Cons. Copper Co., Ray, Ariz.
- Smith, Ralph W., '14 (life).  
1845 Grant St., Denver, Colo.  
Care Potosi Mine, Arden, Nev.
- Smith, Roy F., '11 (annual).  
1845 Grant St., Denver, Colo.  
Supt., Cleveland Mine, Empire Zinc Co., Silver City, N. Mex.
- Smith, Thomas G., '99 (non-member).  
Box 126, Grand Junction, Colo.

- Snodaker, Eugene G.**, '14 (annual).  
Care M. M. Hamma, 425 First National  
Bank Bldg., Denver, Colo.  
Goldfield Cons. M. Co. 55 Crocker Bldg.,  
San Francisco, Calif.
- Snow, Robert E.**, '11 (annual).  
Care Miss Beulah Hendershott Normandy  
Apt., Seattle, Wash.
- Solomon, Irwin R.**, '13 (non-member).  
City Salesman, Great Western Sm. &  
Ref. Co., Care J. M. Sloan, 453 1/2 Drexel  
Blvd., Chicago, Ill.
- Soupcoff, Samuel M.**, '10 (non-member).  
417 N. Craig St., Pittsburgh, Pa.  
A. S. & R. Co., 615 McIntyre Bldg., Salt  
Lake City, Utah.
- Spangler, Howard**, '05 (non-member).  
Hartville, Wyo.
- Spencer, Walter I.**, '04 (non-member).  
275 Larrabee St., Portland, Ore.  
Route 2, Gresham, Ore.
- Spring, Archer T.**, '12 (annual).  
Kappa Sigma House, Golden, Colo.
- Stannard, Burt C.**, '95 (annual).  
Metallurgist, Selby Sm. & Lead Co., San  
Francisco, Calif.
- Starbird, Edwin P.**, '01 (annual).  
2646 Magnolia Ave., Los Angeles, Calif.
- Starbird, H. B.**, '97 (annual).  
2646 Magnolia Ave., Los Angeles, Calif.
- Steele, James H.**, '00 (life).  
1041 Lafayette St., Denver, Colo.  
Instructor, M. T. H. School, Denver, Colo.
- Stein, Edmund**, '13 (life).  
811 Main Ave., San Antonio, Texas.  
Mining Draftsman, U. S. Bureau of Mines,  
4090 Penn Ave., Pittsburgh, Pa.
- Steinhauer, Fred C.**, '99 (life).  
650 Williams St., Denver, Colo.  
Park Supt., 214 City Hall, Denver, Colo.
- Stephens, Charles N.**, '98 (non-member).  
1111 N. K St., Tacoma, Wash.  
Chemical Engineering Work, Tacoma  
Smelter.
- Stephens, Frank M.**, '13 (annual).  
777 So. Williams St., Denver, Colo.  
Supt., Potosi Mine, Empire Zinc Co., Ar-  
den, Nev.
- Stephens, Wallace A.**, '93 (non-member).  
1261 Logan St., Denver, Colo.  
Mining, 621 Colorado Bldg., Denver, Colo.
- Stephenson, Tiffany E.**, '06 (non-member).  
Someone please send in his address.
- Stewart, Hugh A.**, '12 (life).  
Supt., Chungtanil & Yang Chun Mines,  
Chiksan Mining Co., Chiksan, Chosen,  
Korea.
- Stewart, Lincoln Adair**, '15 (annual).  
111 W. 19th St., Hutchinson, Kan.  
Care Syndicate M. Co., Arroyo, Masbate,  
P. I.
- Stockton, Robert S.**, '95 (life).  
Supt. of Operation and Maintenance,  
Western Section, Irrigation Block, C. P.  
Railway, Dept. of Natural Resources,  
Strathmore, Alberta, Can.
- Stoeckley, E. F.**, '05 (non-member).  
Canon City, Colo.  
921 B St., San Diego, Calif.
- Storm, Lynn W.**, '02 (non-member).  
Alaska-Gastineau Co., Juneau, Alaska.
- Stotesbury, H. W.**, '07 (annual).  
Chief Engineer, Tomopah M. Co. of Ne-  
vada, Tomopah, Nev.
- Street, Gerald B.**, '01 (non-member).  
Mining Engineer, E. I. du Pont de Ne-  
mours & Co., Wilmington, Del.
- Strah, George F.**, '10 (Deceased).
- Stronck, Hubert N.**, '13 (annual).  
72 Franklin St., Le Mars, Iowa.  
Vice-President, Illinois Engineering, Au-  
diting and Public Relation Co., 122 So.  
Michigan Ave., Chicago, Ill.
- Strong, Earle A.**, '14 (non-member).  
35 Cherry St., Oneonta, N. Y.  
Engineer, The Dorr Co., 820 Cooper Bldg.,  
Denver, Colo.  
24 E. 14th Ave., Denver, Colo.
- Stroat, Fred McL.**, '96 (non-member).  
Assayer, 371 E. Bennett Ave., Cripple  
Creek, Colo.
- Stuart, Malcolm M.**, '08 (non-member).  
340 W. Granite St., Butte, Mont.
- Suhr, Otto B.**, '95 (life).  
1425 Crescent Heights Blvd., Los Angeles,  
Calif.
- Swainson, Otis W.**, '10 (annual).  
145 Logan St., Denver, Colo.  
U. S. Coast and Geodetic Survey, Wash-  
ington, D. C.
- Swanson, C. Arthur**, '13 (annual).  
Box 441, Golden, Colo., with the American  
Zinc Co., Denver, Colo.
- Taggart, George K.**, '03 (non-member).  
Address lost; please send it in.
- Taggart, Oliver R.**, '09 (annual).  
Chemist, St. Louis Sm. & Ref. Co., 120  
E. Church St., Collinsville, Ill.
- Taylor, Harry Picotte**, '00 (life).  
2360 W. 23rd St., Los Angeles, Calif.
- Taylor, Lemuel K.**, '14 (life).  
47 14th St., Wheeling, W. Va.  
Care Standard Oil Co. of New York,  
Shanghai, China.
- Teets, John Nicholas**, '15 (annual).  
1021 E. 19th Ave., Denver, Colo.  
Temp. Vendome Hotel, Leadville, Colo.
- Terrill, Arthur Clark**, '05 (annual).  
1123 Chestnut St., Glendale, Calif.  
Professor of Mining and Ore Dressing,  
Univ. of Kansas, 1136 Tennessee St.,  
Lawrence, Kan.
- Tescher, Samuel**, '04 (annual).  
513 Colorado Bldg., Denver, Colo., Ameri-  
can Fuel Co.
- Thomas, John S.**, '04. Deceased.
- Thomas, Lester C.**, '12 (life).  
930 Humboldt St., Denver, Colo.  
Sales Dept., Ford Motor Co., Denver, Colo.
- Thompson, James S.**, '99 (life).  
General Supt., Utah Fuel Co., Castle Gate,  
Utah.
- Thomson, A. T.**, '05 (annual).  
Assistant Supt. and Metallurgist, Ohio &  
Colorado Smelter, Salida, Colo.



- Thomson, Francis A., '04 (life).  
Head of Department of Min. and Met.,  
State College of Washington, Box 15,  
Pullman, Wash.
- Thum, Ernest E., '06 (annual).  
Associate Editor Metallurgical and Chem-  
ical Engineering, 239 West 39th St.,  
New York City, N. Y.
- Thurstin, Robert A., '17 (non-member).  
Bowling Green, Ohio.  
U. S. Army.
- Thurston, Ralph V., '11 (annual).  
Payette, Idaho.  
Experimental Work, Miami Copper Co.,  
Box 100, Miami, Ariz.
- Titworth, Frederick S., '95 (life).  
Attorney at Law, Pershing, Titworth &  
Fry, 404 Equitable Bldg., Denver, Colo.
- Toenges, Albert L., '12 (annual).  
252 High St., Dayton, Ohio.  
Engineer, Mine Lamotte Co., Box 644,  
Fredricktown, Mo.
- Townsend, Arthur R., '99 (non-member).  
Address lost.
- Traver, Will M., Jr., '16 (annual).  
1118 16th St., Central City, Nebr.  
Empire Zinc Co., 703 Symes Bldg., Den-  
ver, Colo.
- Trott, Maynard J., '08 (annual).  
1017 N. Hancock Ave., Colorado Springs,  
Colo. Assistant Supt., Golden Cycle  
Mill.
- Trott, Roland S., '06 (non-member).  
Inventor and Mechanical Engineer, Trott  
Automobile Co., 723 Chamber of Com-  
merce, Detroit, Mich.
- Truehart, Lawrence G., '13 (annual).  
736 E. Gunther St., San Antonio, Texas.  
Box 261, Metcalf, Ariz.
- Trumbull, Loyal W., '04 (annual).  
State Geologist, 700 E. 21st St., Cheyenne,  
Wyo.
- Tsai, Hsiang, '15 (non-member).  
Care T. Y. Tsai, Olivier Co., Hankow,  
China.
- Tsui, Y. L., '14 (non-member).  
Address lost.
- Turner, John H., '14 (annual).  
Care Mrs. Gertrude Turner, Golden, Colo.  
New Cornelia Copper Co., Box 131, Ajo,  
Ariz.
- Tyler, Sidney B., '99 (life).  
1135 Columbine St., Denver, Colo.  
Supt., Rare Metals Ore Co., Rollinsville,  
Colo.
- Utley, Howard H., '00 (non-member).  
Care A. G. Utley, Phoenix, Ariz.  
Manager, River Smelting & Ref. Co., Flor-  
ence, Colo.
- Vacek, Vincent F., '10 (life).  
Proprietor and Manager, Vacek Dept.  
Store, 312 N. 24th St., South Omaha,  
Nebr.
- Valentine, Malvern R., '98 (non-member).  
Portland G. M. Co., 315 S. 5th St., Victor,  
Colo.
- Van Burgh, Lisle R., '17 (annual).  
127 So. Humboldt St., Denver, Colo.  
U. S. Army.
- van Diest, Edmond C., '86 (annual).  
Consulting Engineer, 412 Mining Ex-  
change Bldg., Colorado Springs, Colo.
- Van Dolah, Parks Briggs, '15 (annual).  
412 Portland Ave., Victor, Colo.  
Foreman, Custer Slide Mining & Dev.  
Co., Bonanza, Custer Co., Idaho.
- Van Dorp, Glen Howe, '15 (annual).  
1115 Polk St., Topeka, Kan.
- Van Wagenen, Hugh R., '06 (life).  
General Supt., Cons. Nevada Utah Corp.,  
Pioche, Nev.
- Vaughn, Robert M., '04. Deceased.
- Voelzel, Gustave W., '11 (annual).  
123 S. Broadway, Denver, Colo.  
Assistant Townsite Engineer, Burro Mtn.  
Copper Co., Box 170, Tyrone, N. Mex.
- Vorck, Charles R., '16 (non-member).  
Care Goodall Bros., Assayers, Helena,  
Mont.  
Box 607, Salt Lake City, Utah.  
U. S. Army.
- Wackenhut, George J., '04 (annual).  
430 E. Huerfano St., Colorado Springs,  
Colo.  
Gold Coin Apts., Victor, Colo.
- Walker, A. D., '12 (non-member).  
Assistant Supt., Vindicator Cons. G. M.  
Co., Independence, Colo.
- Wallace, Howard J., '04 (annual).  
11 Smelter Hill, Great Falls, Mont.
- Wallace, Louis R., '95 (life).  
Gen. Mgr., Andes Copper Mining Co., Ca-  
silla 230, Antofagasta, Chile, S. A.
- Walter, Adolph S., '15 (non-member).  
2130 Downing St., Denver, Colo.  
Chemist, Durango Plant, A. S. & R. Co.,  
945 5th Ave., Durango, Colo.
- Waltman, Will D., '99 (life).  
Gen. Mgr., Franco-Wyo. Oil Co., Casper,  
Wyo.
- Wang, Shoa-Ying, '13 (non-member).  
Government University, Peking, China.  
Technical Expert First Mining District.
- Ward, Merwin H., '13 (annual).  
Care of A. H. Ward, 3 Garland Way, Ever-  
ett, Mass.  
Manager, Stanley Motor Car Co., 5883-85  
Delmar Ave., St. Louis, Mo.
- Ward, William F., '03 (annual).  
2564 W. 32nd Ave., Denver, Colo.  
Care Wesselhoeft & Wisner, Barranquilla,  
Colombia, S. A.
- Warfel, C. G., '07 (non-member).  
Professor, State College of Mines, Pull-  
man, Wash.
- Warnecke, Carl M., '97 (life).  
Asst. Elec. Engr., P. E. R. R. Co., Sher-  
man, Calif.
- Warren, Seymour P., '13 (non-member).  
Golden, Colo.  
702 Pearl St., Joplin, Mo.
- Washburn, Howard G., '04 (annual).  
Supt., Federal Lead Co., Flat River, Mo.
- Wasley, William A., '09 (annual).  
1541 12th Ave., Greeley, Colo.  
Mill Supt., El Tigre M. Co., Esqueda,  
Sonora, Mex., via Douglas, Ariz.

- Watrous, Mark U., '14 (annual).**  
 Box 765, Monte Vista, Colo.  
 Balakalala Cons. Copper Co., Coram, Calif.
- Watson, Guy P., '10 (life).**  
 Braden Copper Co., Rancagua, Chile, S. A.
- Watson, Hugh C., '01 (annual).**  
 Supt., Yak Mine, Leadville, Colo.
- Watson, Samuel E., '13 (non-member).**  
 Care Carl C. Smith, Clarksville, Tex.  
 Lorraine Apts., Anaconda, Mont.
- Wattles, William C., '03 (annual).**  
 City Engineer of Tropico, Calif., 332 N. Glendale Ave., Tropico, Calif.
- Watts, Alfred C., '02 (annual).**  
 238 Douglas St., Salt Lake City, Utah.  
 Chief Engineer, Utah Fuel Co., 720 Judge Bldg., Salt Lake City, Utah.
- Weed, Floyd, '97 (annual).**  
 467 Emerson St., Denver, Colo.  
 Manager, Bailey Cobalt Mines, Ltd., Glroux Lake, Ontario, Can.
- Weil, Jacob, '04 (non-member).**  
 Secy Altochul Tobacco Co., Quincy, Fla.
- Weinig, Arthur J., '08 (life).**  
 Mill Supt., Liberty Bell G. M. Co., Box 363, Telluride, Colo.
- Weir, John A., '09 (annual).**  
 1710 Ogden St., Denver, Colo.  
 Box 66, Kelley, New Mex.
- Weiss, Andrew, '99 (life).**  
 Project Manager, North Platte Project, U. S. Reclamation Service, Mitchell, Nebr.
- Weisz, Joseph J., '09 (annual).**  
 2619 Leland Ave., Chicago, Ill.
- Wells, Ben T., '04 (life).**  
 211 W. 12th St., Pueblo, Colo.  
 Manager, Mines de Alopepeque, Concepcion, Depto. Chiquimula, Guatemala, C. A.
- Wells, Frank B., '03 (annual).**  
 1110 W. 50th St., Los Angeles, Calif.  
 Care Pacific Creamery Co., Tempe, Ariz.
- Wertheim, Salomonson F. M. G. A., '89. Deceased.**
- West, John R., '10 (non-member).**  
 2125 State St., San Diego, Calif.
- Wheeler, Charles E., '94 (non-member).**  
 Another lost old-timer. Where is he?
- Wheeler, Robert M., '08 (annual).**  
 965 Madison St., Denver, Colo.  
 1023 First Natl Bank Bldg., Denver, Colo.
- Whetsel, Raymond V., '16 (non-member).**  
 Fortville, Ind.  
 Care Burma Mines, Ltd., Nam Tu, Burma, India.
- Whitaker, Charles N., Jr., '14 (annual).**  
 607 E. Orange Ave., Monrovia, Calif.  
 Empire Zinc Co., 703 Symes Bldg., Denver, Colo.
- Whitaker, Orvil R., '98 (life).**  
 1531 Steele St., Denver, Colo.  
 Mining Engineer, 932 Equitable Bldg., Denver, Colo.  
 Trustee, C. S. M.
- White, J. L., '07 (annual).**  
 1490 Stuart St., Denver, Colo.  
 Supt., De Soto Mine, Cons., Ariz. Smelting Co., Ocotillo, Ariz.
- White, Leonard L., '15 (annual).**  
 Box 474, Golden, Colo.  
 Shift Boss, New York, Honduras & Rosario Co., San Jacinto, Spanish Honduras, C. A.
- Whitehead, Paul, '12 (non-member).**  
 2623 California St., Denver, Colo.  
 Ray Cons. M. Co., Ray, Ariz.
- Whitehouse, Howard D., '08 (non-member).**  
 Care E. H. Rollins & Sons, 234 So. La Salle St., Chicago, Ill.
- Whitehurst, J. W., '10 (life).**  
 Care J. D. Whitehurst, Salida, Colo.  
 General Manager, Equity Creede Mines Co., Creede, Colo.
- Wiebelt, Frank J., '16 (annual).**  
 Arvada, Colo.  
 Constancia Cons., Box 17, Bluefields, Nicaragua, C. A.
- Wigton, George H., '13 (annual).**  
 2015 E. 22d Ave., Denver, Colo.  
 Chief Metallurgist, Consolidated Mining Co., Eureka, Utah.
- Wilcoxson, Edward D., '12 (annual).**  
 Box 398, Pueblo, Colo.  
 Box 347, Hurley, N. M.
- Wiley, Walter H., '83 (annual).**  
 367 So. Bonnie Brae St., Los Angeles, Calif.  
 Mining Engineer, Palm Drive, Glendora, Calif.
- Wilfley, Elmer R., '14 (life).**  
 1300 High St., Denver, Colo.
- Wilfley, George, '13 (life).**  
 1300 High St., Denver, Colo.  
 Gen. Supt., Mears & Wilfley, Silverton, Colo.
- Wilkinson, Merle W., '13 (non-member).**  
 936 Lincoln St., Denver, Colo.  
 Care Western Chemical Co., Denver, Colo.
- Williams, Fred T., '01. Deceased.**
- Williams, Irving B., '11 (non-member).**  
 Care Washoe Reduction Works, Anaconda, Mont.
- Williams, John C., '13 (annual).**  
 1760 Franklin St., Denver, Colo.  
 Chemist Von Schulz & Low, 1746 Champa St., Denver, Colo.
- Williams, Wakely A., '99 (life).**  
 Supt., Smelting Plants, Granby Cons. M., S. & P. Co., Grand Forks, B. C., Can.
- Wilson, Dudley M., '09 (annual).**  
 Box 424, Oklahoma City, Okla.  
 Right of Way Engineer, Electric Transmission Lines, Texas Power & Light Co., Dallas, Tex.
- Wilson, Harry R., '16 (non-member).**  
 222 Central Savings Bank Bldg., Denver, Colo.  
 Care Burma Mines, Ltd., Nam Tu, Burma, India.
- Winchell, John H., Jr., '17 (annual)**  
 4285 Federal Blvd., Denver, Colo.  
 Engineer, Demming Mines Co., Murphy, Idaho.
- Wolf, A. G., '07 (life).**  
 260 S. Franklin St., Denver, Colo.  
 Mining Engineer with Geo. E. Collins, 414 Boston Bldg., Denver, Colo.

- Wolf, Harry J., '03 (annual).  
1680 Steele St., Denver, Colo.  
Mining Engineer, First National Bank  
Bldg., Denver, Colo.  
Professor of Mining, Colorado School of  
Mines, Golden, Colo.
- Wong, William A., '13 (annual).  
Care Wong A. Chuck, 526 N. School St.,  
Honolulu, Hawaii.  
Tayeh Iron Mines, Tayeh, Hupeh, China.
- Wood, Ernest B., '09 (life).  
1609 Washington St., Denver, Colo.  
Mech. Engineer and Asst. to Supt., Colo-  
rado Portland Cement Co., Portland,  
Colo.
- Woods, Thomas H., '97 (non-member).  
Supt. Mill, Camp Bird, Ltd., Box F, Ouray,  
Colo.
- Woolf, Joe H., Jr., '14 (annual).  
1115 9th Ave., Greeley, Colo.  
Care Seoul Mining Co., Tul Mi Chung,  
Whang Hai Province, Chosen, Korea.
- Worth, Lee K., '17 (annual).  
728 Colo. Ave., Colorado Springs, Colo.
- Wraith, Charles R., '11 (non-member).  
1063 7th St., Anaconda, Mont.
- Wright, Thomas W., '13 (annual).  
Mine Sampler and First Aid Instructor,  
Junction Mine, Calumet & Ariz. M. Co.,  
General Delivery, Lowell, Ariz.
- Wuensch, Charles Erb, '14 (annual).  
Care Butters Salvador Mines, 625 Market  
St., San Francisco, Calif.
- Yang, W. T., '14 (non-member).  
Address lost.
- Youker, C. Norman, '12. Deceased.
- Young, Frank B., '95. Deceased.
- Young, Peter A., '13 (annual).  
4105 Perry St., Denver, Colo.  
Sugar Loaf, Colo.
- Yuan, Pao-Chiang, '17 (non-member).  
Box 715, Golden, Colo.  
Packard Mines Co., Rochester, Nev.
- Zulch, Herman C., '08 (annual).  
3917 W. 32nd Ave., Denver, Colo.  
Mining Engineer, Foster & Zulch, Box 240,  
Oatman, Ariz.
- Zulch, William G., '14 (annual).  
Mine Engineer, Vindicator Cons. G. M.  
Co., 215 S. 6th St., Victor, Colo.
- Zwetow, Arthur N., '11 (annual).  
1163 Pearl St., Denver, Colo.  
Rock Hill Placer Co., Imlay, Nev.
- Please notify the Assistant Secretary,  
Golden, Colo., of any addresses that are not  
correct, both permanent and temporary.  
Supply missing addresses, if you possibly  
can. Be sure we have your address cor-  
rectly entered on our files.

#### REST.

The man who has money might rest if he  
would;  
And the man who has none, he might rest  
if he could;  
But never, till manhood has gone out of  
style,  
Will the man who's a man want to rest all  
the while.

#### MINES MEN IN U. S. ARMY AND NAVY.

Mines men, Alumni, ex-Mines and stu-  
dents are entering the government service  
so rapidly, we have had great difficulty in  
keeping even partial track of them. We  
want to print as complete a list as possible  
in the August issue. Please send us notice  
when you join, and also inform us of any  
other Mines man you may know of in the  
U. S. Service. Give full particulars.

#### PERSONALS.

'00.

136 W. 7th Street,  
Leadville, Colo., June 12, 1917.

The beautiful flowers which the Alumni  
Association sent me at the hospital in Pu-  
eblo, together with your very kind letter  
reached me safely, and I only wish that all  
of you men could fully realize the deep feel-  
ing of thanks and appreciation with which  
I received your kind remembrance. It is  
such kindly acts that makes a fellow feel  
that there are lots of good men in the world  
who can spare a few moments from their  
busy lives to bestow a few thoughts upon  
one who, for the time being at least, has  
been compelled to drop out of the proces-  
sion, and makes him feel good to think that  
he has not been entirely forgotten.

Please convey my sincere thanks to the  
Alumni Association, and with kind personal  
regards, I am,

Sincerely yours,

John M. Pendery.

'04.

Loyal W. Trumbull, State Geologist of  
Wyoming, motored thru Golden, Sunday  
June 24th, visiting friends for a few hours.

'05.

E. L. Larison, who has been in charge of  
the acid plant of the Anaconda Copper Min-  
ing Co., at Anaconda, Mont., for the past two  
years, has accepted a similar position with  
the A. S. & R. Co., at Garfield, Utah.

Carl A. Allen is now Mining Engineer for  
the U. S. Bureau of Mines in charge of  
Bureau of Mines New Car number 5, at  
present assigned to the Butte District.

R. L. Grider and A. C. Terrill were in  
California early in June inspecting oil fields  
and mining districts.

'06.

Max W. Ball, for years with the U. S. Geo-  
logical Survey and recently with the U. S.  
Bureau of Mines, has resigned from the  
Government service to take charge of the  
work in the Rocky Mountain district for  
the Roxana Petroleum Co., with head-  
quarters at Cheyenne, Wyo.

June 22, 1917.

I was rather disappointed in not reading  
more news regarding the situation in the  
Golden student-faculty ruction. So, I pre-  
sume, the under-graduates made good their  
threat and refused to remain in school.  
That probably means that next year there  
will be nothing but a Freshman class there.  
Most of the alumni are doubtless as much

in the dark as to the concomitant causes of the present debacle as am I. But it appears that it may be merely the logical outcome of an unhealthy faculty and lax discipline. Very probably it extends in its ramifications for many years past. In other words, the present trouble would not have been precipitated had there been no "wrinkling" of a faculty member. It seems very evident to me that if the faculty at Golden were constituted of the right kind of men, such a disrespectful proceeding would be about the last thing to suggest itself to the under-graduate. Even when I was in school there were two or three men on the faculty who were noticeably incompetent, or were lacking in those essential qualifications which unconsciously command respect from the student. They, consequently, were subjected to petty indignities and cavalier treatment by their classes, which were entirely unthinkable in connection with such men as Patton, Fleck, Filkins, Hartman and Mike Brown, of lamented memory. On the other hand, it appears to me that the discipline asserted by the faculty must have been growing looser and looser, else the student body, as a whole, would not have taken up the cudgel to defend the actions of a small number of drunks. The School of Mines has never borne the reputation of being overly gentle and ladylike, but at the same time I am sure that in my day the student body would not have resented such richly merited expulsions.

Unquestionably, major breaches of discipline had been overlooked for perhaps years back, and any student body is quick to build up a belief in their "rights and privileges." And finally, when the new President took a hand and administered the punishment deserved by the atrocities of "Senior Day," the body of the students were quick to take offense regarding it as being a case which formerly would have passed practically unnoticed.

I, personally, view with considerable equanimity the passing of such a student body, but with the advent of a new, and let us hope, more fertile crop, would it not also be well to do a little weeding and cultivating in the faculty room? We not only need a respectable body of undergraduates, but a dignified body of teachers who will command their respect.

The above is merely an expression of my personal opinion which has been formed after reading as much as I could of the present situation. You are quite at liberty to publish this over my signature, as I believe the Alumni Magazine would be doing a real service by soliciting views from some of the graduates on this matter. Right now is the time to "hew to the line."

You may wish to note in your alumni news that I leave my present position, Asst. Prof. of Metallurgy, University of Cincinnati, at the end of the present month to assume the duties of Associate Editor for the Metallurgical and Chemical Engineer-

ing, a McGraw-Hill publication, with headquarters in New York City.

Very truly yours,

E. E. Thum, '06.

'10.

Lester L. Pullen has returned to the States after five years at Masbate, P. I., and has been spending a short vacation with his parents and relatives in Denver. He expected to leave Denver for Wyoming early in July.

'11.

Francis Valentine Geib, seven pounds, arrived at the home of Karl V. Geib in Denver, June 28th.

'12.

Chas. L. Harrington and Miss Nona Galloway were married Thursday, June 14, 1917, at the home of the bride's parents, Mr. and



Charles L. Harrington

Mrs. John Rogers Galloway, Norwood, Colorado. The young couple will be at home at Dove Creek, Colorado, after August first.

Frank Brunel, Jr., arrived at the home of Frank P. Brunel in Ajo, Arizona, about June 20th.

'13.

Bonanza Mine, June 10, 1917.

I just received the May number of the Magazine, and reading there of the trouble gave me quite a jolt.

Of course, I am not in possession of more facts than published in the above mentioned paper, but it seems to me that something must be radically wrong somewhere. I can very distinctly remember when two or three professors were "wrinkled," and there was never any hard feelings on either side. Invariably the students thought more of the professor afterwards. It was a very good index as to the caliber of the man in question and was recognized accordingly. The one example that will always remain in my mind was the time when W. G. Haldane was handled rather roughly on Senior Day. After it was over students in all classes remarked about the way he took it,

and the concensus of opinion was that he was more of a man than we had given him credit for, and we afterwards tried to show him that we appreciated the fact. If some members of the faculty have reached the point where a wrinking is an insult to their womanly modesty, it seems to me that drastic action is necessary.

The suspension of the two students for intoxication must have savored of unjustness, or there would have been no protest. In times past, similar action was taken toward a guilty student, and there was never one murmur from the student body. Students are flighty, to be sure, but they have a well-defined idea of right and wrong. Unanimous action by that number of students cannot exist unless they have a real grievance.

As you say, now is the time to get together, and I certainly hope that things will be straightened out permanently in the near future. Such things hurt the school and the graduates of that school. I, for one, want to see Mines stand where she should—the leading mining school in the United States. Co-operation from everybody at all times is all that she needs to firmly hold that place. Team work from even a number of ordinary men will work wonders, and team work by a number of top-notchers is a world-beating combination.

Very truly yours,

Harvey Mathews, '13.

Frank M. Stephens and his wife visited the School and Golden, June 26, while on a vacation from Arden, Nevada.

Hubert N. Stronck and Miss Clara Hoffman were married on Saturday, June 30,



Hubert N. Stronck

1917, at Chicago, Ill. Stronck is now vice-president of the Illinois Engineering, Auditing and Public Relations Co., 122 So. Michigan Ave., Chicago, Ill.

'14.

E. G. Snedaker visited the School July 2nd on his way to examine some properties

in the southern part of the State for the Goldfield Consolidated Mines Co., of Goldfield and San Francisco. Snedaker expects to receive a commission in the regular army in the near future.

'16.

Howard L. Minister and Miss Amy G. Harris were married in Denver, Wednesday,



Howard L. Minister

June 13, 1917, at the Grace M. E. Church. Miss Harris is the daughter of Mr. and Mrs. Alfred Harris of Golden. Minister is now with the Empire Zinc Co. After a short wedding trip the couple will be at home to their friends at 3029 East Tenth Ave., Denver.

Charles F. Oram and Miss Fay Stanley were married at the home of the bride's



Charles F. Oram

parents in Koeta, Colorado, Wednesday, June 20th. The couple will make their home in Leadville where Oram is employed.

'17.

Sidney S. Small has received a commission for the coast artillery at Fortress Monroe, Va. and has reported for service.

A man may be measured by the things he seeks.

**EX-MINES PERSONALS.**

We made a mistake in last month's issue when we stated that Alvah C. Starkey had graduated from the Missouri School of Mines. Starkey has not yet completed his course there.

'15.

On June 3rd, at Baker City, Oregon, Arthur L. Lee and Miss Ione Irene Holland were married. The bride is the daughter of



Arthur L. Lee

Mr. and Mrs. M. D. Holland of Baker City, Oregon. The young couple will make their home at Homestead, Oregon, where Lee is employed with the Homestead-Iron Dyke Mines Co., Inc.

**MISCELLANEOUS.**

Mr. and Mrs. H. C. Parmelee left Golden Thursday, June 21st, for a motor trip to Omaha and other points East.

Prof. and Mrs. Claude C. Van Nuys left Sunday, June 17th, for South Dakota, where they will visit for the rest of the summer.

Prof. G. A. Mullenburg, formerly of the School of Mines, now with the State geological survey, was in Golden early in July as a guest of Prof. Harry M. Showman.

J. Merrell Parker, secretary of the Mines Y. M. C. A., enlisted Tuesday, June 19th, in the U. S. Marine service and was transferred Thursday, June 21st, to Mare Island, Calif.

Prof. J. C. Roberts attended the coal mining institute at Glenwood Springs, June 18th to 23rd. He also delivered addresses at miners' welfare meetings at Leadville and Breckenridge.

Wu Kung, a mining engineer of China, who has been inspecting mines and mills in various regions of Colorado for the past month, inspected the Golden testing plant and other places of interest about the School of Mines Tuesday, June 26th.

Prof. William A. Allison, formerly of the School of Mines, has been called from Seattle into active war service at San Francisco. He was an officer of high rank in

the Spanish-American war. His little son recently suffered a severe attack of heart trouble and is in quite serious condition.

Prof. Victor Ziegler received the degree of doctor of philosophy from Denver University Thursday, June 14th, through his education received at other institutions and his practice and through special work which he did every Tuesday at the university this year.

Prof. Ziegler is extremely busy this summer with oil geological expert examinations in the Wyoming oil fields. Max T. Hofius, '17, will assist him on the geological survey work for the rest of the summer. Their headquarters are at Kaycee, Wyoming.

Carrol George Dolman, professor of English and Foreign Languages this past year, has accepted the proffered command of a new company of engineers, Company C, which is being formed to complete the battalion of engineers of the Colorado National Guard. He is now actively aiding E. L. Perry and others in Denver in the recruiting for the company, which is making rapid progress.

**RECENT ARTICLES BY MINES MEN.**

Saline Valley Tramway, F. C. Carstarphen, '05, Tramway Engineer, American Steel and Wire Company, Trenton, N. J., Proc. Am. Soc. Civil Engineers, Abstracted in the Mining and Scientific Press, June 30, 1917, pages 913 to 917.

The Empirical Formula in Milling Control, A. J. Sale, '01, Mining and Scientific Press, June 30, 1917, pages 918 and 919.

**MAGNETIC SEPARATOR EXPERIMENTS.**

Some interesting work now under way in the experimental ore dressing and testing plant of the Colorado School of Mines will yield additional operating data on two different types of magnetic separators, namely the Wetherill and the Dinge. Nearly 100 different tests of small lots of ore have been made under varying conditions. The completed work will form the basis of a paper on magnetic separation, to be presented at the St. Louis meeting of the American Institute of Mining Engineers by Professor Geo. J. Young, who is in charge of the Department of Metallurgy at Golden. The literature on this subject is rather meager, and the present contribution will be a very acceptable addition.

**WAR TRAINING AND CONSERVATION OF METAL RESOURCES.**

Military training may be an important feature of the curriculum at the Colorado School of Mines next year. Being an engineering school, it is particularly qualified to turn out good material for the Engineer Corps of the Army, because training can be given not only in the usual infantry drill regulations, but also in field engineering.

Owing to the large demand by the war department for men trained in military mat-

ters, it will be impossible to secure a regular United States army officer to take charge of the work at Golden. A letter recently received from General Hugh L. Scott, Chief of Staff, expressed regret at being unable to detail an officer for this work, but stated that all officers were needed for more important duties. An effort is being made, however, to secure a qualified man who will, if possible, be commissioned by the United States government.

As part of the campaign for economy and conservation which is being carried on throughout the country, the avoidance of metal waste at our mines and mills is of the utmost importance. Probably the greatest losses are sustained in the concentration of base-metal ores, and while the larger companies are extremely alive to the necessity of operating to the highest efficiency, it is doubtful if many small operators really appreciate the tremendous losses that may occur through the absence of accurate sampling and calculations. The average operator may believe that he is making a high recovery, but when a definite check is placed on his work it is more likely that he will find losses running up to 25 and 30 per cent.

The School of Mines is taking active steps to show Colorado operators what means can be taken to improve their methods of operation and reduce waste. It is believed that by a little special attention to this matter we can materially increase the output of base metals in the State and work a permanent improvement in the mining industry.

#### WAR DEPARTMENT EXAMINATIONS FOR POSITION OF SECOND LIEUTENANT, U. S. ARMY.

April 23 and July 23, 1917, examinations will be held to fill vacancies as second lieutenant in the Cavalry, Field Artillery, Coast Artillery Corps and Infantry, from civil life.

Candidates must be between 21 and 27 years of age when appointed.

The pay of second lieutenant is \$1,700 yearly, with 10 per cent increase for every five years' service. Promotions will be very rapid for the next few years, at least.

Married men not accepted as applicants.

Mine graduates can be exempted from part of the mental examinations. Subjects Mine graduates would be required to pass examinations in are: 1, General History; 2, Elementary Surveying; 3, Elementary French, German, or Spanish (as the applicant may elect), and in one of the following subjects (choice left to applicant): Advanced English, French, German, Spanish, Analytical Geometry, Calculus (differential or integral), Military Art and Field Engineering, or Advanced Surveying. If interested, write to the Adjutant General's office, War Department, Washington, for General Orders No. 64, W. D. 1915, and application blanks for position of second lieutenant at once.

Concentration doesn't mean straining. It means cutting out the things that interfere.

#### THE EFFICIENT PURCHASE AND UTILIZATION OF MINE SUPPLIES.

By Hubert N. Stronck, E.M.

Consulting Industrial Engineer, Mem., A. I. M. E., Am. Mining Congress.  
And John R. Billyard, E.M.  
Mining Engineer.

This subject has been given little attention in the past, although materials constitute an important cost item in the mining and smelting industries. It is for this reason that the authors have prepared this volume which will meet the need that has existed for such information.

This book describes in detail the entire subject from purchasing to use, stress being laid on systems for large operating companies, with simplified methods for smaller concerns. Many illustrations and suggestions are also given.

The material presented has been gathered from observations and notes, and from articles which have appeared in technical magazines and books on the Science of Management.

The following list of subjects will give you an idea as to the thoroughness of this work:

##### Contents.

The Laws of Maximum Economy; Purchasing Department; Catalogue Files; Special Quotations; Correspondence and General Price List; Economic Amount to Be Purchased; Book of Standards; Purchase Orders; Receiving and Testing; Stores System; Location of Store-rooms; Arrangement of Store-room; Stock Piles; Oils and Explosives; Powder Magazines; Interior Arrangement of the Warehouse; Standard Bins; Pipe Racks; Additional Space; Arrangement of Bins; Mnemonic Classification of Mine Materials; Stores Records; Checks; Issuing Systems; Reports of Consumption of Supplies; Timber Records; "Lost" Material; Graphic Charts; Method of Preventing Waste; Records of Equipment; Tools; Oils and Lubricants; Timber; Pipe Lines; Prevention of Corrosion of Iron and Steel; Fuel Consumption; General; Training and Loyalty of Workmen.

97 pages, 5 x 7 $\frac{1}{2}$ , illustrated.

Cloth, \$1.25 net.

John Wiley & Sons, Inc., Publishers.

For Sale by the

COLORADO SCHOOL OF MINES ALUMNI  
ASSOCIATION, GOLDEN, COLO.

#### DYNAMITE CHECKED THE ATLANTA, GA., FIRE.

The recent Atlanta, Ga., fire was halted by the use of dynamite. The flames, fanned by a stiff breeze, had devoured over 2,000 homes when liberal use of dynamite finally gained control of the fire.

One of the expert explosive men that helped check the flames had the following comments to make, which will no doubt be

interesting to all whose duty it is to safeguard life and property:

"Up to our arrival there had been burned about fifty city blocks and after we started, the fire did not get out of four city blocks, three of which were dynamited by us.

"When we arrived I found the dynamite squad were attempting to dynamite the houses by tying three or four sticks of dynamite together and priming and throwing them at random into a house, the result of which was to merely shake the house and blow out the windows so that it caught fire more readily.

"I took from one to three cases of 50 per cent Red Cross Extra to a house, depending on its size and solidity, and placed it as near to the centre of the house as possible, on the ground floor, and against the strongest wall. This brought the house down level with the ground in every case and in such shapes would enable the fire company to get a stream on it at once. We shot two houses at once and used cap and fuse method."

This is not the first time dynamite has played an important part in fire control. The San Francisco fire, which followed the great earthquake, was gotten under control by the use of dynamite. It therefore behooves all to be prepared for the emergency.

The Dupont Powder Company will supply any one interested with a valuable pamphlet entitled, "Fighting Fires With Dyna-

mite." It describes fully the methods used for demolishing buildings in a large fire.

Order all your magazine subscriptions and renewals through the Colorado School of Mines Magazine, and save money.

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The best and most efficient methods for all of the regular determinations. Aller was for many years chief chemist for the A. S. & R. Co. There is no better set of modern practical analytical methods printed. Every Mines man should have a copy.

THE COLORADO SCHOOL OF MINES  
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# COLORADO SCHOOL OF MINES MAGAZINE

Vol. VII.

GOLDEN, COLO., AUGUST, 1917.

No. 8

## Manganese Ore Schedules

Albert G. Wolf, '07

The demand for manganese ore for use in the manufacture of steel is steadily increasing. Every technical magazine has mentioned it, and the United States Geological Survey has issued a pamphlet enumerating the various metals and minerals that should be produced in this country in larger quantities; among these metals manganese is prominent. This being the case a little information about the value of manganese ores may be of interest and benefit. Following is the schedule of prices for various grades of manganese ore issued by the Colorado Fuel & Iron Co.:

### The Colorado Fuel and Iron Company.

Pueblo, Colo., March 1, 1916.

Prices which will be paid for Manganese Ore per ton of 2,240 pounds, delivered at Minnequa Works, Pueblo, Colorado.

Settlement to be based on the analysis of the ore in its natural condition as figured from the analysis of samples taken from each car of ore received.

The prices are based on ore, in its natural condition, containing—

Not more than 8.000 percent Silica  
Not more than 0.100 percent Phosphorus  
Not more than 1.000 percent Zinc

Percentage of Metallic Manganese contained in the Ore, in its natural condition, as figured from the analysis:	Price — Cents for each percent of Metallic Manganese per ton of 2,240 lbs. delivered at Minnequa Works:
--	---

15.00 to 17.99 percent.....	20 cents
18.00 to 20.99 percent.....	21 cents
21.00 to 23.99 percent.....	22 cents
24.00 to 26.99 percent.....	23 cents
27.00 to 29.99 percent.....	24 cents
30.00 to 32.99 percent.....	25 cents
33.00 to 35.99 percent.....	26 cents
36.00 to 38.99 percent.....	27 cents
39.00 to 41.99 percent.....	28 cents
42.00 to 44.99 percent.....	29 cents
45 and above percent.....	30 cents

For each 1 percent of Metallic Iron contained in the ore in its natural condition, a premium of six (6) cents will be added to the price per ton.

For each 1 percent in excess of 8.000 percent Silica contained in the ore in its natural condition, a penalty of five (5) cents will be deducted from the price per ton.

For each 0.001 percent in excess of 0.100 percent Phosphorus contained in the ore in its natural condition, a penalty of one (1) cent will be deducted from the price per ton.

In all cases, fractions will be figured at above rates.

Ore, in its natural condition, containing less than 15.00 percent Metallic Manganese, or more than 15.00 percent Silica, or more than 0.25 percent Phosphorus, will be subject to acceptance or refusal, Buyer's Option.

Examples—Ore containing 15.00 percent Manganese, 30.00 percent Iron, 8.00 percent Silica

and 0.100 percent Phosphorus, is worth: 15.00 percent  $\times$  20c — \$3.00 and 30.00 percent  $\times$  6c — \$1.80, or \$4.80 per ton F.O.B. Pueblo.

Ore containing 30.00 percent Manganese, 15.00 percent Iron, 8.00 percent Silica, and 0.100 percent Phosphorus, is worth: 30.00 percent  $\times$  25c — \$7.50, and 15.00 percent  $\times$  6c — \$0.90, or \$8.40 per ton F.O.B. Pueblo.

Ore containing 45.00 percent Manganese, 3.00 percent Iron, 8.00 percent Silica, and 0.100 percent Phosphorus is worth: 45.00 percent  $\times$  30c — \$13.50, and 3.00 percent  $\times$  6c — \$0.18, or \$13.68 per ton F.O.B. Pueblo.

This schedule was issued over a year ago, but recent inquiry elicited from the C. F. & I. the information that while the market value for manganese ores had gone up, the company had made no change.

Some very high-grade ore is used in chemical processes. The Goldschmidt Thermit Co. will use ore assaying 85% MnO<sub>2</sub>, less than 1% Fe, traces of S and P, and no other metals. An ore submitted and rejected as being too low-grade assayed 46% Mn (72% MnO<sub>2</sub>), 4% SiO<sub>2</sub>, 1.1% Fe, 0.02% S and P a trace. A higher price is paid for ore suitable for chemical work, but no quotation is at hand.

It would be of interest to publish in the columns of this magazine prices paid for manganese ore by Eastern steel plants, and by a comparison of prices and freight rates determine the possibility of making larger profits by shipping east ore of grades suitable for steel smelting. Have any of the Alumni members the information?

### THE COLORADO SCHOOL OF MINES QUARTERLY.

The current number of the School of Mines Quarterly, Vol. 12, No. 2, recently off the press, is entitled, "The Foothills Structure of Northern Colorado." It is by Prof. Victor Zeigler, and will prove a valuable document to scientists and students, especially those interested in geology. If you failed to receive a copy, drop a card to the School or the Magazine, with your address and a request.

### BOARD OF TRUSTEES' MEETING.

At the July meeting of the Board of Trustees no definite action was taken toward selecting a president for the School. A committee of the board has been selected to secure a president, but is not yet ready to make specific recommendations.

## MINES MEN IN U. S. SERVICE.

\* Below is a list of Mines men in the U. S. war service. We know this is incomplete, and probably incorrect in some cases. Please send in any corrections and additions you may know of. We hope to obtain a complete list of all Mines men in the Service and print the roster frequently. Help us complete the list. Any Mines men, either graduates and former students, no matter what branch—artillery, cavalry, infantry, marine, aviation, engineers, training camps, reserve corps, etc. Inform us of any changes of address, transfers and promotions.

- Bail, Louis R., '00.**  
Retired Captain U. S. Army.  
Now military instructor, Salt Lake City, Utah.
- Buck, Luther J., Ex '18.**  
Reserve Corps, Fortress Monroe, Va.
- Beyrle, Charles N., Ex '17.**  
Sergeant Company A Engineers, C. N. G., Golden, Colo.
- Chapman, Irving A., '13.**  
Coxswain, U. S. S. P. 41.
- Charles, I. M., Ex '19.**  
Marine Barracks, Mare Island, Vallejo, Calif.
- David, C. Dodge, Jr., '15.**  
U. S. Army.
- Dolman, Carrol George, Former Professor C. S. M.**  
Captain Company C, Engineers, C. N. G., Golden, Colo.
- Ferguson, Kenneth S., '17.**  
Marine Barracks, Mare Island, Vallejo, Calif.
- Finney, Walter, Ex '20.**  
Marine Barracks, Mare Island, Vallejo, Calif.
- Fushey, Jesse J., Ex '19.**  
Second Lieutenant Company A, Engineers, C. N. G., Golden, Colo.
- Hinman, Dale Durkee, '15.**  
Second Lieutenant, U. S. Coast Artillery, Fortress Monroe, Va.
- Howbert, Van Dyne, '16.**  
Engineer U. S. Training Camp, Fort Riley, Kan.
- Kinsley, Arthur C., Ex '18.**  
First Lieutenant, Company A, Engineers, C. N. G., Golden, Colo.
- Knepper, C. M., '17.**  
Retired Captain U. S. Navy.  
Government Inspector for the Navy, Bethlehem, Pa.
- MacNeill, Neil M., '14.**  
Company C, Engineers, C. N. G., Golden, Colo.
- Marshall, Emory M., '11.**  
U. S. Army.
- Menke, J. G., Ex '18.**  
Company C, Engineers, C. N. G., Golden, Colo.
- Mewhrter, Sydney A., '17.**  
U. S. Army Reserve Corps, Fort Riley, Kan.
- Murphy, William J., '17.**  
Company A, Engineers, C. N. G., Golden, Colo.
- O'Neill, Frank E., Ex '18.**  
First Officers Training Company, Fortress Monroe, Va.
- O'Reilly, Walter T., Ex '18.**  
West Point Military Academy, Annapolis, Md.
- Parker, J. Merrill, Secretary of the Mines Y. M. C. A.**  
Marine Barracks, Mare Island, Vallejo, Calif.
- Prior, Charles E., '13.**  
U. S. Army.
- Richardson, Carleton, Ex '19.**  
Company A, Engineers, C. N. G., Golden, Colo.
- Ristedt, Ernest J., '09.**  
First Lieutenant in the Reserve Corps of Engineers, U. S. A.
- Robertson, Fitch, Ex '18.**  
Company A, Engineers, C. N. G., Golden, Colo.
- Russell, Donald O., '09.**  
English Army, Somewhere in France.
- Schoensiegel, A. D., Ex '17.**  
Marine Barracks, Mare Island, Vallejo, Calif.
- Small, Sidney S., '17.**  
Second Lieutenant, U. S. Coast Artillery Corps; Second Officers' Training Co., Fortress Monroe, Va.
- Snedaker, Eugene G., '14.**  
First Lieutenant Engineers Corps, U. S. Army.
- Taylor, C. C., Ex '17.**  
Second Lieutenant Coast Artillery Corps, Fortress Monroe, Va.
- Thurstin, Robert A., '17.**  
U. S. Army, Officers' Training Camp.
- Townsend, Albert, Ex '19.**  
Company A, Engineers, C. N. G., Golden, Colo.
- Van Burgh, Lisle R., '17.**  
First Lieutenant, Company A, Engineers, C. N. G., Golden, Colo.
- Vorck, Charles R., '16.**  
Company A, Engineers, C. N. G., Golden, Colo.
- White, Roger F., Ex '18.**  
Officers' Training Camp, Fort Riley, Kan.
- Williams, Wm. H., Ex '18.**  
Officers' Training Camp, Fort Riley, Kan.

## RECENT ARTICLES BY MINES MEN.

- "Survey of Inclines Without Auxiliaries," by A. J. Sale, '01. Mining and Scientific Press, July 21, 1917, pages 87 to 91, inclusive.
- "Inhibitory Films in Flotation," by Will H. Coghill, '03. Engineering and Mining Journal, July 14, 1917, pages 49 to 53, inclusive.
- "Recent Vulcanism in Salvador," by C. Erb Wuensch, '14. Mining and Scientific Press, July 7, 1917, page 22.

## MAKE THE HANDS WORK WITH THE BRAIN.

### Need of Vocational Training in Our Public School Curriculum.

By Prof. Ransom S. Hawley.

"What do you think of vocational training for our boys and girls? Do you believe in it?"

This question was hurled at me by The Globe editor from one of his heavy guns.

"Do I believe it?" I replied. "Let me tell you something."

Even the editor could not get in a word edgewise for the next ten minutes. He retreated and collapsed. After he got his breath he asked me if I would put that in writing. So here's part of it:

If you want to see a shining example of lack of vocational training look at China. The upper classes have never been taught nor even permitted to use their hands. They are a most helpless lot, and China has drifted along, making little progress for centuries.

Compare the average Chinese boy with the average American boy for usefulness. Until recent years the American boy has been forced to make his way, and regardless of position has turned his hand to most any kind of work.

"Yankee genius" is largely the result of necessity. The curious part about this idea is that in our educational systems we have not recognized this principle that education is not all a matter of training the mind to think, but, rather, training the body to work with the mind.

Some of our good people will even yet argue that unless a boy and girl has spent years in the study of Greek, Latin, philosophy, art, ancient history, Hebrew and a few other very nice but mostly useless subjects, they cannot be considered educated or cultured.

Fortunately, we are gradually, but surely, changing our ideas about these matters. One does not need to look for culture among the college-bred only. Educated folks are found in all kinds of work and all walks of life. Perhaps they never saw the inside of a college, university or even high school.

But they are loyal, useful citizens of the United States. They are making their mark in the world, and you may look for real refinement and true culture among them, and find it in abundance.

What more can the public schools do for our boys and girls than to teach them useful arts? Many of our school pupils go no further than the grades. More drop out in the high school. Comparatively few take a college course. In what better way can we raise the standard of usefulness among our masses.

What other opportunity will many of these boys and girls ever have to learn a useful art? How many are fitted to take up any

kind of occupation which calls for training at the time they are obliged to drop out of school?

We have laws requiring school attendance, and yet we offer no substitute to the old cut-and-dried courses. Our educational system is based on the assumption that a boy or girl will go through the grades, high school and college.

We have manual training high schools and we have agricultural colleges and colleges of mechanical arts. Is there any reason why this same idea should not be carried out from the grades up?

One of the most successful engineering schools in the country today is based on this idea—two weeks in school, two weeks in shops. The president of this school could not get a hearing when he first proposed this scheme. Now the college can not accommodate the applicants for admission.

I do not argue against the common branches nor against the cultural courses of high school and college, but I do believe we are greatly at fault in not carrying on vocational work as well.

Why do our girls now have to do apprentice work in shops? Because in this time of need we have too few with even a little vocational training.

Why is there a crying need for trained boys and men in shop and factory? Because we have taught them Greek instead of Yankee ingenuity.

Why do our young people have to take up an occupation after spending twelve years in school? Because they have been taught a smattering of a thousand different things and their minds are a jumble.

Our educational system is characterized by lack of system and by inefficiency.

Why?

Because—well, this is not in accordance with the opinion of educators. It is better to stop here and let the reader imagine the answer.

Do I believe in vocational training?

I certainly do.—Golden Globe, June 23, 1917.

### "MAKE GOOD."

"He's made good!" Do you catch the thrill wrapped in those magical words? Suppose you should overhear some one say it about yourself—"He's sure made good!"

Making good is not an accident, and much of the romance of this work-a-day world of ours is stored within those words. You know men who have made good, and it's but human to look up to them and wonder how it's done. Yet when it is deduced to its final analysis, it is but the simple tale of work well done—a means within the grasp of everyone, whether he be a laborer in the mine or an executive in the office.

Aye! but it's great to make good! What's that? The carping critic now intrudes and says the expression does not square with grammar! Well, mayhaps 'tis true that it will not stand the acid test of those who

swear by the book and delight in sending words through their paces.

But what of it? No one can mistake its meaning, for does it not perform the very first office for which speech was invented—to give expression to the mind? Primitive man first learned to talk by pointing at objects and giving vent to guttural grunts that finally came to be words. Speech came first, then grammar, and the latter has always remained a few paces behind.

Thus it is "made good" sounds good—is good. Man's chiefest delight has always been in making good. Don't you remember the time when you were a kid—O, glorious days—trying to make good in school and the teacher caught you doing sums on your fingers beneath the desk? What a tingling when she reminded you that fingers weren't made to count with. But they were! That's just the way the primitive man we were talking about made good. He used them to learn to count; but whereas we were limited, in school to ten, he went up to twenty because he wore no shoes, and with every twenty he scratched on the ground with a stick and called it "a score!" And how proud he must have been of this achievement, for had he not made good?"

Yes; make good is good. It's American, too; typically so. Just as we Americans with our land of the open ranges and towering hillsides absorb the very strength of our glorious country, with its countless opportunities of making good, we also vivify the very language until it becomes typical of our achievements.

Make good is a true Americanism and we are proud of it, just as we are even at this moment beginning to stir our pride in many other things in this land of promise and of opportunity.

Opportunity! This word has been slandered and maligned in song and proverb because it was supposed to happen about once in a lifetime. As a matter of fact it hangs around every street corner and would actually be a loafer were it not for those wise enough to see it and grab it up and make good.

That's the formula—opportunity and you equals "Make good!" Every man has a chance to make good—we must make good, for the world expects it of us. And you need no better opportunity in which to enjoy the thrill of those words than in this business of helping the world to its fuel supply. It's a big business and will make those of us big who honestly strive to make good.

More people are going to make good these coming years than there have for many a day. These present days are going to be talked about to future generations as the good old times.

Start now. Make good! Let us sound to the depths of the full meaning of the words. Be deaf and dumb to the whisperer who suggests "Fall down" in place of "Make good." We are out to make good, and when the history of the years is written what a

glorious thing it will be when your page reads "He made good!"

—Coal Age, April 7, 1917.

#### EVERY MAN ON HIS JOB.

Every man's duty is the same. Your job is your duty. Your neighbor's job is his duty. Each of us can do his part most effectively by redoubling present endeavors at whatever his regular occupation may be.

If we are railroading, let us railroad for all we are worth. If we are farmers, let us farm more. If we are mining, let us mine as never before. Let us do the same if making shoes, making clothes, building houses, building factories, warehouses, skyscrapers, roads or whatever it may be.

Our entering into war need not and should not mean a curtailment in road construction and building operations. War does not mean that everybody should forget business and live a life of gloom. Let everyone do his bit along lines he is best suited. Let the world go on as before, work harder, play harder, and the war will end sooner.

Let both public and private useful construction proceed. Production and handling of building materials and public and private construction work are fundamental industries of the country. The country is prosperous. Building investors should not hesitate to go ahead with their plans. Railroads should spare no effort to supply the building industry with the cars needed to transport materials. Government, state, country and municipal authorities should encourage the continuance of all kinds of building. Road and street improvements in particular should go on unabated. Bad roads are factors of first importance in the present high cost of foodstuffs. Never before was the improvement of highways so essential. Let all lend a hand towards getting roads improved.

Contractors should make a careful study of conditions that they may encounter and lay plans accordingly. All work possible should be done by labor-saving devices. What may seem a heavy initial expenditure for equipment will very probably prove to be a wise investment before the contract is completed. It is worse than folly to use slow, costly methods.

Neither government regulations nor railroad restrictions should be imposed unnecessarily to interfere with the shipping of building supplies. If any action is taken which results in the prostration of so fundamentally important industries, there is real danger of a surplus of unemployed labor, a surplus of railroad cars and a crippling of business that will seriously embarrass the government in financing the war.

#### Aggravating the Fault.

"When I say a thing I mean it!" exclaimed the emphatic man.

"But sometimes," replied Miss Cayenne, "that only makes it worse!"



**Guggenheim Hall.**  
**Stratton Hall.**



Experimental Plant, Mount Zion and Lookout Mountain Road

**School of Mines.**

Tune—"Heidelberg."

Up in the hills of old Golden town  
 Stands the school we love so dearly,  
 Keeping her vigil, by day and night,  
 O'er those who serve her well;  
 So let us all fight for the Blue and White,  
 And the fellows who leave us yearly;  
 Wherever they go, in sunshine or snow,  
 Her praises they always will tell;  
 Wherever they go, in sunshine or snow,  
 Her praises they always will tell.

**Chorus.**

Here's to the school we all uphold,  
 Here's to her colors bright,  
 Here's to her boys, so brave, so bold,  
 The Mines is their guiding light.  
 The miner's life is the life for me,  
 In the midst of the mountain pines;  
 The engineer is the best, you see,  
 When he comes from the School of Mines.  
 O School of Mines, dear School of Mines,  
 Thy memory e'er will bring  
 The stirring lays of student days,  
 That round us fondly cling,  
 We'll sing of Golden's engineer,  
 Whose spirit knows no fear,  
 Who cherishes his colors true,  
 The noble White and Blue;  
 Who cherishes his colors true,  
 The noble White and Blue.

**JUST WATCH YOURSELF GO BY.**

Just stand aside and watch yourself go by;  
 Think of yourself as "he" instead of "I."  
 Note closely, as in other men you note,  
 The bag-kneed trousers and the seedy coat.  
 Pick flaws; find fault; forget the man is you,  
 And strive to make your estimate ring true.  
 Confront yourself and look you in the eye;  
 Just stand aside and watch yourself go by.

Interpret all your motives just as though  
 You looked on one whose aims you did not  
 know.  
 Let undisguised contempt surge through you  
 when  
 You see you shirk, oh, commonest of men!  
 Despise your cowardice; condemn whate'er  
 You note of falseness in you anywhere.  
 Defend not one defect that shames your eye;  
 Just stand aside and watch yourself go by.

And then, with eyes unveiled to what you  
 loathe—  
 To sins that with sweet charity you'd  
 clothe—  
 Back in your self-walled tenement you'll go  
 With tolerance for all who dwell below.  
 The faults of others then will dwarf and  
 shrink  
 When you, with "he" as substitute for "I,"  
 Have stood aside and watched yourself go  
 by.  
 —Success Magazine.

**REDUCING MISFIRE COSTS.**

Many times on a muck job one sees the shovel hung up and doing nothing. On investigation it is found that they have encountered some tight bottom which the shot failed to pull. This means a delay of an hour or more while the obstruction is re-drilled and reblasted before the shovel can be advanced and digging resumed. Again a delay of several days may be caused by the discovery that there are missed holes and unexploded powder ahead—naturally the shovel crew is reluctant or refuses to proceed until the danger is removed. Oftentimes the material has to be carefully mucked by hand and all this time the shovel is lying idle. Obviously in order to get the best out of a shovel or dredge continuous steady operation must be maintained. Such delays are very expensive and if they occur frequently may even disrupt the whole organization. It is not uncommon to see a dipper dredge bring up unexploded charges. Occasionally these charges explode when hit by the dipper teeth causing considerable damage. Dig deeper holes to bring bottom. Use more care in loading and in testing caps.

It has been proven by actual experience and tests by U. S. Bureau of Mines that it requires more and stronger explosives for submarine rock excavation than in open cut work. To a great extent delays and danger from above causes can be avoided by the proper selection, and care in loading of explosives. Frozen explosives are less sensitive and efficient than when thawed.

In order to get the maximum out of any explosive it is well to use strong detonators.

For rock work before a steam shovel, if work is wet it is best to use a low freezing gelatin from 40% to 60% strength, depending on the character of the material. Present prices of glycerine being high, contractors are finding that good results can be obtained by using lower grade explosives where higher grades were formerly thought necessary. If work is dry a low freezing dynamite can be used. In tight hard bottom, the gelatin is best suited because in addition to the no-thawing advantage, it combines density with high water-resisting characteristics. Density is an advantage in that more weight of explosive can be concentrated in bottom of any given diameter of bore hole than with lighter dynamites.

For submarine rock blasting a 75% strength gelatin dynamite is best adapted. Nothing weaker than a No. 8 Electric Blasting Cap should be used with any gelatin. There is a lot of potential energy in a gelatin and in order to release it a No. 8 detonator is necessary.

Stick to the well proven standard explosives for best results. Miscellaneous trying out of unproven brands may cause a lot of trouble and expense. It is not difficult to reduce the powder cost per ton or yard of material in almost any operation. The charge

per hole can be arbitrarily reduced a pound or two with seemingly equal results; but watch out! the shovel cost and secondary drilling cost may jump up, more than wiping out the apparent saving.

**SHORTAGE OF LABOR BECOMING MORE ACUTE.**

**Dynamite Is Being Used. \* \* \* Labor Savers in Demand.**

The world today is in need of men. Not alone for war purposes, but for business and industrial conditions. Millions of mechanics and laborers are required to run the world's machinery. With all the available men of the fighting European countries enlisted in military services and search being made for volunteers; in fact, a draft law in sight, in our country, means are being sought whereby work can be done with less men. In farming and industrial work dynamite is being used as a substitute.

Really without explosives we would be in a bad predicament. The extent to which high explosives can be used is certainly amazing. They are used practically all over the world for subsolling, tree planting and land draining.

Fruit growers are high in their praise for dynamite. It prepares the ground for planting orchards so that the roots of the trees may reach far into the loosened earth, and thrive properly. Rain sinks into the mellowed subsoil and there serves its nourishing purposes for weeks after the top soil has become dry.

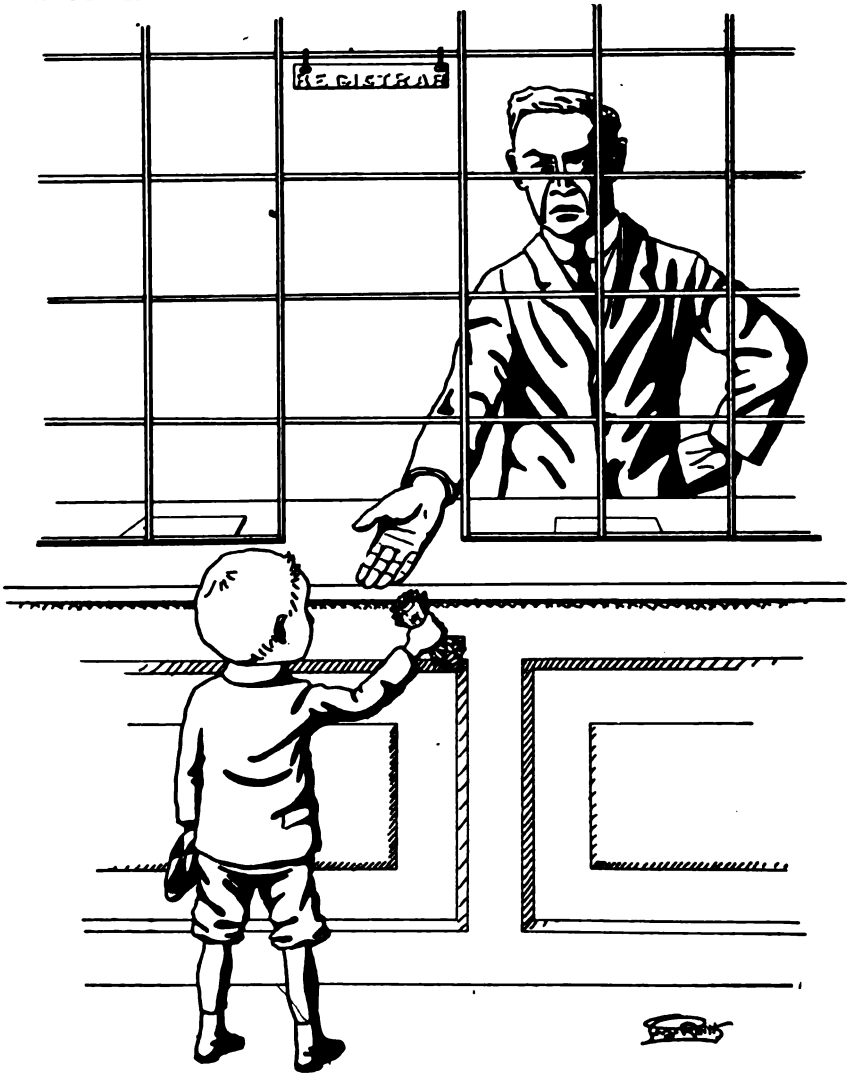
Dynamite is extensively used as a labor-saver for digging trenches, canals and ditches. In road building, especially where heavy grades are to be cut down, explosives do the work of many men.

Columns could be written on the employment of explosives for business purposes and its aid to all great constructive work. But briefly, it is a labor-saver when used for the following purposes, in addition to the previously mentioned: draining swamps, blasting holes for telegraph and telephone line poles, straightening streams by blasting new channels, wrecking old buildings, bridge piers and stone walls, blowing down clay in brick yards, breaking up frozen ore on ground or in open cars, and loosening ground for sewer excavations. While this last use may be considered dangerous, it is being accomplished without danger to the public or to underground pipes.

Explosives are known to many only as instruments of destruction, hence their great labor-saving qualities are a revelation.

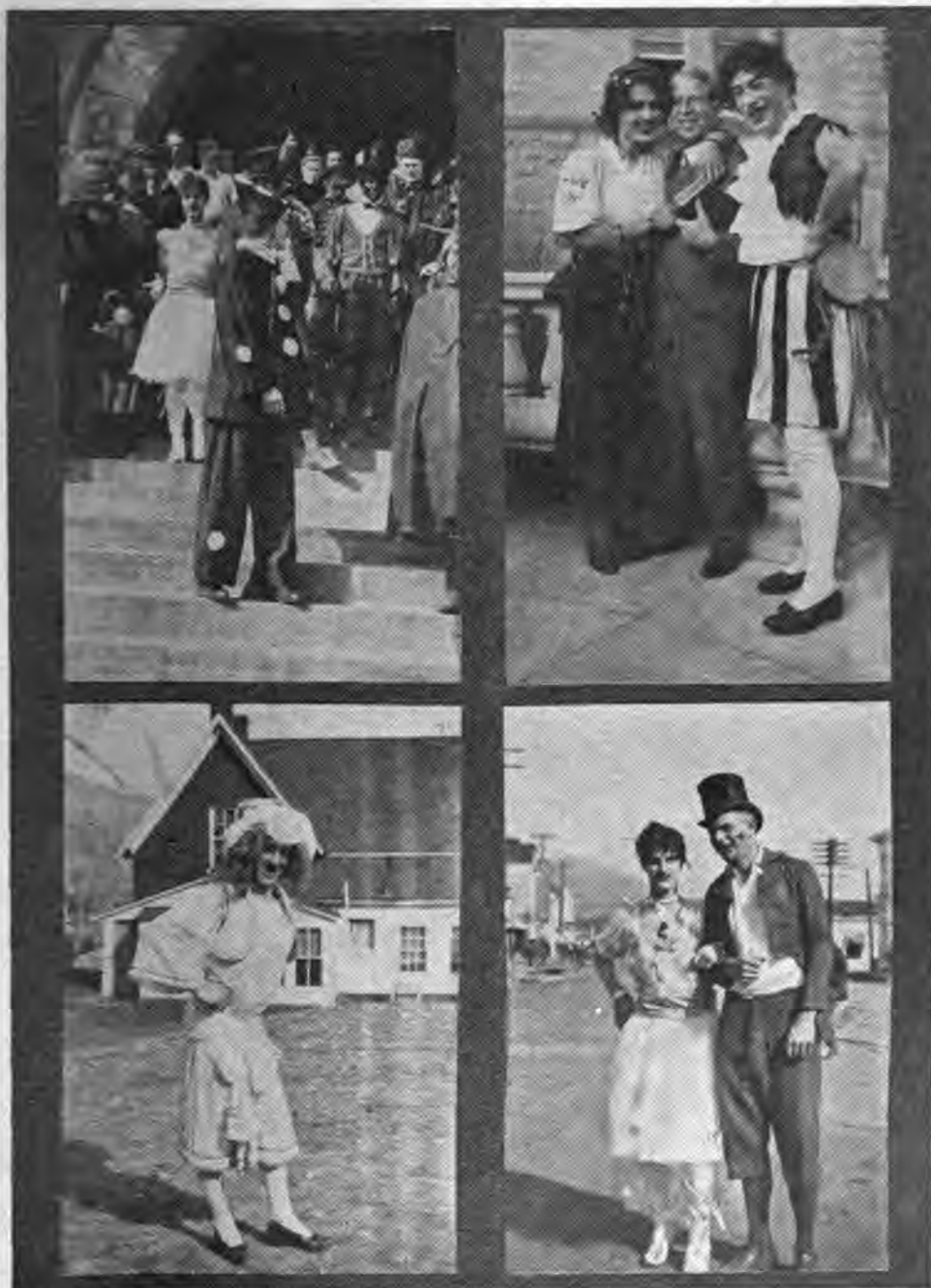
When the great world conflict stops the explosives business will not be materially reduced. The world, in peace, will be in a constructive mood and labor-saving dynamite will be used extensively. Besides millions of acres of European battle fields must be converted into productive farm fruit fields, and the already great use of this agency for land clearing and drainage in this hemisphere will continuously increase.

# FRESHMEN



(Cartoon from 1918 Prospector)





Senior Day

# Colorado School of Mines Magazine

Published every month in the year, at Golden,  
Colo., by the Alumni Association of the  
Colorado School of Mines.

Subscription price .....\$1.25 per annum  
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Advertising rates on application to the  
Manager.

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VOL. VII.      AUGUST, 1917.      No. 8

We had several letters from graduates in regard to the trouble here, including one from a member of the Executive Committee, which we had intended to publish, but just before going to press we were ordered by the president of the association, on behalf of the Executive Committee, to omit from the Magazine all editorials and letters from graduates touching on the affairs here.

Oh, My!

"I wonder why some people don't mind their own business?"

"There are two reasons why. One is that they haven't any mind, and the other that they haven't any business."—Harvard Lam-  
poon.

## IT PAYS TO ADVERTISE.

Write articles and send them to the Magazine for publication. Of course if you send them to the larger technical journals you may get from ten to fifty dollars apiece for them, but they will reach a wider circle if first published by the Colorado School of Mines Magazine.

This statement may sound foolish, but it is true nevertheless. Here is the reason: No technical journal considers our magazine as a financial rival and therefore does not hesitate to reprint any original article of value we may publish, and give us credit.

Practically every original article we have printed since the Magazine was started has been republished in from one to ten of the leading technical journals, depending on its originality and value.

Send us that article first. The ultimate wider circulation will be of more value to you than the few dollars you may get for it elsewhere.

## QUALITATIVE TEST FOR TITANIUM IN PRESENCE OF VANADIUM.

Delicacy of test: 0.10 per cent of titanium can be detected in 1 per cent vanadium solution. Ferrous ammonium sulphate discharges the brick red color of the vanadic solution with hydrogen peroxide more quickly than it does the yellow shade of titanic acid and hydrogen peroxide.

Dissolve the sample in sulphuric acid as usual, then after adding the hydrogen peroxide add slowly 1 c.c. at a time of ferrous ammonium sulphate standard solution to the qualitative vanadium test. If it gradually fades from a brick red to a bright yellow then titanium is surely present. If the red or brown tint fades directly to a nearly colorless condition and not showing a clear, bright yellow, titanium is not present.—R. L. Grider, '05, University Daily Kansas, March 5, 1917.

## THE MINER'S CREED.

Following is a Butte miner's creed. It is good enough for miners elsewhere:

Bar down all loose ground before starting to do any other work;

Never leave candles burning on timber;

See that the grizzlies over chutes are in good repair;

Be careful around electric wiring and all electric apparatus;

Never drill alongside a missed hole;

Cut out all fooling while at work, and also rushing for cage at quitting time;

Keep the stope-floors in good repair and tidy;

Never carry powder with a capped fuse;

Give warning in ALL directions when blasting;

Bend down nails in all boards or lagging that may be lying around where men may step on them;

Keep the guard rails in place on all man-ways;

Never use a drill or metal bar in tamping;

Get all wounds properly treated so as not to risk infection;

Warn and help new men to protect themselves from injury by accident.

## THE WITTY RETORT.

A judge was lurching one very hot day when a politician paused beside his table and remarked: "Judge, I see you're drinking coffee. That's a heating drink. In this weather you should drink iced drinks—something sharp and iced. Did you ever try the combination of gin and ginger ale?"

"No," smiled the judge; "but I've tried several fellows who have."

Paper is now three times as high as it was a year ago. If you owe the printer for any of it, for the love of Mike, pay it.

Many try to drown their troubles in drink; but trouble is a good swimmer.

# ALUMNI

## PERSONALS.

'97.

Louis Cohen has given up his office in Denver for the present, and is in Georgetown, Colorado, with John Gross. Box address, No. 43.

'98.

Orvil R. Whitaker, who is vice-president of the board of trustees, has been secured by the smelter and ore sales investigation committee, named by the recent legislature, to take entire charge of the technical work connected with their examination. Whitaker stands so high in the mining world that any report he may make will be accepted by mining men generally as in perfect accord with the facts. Moreover, the mining men know him well enough to know that his examination will be thorough and searching. Many ore producers have charged the smelters with making excessive and unjust charges for the treatment of ores. Whitaker's work will consist of investigating these charges and explaining to the ore producers and the general mining public the system and working of smelter schedules. The eagerness with which both sides of the controversy have urged Whitaker to accept this position is a high tribute to his ability. Mr. Whitaker's report will certainly be interesting reading, and we hope that we may have the privilege of publishing it in the Magazine.

'03.

William B. Rhodes visited a few days in Golden the latter part of July. Rhodes has just returned from a business trip to San Jose de Gracia, Sinaloa, Mexico. After a business trip to New York, Rhodes expects to return either to Mexico or South America.

Frank J. Nagel has returned to Mexico, where his address is Apartado 70, Chihuahua, Chihuahua, Mexico.

'04.

The School of Mines has been given a prominent place in the recent reorganization of the Washington State College at Pullman, Washington, and Prof. Francis A. Thomson has been appointed Dean of the School. Increased facilities have been provided for the laboratories and the staff, so that thorough

instruction can be given in both mining and metallurgical branches. A special flotation laboratory has been provided.

'05.

L. P. Pressler is mining engineer with the Tonopah Mining Co., Tonopah, Nevada. His permanent address is Hanover, New Mexico.

Arthur Clark Terrill informs us that we are mistaken in our personal in regard to him in the July issue. He has not been in California for two years, but plans to go between August 15th and September 15th. Terrill just returned from a trip to Osage City long wall coal mines, and Blue Rapids gypsum mines and mills about the middle of July, and was planning a visit for a few days to Baxter Springs, Kansas, which is the new boom zinc town. Four or five of the biggest zinc companies in the country are now working at Baxter Springs.

Charles M. Rath's address is now Box 91, Douglas, Wyoming. Rath has been for the past eight years surveyor for the inspection of Mineral Deposits for the U. S. General Land Office. He recently resigned from the government service and accepted the position of geologist for the Western Exploration Company. His official headquarters will be 306 International Trust Bldg., Denver, Colo., but his residence address will be Douglas, Wyoming.

Homer D. Ford, Superintendent of the Gilson Asphaltum Co., at Watson, Utah, spent his vacation in Denver during June, returning to Utah on July 5th. Ford was accompanied by his wife.

T. R. Hunt is Mill Superintendent for the Wellington Mines Co. His address is Box 1133, Breckenridge, Colorado.

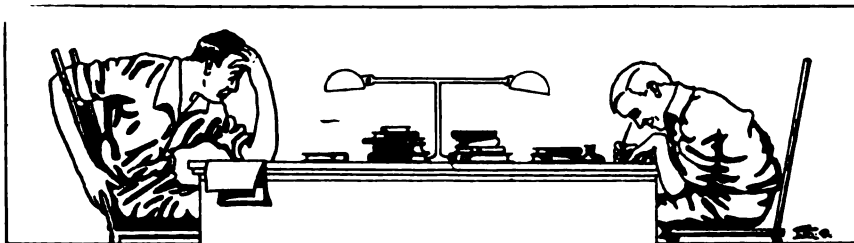
'08.

B. W. Knowles who has been with the Daly Reduction Co., Ltd., at Hedley, B. C., Canada, nearly ever since he graduated, was placed in charge of the mine the 1st of June. He writes that the only drawback was that they had to move up on the Hill where it was like the San Juan—nine months winter and three months cold weather.

C. E. Leshner, coal specialist of the U. S. Geological Survey, testified recently before the Public Utilities Commission of New Jersey as to the best practices in securing by-products from the manufacture of illuminating gas.

'09.

A. F. Hallett has accepted the position of chemist with the Khirgiz Mining and Trad-



ing Company at Ekibastus, near Pavlodar, Siberia, Asia. (Address care of company.) This company is a branch of the Irtysk Corporation, Ltd., of London.

Hallett and Miss Laura White of Montrose, Colorado, were married on May 18th. Hallett and his wife expected to sail from San Francisco for Siberia on July 18th, and will be gone for at least two years.

'10.

Charles M. Glasgow is with the Empire Zinc Co., 703 Symes Bldg., Denver, Colo.

'11.

W. G. Matteson is Petroleum Geologist and Mining Engineer for the Texas Company. Address care of the company, Box 1735, Houston, Texas. Matteson's permanent address is now 2223 Newkirk Avenue, Flatbush, Brooklyn, N. Y.

Gustave Walter Voelzel and Miss Lois Vick Yates were married at 2 o'clock, July 29th, at the Presbyterian Manse, Silver City, New Mexico.

Otto Herres is now Superintendent of the Hiawatha Mine of the United States Fuel Company at Hiawatha, Utah.

'12.

Arnold Wilkinson Harris and Miss Sally Eckard were married on Wednesday the 6th



Arnold Wilkinson Harris

of June, at San Francisco, California. The young couple will be at home to their friends after the first of September at Namtu, via Namyao, Northern Shan States, Burma, India.

Harris worked for the Chino Copper Co. at Hurley, New Mexico, from graduation until November, 1916, when he accepted a position with Bruff, Bradley & Le Barthe, in San Francisco. While there he was engaged to construct a mill at Namtu, Burma, for an English company. This mill was designed in the San Francisco office. Harris and his bride started for India on June 16th. They expect to be gone two years.

Donald R. MacKay is engaged in civil engineering work at Deadwood, Missouri.

D. L. Beck's box address at Alma, Colo., is Box F.

'13.

Chas. S. Arthur is Safety Engineer for the Consolidated Arizona Smelting Co. Address care of the company, Humboldt, Arizona. His permanent address is 1462 Lafayette Street, Denver, Colo.

'14.

Eugene C. Snedaker successfully passed the army examinations for first lieutenant, and has received his commission in the Engineer Corps.

Theo. H. M. Crampton, 207 Santa Monica Blvd., Santa Monica, California.

Rufus E. Litchfield is mill foreman for the Atlas Mining and Milling Company at Sneffels, Ouray Co., Colorado. Address care of the company.

C. Erb Wuensch was in Nevada the latter part of July.

Neil M. MacNeil, of Company C Engineers, and C. R. Vorck, '16, of Company A Engineers, with Mrs. Will Lowe, and her daughter Anne, were going toward Denver in an Overland car the night of July 18th, when, in trying to pass an approaching car MacNeil, who was driving, turned out too far and the car plunged off a fifteen-foot embankment onto the C. & S. tracks. Mrs. Lowe and Vorck were severely injured. MacNeil and Miss Lowe escaped with slight scratches. Mrs. Lowe recovered rapidly, but Vorck was removed to St. Joseph's Hospital, Denver, some days later. He is now doing nicely. The car was badly damaged.

'15.

Ben C. Essig, his wife and baby daughter, after visiting relatives in Michigan, arrived in Golden the latter part of July. Essig has accepted a position in Breckenridge, Colo., and expected to leave for there August 1st.

P. B. Van Dolah is surveying for McNair and Hoskins in Leadville, Colo. Box address 526.

Van Cleave Olson is now at Park City, Utah.

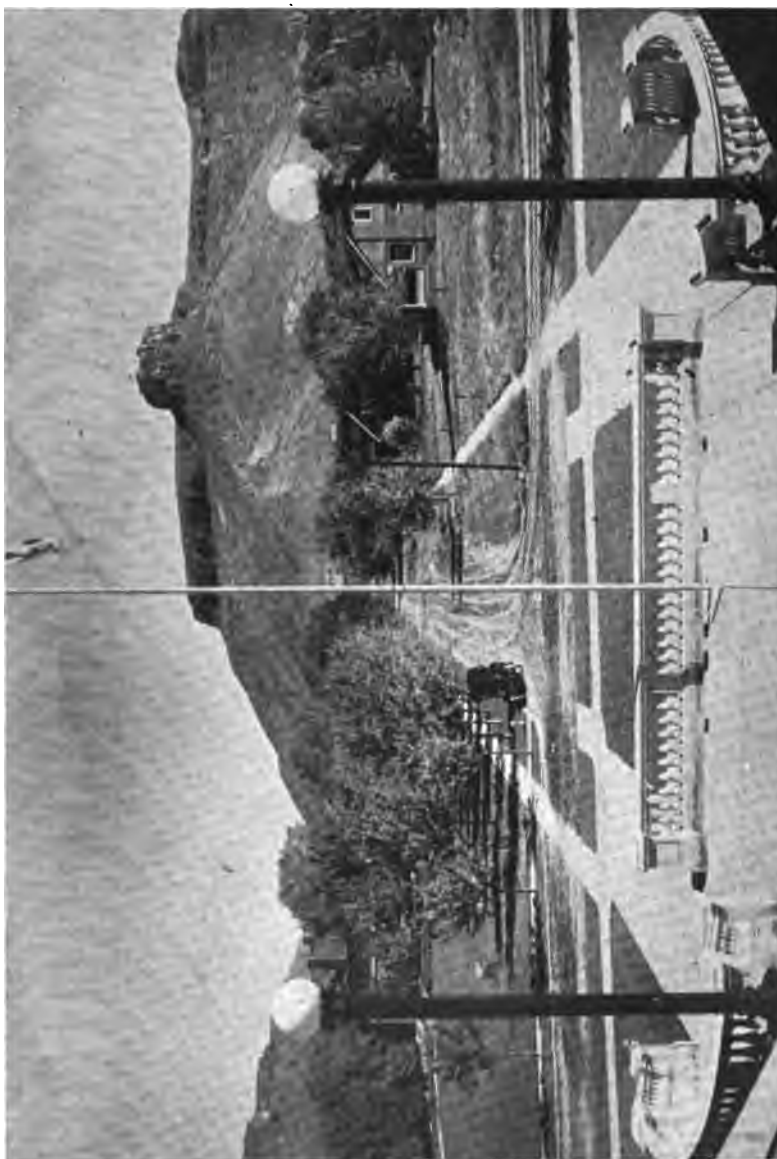
'17.

Lieutenant Van Burgh, Company A Engineers, who has been in charge of the recruiting in Denver, has returned to the camp at Golden and taken charge of the signal section.

R. H. Clarke is chemist for the Chino Copper Co. at Hurley, New Mexico.

Thaddeus H. Andrews is with the Ray Consolidated Copper Co., Ray, Arizona, care of the Ray Consolidated Club. His home address is care of Dr. Geo. D. Andrews, Waldenburg, Colo., and not care of Dr. D. Andrews, as we had it in the July Magazine.

**IF YOUR RECORD IS NOT ON FILE WITH THE CAPABILITY EXCHANGE WRITE FOR A BLANK AT ONCE. WE ARE MOVING MINES MEN TO BETTER POSITIONS NEARLY EVERY WEEK.**



View from Guggenheim Hall

## MISCELLANEOUS.

Prof. H. B. Patton made a short trip to Fort Worth, Texas, in the early part of July.

Prof. George J. Young left for San Francisco early in July and expects to remain there until school opens.

Many persons would have attained to wisdom if they had not presumed that they already possessed it.—Seneca.

Prof. R. S. Hawley, accompanied by his family and some friends, motored to Estes Park for a few days' camping trip.

Prof. Louis C. Hill, former professor of physics during the Chauvenet regime, visited friends in Golden early in July. Prof. Hill is now living at Hollywood, Calif.

Prof. Victor Ziegler returned to Golden from Kaycee, Wyo., early in July for a short visit. Later in the month Prof. Ziegler paid another brief visit to Golden, and when he returned took his wife and children with him for an automobile camping trip.

William G. Raymond, dean of the School of Engineering, University of Iowa, was in Golden about the middle of July for a trip of inspection through the School of Mines buildings. Dr. Raymond is one of the men who is being considered by the board for the presidency of the school.

Prof. R. S. Hawley tested out a device intended to be used with gasoline engines as a carbon remover and charge purifier early this Summer. The device is covered by a patent held by a Denver party, who expects to have it placed on the market in the near future. Prof. Hawley states that this device is likely to advance the two-cycle engine, as it should remove the one obstacle to the satisfactory operation of this type of engine. Prof. Hawley received an offer from the same parties to take a position as testing and designing engineer, but has not decided to accept the offer.

## Engineers Mobilize in Golden.

The entire battalion of Engineers, C. N. G., are mobilized in Golden. Some are camped in the City Park, where a model camp has been laid out. Others are using the School of Mines Gymnasium and the Armory as quarters. Taylor, former Captain of Company A, is now Major of the battalion. The new company (C), just organized, is in charge of Captain Dolman, who was Professor of English and Modern Languages at the School last school year.

## Keep At It.

Recently a little boy in South Africa nearly drowned and pronounced dead by some, was revived after nearly three hours' work at artificial respiration.—From "The Reef," safety organ of the Rand Mutual Assurance Co., Ltd., Johannesburg, South Africa.

Some months ago a miner at Leadville was overcome with gas and pronounced dead by two physicians. A first-aid crew, under the direction of a Mines graduate, worked over him for over two hours when the man revived. He was back to work a few days later. Keep at it.

## NEEDLESS ADVICE.

By Rufus T. Strohm.

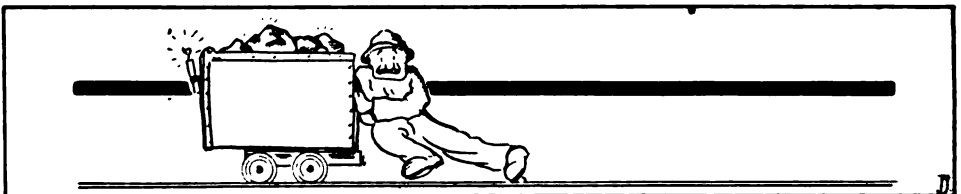
It was in a mining paper  
Which from week to week I scan,  
That a list of "Dont's" was printed  
To instruct the mining man;  
And among the many warnings  
Set before him there, I read  
That if accidents should happen  
He should never lose his head.

Well, it struck me rather funny,  
Yet it seemed too bad to joke  
In a sober-minded journal  
Written for the mining folk;  
For a fellow who is working  
Where the snares of peril spread,  
Doesn't need to be reminded  
To be careful of his head.

He could lose his reputation,  
Or his temper, or his nose,  
And dispense with teeth or fingers,  
Or a couple of his toes;  
But in case of grim disaster,  
He's aware that he'd be dead  
If he failed to heed instructions  
And should chance to lose his head.

So, advise him to be cautious,  
Tell him not to lose his wits  
When a sudden danger threatens  
To distribute him in bits;  
But as long as breath and spirit,  
Thought and reason haven't fled,  
You can bet your bottom dollar  
He'll be sticking to his head.  
—Written expressly for Coal Age, March  
24, 1917.

Some of the fellows who have been waiting for their ships to come in now blame it on the U-boats.—Life.



**THE TORN TROUSERS.**

Arriving quite late at a dance one evening, Mr. Jones discovered that in slipping on the icy pavement outside, he had torn one knee of his trousers.

"Come into the ladies' dressing room, John," said his wife. "There's no one there, and I'll pin it up for you."

Examination showed that the rent was too large to be pinned and Mrs. Jones began to look about for sewing material. A maid furnished needle and thread, and was stationed at the door to keep out intruders, while Mr. Jones removed his trousers, putting on his overcoat to serve as a robe, and his wife went busily to work.

Presently at the door sounded excited voices.

"We must come in, maid," a woman was saying. "Mrs. Brown is ill. Quick, let us in."

"Here," said the resourceful Mrs. Jones to her terrified husband, "get into this closet for a minute."

She opened the door and pushed her husband through it, just in time. But, instantly, from the opposite side of the door, came loud thumps and the agonized voice of Mr. Jones, demanding that his wife open it at once.

"But the women are here," Mrs. Jones objected.

"Oh, confound the women!" profanely answered Mr. Jones, with another and louder thump. "I'm out in the ball room."

To other gems of brevity should be added the opinion of an engineer on the merits of consolidating some properties: "The consolidation is based on the assumption that putting four dead cats together will make one live one. This is an error."

There is some pure gold in the worst of men, but it eats up all the profits digging it out.

Fortunate is he who sees the point of a joke instead of feeling it.

**MINES SHIELDS**



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**Efficient Methods**

Rapid Methods of Technical Analysis,  
Frank D. Ailer, '92.....60c

The best and most efficient methods for all of the regular determinations. Ailer was for many years chief chemist for the A. S. & R. Co. There is no better set of modern practical analytical methods printed. Every Mines man should have a copy.

Quantitative Analysis, C. D. Test.....20c  
Used as text in Sophomore laboratory work.

Laboratory Notes, J. C. Ballar.....30c

Notes on Assaying, F. W. Traphagen...60c  
These notes accompany the lectures in Fire Assaying at the Colorado School of Mines.

THE COLORADO SCHOOL OF MINES  
ALUMNI ASSOCIATION,  
GOLDEN, - - COLORADO.



## The Efficient Purchase and Utilization of Mine Supplies.

This neat, hundred-page book by Hubert N. Stronck, '13, and John R. Billyard, '13, thoroughly and carefully covers an important branch of mine management, to which very little attention is given by many mine managers and superintendents.

The keynote of all modern scientific industrial management is efficiency, which means, briefly, "getting the best possible results from effort or money expended."

Stronck and Billyard tell you how to get "the best possible results" in the purchase and use of all kinds of mine supplies, how to buy, how to inspect and keep track of supplies, including office records and warehouse or storeroom plans, how to distribute and use supplies economically, how to train the employees to be economical and efficient with supplies, and how to best preserve and conserve tools, timbers, iron and steel work and cables, fuel, etc.

Published by John Wiley and Sons, New York.

Price, \$1.25 net. We will be glad to furnish you with a copy. Delivered in Golden or Denver, \$1.25. Postpaid anywhere else on earth (barring European war zone), \$1.35. Send for your copy NOW.

You will find it a good investment.

THE COLORADO SCHOOL OF MINES  
ALUMNI ASSOCIATION.  
GOLDEN, COLORADO.

## NOTES ON ELECTRICITY AND MAGNETISM.

This set of notes by C. C. Van Nuys, Professor of Physics, is really a textbook on the subject, and is so used by the students here. It is printed in uniform style with our other sets of notes, on regular size letter paper, 8½ by 11, punched, so that they may be placed in loose-leaf binders if desired. Printed on one side of the sheet only, leaving abundant room for additional notes, sketches, etc. There are sixty-nine sheets in the set, neatly bound in a tag-board cover and completely indexed. Price \$2.00, delivered anywhere.

You will find this set a valuable reference book on the subject. Send for a set now. Here is the Index:

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# COLORADO SCHOOL OF MINES

## MAGAZINE

Vol. VII.

GOLDEN, COLO., SEPTEMBER, 1917.

No. 9

### The Determination of Oxidized Copper in Ores

H. D. Hunt, '09, and R. V. Thurston, '11\*

By oxidized copper is meant the carbonates and silicate as well as the true oxides of copper.

The most generally used methods for the determination of oxidized copper with which the writers are familiar are: leaching the ore either with dilute sulfuric acid, or with ammonia and ammonium salts.

The dilute sulfuric acid leaching gives low results on all ores into which metallic iron has been introduced, either by ball mill grinding as in present milling practice, or by grinding the samples in disc pulverizers, or on bucking boards. In the leaching, the metallic iron precipitated metallic copper from the sulfate copper solutions. On ores containing cuprite, only one-half of the copper in the cuprite is brought into solution as the sulfate by the dilute sulfuric acid leaching.

Leaching with ammonia in the presence of ammonium salts is very slow and does not completely dissolve the copper silicate, even after sixteen-hour leaching.

The ores of the Miami Copper Company contain very little cuprite. Azurite, malachite and chrysocolla are the important oxidized copper minerals. Chalcocite is the important copper sulfide mineral. The amount of chalcocite present in the ore is negligible. Leaching with dilute sulfuric acid was the method formerly used for determining the amount of oxidized copper in the ore. For the oxide determinations, unground samples of the products of the concentrator were made use of as far as possible. This procedure gave fairly satisfactory results, but in many cases it was not possible to use unground samples. It was, therefore, necessary to develop another method for determining oxidized copper. In this experimental work four points were kept in mind.

1. Metallic iron must not interfere.
2. Chalcocite must be unaffected by the reagents used.
3. The resulting solution must be such that the copper could be determined directly by electrolysis.
4. The method must be applicable to a large number of samples daily.

Some time was spent upon leaching with ammonia and ammonium salts. These leach-

ings did not completely dissolve the silicate copper even upon 16-20 hours of leaching. Ammonia and ammonium carbonate was found to attack chalcocite appreciably.

Another method tried was the addition to the dry ore of a dilute neutral solution of copper sulfate. When reaction between the metallic iron and the copper sulfate had ceased, the determination was filtered and washed thoroughly with hot water. The oxidized copper was then determined by leaching the residue on the filter with hot dilute sulfuric acid. This method invariably gave high results, due, possibly, to the retention of some of the original copper sulfate by a basic sulfate of iron formed during the precipitation of the metallic copper, or to partial oxidation of the finely divided metallic copper during filtration.

The "mercury" method of determining copper sulfides alone, as suggested by Mr. Van Arsdale, was also tried. This method consists of a leaching with dilute sulfuric acid, filtering and washing. The metallic copper in the ore (formed either from cuprite or the reaction between iron and copper sulfate) is then amalgamated with mercury, by working a globule of mercury through the ore, in the bottom of a beaker. The mercury is then washed free of the ore and the sulfide copper in the ore determined. This method gave us high results for oxidized copper because some sulfides would always stick to the copper-mercury amalgam and could not be washed off. Besides, the manipulation was such that the method could not be applied to a large number of samples daily.

The following method, which, as far as we know, is new, was then worked out:

To 2 grams of ore, 20 cc's of a solution of caustic soda-sodium tartrate is added, and the determination boiled gently 5 to 10 minutes with occasional shaking of the beaker. To the hot solution, 25 cc's of a 20% solution of ammonium sulfate is added, and the heating continued 10 minutes. Filter, wash several times with a hot ammonium hydroxide-ammonium sulfate solution and finish the washing with hot water. For electrolysis, the filtrate is neutralized with sulfuric acid and 2½ cc's of concentrated sulfuric acid is added in excess; 2½ cc's of concentrated nitric acid is then added and the solution is ready for electrolysis. In our deposition

\* Research Laboratory, Miami Copper Company, Miami, Arizona.

with rotating anodes, deposition is started at 1½ amperes. In 10 minutes the current is increased to 2½-3 amperes. Ores containing 1½% oxidized copper are deposited in 30 minutes. The total time of the determination is about one hour.

The method is applicable to the determination of any or all of the oxidized copper minerals. If properly handled it gives consistent accurate results. We have checked it repeatedly on ores containing 1.65% oxidized copper as azurite, malachite, cuprite and chrysocolla. Half of this sample was ground very fine in disc pulverizers and contained much iron, and the other half was ground to minus 100 mesh in a porcelain mortar.

In the method given above, the following points are worthy of note:

1. The advantages of the first treatment of the ore with the caustic soda-sodium tartrate solution are—

(a) Complete and rapid solution of the copper silicate.

(b) Complete and rapid solution of the malachite, azurite and melaconite.

(c) At least partial decomposition of the cuprite. The balance of the cuprite is dissolved by ammonium hydroxide produced as hereinafter described.

2. The caustic soda-sodium tartrate solution must be of sufficient strength to redissolve the copper hydroxide first formed by the action of the solution upon the oxidized copper minerals in the ore. The sodium tartrate assists in redissolving the copper hydroxide, as well as prevents the re-precipitation of the copper even upon prolonged boiling.

3. The ore and caustic soda-sodium tartrate solution must never be allowed to boil to very small volume or to dryness. In that event, some copper compound is formed which is insoluble in either the caustic soda-sodium tartrate solution or in ammonium hydroxide.

4. The function of the ammonium sulfate is:

(a) To convert the excess sodium hydrate into sodium sulfate. Ammonium hydroxide is formed by this reaction.

(b) The ammonium hydroxide thus formed reacts with the copper in solution forming the cuprum ammonium compound. The ammonium hydroxide also dissolves any cuprite that may not have been completely decomposed by the caustic soda-sodium tartrate solution.

(c) Gelatinous silica and aluminum hydroxide are precipitated by the reaction of ammonium hydroxide upon the previously formed sodium silicate and sodium aluminate. These precipitates, upon filtration, tend to hold up some soluble copper. Washing with hot ammonium hydroxide-ammonium sulfate solution frees the copper.

(d) Upon the completion of the above mentioned reactions, the determination is readily filtered and washed.

5. Chalcocite is not affected by any of the combinations of reagents used. The sul-

fide copper can readily be determined in the residue from the oxidized copper determination. The usual practice is, however, to determine the total copper and the oxidized copper in an ore and find the sulfide copper by difference.

6. The above described method will give the total oxidized copper in an ore. Analytical distinction between the different oxidized copper minerals is extremely difficult. As between the carbonates and oxides on one hand and the silicate on the other, our experiments indicate that the silicate is not appreciably attacked by ammonium hydroxide in the cold in the absence of ammonium salts, if the time of contact is not more than fifteen minutes. The carbonates and oxides are completely dissolved by ammonium hydroxide alone in 5 minutes' contact.

#### Stock Solutions.

Commercial caustic soda and ammonium sulfate can be used, provided the commercial salts do not contain sufficient chlorides to interfere with the electrolytic deposition of the copper; i. e., give poor deposits.

Sodium Hydrate-Sodium Tartrate Solution:

100 grams Sodium Hydrate  
50 grams Sodium Tartrate  
1000 cc's Distilled Water

Ammonium Sulfate Solution:  
250 grams Ammonium Sulfate  
1000 cc's Distilled Water

Ammonia-Ammonium Sulfate Solution for Washing:

100 cc's Ammonium Hydroxide  
100 grams Ammonium Sulfate  
1000 cc's Distilled Water

August 17, 1917.

#### COLORADO ENGINEERS LEAVE FOR CAMP KEARNEY.

After several false starts and many rumors during the past six weeks, the Colorado Engineers left Golden on Saturday, Sept. 8th, for Camp Kearney, Linda Vista, Calif., where they will train until are sent to the front. The Engineers have added much to the life of Golden for the past summer and will be greatly missed.

#### FORTY-FOURTH OPENING.

The Colorado School of Mines opened as scheduled on September fifth for its 44th year. Registrar T. C. Doolittle was in official charge pending the confirmation of Dr. Alderson's appointment by the Board of Trustees.

There were 129 students registered, 62 of them in the Freshman Class. With the final settlement of the trouble at the School, it is expected that about twenty more will register.

Over fifty of last year's students are now in the U. S. Service

Half of last year's Junior Class are in the Service.

## A Sunshine Mine—Mining Manganese in Grande County, Utah

W. J. Mayer, '11; A. N. Zwetow, '11.

August, 1917.

At this time the mining magazines are all printing articles in regard to the great demand for manganese, and its scarcity in proportion to that demand. The Secretary of the Interior recently published a statement to the effect that this country is securing only about 20 per cent of the amount it requires. A short description of a manganese property which was idle for twelve years, and is now being developed by two Golden men for the Green River Mining Co., may prove of interest:

### Location.

The property operated by the Green River Mining Co., which is leased by the Hahnwalds of Leadville, William Reynolds, James A. Shinn, W. J. Mayer and A. N. Zwetow, consists of about 2,800 acres. It is situated in the Little Grande Mining District, in Grande County, Utah, five miles from the Green River; about twelve miles southeast of the town of Green River; ten miles south by wagon road from Floy, a station on the Denver & Rio Grande R. R., and lies in the Bad Land type of country, characteristic of the desert sections of Utah and Arizona.

The Green River channel is about five hundred feet lower than the mesa on which the mine is situated, and affords the nearest water supply. Lumber, hardware, groceries and all other supplies are shipped by rail from Green River to Floy, and are hauled to the mine by returning ore wagons. We are at present hauling all water for horses and camp use from the river. We are now planning a pipe line from the river to eliminate this problem.

As typical of the desert, there is not a tree within miles of the mine. Coal is hauled into the camp for cooking purposes. Up to date Old Sol is furnishing more than sufficient heat for all other purposes.

### Geology and Ore Occurrence.

All the rocks in this section of the country are sedimentary; chiefly alternate layers of shales and sandstones, which lie horizontal or dipping slightly to the northeast. Nodules of ore varying in size from a fraction of an inch up to three and four inches in diameter, as float, cover acres of ground. A great deal of this material has been derived from the erosion of overlying beds. Large areas of the wash, sometimes to a depth of two feet, contain up to forty per cent by weight of such nodules.

Between the bedding planes of the solid sedimentaries occur the manganese oxide blankets. They vary in thickness from less than an inch to several feet. These blankets occur in four horizons as so far developed.

No prospecting has been done below a depth of 50 feet, but it seems reasonable to presume that the blankets continue in lower horizons.

This deposit is clearly one of deep-sea deposition, of the type Kemp describes on page 417 in his book, "Ore Deposits of United States and Canada." The blankets or beds are usually lenticular and very irregular; they vary in length and width from a few feet to several hundred feet, but they are very close together, and very much resemble the pinches and swells of fissure veins.

The ore is pyrolusite mixed with lime and silica. The greater part of the deposit is over 35 per cent manganese and under 10 per cent silica, an especially acceptable ore for the steel trade. It also contains less than the penalizing amount of phosphorous. Many of the lenses contain more than 50 per cent manganese. Much of this higher grade ore has been shipped to the metallurgical trade.

The property is very much cut up by deep ravines and canyons. A trench up the side of one of these nicely exposes the successive ore layers, and eliminates the necessity of shaft sinking or drilling.

### Method of Mining.

After reading the foregoing description it will be appreciated why Colonel Shinn has dubbed this a "mineral farm."

After considerable of the float has been raked together in small piles, with common garden rakes, it is gathered with wagons and unloaded over quarter-inch screens, upon leading plats, which are placed at convenient points in the field.

When an appreciable area has been raked, the next step is to remove the wash with plows and scrapers. From this material we shall later derive a large tonnage upon running it through a trommel screen. For the present we are collecting it in large dumps. We have ordered harrows to follow the plows and turn up the larger pieces of float. Three or four men with buckets follow each plow and pick up these larger pieces.

When a block of ground has been thus stripped it is a simple matter to secure the underlying ore with picks and bars. No drilling nor powder is necessary.

The ore that lies in the lower horizons we shall not attempt to mine for the present, as the float, ore in the wash, and top horizon, on account of the large territory, will afford as much ore as we can find labor and means to extract, for a long time to come, and at a lower cost.

For the development of more lenses we are laying the field off in blocks, and by means of plow and scraper shall systemati-

cally drive our "sunshine crosscuts." In time we intend to replace our horse-pulled scrapers with drag-line excavators operated by gas engines.

The writers have never had the privilege of viewing a mine quite like this one, and have on several occasions regretted that they had not spent a few days on a farm, as they would with a little farming experience be enabled to harvest the manganese crop with greater facility.

However, the problems are working themselves out, and after the installation of a screening and sorting plant we shall easily secure 75 to 100 tons of ore per day, working one shift with comparatively few men. If the present demand continues we shall light the field with search lights and work two shifts.

#### Transportation.

The ore haul of ten miles over a fairly good road without a single steep pitch, has been a problem only because sufficient teams were not available. Up to the present time we have been hauling only 15 tons per day. We have just entered into a contract with a motor truck company. They have just installed a three-ton Jeffrey truck with a four-ton trailer, which will make four round trips per twenty-four hours. If satisfactory, this outfit will be followed by others.

#### Labor.

We are paying \$3.75 for eight hours' work, and charging \$1.25 for board. We are having difficulty in securing men and in holding the ones we do secure, as is no doubt the case throughout the country now. The company owns a Dodge car used principally for transporting laborers.

#### Market.

We note Brother Harrington's query in the August Magazine relative to an up-to-date Manganese Schedule, and in answer thereto, we append the August Schedule of an Eastern steel company. Our company has entered into a contract with one concern for our total output for the next eighteen months at a fixed price per ton, mine run.

#### Costs.

The present management has had charge of the property only six weeks, and is not yet in a position to publish anything in regard to costs. We are reminded of the following story, although it is not entirely apropos: An old prospector and owner of a large lead producer in Utah decided to put his mine on a sound business basis; he hired an expert accountant to straighten things out. After estimating the ore in the mine the accountant proceeded to list the assets. The owner, standing at the elbow of the accountant, noted that he was heading the list with "pick, shovel and wheelbarrow." "Stop right there!" the owner remarked, "the rest is all profit."

#### Manganese Schedule Month of August, 1917.

F. O. B. Chicago.

Per Cent Manganese	Per Ton of 2,240 Lbs.
35	\$25.73
36	26.42
37	29.38
38	30.18
39	34.10
40	34.98
41	37.50
42	38.42
43	41.06
44	42.02
45	44.78
46	45.78
47	48.66
48	49.70
49	52.70
50	53.78
51	64.86
52	65.94

SiO<sub>2</sub>, to be under 20 per cent or subject to rejection at buyers' option; 50 cents per unit penalty if over 10 per cent; 50 cents bonus if under 10 per cent.

Fifteen cents per each 0.01 per cent phosphorous penalty over 0.15 per cent P. Maximum 0.25 per cent.

The above is the August schedule published early in the month. Present settlements are being made on a slightly advanced schedule.

#### No Exemption for Engineer Students.

Senior engineering students at the School of Mines, the State University and other colleges throughout the State who had expected to be exempt from war service, if drafted, will be disappointed, as the orders have been rescinded by the war department. It was at first held by the war department that an engineering student would be more valuable to the government after graduation as an engineer than as a soldier before graduation. Now, however, it appears that engineering students must answer the call to arms the same as others.

#### In the Year of Our Lord, 2000.

Give me a spoon of oleo, ma,  
 And the sodium alkali,  
 For I'm going to make a pie, mamma!  
 I'm going to make a pie.  
 For John will be hungry and tired, ma,  
 And his tissues will decompose;  
 So give me a gram of phosphate,  
 And the carbon and cellulose.  
 Now give me a chunk of casein, ma,  
 To shorten the thermic fat,  
 And give me the oxygen bottle, ma,  
 And look at the thermostat.  
 And if the electric oven is cold  
 Just turn it on half an ohm,  
 For I want to have the supper ready  
 As soon as John comes home.

—Cleveland Leader.

# A Flexible Idler Drive for an Air Compressor

B. W. Knowles, '08\*

Part of the air used in the Mines of the Hedley Gold Mining Company, of Hedley, British Columbia, is compressed in a 2,500 cubic foot Rand Compressor. This was formerly driven by a 16-foot Knight Water-wheel, under a head of 485 feet.

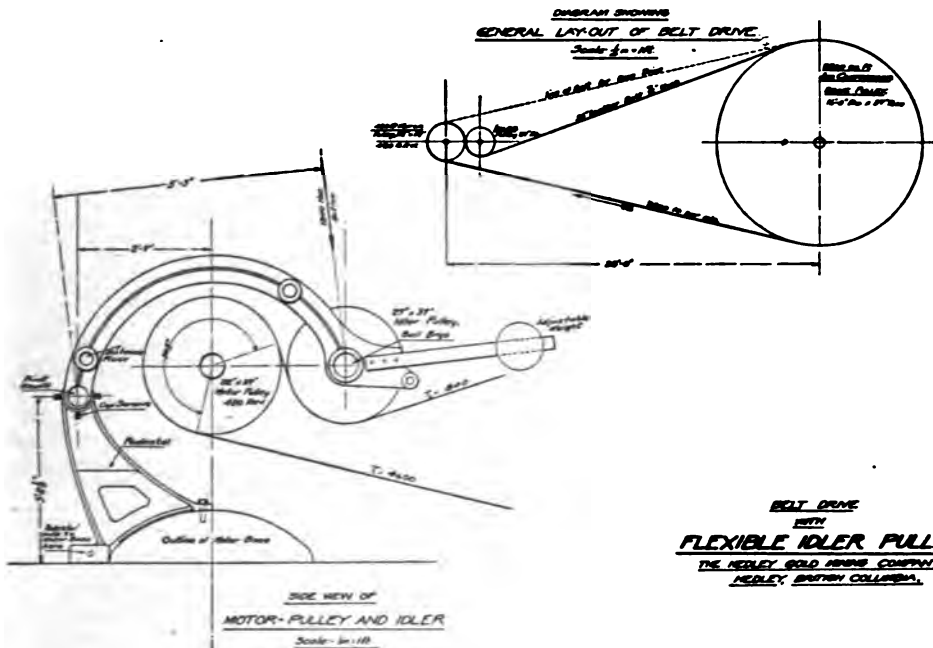
It was found desirable to change this from a direct drive to a belted motor drive. The water-wheel was replaced by a cast iron pulley, 16 feet in diameter and 37 inches wide, that being the maximum width obtainable between the bearings of the compressor main shaft. This large pulley was belted to a 32-inch pulley on a 400 h. p. induction motor, running 420 revolutions a minute. The centers were 35 feet apart.

The length of this drive was sufficient for good results, even with the discrepancy in the relative sizes of the driving and driven

type, the curved arms carrying the bearings of the idler pulley were so designed that access could be had to the motor bearings. A heavy pedestal was bolted to the base below the motor pulley, and the curved arms attached to a shaft carried in bearings at the top of the pedestal. The arms pivot on this shaft and raise or lower the idler according to the load changes.

This drive works very satisfactorily, indeed. The belt is loose, but with the added wrap due to the introduction of the idler there is no slip, and after four months' use there is not the slightest indication of wear on the belt.

The drive might well have been made a short center one, but as the installation was in the nature of an experiment, it was thought best to have a belt long enough to



**BELT DRIVE WITH FLEXIBLE IDLER PULLEY.**  
THE HEDLEY GOLD MINING COMPANY  
HEDLEY, BRITISH COLUMBIA.

pulleys; but the width (36 inches) was not enough to transmit 400 h. p., at a belt-speed of about 3,700 feet a minute, except with a very tight, heavy belt. A six-ply balata belt was tried, but did not give satisfaction. The belt showed a tendency to slip, under peak loads, and wore out rapidly on account of its extreme tightness and the consequent friction developed. It was, therefore, decided to try a flexible idler drive of the Lenix Type, with a leather belt, 36 inches wide and seven-sixteenths thick.

As the motor was of the three-bearing

drive without the idler at all. There would have been considerable saving in the cost of the belt, and there is no doubt that the drive would work equally as well on 15 to 20 foot centers.

In presenting this article for publication, no claim is made for any originality in the apparatus used. It is merely offered with the hope of its being of some value to others under circumstances similar to those noted. This form of drive has proven a very valuable adjunct in furnishing a constant, even, air pressure for drilling, hoisting and pumping operations, at this Company's mines.

Hedley, B. C., Canada, June 2, 1917.

\* Superintendent Nickel Plate Mine, Hedley Gold Mining Company, Hedley, B. C., Canada.

### VICTOR C. ALDERSON RETURNS TO THE COLORADO SCHOOL OF MINES AS PRESIDENT.

After a month or six weeks of more or less confusion and newspaper notoriety, the Board of Trustees officially elected Dr. Alderson president on Saturday, September 8th.

Three members of the board early last month concurred in offering Dr. Alderson the presidency and agreed to formally elect him at the regular September meeting, as it was then impossible to secure a full



Dr. Victor C. Alderson.

meeting. Dr. Alderson accepted and was requested to take unofficial charge of the School and get it started. He came to Golden and outlined the policy he expected to follow upon his election and the faculty recommendations he would make.

Then the trouble began. All kinds of charges and statements were made by some former professors, some alumni, and others. Much of this was printed and exaggerated in the Denver papers. At the Governor's request the Board of Trustees held a full meeting in the Governor's offices on September first. At that meeting formal charges were made, signed by about twenty alumni and former professors, against Dr. Alderson's appointment and requesting an opportunity to prove the charges. The board then placed Registrar Doolittle in charge of the School until a president should be officially appointed, and adjourned the meeting until September 8th.

On September 8th a number of witnesses testified and a number of letters and telegrams were read in support of these charges. This evidence engaged the attention of the board from 10 a. m. to 1:30 p. m., when the board went into executive session. The board decided the charges were not proved and formally elected Dr. Alderson president and confirmed the ap-

pointment of the faculty recommended by him.

It is to be hoped that all of the Alumni and other friends of the School will now unite in support of the School, forgetting all differences of opinion. If active support is impossible until prejudices wear away, at least do not "knock."

### NEW PROFESSORS AT THE COLORADO SCHOOL OF MINES.

#### Professor of Chemistry.

M. F. Coolbaugh, the new Professor of Chemistry, is essentially a Colorado product. He received his first degree at Colorado College and was invited to return as an instructor in chemistry. Later he went to Columbia University in New York, where he was assistant in chemistry and took his degree of Master of Arts. Later he had charge of chemistry at the South Dakota School of Mines and was Assistant Professor of Chemistry at the Case School of Applied Science, Cleveland, Ohio, when invited to come to Golden.

Professor Coolbaugh has done a large amount of commercial work in Colorado, New York, South Dakota and Ohio, and has become thoroughly familiar with the application of chemistry to industrial needs. At the present time chemistry is needed more than ever for a clearer understanding of the genesis of ore deposits and the most efficient treatment of ores. The school is particularly fortunate in securing a man at the head of this department who has made a specialty of the application of chemistry to industrial needs and is thoroughly in sympathy with the great need of chemistry in the education of mining and metallurgical engineers.

#### Assistant Professor of Modern Languages.

The new Assistant Professor of Modern Languages will be L. W. Martin. Professor Martin has made a specialty of pedagogy, educational psychology, and modern languages. His training has been received at the University of Missouri, the State Normal School in Missouri, the University of Denver, and the State Teachers' College at Greeley.

Professor Martin has had wide experience in public school work in Missouri, New Mexico, Oklahoma and Colorado. He comes to the School of Mines strongly recommended by Dr. J. C. Jones, Dean of the College of Arts and Sciences, University of Missouri; by Dr. D. E. Phillips of the University of Denver; by Dr. T. C. McCracken, Dean of the Graduate College at Greeley, and by Dr. Mary C. C. Bradford, State Superintendent of Public Instruction of Colorado.

In reorganizing the School of Mines Dr. Alderson feels that the subjects of English and Spanish should receive special consideration. Professor Martin's experience and

training indicate that this work in the School of Mines under his direction will develop into one of the strongest departments of the school and will prepare its graduates, who may go to Mexico or South America, with a knowledge of the Spanish language.

#### Professor of Metallurgy.

Irving A. Palmer, the new Professor of Metallurgy, is a graduate of Lafayette College, Pennsylvania, where he specialized in chemistry and metallurgy. He was with the Silver and Lead Refinery of the Pennsylvania Lead Co., Pittsburgh, for ten years as chemist, assayer and electrometallurgist. He has been with the American Smelting & Refining Co. for thirteen years. He was superintendent of the Pueblo Plant and assistant superintendent of Eiler's Plant for eight years. For two years he was assistant superintendent of the Arkansas Valley Plant at Leadville. He was in Mexico for two years as metallurgist of the Chihuahua Plant. Recently he has been superintendent of the United Zinc and Chemical Co. at Springfield, Ill.; consulting metallurgist of the United States Smelting Co. at Midvale, Utah, and consulting metallurgist for the United States Smelting & Refining Co., and superintendent of the Altoona Zinc Smelting Plant, at Altoona, Kansas.

Professor Palmer is a member of the Engineering Society of Western Pennsylvania, the American Chemical Society, the American Association for the Advancement of Science, and the American Institute of Mining Engineers.

Professor Palmer will reach Golden this week and begin immediately upon his duties.

#### Professor of Geology and Mineralogy.

Professor Victor Ziegler, the new head of the Department of Geology and Mineralogy, is a graduate of the University of Iowa and of the Columbia School of Mines, in New York. He received the degree of Doctor of Philosophy at the University of Denver. He has been Professor of Geology in the Pennsylvania State College and in the South Dakota School of Mines. He has done field work for the United States Geological Survey in Pennsylvania and for the State of South Dakota in the Black Hills. He has done private examination work in Alabama and Colorado, and has made a specialty of oil and gas in Wyoming. His special work in this region has been remarkable because his study of the foothill geology from Morrison to Fort Collins has disproved the older geological theories of Eldridge, Fenneman, and Emmons, which has proved presence of huge thrust faults of from 10,000 to 12,000 feet of stratigraphic displacement.

This work alone marks Professor Ziegler as a geologist of the highest type. In addition to being a geologist of such rank he has proved himself to be a remarkable teacher and is exceedingly popular with students.

The Secretary of the Interior is not Mr. Lane, it is Mr. Hoover.

#### FACULTY.

Recommended by Dr. Alderson and approved by the Board of Trustees at a meeting held September 8th in the Governor's offices.

**Regis Chauvenet.** Special lecturer on chemistry and metallurgy.

**C. R. Burger.** Professor of mathematics.

**L. W. Martin.** Assistant professor of English and modern languages.

**R. S. Hawley.** Professor of mechanical engineering.

**W. J. Hazard.** Professor of electrical engineering.

**Victor Ziegler.** Professor of geology and mineralogy.

**J. C. Roberts.** Professor of safety engineering.

**G. E. F. Sherwood.** Associate professor of mathematics.

**H. M. Showman.** Assistant professor of civil engineering.

**C. D. Test.** Assistant professor of chemistry.

**C. C. Van Nuys.** Professor of physics.

**H. J. Wolf.** Professor of mining.

**I. A. Palmer.** Professor of metallurgy.

**M. F. Coolbaugh.** Professor of chemistry.

**J. S. Jaffa.** Mining law lecturer.

**J. C. Williams.** Assistant director, experimental plant.

**J. C. Bailer.** Assistant professor of extension work.

Positions still to be filled are an assistant in geology and mineralogy, and a director for the experimental plant.

#### Haldane Resigns from Faculty.

Prof. W. G. Haldane, who has been in the metallurgical department for many years, has resigned his position, and will become associated with a company operating in the potash fields of Nebraska.

#### RECENT ARTICLES BY MINES MEN.

"Liberty Bell Mercury Trap," by Albert G. Wolf, '07. Mining and Scientific Press, August 11, 1917, page 206, illustrated.

"Artificial Covellite," by J. M. Frankel, '13. Engineering and Mining Journal, August 11, 1917, page 252.

"The Puritan Mine," by Samuel Tescher, '04. General Superintendent National Fuel Co., Denver, Colo. Coal Age, September 1, 1917, page 358.

"Colorado Mines Presidency," by Parker Liddell, '03. The Mining American, August 1, 1917, pages 8 and 9.

"The Sulphur Deposits in Culberson County, Texas," by William B. Phillips, former President. Bulletin A. I. M. E., September, 1917, pages 1449 to 1467.

"Geology of the San Sebastian Mine, Salvador," by C. Erb Wuensch, '14. Mining and Scientific Press, September 8, 1917, pages 345 to 350. Illustrated.

Stop spending that nickel! Just drop it into your other pocket and add to your savings account.

## MINES MEN IN U. S. SERVICE.

Below is a list of Mines men in the U. S. war service. We know this is incomplete, and probably incorrect in some cases. Please send in any corrections and additions you may know of. We hope to obtain a complete list of all Mines men in the Service and print the roster frequently. Help us complete the list. Any Mines men, either graduates or former students, no matter what branch—artillery, cavalry, infantry, marine, aviation, engineers, training camps, reserve corps, etc. Inform us of any changes of address, transfers and promotions.

**Ball, Louis R., '00.**

Retired Captain U. S. Army.

Now military instructor, Colorado Agricultural College, Fort Collins, Colorado.

**Beyrle, Charles N., Ex '17.**

Sergeant Company A Engineers, U. S. N. G. C., Camp Kearney, Linda Vista, Calif.

**Billisoly, Walter E., Ex '20.**

U. S. Marine Corps, Officers' Training School, Norfolk, Va.

**Bird, L. W., Ex '19.**

U. S. Army.

**Block, Gary E., '08.**

Capt. U. S. R., Engineer Officers' Training School, Fort Leavenworth, Kansas.

**Breckenridge, L. D., Ex '19.**

Second Lieutenant Marine Corps, U. S. R. Brown, F. A., Ex '19.

Corporal Co. A Engineers, U. S. N. G. C., Camp Kearney, Linda Vista, Calif.

**Buck, Luther J., Ex '18.**

Reserve Corps, Fortress Monroe, Va.

**Chapman, Irving A., '13.**

Coxswain, U. S. S. P. 41.

**Charles, I. M., Ex '19.**

7th Reg., 37th Co., U. S. M. C., American Expeditionary Forces, care Postmaster, New York City.

**Cunningham, S. D., Ex '19.**

Co. A Engineers, U. S. N. G. C., Camp Kearney, Linda Vista, Calif. Expects commission in Aviation Corps.

**Cutting, George W., Ex '17.**

Second Lieutenant Battery, Ft. Riley, Kansas.

**David, C. Dodge, Jr., '15.**

Second Lieutenant, U. S. O. R. Corps.

**Dolman, Carrol George, Former Professor C. S. M.**

Captain Company C Engineers, U. S. N. G. C., Camp Kearney, Linda Vista, Calif.

**Ferguson, Kenneth S., '17.**

Marine Barracks, Mare Island, Vallejo, Calif.

**Finney, Walter, Ex '20.**

Marine Barracks, Mare Island, Vallejo, Calif.

**Flemming, C. W., Ex '15.**

U. S. Army, Ft. Riley, Kansas.

**Fushey, Jesse J., Ex '19.**

First Lieutenant Company A Engineers, U. S. N. G. C., Camp Kearney, Linda Vista, Calif.

**Graham, Burdette S., former Y. M. C. A. Secretary.**

U. S. Aviation School.

**Hanley, Dr. Wm. B., former Coach.**

Lieutenant U. S. Medical Corps.

**Hinman, Dale Durkee, '15.**

Second Lieutenant, U. S. Coast Artillery, Fortress Monroe, Va.

**Howbert, Van Dyne, '16.**

Engineer U. S. Training Camp, Fort Riley, Kan.

**Jones, David L., Ex '19.**

Second Lieutenant, Artillery, U. S. O. R.

**Kinsley, Arthur C., Ex '18.**

First Lieutenant, Company A Engineers, U. S. N. G. C., Camp Kearney, Linda Vista, Calif.

**Kistler, Erle O., former Coach.**

Major, U. S. O. R.

**Knepper, C. M., '17.**

Retired Captain U. S. Navy.

Government Inspector for the Navy, Bethlehem, Pa.

**Krier, Edw. J., Ex '18.**

U. S. Army.

**Levy, Milton M., '16.**

Second Lieutenant, Engineer Corps, U. S. R.

**Locke, D. R., Ex '18.**

Second Officers' Training Camp, Camp Funston, Texas.

**MacNeill, Neil M., '14.**

Corporal Company C Engineers, U. S. N. G. C., Camp Kearney, Linda Vista, Calif.

**Marshall, Emory M., '11.**

U. S. Army.

**Menke, J. G., Ex '18.**

Sergeant Company C Engineers, U. S. N. G. C., Camp Kearney, Linda Vista, Calif.

**Mewhirter, Sydney A., '17.**

First Lieutenant, E. O. R. C., 314th Engineers, Ft. Riley, Kansas.

**Murphy, William J., '17.**

Sergeant Company A Engineers, U. S. N. G. C., Camp Kearney, Linda Vista, Calif.

**O'Malley, John J., Ex '18.**

Second Lieutenant Aviation Corps. In Canada or France.

**O'Neill, Frank E., Ex '18.**

First Officers' Training Company, Fortress Monroe, Va.

**O'Reilly, Walter T., Ex '18.**

West Point Military Academy, Annapolis, Md.

**Parker, J. Merrill, Secretary of the Mines Y. M. C. A.**

Marine Barracks, Mare Island, Vallejo, Calif.

**Pearce, James W., '14.**

Company C Engineers, U. S. N. G. C., Camp Kearney, Linda Vista, Calif.

**Phillips, L. V., Ex '19.**

Sergeant Company A Engineers, U. S. N. G. C., Camp Kearney, Linda Vista, Calif.

**Price, Harold C., '13.**

Company 2, C. A. C., care F. R. S. T. C., Camp Funston, Texas.

**Prior, Charles E., '13.**

U. S. Army.

**Rabb, John H., Jr., Ex '18.**

Sergeant Company A Engineers, U. S. N. G. C., Camp Kearney, Linda Vista, Calif.

**Reynolds, K. W., Ex '18.**

U. S. Army.



- Richardson, Carleton, Ex '19.  
 Company A Engineers, U. S. N. G. C.,  
 Camp Kearney, Linda Vista, Calif.
- Ristedt, Ernest J., '09.  
 First Lieutenant in the Reserve Corps of  
 Engineers, U. S. A.
- Robertson, Fitch, Ex '18.  
 Company A Engineers, U. S. N. G. C.,  
 Camp Kearney, Linda Vista, Calif.
- Robinson, H. A., Ex '18.  
 Lieutenant, U. S. O. R. Corps.
- Russell, Donald O., '09.  
 English Army, Somewhere in France.
- Schade, Roger M., Ex '18.  
 Sergeant Company C Engineers, U. S. N.  
 G. C., Camp Kearney, Linda Vista, Calif.
- Schoensiegel, A. D., Ex '17.  
 Marine Barracks, Mare Island, Vallejo,  
 Calif.
- Small, Sidney S., '17.  
 Second Lieutenant, U. S. Coast Artillery  
 Corps; Second Officers' Training Co.,  
 Fortress Monroe, Va.
- Snedaker, Eugene G., '14.  
 First Lieutenant Engineers Corps, U. S.  
 Army.
- Solomon, Irwin R., '13.  
 First Lieutenant, U. S. O. R. Corps, 4540  
 Drexel Blvd., Chicago, Ill.
- Stedman, A. W. Jr., Ex '17.  
 First Lieutenant 6th Reg. Infantry, Ft.  
 Oglethorpe, Ga.
- Taylor, C. C., Ex '17.  
 Second Lieutenant Coast Artillery Corps,  
 Fortress Monroe, Va.
- Thuratin, Robert A., '17.  
 U. S. Army, Officers' Training Camp.
- Tongue, Walter B., Ex '18.  
 Second Lieutenant Aviation Corps. In  
 Canada or France.
- Townsend, Albert, Ex '19.  
 Company A Engineers, U. S. N. G. C.,  
 Camp Kearney, Linda Vista, Calif.
- Van Burgh, Lisle R., '17.  
 First Lieutenant, Engineer Train, U. S. N.  
 G. C., Camp Kearney, Linda Vista, Calif.
- Van Dorp, G. H., '15.  
 Second Lieutenant, U. S. O. R. Corps, Ft.  
 Riley, Kansas.
- Vorck, Charles R., '16.  
 Company A Engineers, U. S. N. G. C.,  
 Camp Kearney, Linda Vista, Calif.
- Williams, Wm. H., Ex '18.  
 Second Lieutenant, U. S. O. R. Corps, Ft.  
 Riley, Kansas.

Happy Horace.

"Haven't seen Horace at the club lately, Mrs. Bossy. Is he sick or what's the matter?"

"Horace," said Mrs. Bossy severely, "stays at home now, and enjoys life in his own way as I want him to."

Those new dimes are lovely, but it is a pity they didn't come along in the good old days, when a dime would buy ten cents' worth of anything.

Money can be lost in more ways than won.

## Colorado School of Mines Magazine

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VOL. VII. SEPTEMBER, 1917. No. 9

EDUCATIONAL WRECKERS.

(From the Pueblo Chieftain, Wednesday, Aug. 22, 1917.)

Two things have brought the Colorado State School of Mines to the verge of ruin. One of these, and the most important, is the professional jealousy of professors who put their personal dignity, honor and feelings far ahead of the welfare of the institution with which they are connected or of the interests of the people of this State. The other is the persistent and too often successful effort of professional politicians to run the schools of the State as an instrument of their personal ambitions or their partisan advantage.

Dr. Victor C. Alderson, one of the foremost educators of the country, was forced out of the School of Mines several years ago because he was trying to run the school upon a system of educational efficiency. Since his departure the school has been going from bad to worse, and as a last resort he has been called back to save the school—if it can be done.

His first act, in taking over the management, was to decline to recommend for re-appointment two of the most prominent members of the faculty, one of whom had been connected with the school for more than twenty years.

The Chieftain does not know anything about the professional or the personal qualifications of Professors Patton and Young, but we do know this: Either Dr. Alderson will run the School of Mines according to his ideas upon the basis of educational efficiency, or else the School of Mines, as a separate institution, will cease to exist. Such an institution must have a head.

Already the gang of wreckers are hard at work. The elements of professional

jealousy, of personal partiality, of partisan politics, and of newspaper sensationalism are hard at work. Whatever rocks can be thrown at Dr. Alderson will be thrown. Whatever obstacles can be placed in his path will be skillfully located.

The one thing that can save the School of Mines is the steadfast support of Dr. Alderson by every citizen of the State who has faith in the school and who puts public interest above personal advantage and ambition.

#### MISCELLANEOUS.

Prof. C. D. Test and family spent part of the summer vacation camping at Grand Lake.

Prof. Victor Ziegler paid a short visit to Omaha and Iowa City the latter part of August.

W. S. Stringham, Ex Mines, is purchasing agent of the Welch M. Co. Address is 618 N. Byers, Joplin, Mo.

Prof. C. C. Van Nuys was called to Flandreau, So. Dakota, early in August because of the serious illness of his father.

W. H. Wright, Ex Mines of Golden, has made a number of mine examination trips this summer and is now in Nevada on mining business.

Prof. S. E. Roberts of the University of the Philippines and two of his students, Messrs. Abadilla and Alvir, arrived in Golden the 23rd of August. Abadilla and Alvir have entered the School.

President H. C. Parmelee left Golden early in August for Denver where he has resumed his former position as western editor for the Metallurgical and Chemical Engineering, with his office in the Boston Bldg.

Second Lieutenant Jesse J. Fushey of Co. A Engineers, U. S. N. G. C., and Miss Madeline Cloud of Hot Springs, Ark., were married Wednesday, August first, at Calvary Episcopal Church, Golden, by the Rev. Don Frank Fenn.

David H. Orr, Ex Mines, is now with the Copper Queen at Bisbee, Arizona, having left Morenci because of the closing of the properties there on account of the strike. On July 16th there arrived at his home David Herbert Orr, Jr., 8½ lbs. According to Orr, David Jr. "yells for Mines every night until the wee hours of the morning."

Malcolm H. Carpenter, Ex Mines, Engineer for the Koering Cyaniding Process Co., returned to Salt Lake City early in August from the Boise Basin, sixty miles north of Boise, Idaho, where he was accompanied by Assistant Engineer Forrest Mathez, Ex Mines, who will superintend the erection of a small Koering experimental plant at the Golden Age Jr. M. Co. This is preliminary to the installation of a 300-ton plant later.

A dead past is one of those galvanic freaks that won't stay buried.

## ALUMNI

#### ALUMNI ASSOCIATION MEETING.

A meeting of the Alumni Association was called by the President James H. Steele, and held in the Albany Hotel, Denver, the evening of August twenty-seventh, to discuss the situation at the school. The Alumni who urged the calling of the meeting felt that an emergency existed and that there would not be time to send out a general notice, so only those in Denver, Golden and vicinity were notified that day by phone. About twenty-four members in all attended, though two or three left early for other engagements. After considerable discussion of all sides of the trouble the following resolutions were adopted:

First—"That the President of the Board of Trustees and President H. C. Parmelee be requested not to give the Colorado School of Mines any more unfavorable publicity." No roll call was taken on this motion.

Second—"That it is the sense of this meeting that the Board of Trustees of the Colorado School of Mines take action at the earliest possible moment toward electing a President of the Colorado School of Mines for the ensuing year, and that we recommend the election of Dr. Victor C. Alderson."

The vote on this motion was twelve "Aye" and eight "No."

Aye: A. E. Perkins, '10; Geo. O. Marrs, '01; Donald Dyrenforth, '12; Edward J. Dittus, '11; Hamilton W. Baker, '11; Orville Harrington, '98; Arthur J. Hlester, '12; Chas. N. Whitaker, '14; John C. Williams, '13; Robert M. Keeney, '10; Frank J. Reinhard, '05; E. R. Ramsey, '12.

No: C. B. Gauthier, '16; Arthur F. Hewitt, '05; Lester C. Thomas, '12; Arthur C. Daman, '15; Robert M. Wheeler, '08; Albert T. Mertes, '12; Clarence C. Malmstrom, '00; James H. Steele, '00.

Not voting: Jay Lonergan, '05.

#### PERSONALS.

'83.

Walter H. Wiley, of Glendora, California, was recently in San Francisco and later Tucson, Arizona.

'95.

Carl R. Davis, manager of the Brakpan Mine, Johannesburg, South Africa, is spending a vacation in the United States.

'97.

John Gross has recently been appointed Metallurgist, U. S. Bureau of Mines, at Fairbanks, Alaska. Gross, who has been engaged in testing out a new concentrating mill at Georgetown, Colo., closed up his offices in Denver and left for Alaska about the 1st of September. Mrs. Gross accompanied him.

'98.

Richard W. Lucy died Thursday, August 2nd, at Ruby, Utah, from injuries received

Monday, July 30th. Lucy, who has been assistant engineer for the Denver & Rio Grande Railroad for many years, was engaged in directing some big construction work for the company near Ruby, Utah. A huge charge of dynamite was exploded prematurely and a large rock struck and horribly mangled Lucy. He was rushed to the hospital at Ruby, but surgeons were unable to do anything to save him. His body was taken to Denver for burial, where the funeral was held from the Yeager Undertaking Parlors, Sunday, August 5th. The services were conducted under the auspices of the Masons, and the Colorado Engineers' Association.

The older Mines men will recall the peculiar coincidence that his brother, F. A. Lucy, '01, was killed under somewhat similar circumstances about ten years ago near Goldfield, Nevada.

Dick Lucy always had a smile on his face for everyone he knew. We will greatly miss his pleasant face and quiet, cheerful disposition. In all the years we have known him we cannot recall his ever saying anything disagreeable about anyone.

'00.

Captain Louis R. Ball, U. S. A., retired, has been appointed commandant of the cadets at the State Agricultural College, succeeding Captain Christian. He received his commission soon after leaving school at the beginning of the Spanish War, and served until a few years ago, when he was retired because of injuries received while at the officers' riding school in Fort Riley. Captain Ball was visiting Golden friends Tuesday, September 4th.

'01.

George B. Clark, 515 Boston Bldg., Denver, Colo.

F. E. Lewis is at his home in Denver, 1007 South Race St., for a short visit. He expects to leave for New Mexico in the near future.

'02.

Prof. Chas. E. Rowe, of the University of Texas, spent his vacation teaching in the School of Military Aeronautics instead of paying his usual Summer visit to his old home in Denver.

J. E. Bergh is with the Ohio Copper Co., at their offices in the Newhouse Bldg., Salt Lake City, Utah.

'03.

L. D. Fry, General Manager of the Mazapil Copper Company, Ltd., has returned to Mexico, where the company has resumed operations. Address Apartado 64, Saltillo, Coahuila, Mexico.

Wm. B. Rhodes sailed from New York about August 15th for Colombia, where he will take over the entire management of all the properties belonging to the Bar Principal Mining Company of Wilkes-Barre, Pa. Until further notice his address will be care of W. B. Robinson, 204 Coal Exchange Bldg., Wilkes-Barre, Pa.

Harry J. Wolf left Golden August 1st for an extended professional business trip

through the East, returning to Denver August 29th. He visited St. Louis, Washington, Philadelphia, New York, Boston, Cleveland and Chicago. Immediately after his return he made a mining examination in Saguache County, returning in time for the opening of School, September 5th. He left again for a brief examination in Fremont County on September 7th.

'04.

Prof. Francis A. Thomson, Dean of the School of Mines at the State College of Washington, Pullman, Washington, resigned recently to accept the Deanship of the newly organized School of Mines at the University of Idaho, Moscow, Idaho. This change took place September 1st. Prof. Thomson has been connected with the State College of Washington for nearly eleven years. His book on "Stamp Milling" is considered one of the best on the subject, and is used as a text by a great many of the colleges that teach metallurgy.

'05.

Chas. M. Rath and family of Douglas, Wyoming, were called to Golden the latter part of August because of the death of M. T. Morrill.

Frank J. Reinhard is occupying new offices in the Rubey Block, Golden.

E. M. Rabb, Superintendent of the Four Reed Mine, has returned to Oatman, Ariz., after a trip to the mining districts in Colorado and Arizona.

'06.

Karl E. Neugebauer's address in Pueblo is now 930 South Union Avenue.

Hugh R. Van Wagenen has returned to Denver from Pioche, Nevada, where he has been superintendent of the Amalgamated Pioche for some time. His father, T. F. Van Wagenen, assumed the management of the property.

'08.

Prof. Wm. R. Chedsey has been promoted to Associate Professor of Mining at the State College of Pennsylvania.

Gary E. Block has received a commission as Captain in the U. S. O. R., and has been attending the Engineer Officers' Training School at Fort Leavenworth, Kansas.

Leon P. Hills is at Sonora, California.

Byron M. Johnson is with the A. S. & R. Co. Address care of the Company Monclova, Coahuila, Mexico, Apartado 19. At present he is engineer for the Panuco Mines about 45 miles out of Monclova. This is a low-grade copper property that will be in full operation about October first.

Karl G. Link is now at the Victor Hotel, Glendale, California, because of the closing down of the property at Danby, where Link has been superintendent. This address will probably be very temporary.

'09.

Dudley M. Wilson, who has been with the Texas Power and Light Co. for a number of years, will make a trip to Nicaragua to examine a number of lode and placer properties for New York capitalists.

John R. Griffith, who is Research Engineer for the Norton Company is at Cologne, Germany, presumably interned. No mail from this country reaches Germany now.

'10.

D. Ford McCormick, Superintendent of the Minas de Matabambre, Matabambre, Provincia Pinar del Rio, Cuba, writes that many Americans are leaving the Island for the States to enlist.

H. D. Phelps is with the Blue Bell Mine at Mayer, Arizona. Address care of the company.

S. W. Laughlin is with the Consolidated Coppermines Co. at Kimberly, Nevada, but is still living at Ely, which is only ten or fifteen miles distant.

'11.

Hamilton W. Baker expects to be in and out of the Boston office, 185 Devonshire Street, more frequently than the Idaho office, and mail should be sent to his Boston address.

S. R. Brown, Jr., has resigned as Mill Superintendent of the Plymouth Consolidated to accept the charge of the Porphyry Dyke Gold Mining Company at Rimini, Montana. Address care of the company.

Walter J. Mayer and Arthur N. Zwetow are operating a "Sunshine" Mine for Mansanto near Green River, Utah. Address Box 217, Green River, Utah.

'12.

While Frank P. Brunel, with his wife and son, were on a visit to his old home in Golden from Ajo, Arizona, he received notice that he was called in the draft and to appear before the PIMA County (Arizona) Civil Control examination. He requested to be allowed to take the examination before the Pima County Exemption Board.

W. W. Curran, chemist for the Ray Consolidated Copper Co. at Ray, Arizona, visited in Tucson the latter part of August while on his vacation.

W. J. Cook is at Alma, Colorado, where his office address is Box F.

W. W. Grier's address is now 4542 Brookside Avenue, Seattle, Washington. Grier is now in Denver, working under the cooperation of the United States University.

W. J. H. and the U. S. Bureau of Mines.

Mr. H. J. Smith has changed his home address to 1014 1/2 W. 13th Street.

Mr. H. J. Smith has arrived at the home of Mr. W. A. and Mrs. E. M. on August 10th. His family will enter Mines Magazine.

Mr. H. J. Smith has returned to his work at the Blue Bell Mine, company early in the month. His honeymoon trip to the Blue Bell Mine was a profitable one. A committee has been organized to raise money for the property and hardware of the Blue Bell Mine, Colorado.

Mr. H. J. Smith has been given the duty of the Blue Bell Mine, company, at Mayer, Arizona.

Mr. H. J. Smith is a member of the

'13.

W. J. Eaton, who is engineer for the Compania Minera de Penoles, at Ocuila, Durango, Mexico, has called our attention to the mistake we made in the July Magazine when we got "Coahuila" instead of "Durango" in his address.

With the improved conditions in Mexico, Fidel Martinez has returned to that country where his address is 262 Matamoras St., Monterrey, N. L., Mexico.

James W. Dudgeon left the Butte and Superior Mining Company in Butte and accepted the position of Assistant Superintendent for the Basin Salvage Company at Basin, Mont.

J. F. Meyers, with the Empire Zinc Co. and whose headquarters are at Canon City, Colo., is installing a flotation plant for the company at Silver City, New Mexico.

S. Power Warren is Manager of the Rialto Mining Co. at Baxter Springs, Kansas.

L. G. Trueheart's Box number at Metcalf, Arizona, is now 523. He writes that all the mines are closed down because of labor troubles.

H. M. Cronin is engineer for the United Verde Copper Co. Address Box 1071, Jerome, Arizona.

Harold C. Price has been accepted for the Second Officers' Training Camp and has resigned his position at Bartlesville, Oklahoma. He is trying for the Coast Artillery. His address will be Co. 2, C. A. C., Camp Funston, care F. R. S. T. C., Texas.

C. B. Neiswander is carrying on flotation experiments for the Pacific Mines Corporation, at Camp Steadman, via Ludlow, Stagg P. O., San Bernardino, California. Frank Royer, '09, is consulting engineer, and George Nordenholt, Ex. '07, is general manager for the Company.

Irwin R. Solomon, whose Chicago address is 4540 Drexel Blvd., has been appointed a First Lieutenant in the United States Officers Reserve Corps.

Harvey Mathews' address is now care of the Tonopah Nicaragua Company, Bluefields, Nicaragua, C. A. The Bonanza Mine finally had to close down because of the constantly increasing cost of supplies. At present Mathews is engineer for the above Company at one of their prospects, the Rosita Mine, about twenty miles from where he formerly worked.

'14.

James W. Pearce left Gilmore, Idaho, about August 20th, to join Co. C., Engineers at Gothen. His address will be Co. C Engineers, U. S. N. G. of Colo., Camp Kearney, Santa Vista, California, for the time being.

A. W. Smith's address is 38 Lincoln Apts., Youngstown, Ohio.

A. Ringgold Brousseau is bonus boss at the Blue Bell Mine at Mayer, Arizona.

Theo. H. M. Crampton is now in Washington, D. C., where his address is 1509 13th St., N. W., with a military invention he is submitting to the government.

Van Cleave A. Olson is shift boss at the Daily Judge Mine at Park City, Utah. Olson

was drafted but probably will not have to leave in the first call.

A. E. Bolam is assayer for the Consolidated Copper Mines Company at Kimberly, Nevada.

Hsiang Tsai has spent the past year in traveling through all the mining regions of Central China for a mining capitalist. His address will be Chang Shin Coal Mining Company, 12 French Bund, Shanghai, China.

Keith Roberts is no longer connected with the Dome Mine, but is still in South Porcupine, Ontario, Canada, and in business for himself as mining engineer.

G. H. Van Dorp received his commission as Second Lieutenant, U. S. R., and is attending the Engineer Officers' Training School at Ft. Leavenworth, Kansas.

Ben C. Essig is preparing to move to Empire, Colo., where, as assistant superintendent, he will be engaged in the erection of a large mill for the Company.

A. S. Walter has changed his mail address in Durango, Colorado, to 928 Third Ave. He is still with the A. S. & R. Co.

'16.

Roy H. Miller, who has been with the Anaconda Copper Co. at Anaconda and Great Falls since graduation, was visiting in Golden on August 21, 1917. He expected to report for army service at Helena on September first.



R. M. Fullaway.

R. M. (better known as "Steve") Fullaway, one of Mines football stars, and Miss Callista McCormick were married in Los Angeles in July. Fullaway has received a commission as Lieutenant in the army.

J. M. Lliteras, from Antioch, Nebraska, was visiting in Golden the latter part of August.

Charles R. Vorck, of Co. A Engineers, who was injured in an automobile accident near Golden some weeks ago, was removed from St. Joseph's Hospital in Denver to the William Lowe home in Golden the latter part of August.

'17.

A. L. Miller is visiting at the Beta House in Golden. He came to Golden expecting to join the Engineers, but was refused because of the condition of his heart.

Sydney A. Mewhirter, Second Lieutenant, U. S. R., has been attending the Engineer

Officers' Training School at Ft. Leavenworth, Kansas. He was recently assigned to the 314th Engineers organizing at Ft. Riley, where his address will be E. O. R. C., 314th Engineers, Ft. Riley, Kansas. Any drafted Mines men who are to be sent to Ft. Riley are requested to inform him as early as possible so that he can have them assigned to the Engineers if possible.

George M. Cheney expected to sail from New York the latter part of August to take a position with a Mining Company in Ecuador. We have not yet received his exact address.

**Popular Officer Weds.**

(By Ethel Hueston Best, in the Colorado Transcript of September 6th.)

The Engineers' camp in Golden has been in a state of turmoil for the past week, trying to make final telegraphic arrangements for the marriage of Miss Marcella Sterling, of Denver, to Lyle R. VanBurgh, First Lieutenant with the Engineer train, and even at the last, when the battalion boots were polished to a state of unbelievable brilliancy, when the shining spurs were oiled



Lyle R. VanBurgh.

(The Engineers left Golden for Linda Vista, California, before we could obtain a photograph showing the "mustachios.")

to the point of clicking at every tremor of the Lieutenant's knees, when the continental mustachios were spiked to a truly ferocious extent, when the minister and the rice waiting at the church, and the entire battalion was smoking VanBurgh's cigars, even then there was a hitch in the proceedings, for the train bearing the bride-to-be from California was two hours late.

Only the unflinching support of devoted friends saved the young man from total collapse, but by earnestly entreating him to remember the wilting effect on the said spikes of his mustachios and the menace of tear drops to the brilliant boots, they succeeded in reviving his drooping spirits. At eleven-thirty p. m. the bridal party entered the church, to the strains of the

time-honored wedding march. I am not musical enough to know which one it was, but anyhow it begins "Here Comes the Bride."

The ceremony was performed at Calvary Church by the Reverend Don F. Fenn. The bride and groom were attended by Lieutenant Jesse Fushy, of Golden, and Miss Helen Kohankie, of Denver.

The bride is a charming and beautiful young woman, who was literally torn from the halls of learning at Berkeley, Calif., to assume the role of caretaker to the Battalion Boots and Spurs. Lieutenant Van-Burgh, School of Mines graduate and former football star, is the ornament of the camp, and his melting eyes belie the bristling mustachios.

Mrs. VanBurgh is a great acquisition to the camp circle, and will receive a hearty welcome on every hand. Unless appearances are deceitful, her personality is quite as pleasing as her face and manner.

Anyhow, it is noted that the other young officers are assiduously saving up for an investment in boots and spurs. If it worked once, why shouldn't history repeat itself? The local drug stores are advised to lay in liberal supplies of mustache wax.

Prof. Michiya Hiraoka, Professor of Mining Engineering and Metallurgy, Osaka Higher Technical College, Japan, and Mr. M. Saito, also from Japan, visited the School and the U. S. Bureau of Mines on August 21st. They are making a tour of the important mining and metallurgical centers of the U. S. They are particularly interested in the problem of smelter fume disposal.

#### Mine Ventilation.

The Jeffrey Manufacturing Co. have out a new Bulletin, No. 229, on this subject containing much useful information and valuable data. Anyone interested in the subject should write for a copy either to the main office, 950 North Fourth St., Columbus, Ohio, or to any of their branch offices.

#### LOST ADDRESSES.

We have been unable to locate or have recently lost the addresses of the following graduates. If you have any knowledge in regard to the addresses of any of the graduates on this list, kindly communicate with the Assistant Secretary at Golden, Colo.

Chas. Adams ... '04	Fred G. Kelley... '39
W. J. Atkinson... '96	Wm. M. Lewis... '09
W. J. Barendsehoer... '96	Jno. B. Neville, Jr... '05
S. S. Bruce... '89	C. O. Olsen... '11
Burt Cole... '92	Evaristo Paredes... '05
W. Christensen... '02	W. B. Phelps... '07
Wm. H. Craigue... '89	Chas. D. Root... '08
Geo. C. Foster... '03	Edward E. Rowe... '95
F. F. Frick... '08	Thos. G. Smith... '99
J. M. G. Adalpe... '06	T. E. Stephenson... '06
F. R. Hamilton... '98	Geo. K. Faggart... '03
Willis E. Hindry... '92	Y. L. Tsum... '14
Gilbert E. Jewel... '93	Guy P. Watson... '10

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Count the value of little things; you can't love a dollar and despise a dime.

Consider yourself a plaintiff before the bar of your mind; in self-judgment neither give nor expect leniency.

Endeavor to make friends your most prized possessions, after your family; know that people are greater than things; that their opinions are better than books.

Surrender your vices—keep your body and mind fit; don't worry; make your failures stepping stones to achievement; if you fall, fight on your knees.

Say to yourself every day: Self-respect is greater than the esteem of men, wealth of the soul is more than the wealth of the Indies.

—Coal Age, April 7, 1917.

#### MAGAZINE SUBSCRIPTIONS

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Frank D. Aller, '32.....60c

The best and most efficient methods for all of the regular determinations. Aller was for many years chief chemist for the A. S. & R. Co. There is no better set of modern practical analytical methods printed. Every Mines man should have a copy.

Quantitative Analysis, C. D. Test.....20c  
Used as text in Sophomore laboratory work.

Laboratory Notes, J. C. Bailar.....30c

Notes on Assaying, F. W. Traphagen....60c  
These notes accompany the lectures in Fire Assaying at the Colorado School of Mines.

THE COLORADO SCHOOL OF MINES  
ALUMNI ASSOCIATION,  
GOLDEN. - - COLORADO.

# COLORADO SCHOOL OF MINES MAGAZINE

Vol. VII.

GOLDEN, COLO., OCTOBER, 1917.

No. 10

## Role of Geology in Petroleum Discovery

Chief Value Is Ability to Determine Rock Structure and Locate Favorable Areas.

By VICTOR ZIEGLER \*

There is much misconception as to the value of geology and its method of application in the search for and the locating of lands carrying commercial accumulations of gas and oil. The popular idea sees the geologist, either endowed with some sort of "witchcraft" or "second sight," which enables him to see the oil deep under the surface of the ground, or equipped with the "divining rod" or "forked stick," which, when properly treated, is considered by many a sure means of locating anything of



Victor Ziegler

value under ground, whether it be water or buried treasure.

There is no excuse for such ideas, as the principles under which the geologist works are few and easily understood. The geologist does not see a reservoir of oil underground. Indeed, he can see no farther into the ground than any other man. The geologist, however, is so trained that, after an examination of the distribution and arrangement of the rocks at the earth's surface, he arrives at certain deductions and conclusions which determine:

First—The presence or absence of layers likely to carry oil.

Second—Their depth under the earth's surface.

Third—Their attitude or arrangement under ground, which may or may not be favorable to oil accumulation.

There are certain fundamental principles underlying oil accumulation which are the chief stock of trade of the oil geologist. They may be summarized as follows:

First—All commercially important oil fields are located in "sedimentary" or "stratified" rocks. These rocks are usually deposited under water. They are arranged in parallel layers or beds. A collection or group of such beds is known as a "formation" and is usually named after a town, mountain or stream. Thus we have a "Denver" formation, a "Bighorn" formation, a "Wall Creek" formation, etc.

There are three common kinds of sedimentary rocks. Sands cemented into rock become sandstone; muds or clays, hardened and compressed into rock, become shale; the shells (hard parts) of oysters, clams, corals, etc., become limestone.

Second—Oil is not present in underground lakes or rivers, but fills the minute pores and openings in sands and sandstones. Such a sandstone, soaked with oil like a sponge with water, forms an "oil pool." Very rarely other rocks form a "reservoir" for oil. Thus in the Lima field in Ohio the oil fills pores and cavities in limestone; in Florence the oil occurs filling small cracks and fissures in shales. It is, however, safe to state that in 95 per cent of all cases the reservoir is in oil sand. This is noticeably true in Wyoming, Oklahoma, Kansas, California, Pennsylvania, etc.

Third—Commercial accumulations of oil occur only in the higher parts of the folds or wrinkles in the rocks.

In the oil fields we do not find the sedimentary rocks flat and undisturbed as they were originally deposited, but we find the rocks folded and wrinkled much like the quilt on our bed after a night's sleep. The upfolds or arches are anticlines, the downfolds or troughs are synclines. The higher parts of the folds, which experience has shown to be more likely to carry oil, are

\* Professor of Geology, Colorado School of Mines.

then known as "anticlines." This rule, for obvious reasons called the "anticlinal theory," is the most important principle of oil geology and one that should govern all prospecting and examination of oil lands, whether located in California or in Pennsylvania, in Texas or in Wyoming.

This fundamental principle of oil geology explains the accumulation of oil in the higher parts of the folds—or in the anticlines—as follows:

The sandstones which act as oil and gas reservoirs are, in most cases, also saturated with water. They are usually overlain and underlain by shale, which forms a practically impervious cover. Oil and water, even if vigorously stirred up and shaken up in a bottle will not mix, but will separate into two layers according to their weight—with the oil on top and the water below. Similarly in the oil sand such a separation will take place; provided the sand is completely saturated or filled with water the oil will rise to the highest part of the reservoir—which is the very top or crest of the anticline.

If the sands are only partially saturated the oil will accumulate on top of the water level along the sides of the folds. If the sands are dry, the oil, of necessity, will be formed in the bottom of the troughs, or, to use the geologic term, in the synclines. In by far the great majority of cases we have the oil sands completely saturated and therefore find the oil in the crests of the anticlines.

These are the conditions met with in most sands of Wyoming, California and the Appalachians. Whether or not a sand is saturated can only be determined with certainty by drilling. Common experience in a field is the only reliable guide. The geologist is of value because he can pick out that part of the structure which holds out the greatest chance for success under the conditions prevalent in that field.

There are other arrangements of rocks besides the anticlines that afford a chance for the formation of oil pools. Thus the oil man's idea of the so-called "dome," which is a fold shaped like an inverted bowl. Domes are not necessarily circular in ground plan—they may be elongated, oval, or eccentric in shape. Most of the producing Wyoming oil fields are domes.

As in the anticlines, the oil rises to the top of the water level, and since the sands are usually saturated, accumulates at the highest point or the apex of the fold. Horizontal rocks are usually unfavorable. There are rare exceptions, where as a result of the intrusion of a dyke or plug of lava or igneous rock, the sediments are sufficiently disturbed and tilted to form a reservoir. This is true of certain Mexican fields.

Rocks dipped or inclined in one direction only are usually unfavorable, since the oil upon rising upwards seeps out on the surface and is hence lost. This is the case in the great oil fields of Wyoming. Occasionally

the oils are so heavy and viscous that upon rising toward the surface they harden, due to the loss of their volatile constituents, and clog up the pores of the sandstone. In this way are formed the bituminous and asphalt-bearing rocks of California and Oklahoma. These asphalt rocks frequently form the cover or seal of an oil pool. Again slight warping may affect the uniform slope of the rocks and form a trap in which oil and gas collect. Of such nature are the "structural terraces" of the Ohio, Indiana and Kansas-Oklahoma fields.

There are many other structural conditions favorable to oil accumulation, but all following, in modified form, the principles stated. Thus we must have a porous rock, usually a sandstone, capable of acting as a reservoir and inclosed in relatively impervious rock, usually shale. The arrangement of rocks must be such that there exists an opportunity for the accumulation of commercial quantities of oil and gas. The most important single factor in the locating of an oil well is, therefore, the geologic structure. The chief value of the geologist is his ability to determine the structure from the distribution and arrangement of the rocks at the surface and to locate the favorable areas for testing. He, to be sure, cannot say where to drill to be certain of success, but he can say where to drill with the best chances of success and where not to drill because of the practical certainty of failure. —The Denver Times, September 23, 1917.

#### Practice for Prexy's English Classes.

What is the longest English word? Some time ago the London Academy published a list of words of Gargantuan dimensions, with their authorities and instances of actual usage. Among other words which figure in the list are *velocipedistrianisticalist-nariananologist*, *ultradisestablishmentarists*, *antidisestablishmentarian*, *ultraantidisestablishmentarianists*, *antitranssubstantiationistically*, *focipancinihilipilification* (used by Sir Walter Scott in his journal), and *honorificabilitudinitatibus* (used by Shakespeare and several others). Certain trifles such as *incircumscribibility* do not count, and the big word of Rabelais, *antipermetanarbeugedamphiscibrationis*, is apparently ruled out, for the Academy says: The Englishmen's real jawbreaker is a Welsh word over which Mr. Justice Lawrence once, at the Anglesey Assizes, asked an explanation from Mr. Byrn Roberts, M. P. "What is the meaning of the letters 'p'g' after the name Llanfair?" The answer was. It is an abbreviation for the village of *Llan-fair-wyngyllogerychwyrndrobwllantysilogogon*. How is this pronounced? It will take some bearing. This word of fifty-four letters, if repeated often enough, is said to be a cure for the toothache.

"Who blamed the ventilating system for this outbreak?"

"Some draftsman, I suppose."



## The Practical Value of Oil and Gas Bureaus<sup>†</sup>

By W. G. Matteson,\* '11, B.S., E.M., E.Met.

The Oklahoma legislature recently passed a bill providing for "the creation of an oil and gas department under the jurisdiction of the Corporation Commission, authorizing the Corporation Commission to appoint a chief oil and gas conservation agent, and conferring exclusive jurisdiction on the Corporation Commission in reference to the conservation of oil and gas, and the inspection of gasoline and oil, the product of crude petroleum, and repealing all acts or parts of acts in conflict therewith and declaring an emergency." Some of the functions of the new bureau include the receiving and filing of all well logs and the direction and supervision of plugging all abandoned oil and gas wells under rules prescribed by the Corporation Commission.

The two leading petroleum-producing States of the country, Oklahoma and California, have now established oil and gas bureaus with a staff of inspectors to see that the important rules relating to the conservation of oil and gas are thoroughly enforced. The economic significance and the value of well logs in the conservation work has been recognized and the necessary legal action taken to insure and procure them. William B. Heroy, of the Government Land Classification Board, in a personal communication to the writer, says that the drilling of wells is also regulated by public authority in the Roswell artesian basin in southeastern New Mexico, where a permit must be obtained for the drilling of any well and a certified log of the well recorded with a county official. The method is said to give fairly satisfactory results.

In a recent article<sup>1</sup> a National instead of a State Bureau was suggested for collecting and filing well logs. In discussing the paper, L. L. Hutchison characterized such a plan as impractical because the average driller or contractor will often juggle or guess at the log and will not keep the record sufficiently close or accurate, making it necessary to maintain a special man at each well for the sole purpose of obtaining such data correctly, a procedure that is expensive. A number of geologists and producers will take issue with this contention. Moreover, the excellent logs of every well in California, obtained at little or no expense, form the best refutation and answer to such an objection. It should be further borne in mind, as suggested previously, that a log need not be accurate in a strict scientific

sense to be of great practical value when projected on the scale of 1 in. = 100 feet. Where a number of logs are obtained from the same field, any glaring inaccuracies resulting from an improper record are generally detected when checked against the average of several adjacent logs. Such inaccurate logs can therefore be rejected.

To emphasize further the practical value of well logs from a geological standpoint, the writer knows of a company that has saved and made several millions of dollars in one pool by the judicious application of such data. This company industriously gathered well records for a considerable period and projected them on a scale of 1 in. = 100 ft. In this way, the structure of the pool was completely and quite accurately defined, the purchase of much high-priced but poor acreage avoided while acreage that was considered questionable was shown to contain some of the best wells in the region. All the large producing oil companies have recognized the practical importance of well logs and many now maintain special subsurface departments whose chief functions are the recording and plotting of such data.

As for the difficulty of getting the head driller or contractor to keep an accurate record of the well, the writer has questioned a number of operators who say that such difficulty is greatly exaggerated. The driller generally shows a tendency to co-operate in every way and to obtain that which is requested. In some regions, it might be necessary to educate the driller to the point of recognizing the value of accurate logs. In this connection, it is gratifying to note the vast improvement during the last two to four years in this matter. Where there were ten accurate records five years ago, there are a thousand today. The "oil smeller" or geologist is no longer viewed with suspicion or contempt by the field men; he has come into his own. If such results can be secured under very unfavorable conditions, there seems to be no logical reason why a more determined and organized effort, supported by public authority and directed by a standard and efficient bureau, should not produce the results desired. Aside from the geological importance, if water troubles are to be prevented, if desirable and satisfactory data are to be obtained on the life and rate of decline of wells, if accurate estimates of oil reserves are to be obtained, well logs are vital and an efficient oil and gas bureau becomes a practical necessity.

Despite the advantages that a national bureau of well-log statistics or a national oil and gas bureau might possess over a state organization of similar design, the establishment of such a bureau would constitute undoubtedly an infringement of state

<sup>†</sup> Paper presented at the St. Louis meeting of the American Institute of Mining Engineers, October, 1917.

\* Petroleum geologist and mining engineer, Producers Oil Co.

<sup>1</sup> W. G. Matteson: The Need and Advantages of a National Bureau of Well Log Statistics, *Bulletin* No. 122 (February, 1917).

Herein lies the main obstacle to the formation of a national organization, and there seems to be no way at present to overcome it. The matter, therefore, must await the initiative of each state, and it is to be hoped that the importance of such an organization will be so recognized that the bureau will not be made ineffective by the appointment for political reasons, of incompetent and inexperienced officials.

The new Oklahoma Oil and Gas Bureau has unlimited possibilities, since its powers are not expressly defined by any definite and prescribed statute as they are in California. The Oklahoma bureau is under the direct jurisdiction and supervision of the Corporation Commission, a body which has the power to hear and to sit in judgment in any case or complaint pertaining to oil and gas and their conservation, and to prescribe and cause to be enforced any rule or provision which it deems necessary to remedy an undesirable condition. The development of this bureau will therefore be studied with interest. Meanwhile it would be gratifying to see similar state bureaus established in Texas, Louisiana, Pennsylvania, West Virginia, Ohio, Illinois, Wyoming, Kentucky and all other states where extensive drilling operations are now in progress.

W. L. Bequaert. Discussion of the Need and Advantages of a National Bureau of Well-Log Services. *Bulletin No. 124* (April, 1917), 635.

#### COURT RULES THAT IT HAS NO JURISDICTION IN ALDERSON MATTER.

In the controversy over the presidency of the School of Mines, hearing of which was held in the Denver District Court, September 24th and 26th, the court held that it had no jurisdiction in the case, and the hearings were ended.

In the first place, the opponents of Dr. Alderson obtained from Judge Butler a temporary restraining order preventing the trustees from carrying their election of Dr. Alderson. On September 26th the case was taken to the United States Court, sitting in Denver, before Judge Cooper, of Canon City, sitting by the order of the court. At this time Attorney A. W. Quistance, representing the plaintiffs, objected to his amended complaint. The court refused to hear this, and then Attorney General Bouck, representing the trustees, filed a demurrer, setting out the grounds that the court had no jurisdiction in the case, and after the arguments were heard, the court sustained this demurrer. It was held that this action, showing that the court had no jurisdiction, would end the case, and the trustees could proceed with the Alderson election.

The court then gave the plaintiffs twenty days by which to endeavor to obtain a writ from the supreme court, and a temporary restraining order within the twenty days. If no writ was obtained by the supreme court, the temporary restraining order would expire, and the trustees would be allowed to ratify the election.

The peculiar phase of the matter, and one that is baffling to the layman, at least, is that the court, after ruling it had no jurisdiction, should continue the restraining order and give permission to apply for a supersedeas.

In the amended complaint which Attorney Quistance attempted to bring in, it was alleged that a deep, dark conspiracy had existed between Dr. Alderson, and Trustees Rubey, Smith and Carlton.

#### VINDICATION OF DR. ALDERSON.

(By John C. Vivian.)

The election of Dr. Victor C. Alderson as president of the Colorado School of Mines means the salvation of that institution. It is a complete vindication of Dr. Alderson and his actions as president of the school for ten years prior to 1913 when he was discharged.

At the time of Dr. Alderson's dismissal, the institution had reached the zenith in its power, popularity and efficiency. At no time in the history of the school had it been so well known nor enjoyed such an enviable reputation as during Dr. Alderson's regime. Dr. Alderson was removed from the presidency of the School of Mines solely because of personal prejudice against him. There were members of the Board of Trustees who brought about this action who were personally displeased over the way Dr. Alderson was running the institution. There was no valid reason for the action that was taken at that time.

President Alderson is a big man in the educational world. He is broad and capable; efficient and painstaking, brainy and able at all times to cope with the educational problems that have to be met at the School of Mines.

The western end of the School of Mines campus is distinctly "Alderson." Most of the new buildings can be directly traced to his interest and activity when he was here before.

Dr. Alderson combines all of the qualities that go to make up the head of an institution such as the School of Mines. He is an educator, a business man, a professional man and enough of a politician in the higher sense of the word to successfully mix with and get results from the practical men of the state and the nation. He knows how to meet legislators, governors and state officials. They all have a high regard for him.

The people of Golden almost unanimously approve of the action of the Board in re-electing Dr. Alderson president of the Mines. The people of this city are in a position to know better the conditions at the school and what the remedy is than those on the outside. Townspeople, who have had the interests of the school at heart for a great many years, have been accused by people out in the state who were opposed to Dr. Alderson, as being interested in running the school for the benefit of Golden as

against that of the state. Nothing could be more ridiculous. Every person who has advocated the re-election of Dr. Alderson in Golden, has done so with a motive of loyalty to the state and one of its most prominent educational institutions.

The opposition to Dr. Alderson was slight. It was not organized, its sentiment was not crystalized.

The opposition was purely personal. Either the protestants did not like Dr. Alderson personally or disliked some of the things he announced he would do when he became president.

The fact remains that the School of Mines enjoyed the reputation of the greatest mining school in the world during Dr. Alderson's incumbency from 1903 to 1913. Dr. Alderson will enjoy the confidence and the co-operation of all loyal citizens in taking up his new duties.—Golden Globe.

#### ENGINEERS LEAVE GOLDEN SEPTEMBER 8th AND ARRIVE AT CAMP KEARNEY SEPTEMBER 11th.

The orders were to entrain at 6 a. m. on Saturday morning, and reveille was sounded long before daylight, and in a short time the men were at the Intermountain tracks, waiting impatiently for the sound of the locomotive whistle. Some mixup about the train occurred, however, and it was not until nearly three o'clock in the afternoon that the boys piled on the train and the last farewells were said.

There was a great gathering of Golden people at the train to see the boys off, and while the soldiers tried to appear jolly and nonchalant, many tears flowed down manly faces. Mothers and fathers clung to sons, sweethearts and wives clung to lovers and husbands, and sisters clung to brothers. They were all sad, but all were mighty proud of the fact that their boys were going forth, voluntarily, to fight for America's great cause.

The Engineers were well fixed up for their long trip to California. A baggage car was fitted up as a mess car, and great stores of provisions were piled into another baggage car, so hot meals were assured them on the way. A ton of fruit and fresh vegetables was sent as the gift of several commission houses, and scores of the soldiers had boxes and baskets of cake, fruit and other good things from home.

The train was made up of tourist sleepers, with three men to each section.

A glorious send off was given the boys when they passed the big military camp at Camp Baldwin, Denver. More than a thousand soldiers lined up there on both sides of the track and the Engineers' train was halted for a few moments. The Camp Baldwin boys gave the Golden boys a send off which they will long remember.

All along the way people crowded to the depots to wish the boys God speed, and at many places they were showered with good things. At Grand Junction wagon loads of

fruit were waiting when the train pulled in, and at various cities in California fruit was given them.

Camp Kearney is located at Linda Vista, fifteen miles north of San Diego, on the Santa Fe railroad. Mail for the boys should be addressed to Camp Kearney, Calif, giving his company and regiment or battalion.

The guards from California, Utah, Arizona, New Mexico and Colorado are to mobilize at this camp. The commanding officers there are Maj. Gen. F. S. Strong, commanding; Lieut. Col. J. W. Gulick, chief of staff; Brig. Gen. G. H. Cameron, Seventh-eighth Infantry Brigade; Brig. Gen. A. M. Tuthill, Seventy-ninth Infantry Brigade; Brig. Gen. Le R. S. Lyon, Sixty-fifth Field Artillery Brigade.

#### NEW PROFESSORS AT THE COLORADO SCHOOL OF MINES.

##### Professor of Mechanical Engineering.

James L. Morse, who succeeds Ransom S. Hawley, as Professor of Mechanical Engineering, arrived in Golden October 6th. Prof. Morse has had eleven years teaching experience, four at Highland Park College, Des Moines, and the past seven years at the Michigan Agricultural College at East Lansing, Michigan.

His college education was obtained at Highland Park College, Michigan Agricultural College, and Ohio State University. He received his degree of Mechanical Engineer at the Michigan Agricultural College.

Prof. Morse was Superintendent of the College machine and forge shops at Highland Park College for one and a half years, in addition to his four years teaching there.

He was two and a half years with the Kerrihard Foundry and Machine Company, at Red Oak, Iowa.

From 1907 to September, 1910, he was traveling representative for the Otto Gas Engine Works.

From September, 1910, to date, he has been Assistant Professor of Drawing and Machine Design at Michigan Agricultural College.

He is a member of the Society for the Promotion of Engineering Education. Both his practical and teaching experience have been excellent. He has the reputation for being able to secure the confidence and respect of his students.

##### Assistant Professor of Geology and Mineralogy.

Francis M. Van Tuyl, the new Assistant Professor of Geology and Mineralogy, was born at Denmark, Iowa, October 15, 1887. Graduated from Denmark Academy in 1907. Honor Scholar in State University of Iowa, 1907-11. Received B. A. Degree in 1911. Won Jourden prize in geology and elected member of Honorary Societies of Phi Beta Kappa and Sigma Xi in senior year. Assistant in geology, University of Iowa, 1911-12. Awarded M. S. Degree in 1912. Fellow

in geology. Columbia University, 1912-13. Assistant in geology. Columbia, 1913-14. Carried on research work on origin of dolomitic limestones for Iowa Geological Survey and New York Academy of Science, 1912-14.

Employed by State Geological Survey of Iowa, Illinois and Missouri to carry on investigate work on Mississippian formations of Mississippi Valley at the University of Chicago. 1914-15. Awarded Degree of Ph.D. by Columbia University in 1915. Instructor in geology at University of Illinois, 1915-17. Geologist of Iowa Geological Survey since 1913. Geologist of University of Illinois Hudson Bay Exploring Expedition in 1916. Fellow of American Association for the advancement of Science, fellow of the Illinois Academy of Science, fellow of the Iowa Academy of Science, member of the New York Academy of Science, member of the Paleontological Society of America, nominated for fellowship in Geological Society of America.

#### MINES MEN IN U. S. SERVICE

Below is a list of Mines men in the U. S. war service. We know this is incomplete, and probably incorrect in some cases. Please send in any corrections and additions you may know of. We hope to obtain a complete list of all Mines men in the Service and print the roster frequently. Help us complete the list. Any Mines men, either graduates or former students, no matter what branch—artillery, cavalry, infantry, marine, aviation, engineers, training camps, reserve corps, etc. Inform us of any changes of address, transfers and promotions.

**Balt, Louis R., '00.**

Retired Captain U. S. Army.

Now military instructor, Colorado Agricultural College, Fort Collins, Colorado.

**Beyrle, Charles N., Ex '17.**

Sergeant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.

**Bilisoly, Walter E., Ex '20.**

U. S. Marine Corps, Officers' Training School, Norfolk, Va.

**Bird, L. W., Ex '19.**

U. S. Army.

**Block, Gary E., '08.**

Capt. U. S. R., Engineer Officers' Training School, Fort Leavenworth, Kansas.

**Breckenridge, L. D., Ex '19.**

Second Lieutenant Marine Corps, U. S. R.

**Brown, F. A., Ex '19.**

Corporal Co. A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.

**Buck, Luther J., Ex '18.**

Reserve Corps, Fortress Monroe, Va.

**Chapman, Irving A., '13.**

Coxswain, U. S. S. P. 41.

**Charles, I. M., Ex '19.**

7th Reg., 37th Co., U. S. M. C. American Expeditionary Forces, care Postmaster, New York City.

**Cunningham, S. D., Ex '19.**

Co. A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif. Expects commission in Aviation Corps.

**Cutting, George W., Ex '17.**

Second Lieutenant, 342nd Field Artillery, Camp Funston, Kansas.

**Dodge, David C., Jr., '15.**

Second Lieutenant, U. S. O. R. Corps.

**Dolman, Carrol George, Former Professor C. S. M.**

Captain Co. C, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.

**Downes, Frank A., '13.**

Co. C, 346th Machine Gun Battalion, Camp Lewis, American Lake, Washington.

**Ferguson, Kenneth S., '17.**

U. S. Marine Corps. In Cuba. Mail address 2333 Eudora Street, Denver, Colo.

**Finney, Walter, Ex '20.**

Marine Barracks, Mare Island, Vallejo, Calif.

**Flemming, C. W., Ex '15.**

U. S. Army, Ft. Riley, Kansas.

**Fullaway, R. M., '16.**

Co. B, 4th Engineers, U. S. A., Vancouver, Washington.

**Fushey, Jesse J., Ex '19.**

First Lieutenant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.

**Graham, Burdette S., former Y. M. C. A. Secretary.**

U. S. Aviation School.

**Hanley, Dr. Wm. B., former Coach.**

Lieutenant U. S. Medical Corps.

**Hinman, Dale Durkee, '15.**

Second Lieutenant, U. S. Coast Artillery, Fortress Monroe, Va.

**Howbert, Van Dyme, '16.**

Engineer U. S. Training Camp, Fort Riley, Kan.

**Jeuck, John William, Ex '13.**

U. S. A., Camp Funston, Kansas.

**Jones, David L., Ex '19.**

Second Lieutenant, Artillery, U. S. O. R.

**Kinsley, Arthur C., Ex '18.**

First Lieutenant, Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.

**Kistler, Erle O., former Coach.**

Major, U. S. O. R.

**Knepper, C. M., '17.**

Retired Captain U. S. Navy.

Government Inspector for the Navy, Bethlehem, Pa.

**Krier, Edw. J., Ex '18.**

U. S. Army.

**Levy, Milton M., '16.**

Second Lieutenant, 315th Engineers, Camp Travis, Ft. Sam Houston, Texas.

**Light, Victor A., '13.**

U. S. A., Fort Riley, Kansas.

**Locke, D. R., Ex '18.**

Second Officers' Training Camp, Camp Funston, Texas.

**MacNeill, Neil M., '14.**

Corporal Company C, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.

**Marshall, Emory M., '11.**

U. S. Army

- Menke, J. G., Ex '18.  
Sergeant Company C, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Mewhirter, Sydney A., '17.  
First Lieutenant, E. O. R. C., 314th Engineers, Ft. Riley, Kansas.
- Murphy, William J., '17.  
Sergeant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- O'Malley, John J., Ex '18.  
Second Lieutenant Aviation Corps. In Canada or France.
- O'Neill, Frank E., Ex '18.  
U. S. Marine Corps, Ft. Howard, Md.
- O'Reilly, Walter T., Ex '18.  
West Point Military Academy, Annapolis, Md.
- Parker, J. Merrill, Secretary of the Mines Y. M. C. A.  
Marine Barracks, Mare Island, Vallejo, Calif.
- Pearce, James W., '14.  
Company C, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Phillips, L. V., Ex '19.  
Sergeant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Poulin, John A., Ex '20.  
U. S. Aviation Corps.
- Price, Harold C., '13.  
Company 2, C. A. C., Ft. Winfield Scott Training Camp, Ft. Winfield Scott, Calif.
- Prior, Charles E., '13.  
U. S. Army.
- Rabb, John H., Jr., Ex '18.  
Sergeant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Reynolds, K. W., Ex '18.  
U. S. Army, Fort Riley, Kansas.
- Richardson, Carleton, Ex '19.  
Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Ristedt, Ernest J., '09.  
First Lieutenant in the Reserve Corps of Engineers, U. S. A.
- Robertson, Fitch, Ex '18.  
Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Robinson, H. A., Ex '18.  
Lieutenant, U. S. O. R. Corps.
- Russell, Donald O., '09.  
English Army, Somewhere in France.
- Schade, Roger M., Ex '18.  
Sergeant Company C, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Schoensiegel, A. D., Ex '17.  
Marine Barracks, Mare Island, Vallejo, Calif.
- Small, Sidney S., '17.  
Second Lieutenant, U. S. Coast Artillery Corps; Second Officers' Training Co., Fortress Monroe, Va.
- Snedaker, Eugene G., '14.  
First Lieutenant Engineers Corps, U. S. Army, Vancouver Barracks, Washington.
- Solomon, Irwin R., '13.  
First Lieutenant, U. S. O. R. Corps, 4540 Drexel Blvd., Chicago, Ill.
- Stedman, A. W. Jr., Ex '17.  
First Lieutenant 6th Reg. Infantry, Ft. Oglethorpe, Ga.
- Taylor, C. C., Ex '17.  
Second Lieutenant Coast Artillery Corps, Fortress Monroe, Va.
- Taylor, Ilo I., Former Professor.  
In charge of Engineer Depot at Fort Lee, Petersburg, Va.
- Thurstin, Robert A., '17.  
U. S. Army, Officers' Training Camp.
- Tongue, Walter B., Ex '18.  
Second Lieutenant Aviation Corps. In Canada or France.
- Townsend, Albert, Ex '19.  
Sergeant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Trounce, Henry D., Ex '12.  
Lieutenant, English Army.
- Van Burgh, Lisle R., '17.  
First Lieutenant, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Van Dorp, G. H., '15.  
Second Lieutenant, U. S. O. R. Corps, Ft. Riley, Kansas.
- Vorck, Charles R., '16.  
Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Williams, Wm. H., Ex '18.  
Second Lieutenant, U. S. O. R. Corps, Ft. Riley, Kansas.

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**SOCIETY ITEM.**
**Golden Boys on Trip.**

A large number of popular young Golden men left here last week for California, where they expect to sojourn several weeks, after which they are planning to go abroad to spend the Fall and Winter. The boys, not wishing their party broken up and not caring to mingle with the people traveling on the ordinary railway cars, engaged a special train for their select party, securing same through favor of the government. They had their private chefs with them. When the party reached California they planned to go direct to Linda Vista, a summer resort near San Diego bay, where they have engaged comfortable bungalows. They intend to spend a great deal of time roughing it in the open, and for that reason they have all provided themselves with comfortable suits of khaki clothing, leggings, etc. Desiring to be unique in their form of entertainment during their stay in California, the boys have decided not to indulge in golf, tennis and other ordinary amusements, but are planning something new in the way of an outing, such as digging trenches, laying sewer and water lines, etc., and will have something to tell about when they return. The boys are certain they will go to France soon, intending to spend some time in Paris and its environs. Later they will go to Germany, but do not intend to stop in that country until they reach Berlin.—Colorado Transcript, September 13, 1917.

Buy a Liberty Loan Bond and help the Yankee punch to reach its mark.

In geology, Columbia University, 1912-13. Assistant in geology, Columbia, 1913-14. Carried on research work on origin of dolomitic limestones for Iowa Geological Survey and New York Academy of Science, 1912-14.

Employed by State Geological Survey of Iowa, Illinois and Missouri to carry on investigative work on Mississippian formations of Mississippi Valley at the University of Chicago, 1914-15. Awarded Degree of Ph.D. by Columbia University in 1915. Instructor in geology at University of Illinois, 1915-17. Geologist of Iowa Geological Survey since 1913. Geologist of University of Illinois Hudson Bay Exploring Expedition in 1916. Fellow of American Association for the advancement of Science, fellow of the Illinois Academy of Science, fellow of the Iowa Academy of Science, member of the New York Academy of Science, member of the Paleontological Society of America, nominated for fellowship in Geological Society of America.

#### MINES MEN IN U. S. SERVICE.

Below is a list of Mines men in the U. S. war service. We know this is incomplete, and probably incorrect in some cases. Please send in any corrections and additions you may know of. We hope to obtain a complete list of all Mines men in the Service and print the roster frequently. Help us complete the list. Any Mines men, either graduates or former students, no matter what branch—artillery, cavalry, infantry, marine, aviation, engineers, training camps, reserve corps, etc. Inform us of any changes of address, transfers and promotions.

**Ball, Louis R., '00.**

Retired Captain U. S. Army.

Now military instructor, Colorado Agricultural College, Fort Collins, Colorado.

**Beyle, Charles N., Ex '17.**

Sergeant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.

**Billsoly, Walter E., Ex '20.**

U. S. Marine Corps, Officers' Training School, Norfolk, Va.

**Bird, L. W., Ex '19.**

U. S. Army.

**Block, Gary E., '08.**

Capt. U. S. R., Engineer Officers' Training School, Fort Leavenworth, Kansas.

**Breckenridge, L. D., Ex '19.**

Second Lieutenant Marine Corps, U. S. R.

**Brown, F. A., Ex '19.**

Corporal Co. A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.

**Buck, Luther J., Ex '18.**

Reserve Corps, Fortress Monroe, Va.

**Chapman, Irving A., '13.**

Coxswain U. S. S. S. P. 41

**Charles, I. M., Ex '19.**

1st Reg. 5th Cav, U. S. M. C. American Expeditionary Forces, late Postmaster, New York City

**Cunningham, S. D., Ex '19.**

Co. A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif. Ex commission in Aviation Corps.

**Cutting, George W., Ex '17.**

Second Lieutenant, 342nd Field Artillery, Camp Funston, Kansas.

**Dodge, David C., Jr., '15.**

Second Lieutenant, U. S. O. R.

**Dolman, Carrol George, Former C. S. M.**

Captain Co. C, 115th Engineers, Camp Kearney, Linda Vista, Calif.

**Downes, Frank A., '13.**

Co. C, 346th Machine Gun Battalion, Lewis, American Lake, Va.

**Ferguson, Kenneth S., '17.**

U. S. Marine Corps. In address 2333 Eudora Street, San Francisco, Calif.

**Finney, Walter, Ex '20.**

Marine Barracks, Mare Island, Calif.

**Flemming, C. W., Ex '15.**

U. S. Army, Ft. Riley, Kan.

**Fullaway, R. M., '16.**

Co. B, 4th Engineers, U. S. Army, Washington.

**Fushey, Jesse J., Ex '19.**

First Lieutenant Company B, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.

**Graham, Burdette S., Former Secretary.**

U. S. Aviation School.

**Hanley, Dr. Wm. B., former**

Lieutenant U. S. Medical Corps.

**Hinman, Dale Durkee, '17.**

Second Lieutenant, U. S. Army, Fortress Monroe, Va.

**Howbert, Van Dyne, '16.**

Engineer U. S. Training School, Kan.

**Jeuck, John William, Ex '19.**

U. S. A., Camp Funston, Kansas.

**Jones, David L., Ex '19.**

Second Lieutenant, U. S. Army, Camp Kearney, Linda Vista, Calif.

**Kinsley, Arthur G., Ex '17.**

First Lieutenant, U. S. Army, Camp Kearney, Linda Vista, Calif.

**Kistler, Eric G., former**

Major, U. S. D. O.

**Knepper, C. M., '17.**

Retired Captain U. S. Army, Government Inspector, Lehigh, Pa.

**Krier, Edw. J., Ex '18.**

U. S. Army.

**Levy, Milton M., '16.**

Second Lieutenant, U. S. Army, Travis, Ft. Seward, Va.

**Light, Victor A., '13.**

U. S. A., Fort Funston, Kansas.

**Locke, D. R., Ex '18.**

Second Lieutenant, U. S. Army, Camp Funston, Kansas.

**MacNeill, Neil, '13.**

Corporal, U. S. Army, Camp Funston, Kansas.

**Marshall, '16.**

U. S. Army.

# Colorado School of Mines Magazine

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 CLASS EDITOR, FRED L. SEVIVSS, '20.

VOL. VII. OCTOBER, 1917. No. 10

## TEMPORARY RESTRAINING ORDER ISSUED BY THE DISTRICT COURT AGAINST THE BOARD OF TRUSTEES.

When the Board of Trustees, with the approval of the Governor, at their meeting held at the Capitol Saturday, September 8th, elected Doctor Victor C. Alderson president and approved his recommendation for the faculty after listening to the charges made against Dr. Alderson and the testimony submitted attempting to prove the charges, and dismissing it all as unproved or trivial, it was that the protestants would cease their efforts to prevent Dr. Alderson's election.

However, on Monday, September 10th, five of the protestants, Edwin H. Platt, Arthur F. Hewitt, Lester C. Thomas, John G. May and Herman Fleck petitioned the District Court for an injunction to prevent the Board from ratifying the election of Dr. Alderson. As they presented a bond, the Court issued a temporary restraining order and set September 13th as the date for a hearing as to whether or not an injunction would be issued. As all official meetings of the Board must be held in Golden, and as the Board must meet on the second Thursday of each month, and as September 13th was the regular meeting day, this hearing was then postponed until September 25th. On September 25th the Attorney General, through Deputy Attorney Bouck, entered a demurrer in behalf of the Board, stating that the Court had no jurisdiction. This legal point was argued all day the 25th and taken under advisement by the Court.

At the opening of Court the 26th the demurrer was sustained, the Court ruling it had no jurisdiction in the matter and dismissed the suit for an injunction. However,

upon notice that an appeal would be taken to the Supreme Court, the temporary restraining order was continued for twenty days to give the plaintiffs time to apply to the Supreme Court. As the legal point involved, that of jurisdiction, is a fundamental one, there is little doubt but that the Supreme Court will refuse to assume jurisdiction. In brief, the Board belongs to the Executive branch of the Government, and it is their duty to elect a president for the School when there is a vacancy. No Court has jurisdiction to prevent them electing anyone they see fit, provided, of course, they do it in a legal manner. If proof could be given that harm or wrong would result from such an election the Courts might then have the right to prevent such an elected president from taking office.

In this connection it might be of interest to quote from the minutes of the 1913 annual meeting of the Alumni Association as printed in the June, 1913, Magazine.

"Platt spoke up, and said: 'Let's all bury the hatchet and be loyal to the School of Mines at all times.'"

Hewitt then moved and Schneider seconded the following resolution: "Be it resolved, that the Alumni Association forget all the past differences and that all stand together to aid and support the best interests of the school and the administration of the school at all times." This resolution was unanimously adopted. Hewitt then moved a resolution that the Association commend Dr. Alderson for the great improvements and material benefits he had added to the School of Mines. This motion was amended by Schneider, calling for the appointment of a committee to draw up and present to Dr. Alderson, a memorial, expressing the appreciation of the Alumni Association for his ten years' service at the School of Mines. Hewitt accepted the amendment and the resolution was passed as amended. President Kennedy then appointed, as the committee, Harry J. Wolf, Arthur J. Hewitt and Frank A. Downes. It was then moved and seconded that a committee of five be selected to see about securing a portrait of Dr. Alderson for the library and to obtaining the necessary funds.

The vindictive chap never has as much fun as the fellow who can smile and forget it.

### PREJUDICE.

Because men do not understand, do not have the full knowledge of things, they become prejudiced, and prejudice is one of man's greatest enemies. To be prejudiced means to pre-judge, which destroys the sense of justice, prevents him from dealing fair with others, and therefore with himself. It robs him of all powers to distinguish right from wrong.—Koehring Mixer.

# FOOTBALL

## MINES' NEW COACH.

**Former Coach of Iowa College in Golden to Whip Dynamite Team Into Shape.**

Charles L. Parsons, the new coach of the Mines football team, has arrived in Golden, and has taken charge of the squad. In spite of the lack of veterans at the Mines this year Mr. Parsons is confident that there will be a team which will be a credit to the school. The old-time Mines "Pep" is greatly in evidence, despite the lack of material, and indications are that the Dynamiters will be up and coming, as usual.



Charles L. Parsons

...the work of making a team out of it. All his men are putting forth every effort every day and every night. Only a few days ago, when they were back, these men were in the hands of Al Schneider. Most of the men in the team are again on their feet and are working hard. The coach and men are also coming in from the varsity team the same day.

...held Monday. Coach Parsons said he would have a lot of green men

rial, and that he was confident that with the old Mines fighting spirit and with the men he had under him he would be able to overcome the obstacles he had to face and turn out a team worthy of the school.

Parsons graduated from the engineering school of the University of Iowa in 1914. He was a member of the football, basketball and track teams during his entire period of attendance there, making his "I" in every branch of the sport.

For the past three years Coach Parsons has been connected with Trinity College at Sioux City, Iowa. His work there in taking a school that never boasted of athletics and had never before played football and putting it in the front rank of colleges in Iowa, South Dakota and Nebraska, speaks well for his ability. Parsons took hold of a bunch of green men in 1914 and whipped them into one of the most formidable football teams in that section of the country.

Personally, Coach Parsons is a fine type of man. He is clean in his coaching business and has always done everything he could to keep college athletics on a high plane. He has the ability to handle men in all forms of athletics. He has the reputation of having put out teams which played a sportsmanlike game. He never violated any of the rules either by allowing his men to use foul tactics or letting any of his men coach from the side lines. He himself always kept a seat on the lines and let his team play the game.

### New Rules.

It had been hoped that on account of conditions at all the conference schools, attendance at all being cut by the war, freshmen would be allowed to play football on varsity teams this year. At a meeting of the faculty conference members a week ago Saturday, this matter was brought up, and an adjournment was taken until last Saturday. However, the week of thought over the situation made for changes of minds, and the faculty members representing the Mines and Aggies, who were the chief contenders for abolishing the freshmen rule, voted to maintain the old rule and bar the freshies.

The effect of this decision will, it is said, eliminate the University of Wyoming, where there is a mere handful of students this year. The Aggies, like the Mines, will be hard hit, as they have none of last year's team for a nucleus. At Boulder three of the old men are out and there is a hardy squad of new men seeking football fame. As usual, it is impossible to get any information from Coach Rothgeb at Colorado College, but it is likely that he and Coach Fike, of Denver University, consider they have good prospects.

Never in character are the few changes in the football rules this year, and they may be told in a few paragraphs. Perhaps the most important is one that prevents an incoming substitute from communicating with any of his team on the field until after the first play. This is intended to bar as



much as possible the advices of a coach while the teams are in play and when the situation is a critical one for either side.

The new rule, however, has its exception, for if the substitute replaces the quarterback he is permitted to give his signal.

Interference with a man attempting to catch a forward has been changed to the loss of the ball to the offended side at the spot of the foul. This replaces the penalty which cost the offending side a certain distance toward its own goal line. The penalties for running into or roughing the kicker are now measured from the spot where the ball was put in play.

A place kick has been more clearly defined. It must be made by kicking the ball from its position when resting on the ground. A player may scrape up the earth, but may not make use of artificial tees. On kick-offs and free kicks not made from scrimmage the players may be in the motion in any direction, provided they are on-side when the ball is kicked.

Provision is made that an uncompleted pass does not constitute a foul, which makes it possible to decline any penalty.

#### MINES FOOTBALL SCHEDULE.

October 13—U. of Wyoming at Cheyenne.

October 20—U. of Colorado at Denver.

October 27—Open yet. May play New Mexico at Denver.

November 3—Open.

November 10—Colo. College at Denver.

November 24—Colo. Aggies at Denver.

November 29—Open yet. A game will be arranged for later.

#### MINES 54; FORT LOGAN MEDICS 0.

This score looks like the "good old days." This practice game was played in Golden Saturday, October 6th.

The Mines team showed some real football even as against a much weaker eleven. They rushed well, carried the ball in fine shape, and otherwise played like real football men. Pittser did some remarkable kicking. On the opening kickoff he sent the ball clear across the opposing goal line and duplicated the feat several times during the contest.

During the first half Parsons used all of his first string men in succession and the score was 35 to 0. In the second half the second string of men went in and added 9 more points to the score.

#### MINES SPIRIT.

At Harvard, where they have thousands of students, only twenty-five men turned out for first football practice. Here, where the students number 150, forty turned out the first day.

He (after their dance) "You surely have attractive feet."

She (coldly) "Yes, I noticed during the dance."—Gargoyle.

#### SOPHOMORE NOTES.

F. L. Serviss.

Ye scribe having just returned to school from a brief but pleasant sojourn (made so by the pretty nurses), to the hospital, is somewhat unprepared to write on class activities. The earnest entreaties of Mr. Harrington for us to furnish a space filler is the main reason for this column at present.

Has anyone seen Dad Bailar lately?

We are (or are we yet!) sophomores, and even our irregularities of schedule and eight hours of Physics a week, not to say anything of our present program of three lecture hours in quant., cannot keep us from insisting that we are the best class in Mines, and we can prove it.

The quant. lab. has gone up like the price of pork, due, no doubt, to the war. Anyone looking for the quant. lab. is now forced to climb to the second floor where Tiny holds court in his shirt sleeves.

Several of our fellows are out for football, quite a few are on the first team. Watch out for Mines this year. We are small but mighty.

The effect of the war is seen in the class enrollment, many of last year's Frosh are now on Uncle Sam's payroll and more of us are liable to be there before long. Our hearts are with the boys, and the best cheer we can send them is to "Give 'em 'ell Mines."

#### MINERS PUTTING IN HARD LICKS.

About twenty-five men are out for practice every night at the athletic field, and all are trying hard for positions on the varsity team. Coach Parsons has good material for two teams, and with a rattling good freshman team out, he has plenty of opportunity to give the first string men practice. Hard scrimmage is the rule now every evening.

Rigid training rules are now in force, and the coach has given notice that they must be strictly observed by all aspirants for the varsity eleven. All the men have gobs of the old-time Mines pep, and the indications are that the Dynamiters will have to be reckoned with by the other contenders for the conference pennant.

#### SWARTKOPENSKY HANGED.

Man Who Lectured in Golden is Executed as Spy.

The many Golden people who last winter heard the interesting lectures of one Meteor Swartzkopensky, will be interested to learn that he is no more, having been hanged as a spy in England last August.

Swartzkopensky, posing as a fugitive from Siberia, gave two lectures in Guggenheim Hall last winter, and his graphic description of the terrors of the Russian prisons interested large audiences.

We all want to go to heaven—but there is no demand for rapid transit.



E. M. Field, who is studying law at the Kansas City School of Law, last spring won the highest prize given to Freshmen. The prize was a set of law books. He had the highest average grades in a class of about 100 men. Recently, he was made President of the class. A Miner is always bound to come out on top.

'13.

Chas. N. Bronstein is now with the Garfield Smelting Company, Garfield, Utah. Address care of the Company.

J. C. Williams has moved to Golden and is living at 1006 Twelfth Street.

Victor A. Light has been drafted into the Army. He was drafted from Arizona and will go to the cantonment camp at Fort Riley, Kansas.

'14.

Theo. H. M. Crampton visited in Golden on September 29th while on his way back to Santa Monica from Washington. Crampton is obtaining a patent for an instrument to solve graphically trigonometric problems and expects to return to the East soon on business connected with the manufacture of the instrument.

Meritt Hutton and Miss Frances Madeline King were married on Wednesday, Septem-



Merritt Hutton

ber the fifth, at Philipsburg, Pa. Hutton is located at St. Benedict, Pa., where he is Chief Engineer for the Rembrandt Peale coal interests.

Carl L. Klatt, who has been visiting his mother in Golden, returned to Warren, Arizona, September 26th.

Lieutenant E. G. Snedaker, of the Engineer section of the Officers Reserve Corps, is now at Vancouver Barracks, Washington.

'15.

B. C. Essig is connected with the Primos Chemical Company and is living in Golden at the corner of East and Fifteenth Streets.

A. F. Duggleby, Mine Superintendent for the Juragua Iron Company at Santiago de Cuba, Cuba, was in New York City recently.

A Pueblo report is to this effect: S. J. Burris, Jr., in charge of the development

work of the Incas Gold Mining Company in the La Plata Mountains, west of Durango, has a rich ore strike in the lime beds on the Company's property. A sample assayed twelve ounces in gold and a carload shipment ran ten ounces or \$200 to the ton.

The ore shows free gold in the lime—the first time that the lime in the La Plata Mountains has carried free gold. The strike was made almost at the grass roots and the vein is about two feet wide. Superintendent Burris states that the entire vein will probably average three ounces in gold, which means that it can be broken down and shipped without sorting.

Six men have been put to work on the strike and shipments will go to the Durango smelter as rapidly as the ore can be mined. The vein should pay for the development work on the tunnel being run to tap three leads of ore that have been opened at the surface and which will be tapped below the lime beds in the tunnel.—Rocky Mountain News.)

John N. Teets is engineer for the Akron Mines, Whitepine, Colorado.

J. R. Shanley, Jr., engineer with Arizona Copper Company, address, Box 305, Morenci, Arizona, expects to be sent to the Training Camp at Fort Riley soon.

'16.

C. B. Gauthier has changed his Denver address to 1285 South Lincoln Street.

'17.

George M. Cheney is Mining Engineer for the South American Development Company. Address, Box 655, Guayaquil, Ecuador, South America.

A. L. Miller is Chemist for a Potash Company. Address care of W. G. Haldane, Antloch, Nebraska.

K. L. Hsueh is a graduate student at the Massachusetts Institute of Technology. Address, Suite 3, 18 Inman Street, Cambridge, Mass.

Fred C. Sealey, of Casper, Wyoming, was visiting in Golden for a few days early in September.

Y. K. Chiang is a post-graduate student at Lehigh University, Lehigh, Pa.

George Goldfain, who has been at Ray, Arizona, has accepted a position with a Potash Company at Bayard, Nebraska.

Albert K. Chan, 1812 Jackson Street, S. E., Minneapolis, Minn.

Kenneth S. Ferguson is now stationed with the U. S. Marine Corps at Guantanamo Bay, Cuba. Address him at his permanent address, 2333 Eudora Street, Denver, Colo., and it will be forwarded.

#### FLOTATION OF ORES.

Technical Paper No. 176, U. S. Bureau of Mines, Bibliography of Recent Literature on Flotation of Ores, July to December, 1916, was recently issued. Copies free from the bureau at Washington while the allotment lasts, or from the Superintendent of Documents, Government Printing office, at five cents a copy.

ARTICLES BY MISS MERR

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# COLORADO SCHOOL OF MINES

## MAGAZINE

Vol. VII:

GOLDEN, COLO., NOVEMBER, 1917.

No. 11

### The Present Status of the Dolomite Problem<sup>1</sup>

By Francis M. Van Tuyl\*

The problem of the origin of the dolomites and dolomitic limestones has long occupied the minds of geologists and many theories have been advanced for their formation. But no one of these has been universally accepted. The chief theories which have been proposed are briefly as follows: First, the alteration theories which assume that dolomites have been formed by the partial replacement of limestones by magnesia either (1) before they emerged from the sea, through the agency of sea-water, or (2) subsequent to their emergence through the agency of ground-water. Second, the primary deposition theories which maintain that the dolomites were originally deposited in the form that they now appear, (1) by chemical precipitation from the sea, or (2) by the deposition of clastic grains of dolomite derived from the disintegration of older dolomite limestones. Third, the leaching theories which are based on the well-known fact that during the weathering of a dolomitic limestone the lime is removed more rapidly than the magnesia, thereby causing an enrichment of the latter constituent. This leaching is supposed to take place either (1) through the agency of sea-water prior to emergence, or (2) through the agency of atmospheric water after the limestone has become a part of the land.

The marine alteration theory is by far the most widely held to-day, but the chemical precipitation theory has many champions.

The writer was led to suspect several years ago that a careful field study of dolomitic formations would throw some light upon their origin and through the aid of the Iowa Geological Survey and an appropriation from the Esther Herrman Research Fund of the New York Academy of Sciences he has been able to examine nearly all of the important dolomites of the Mississippi Valley and the eastern United States.

These studies have furnished irrefutable evidence that the majority of the dolomites examined have resulted from the alteration of limestone. The following facts support this contention: (1) the lateral gradation of beds of dolomite into limestone, sometimes very abruptly; (2) the mottling of lime-

stones on the border of dolomite masses by irregular patches of dolomite; (3) the existence of remnants of unaltered limestone in dolomite, and of nests of dolomite in limestone; (4) the irregular boundaries between certain beds of limestone and dolomite; (5) the presence of altered oolites in some dolomites; (6) the protective effect of shale beds; and (7) the partial obliteration of original structures and textures in many dolomites and dolomitic limestones.

Concerning the conditions under which the dolomitization took place there are many reasons for believing that the more extensive dolomites have all been formed beneath the sea prior to or contemporaneously with recrystallization, and that the dolomitization produced by ground-water is only local and very imperfect. Some of the features which lend weight to this view are as follows: (1) Recent dolomitized coral reefs are known to have been formed by the reaction of the magnesia of sea-water with the limestone. (2) The dolomite areas of mottled limestones are believed to have undergone recrystallization at the same time as the associated limestone areas, as suggested by the occasional development of zonal growths of calcite and dolomite. (3) In imperfectly altered limestones the dolomite is seen to follow original lines of weakness rather than secondary structures, such as joints or fractures. (4) In most cases of mottling the dolomitization appears to have progressed uniformly as we should expect it to do in an unrecrystallized rock, rather than to have progressed by forming veinlets and stringers in the early stages. (5) The existence of perfect rhombs of dolomite in many imperfectly altered limestones suggest that the latter had not yet solidified when the dolomite rhombs were formed. (6) The widespread extent and nearly uniform composition of many dolomites indicates that they must have been formed by an agent capable of operating uniformly over wide areas. (7) An adequate source of magnesia for transforming extensive limestone formations into dolomite is found only in the sea which contains many times as much of the constituent as ordinary ground-water. (8) Many dolomites are directly and regularly overlain by pure limestone formations or by thick shale beds, proving that they must have been formed before these overlying beds were deposited, and that de-

<sup>1</sup> From Science, 1916.

\* Assistant Professor of Geology and Mineralogy.

scending ground-water has not been influential in their production.

The evidence of dolomitization beneath the sea then must be considered as positive, but the controlling factors of the process are very imperfectly understood due chiefly to the lack of careful study of the phenomena in the modern seas. A thorough investigation of the conditions which favor the transformation in the sea to-day would be invaluable in interpreting the history of the ancient dolomites. It is believed that very important data bearing on the problem could be obtained from a more careful study of the coral islands of the Southern Pacific.

As to whether dolomitization takes place in concentrated seas or not there has been considerable disagreement. Until recently the tendency has been to follow Dana, who believed that dolomitized portions of recent coral reefs were formed in concentrated lagoons and assumed that the ancient dolomites must have been formed under similar conditions, but Skeats pointed out in 1905<sup>2</sup> that the outer parts of certain fringing reefs of the South Sea Islands, which face the open ocean, are occasionally dolomitized, and that the dolomitization of coral reefs is not confined to the lagoons; and Philippi<sup>3</sup> soon after presented evidence of recent dolomitization in the open sea. Still more recently Blackwelder<sup>4</sup> has given it as his opinion that the Bighorn dolomite has resulted from the progressive alteration of limestone during deposition, the concentration of the magnesia being not more than two or three times as great as in the present ocean, since more than this amount would have been unfavorable to the life processes of the time. There are many commendable points to this theory of progressive dolomitization at low concentrations, but if dolomitization can go on under these conditions, why are not all of our limestones dolomitic? In answer to this query it might be said that the alteration takes place under unusual circumstances, possibly through the agency of certain bacteria which are not always present when limestone is deposited.<sup>5</sup> But much of the field evidence speaks against progressive dolomitization. The wavy boundaries sometimes exhibited between the dolomitic and non-dolomitic portions of formations; the lateral gradation of beds of dolomite into limestone; pseudo-interstratification effects of dolomite and limestone; the presence of imperfectly dolomitized oolite beds in dolomites; the occurrence of mottled limestones grading gradually into dolomite, and many other features can only be accounted for by assuming that dolomitization took place after all of the beds involved were deposited, or at least in the closing stages of their deposition.

<sup>2</sup> Quart. Jour. Geol. Soc. London, Vol. LXI., p. 97, 1905.

<sup>3</sup> Neues Jahrb., Festband, Vol. I, 1907, p. 397.

<sup>4</sup> Bull. Geol. Soc. America, Vol. XXIV, p. 697, 1913.

<sup>5</sup> Both Nadson and Walther have suggested the possible influence of bacteria in dolomitization. See "Gesichte der Erde und des Lebens," p. 90.

When, however, a pure limestone member succeeds a dolomite member, known to be an alteration product, conformably, the contact line being regular and continuous over wide areas, it can not be assumed that this relationship has resulted from the alteration of the lower bed after both beds were deposited. The "Lower Buff beds" of northeastern Iowa, which consist of dolomite with occasional minute limestone remnants, are abruptly followed by the pure limestone of the "Lower Blue beds" over hundreds of square miles, the transition from one into the other taking place through only a few inches of imperfectly dolomitized limestone.

Moreover, the tendency of some limestones to be more highly dolomitic in their lower portions and to become progressively less dolomitic upwards, must also be regarded as lending support to the theory of progressive dolomitization. Orton and Peppel<sup>6</sup> state that the Delaware and Columbus limestones of Ohio are more dolomitic in their lower than in their upper portions.

But even if it should be positively shown that dolomitization can go on at low concentrations, all must agree that it would proceed not only much more rapidly, but also more completely at higher concentrations. With reference to the question whether the ancient seas which accomplished such extensive dolomitization were more concentrated than the modern ones or not, little can yet be said. On this point we must rely solely upon inference. Steidtmann<sup>7</sup> has presented evidence to show that the ancient seas were more highly magnesian than those of to-day. From independent lines of reasoning based upon paleogeographic evidence the writer is also led to believe that the magnesia content of the ancient seas may have been at least temporarily greater than at present. Let us consider the conditions obtaining in a constricted interior sea from which limestone is being deposited on a great scale. Fresh quantities of lime and magnesia and other salts are being introduced into this interior sea both by influx from the open ocean and from the streams draining the land. Now lime is constantly being depleted from this inland sea by lime-secreting organisms, while the magnesia and other salts tend to accumulate. It seems possible, then, that during a long period of limestone formation under these conditions magnesia might accumulate in considerable excess and that ere long extensive dolomitization might set in and continue until equilibrium was once more established.

Applying this theory now to the stratigraphic column, we actually find that many periods of extensive limestone formation in interior seas may be correlated with periods of extensive dolomitization. Witness the great dolomitic masses of the Cambrian of the Appalachian province, and of the early Ordovician and of the Niagara.

<sup>6</sup> Ohio Geol. Survey, 4th ser., Bull. 4, p. 165.  
<sup>7</sup> Jour. Geol., Vol. 19, pp. 323 and 392, 1911.

As further evidence that the early seas which accomplished extensive dolomitization may have been temporarily concentrated, attention may be called to the fact that these seas in many instances were retreating and contracting towards the last, and that unless they were freely connected with the open ocean, evaporation under arid or semi-arid conditions might give rise to a considerable increase in salinity. Such a condition would seem to apply especially well to the Niagaran sea. Paleogeographic studies have shown that this sea became very much contracted towards the close of this epoch, and Clarke and Rudemann<sup>1</sup> have concluded that Guelph fauna must have inhabited a sea of abnormally high salinity. The latter fact considered in connection with the evidence of widespread dolomitization in the later stages of the Niagara seems significant.

<sup>1</sup> Mem. N. Y. State Museum, No. 5, p. 117.

### DR. ALDERSON ELECTED.

Mines Trustees Name Him Head of Institution—Faculty is Selected.

At an adjourned meeting of the board of trustees of the School of Mines held Monday, October 29th, Dr. Victor C. Alderson was elected president of the School. This was the first session of the board since the



Victor C. Alderson

Supreme Court decided it had no jurisdiction in the action brought to prevent the election of Alderson.

Now that those opposed to Dr. Alderson have been unsuccessful in their efforts to prevent his election, it would appear that everyone with the interest of Golden and the School should unite for the upbuilding of the city and the institution.

The board at the meeting Monday also selected a faculty, as follows: C. R. Burger, professor of mathematics; M. F. Coolbaugh,

professor of chemistry; W. J. Hazard, professor of electrical engineering; J. L. Morse, professor of mechanical engineering; I. A. Palmer, professor of metallurgy; J. C. Roberts, professor of safety engineering; G. E. F. Sherwood, associate professor of mathematics; H. M. Showman, assistant professor of mathematics and civil engineering; C. D. Test, assistant professor of chemistry; C. C. Van Nuys, professor of physics; F. M. Van Tuyl, assistant professor of geology and mineralogy; H. J. Wolf, professor of mining; Victor Zelgler, professor of geology and mineralogy; J. C. Ballar, special extension work; J. C. Williams, assistant director, experimental plant.

### ALDERSON'S ELECTION EDUCATION TRIUMPH.

By John C. Vivian.

Dr. Victor C. Alderson was formally elected president of the Colorado School of Mines by the trustees of that institution at an adjourned meeting held at the School Monday, October 29th. The election of the board is a triumph for education and for Golden and the School of Mines.

Dr. Alderson's election is the aftermath of an attack that was made upon him by certain citizens and alumni who claimed that the election would wreck the institution. The protest grew into an ill-advised law suit which sought to restrain the board of trustees from exercising its discretion and from electing Dr. Alderson. The case was dismissed for want of sufficiency of a cause of action. The decision of the lower court was affirmed by the Supreme Court when it refused to grant a supersedeas and later to review the case on its merits.

Dr. Alderson was called to the presidency of the Mines in an informal way in August by a committee named by the board to select a president, of which Harry M. Rubey was chairman. Dr. Alderson announced that he would not recommend certain members of the old faculty for reappointment. This, entirely within his rights and in accordance with past customs in this and other institutions. As is usual in such cases when the meteor first breaks, there was a storm of protest. The actions of Dr. Alderson, however, seemed to meet with the approval of the majority of the townspeople. This drew from the Alumni Association an endorsement of the action of the board's committee in calling Dr. Alderson to head the School.

A pretended law suit, which had its inception with those who personally disliked Dr. Alderson, but which carried little weight with lawyers, let alone laymen, was started in the Denver District Court. It merely delayed action by the board. The court held the plaintiffs had no capacity to sue.

The election of Dr. Alderson saves the situation. It means that the School of Mines will again take its place as the leading mining school of the world. It means that there will be efficiency in the conduct of the

institution—the same efficiency which raised the School to the zenith of its power during Dr. Alderson's incumbency from 1903 to 1913.

It is restful to the public mind to have the atmosphere cleared and to see smooth sailing ahead. Most of those who opposed Dr. Alderson did so with honest motives, but there was malice, apparently, in the hearts of others. A mistake was made in attempting to obstruct the course of the board of trustees, whose duties are plainly laid down in the statutes and whose discretionary powers have been exercised under the law in the recent election of Dr. Alderson.—Golden Globe, November 3, 1917.

#### True To His Word.

"I haven't any case," admitted the client. "but I have money."

"How much?"

"Sixty thousand dollars."

"Phew! You have the best case I ever handled," said the lawyer. "I'll see that you never go to prison with that sum."

And the client didn't—he went there broke.

#### WHO ARE YOU?

Who are you?

You expect the soldiers of the U. S. A. to stand up and be shot, if necessary, to protect you, your home, your wife and children?

You expect the boys on the battleships to sail into the jaws of death and to brave the hell-fire of enemy guns and the assassin thrust of the sneaking submarines, all to defend you and your neighbors from invasion?

And who are YOU?

What do you expect to do? You? Yourself?

Did you say the other day that you didn't think you'd put your money in a Liberty Bond because you could beat that; you could invest your funds at 6 to 10 per cent, and you didn't see why you should purchase Government paper that only pays three and a half?

DID YOU say that?

When your country asks you to advance a measly fifty or a hundred dollars to help keep the edifice of civilization from tumbling, do you prate of making more by lending elsewhere?

Say, what kind of a fellow ARE you?

Do you want other men to sacrifice their business, their prospects and positions, and go to marching, drilling, and by and by starving, suffering from wounds, dying, while you don't turn your hand over to help?

WHAT are you?

Do you mean to say you'll not buy all the Liberty Bonds you can afford, that you'll not come gladly, willingly, up to the scratch and put your name down as a financial backer of Uncle Sam to the extent of your ability?

Who are YOU, that you should hem and haw when others salute the flag with a blithe smile and step forth to die?

There are shadowed homes aplenty now in France and England, and from all ap-

pearances there will be others in this land before this horror is over. Those tears shed are honorable tears.

Though mothers mourn their first-born and fathers bow their heads because their hopes that clustered around the bright, fine boy have been extinguished; though wives and sweethearts are desolute, yet underneath it all they're proud, there's a little spot of joy to know the boy died for his country, literally sacrificed his life for liberty.

But how about YOU? How will YOU feel, you who wouldn't even obligate yourself for fifty dollars?

Wake up!

Come a-runnin'!

Go right away to your bank and say to the banker:

"Quick! Put me down for a Liberty Bond. Don't let me be disgraced by having this loan pass without my subscription."

—Dr. Frank Crane in New York Evening Globe.

#### COMPLEX ZINC-LEAD ORE WANTED.

Professor M. F. Coolbaugh, head of the chemistry department, wishes to get from ten to twenty-five pounds of some complex zinc-lead ore, the reduction of which by the usual concentration methods is difficult or impossible. If the ore contains other values or other interfering elements so much the better. Prof. Coolbaugh discovered a new chemical separation method for zinc and lead that worked well on laboratory mixtures, which he wishes to try out on a difficult ore. A Colorado ore that carries sufficient amounts of the valuable metals, and which occurs in a large enough deposit or deposits to give promise of profitable mining is preferred. Any reader who can secure, or who knows of such an ore, please inform Prof. Coolbaugh or the editor.

#### RECENT ARTICLES BY MINES MEN.

The Granby Mine at Anyox, B. C., by Wakely A. Williams, '99, Superintendent of Smelters, Granby Consolidated Mining, Smelting and Power Company, Anyox, B. C., Engineering and Mining Journal, October 13, 1913, pages 629 to 634, continued in October 20th issue. Illustrated.

Skip-changing Devices at the Butte Mines, by Theodore Pilger, Ex '10, Mining and Scientific Press, October 27, 1917, pages 607 to 610. Illustrated.

Miners' Circular 23, Elementary First Aid for the Miner, by Daniel Harrington, '00, and W. A. Lynott, U. S. Bureau of Mines, Washington, D. C., 39 pages, 19 figures. Three editions, one in Italian, one in Polish, and one in Slavick, with English translations on opposite. (Say which edition is desired.)

"So you got mad at him for kissing you?"

"No, I got angry at him for saying he was sorry he did it, when I pretended I was angry."



## MINES MEN IN U. S. SERVICE.

Below is a list of Mines men in the U. S. war service. We know this is incomplete, and probably incorrect in some cases. Please send in any corrections and additions you may know of. We hope to obtain a complete list of all Mines men in the Service and print the roster frequently. Help us complete the list. Any Mines men, either graduates or former students, no matter what branch—artillery, cavalry, infantry, marine, aviation, engineers, training camps, reserve corps, etc. Inform us of any changes of address, transfers and promotions.

- Ball, Louis R., '00.**  
Retired Captain U. S. Army.  
Now military instructor, Colorado Agricultural College, Fort Collins, Colorado.
- Beck, W. L., '14.**  
Camp Kearney, Calif.
- Beyrle, Charles N., Ex '17.**  
Sergeant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Bigley, A. C., '13.**  
U. S. A., Camp Lewis, American Lake, Wash.
- Bilheimer, E. L., Ex '18.**  
Officers Training Camp.
- Billsoly, Walter E., Ex '20.**  
Second Lieutenant U. S. Marine Corps, Quantico, Va.
- Bird, L. W., Ex '19.**  
U. S. Army.
- Block, Gary E., '08.**  
Capt. of Eng. U. S. R., 314th Engineers, Camp Funston, Kan.
- Boehmer, Max, Ex '15.**  
U. S. A., Camp Lewis, American Lake, Wash.
- Bowman, R. G., '11.**  
First Lieutenant Eng., Officers Reserve Corps, Co. 3, E. O. T. C., Fort Leavenworth, Kan.
- Breckenridge, L. D., Ex '19.**  
Second Lieutenant Marine Corps, U. S. R.
- Brown, F. A., Ex '19.**  
Corporal Co. A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Bryant, Routt A., Ex '13.**  
U. S. Aviation Corps. In training near Boston.
- Buck, Luther J., Ex '18.**  
Second Lieutenant, Coast Artillery Reserve Corps, Fortress Monroe, Va.
- Chapman, Irving A., '13.**  
Coxswain, U. S. S. P. 41.
- Charles, I. M., Ex '19.**  
7th Reg, 37th Co., U. S. M. C., Camaguey, Cuba.
- Cunningham, S. D., Ex '19.**  
Co. A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif. Expects commission in Aviation Corps.
- Cutting, George W., Ex '17.**  
Second Lieutenant, 342nd Field Artillery, Camp Funston, Kansas.
- Dawson, Leo H., Ex '18.**  
Aviation Corps, somewhere in France.
- De Laittre, H. H., Ex '14.**  
Second Lieutenant Infantry, somewhere in France. Home address, 2309 Lake of Isles Blvd., Minneapolis, Minn.
- Dodge, David C., Jr., '15.**  
Second Lieutenant, U. S. O. R. Corps.
- Dolman, Carrol George, Former Professor C. S. M.**  
Captain Co. C, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Downes, Frank A., '13.**  
Co. C, 346th Machine Gun Battalion, Camp Lewis, American Lake, Washington.
- East, Joseph B., Ex '18.**  
Aviation Corps, Ratoul, Ill.
- Ferguson, Kenneth S., '17.**  
U. S. Marine Corps. In Cuba. Mail address 2333 Eudora Street, Denver, Colo.
- Finney, Walter, Ex '20.**  
Marine Barracks, Mare Island, Vallejo, Calif.
- Flemming, C. W., Ex '15.**  
U. S. Army, Ft. Riley, Kansas.
- Frey, Carl E., '13.**  
Second Officers Training Camp, California.
- Fullaway, R. M., '16.**  
Co. B, 4th Engineers, U. S. A., Vancouver, Washington.
- Fushey, Jesse J., Ex '19.**  
First Lieutenant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Galloway, James V., Ex '20.**  
Quartermaster Sergeant, Co. 8, 2nd Tr. Bn., 65th Depot Brigade, Camp Kearney, Calif.
- Gates, A. O., Ex '03.**  
Naval Reserve Station, San Pedro, Calif.
- Graham, Burdette S., former Y. M. C. A. Secretary.**  
U. S. Aviation School.
- Hammen, Chas. W., '14.**  
Aviation Corps. Permanent address, 2219 Dayton St., Chicago, Ill.
- Hanley, Dr. Wm. B., former Coach.**  
Lieutenant U. S. Medical Corps.
- Harrod, Wayne A., '16.**  
25th Co., 7th Bn., 166th Depot Brigade, Camp Lewis, American Lake, Wash.
- Hinman, Dale Durkee, '15.**  
First Lieutenant, U. S. Coast Artillery Corps, Fortress Monroe, Va.
- Howbert, Van Dyne, '16.**  
Engineer U. S. Training Camp, Fort Riley, Kan.
- Jeuck, John William, Ex '13.**  
U. S. A., Camp Funston, Kansas.
- Jones, David L., Ex '19.**  
Second Lieutenant, Artillery, U. S. O. R.
- Jones, E. F., '10.**  
Camp Funston, Kan. Mail address, care E. R. Jones, Box J., Eagle Pass, Texas.
- Jones, Percy, Jr., '08.**  
U. S. Army.
- Kinsley, Arthur C., Ex '18.**  
First Lieutenant, Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Kistler, Erie O., former Coach.**  
Major, U. S. O. R.

- Knepper, C. M., '17.**  
Retired Captain U. S. Navy.  
Government Inspector for the Navy, Bethlehem, Pa.
- Krier, Edw. J., Ex '18.**  
U. S. Army.
- Lee, Wallace, '04.**  
First Battery, Ft. Sheridan Tr. Camp, Ft. Sheridan, Ill.
- Levy, Milton M., '16.**  
Second Lieutenant, 315th Engineers, Camp Travis, Ft. Sam Houston, Texas.
- Light, Victor A., '13.**  
U. S. A., Fort Riley, Kansas.
- Locke, D. R., Ex '18.**  
Second Officers' Training Camp, Camp Funston, Texas.
- MacNeill, Neil M., '14.**  
Corporal Company C, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Marshall, Emory M., '11.**  
Ordnance Department, Camp Kearney, Calif.
- Maynard, John B., Ex '08.**  
Lieutenant, U. S. Coast Artillery, Galveston, Texas.
- Menke, J. G., Ex '18.**  
Sergeant Company C, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Mewhirter, Sydney A., '17.**  
First Lieutenant, E. O. R. C., 314th Engineers, Ft. Riley, Kansas.
- Miller, Roy H., '16.**  
Co. D, 316th Supply Trains, Camp Lewis, American Lake, Wash.
- Murphy, William J., '17.**  
Sergeant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- O'Malley, John J., Ex '18.**  
Second Lieutenant Aviation Corps. In Canada or France.
- O'Neill, Frank E., Ex '18.**  
Second Lieutenant, C. A. C., Reg. Army, Ft. Howard, Md.
- O'Reilly, Walter T., Ex '18.**  
West Point Military Academy, Annapolis, Md.
- Parker, J. Merrill, Secretary of the Mines Y. M. C. A.**  
Marine Barracks, Mare Island, Vallejo, Calif.
- Pearce, James W., '14.**  
Company C, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Phillips, L. V., Ex '19.**  
Sergeant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Poulin, John A., Ex '20.**  
U. S. Aviation Corps.
- Price, Harold C., '13.**  
Company 2, C. A. C., Ft. Winfield Scott Training Camp, Ft. Winfield Scott, Calif.
- Prior, Charles E., '13.**  
First Lieutenant Infantry. Detailed with Motor Transportation Unit, now in Washington, D. C. Mail address, care Penna. Textile Corp, 25 Madison Ave., New York City.
- Rabb, John H., Jr., Ex '18.**  
Sergeant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Reynolds, K. W., Ex '18.**  
U. S. Army, Fort Riley, Kansas.
- Richards, J. V., '02.**  
U. S. Officers' Training Corps. Mail address, 1024 Old National Bank Bldg., Spokane, Wash.
- Richardson, Carleton, Ex '19.**  
Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Ristedt, Ernest J., '09.**  
First Lieutenant in the Reserve Corps of Engineers, U. S. A.
- Robertson, Fitch, Ex '18.**  
Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Robinson, H. A., Ex '18.**  
Lieutenant, U. S. O. R. Corps.
- Russell, Donald O., '09.**  
English Army, Somewhere in France.
- Schade, Roger M., Ex '18.**  
Sergeant Company C, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Schoensiegel, A. D., Ex '17.**  
Marine Barracks, Mare Island, Vallejo, Calif.
- Simon, W. W., '15.**  
U. S. Naval Radio, Co. 19, Howard University, Cambridge, Mass.
- Skeen, Leslie C., Ex '18.**  
U. S. Army.
- Small, Sidney S., '17.**  
First Lieutenant, C. A. C., Reg. Army; Second Officers' Training Co., Fortress Monroe, Va.
- Snedaker, Eugene G., '14.**  
First Lieutenant Engineers Corps, U. S. Army, Vancouver Barracks, Washington.
- Solomon, Irwin R., '13.**  
First Lieutenant, U. S. O. R. Corps, 4540 Drexel Blvd., Chicago, Ill.
- Stedman, A. W. Jr., Ex '17.**  
First Lieutenant 6th Reg. Infantry, Ft. Oglethorpe, Ga.
- Swainson, Otis W., '10.**  
First Lieutenant, Coast Artillery Corps; headquarters Fortress Monroe, Va.
- Taylor, C. C., Ex '17.**  
First Lieutenant Coast Artillery Corps, Fortress Monroe, Va.
- Taylor, Ilo I., Former Professor.**  
In charge of Engineer Depot at Fort Lee, Petersburg, Va.
- Thurstin, Robert A., '17.**  
U. S. Army, Officers' Training Camp.
- Tolman, Crit. C., Ex '14.**  
U. S. Aviation Corps.
- Tongue, Walter B., Ex '18.**  
Second Lieutenant Aviation Corps. In Canada or France.
- Townsend, Albert, Ex '19.**  
Sergeant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Trounce, Henry D., Ex '12.**  
Lieutenant, English Army.
- Van Burgh, Lisle R., '17.**  
First Lieutenant, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.

Van Dorp, G. H., '15.

Second Lieutenant, U. S. O. R. Corps, Ft. Leavenworth, Kansas. Mail address 1115 Polk St., Topeka, Kansas.

Vorck, Charles R., '16.

Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.

Williams, Wm. H., Ex '18.

Second Lieutenant, U. S. O. R. Corps, Ft. Riley, Kansas.

### CAMP KEARNEY.

"We do not know exactly when we will get into the new quarters, but I hope soon. You can get some idea of the gigantic undertaking here when I tell you they have two rows of mess shacks over two miles long. We will be quartered in tents with board floors. Men are coming in every day, and this will sure be some place when the camp is filled. All the boys have been working hard cutting and burning brush. The eats are good and there are plenty of them and all the boys are contented and well."

The Colorado Engineers are now attached to the 115th regiment. The following news items, of interest to Golden people, are taken from *The Service Journal*, a weekly paper published for the soldiers.

The 115th Colorado Engineers are beginning to make baseball history at Camp Kearney, and although they have been in the camp only three weeks they have a nice little string of victories to their credit. Last Saturday they tangled with the team of the Utah Medical Corps and won by a score of 5 to 4. Bobby Williams, pitcher, and Lieutenant Fushey, catcher, formed the Engineers' battery. On the following Sunday morning they mixed with the Q. M. C. and emerged victors to the tune of 14 to 5. McKay pitched and Nelson caught.

A baseball game will be played today (Saturday) between Headquarters Troop and Company A, 115th Engineers. While we are not prejudiced against the troopers we are inclined to place a wee, sma' bit on the engineers. If you want a reason ask the Utah Medicos.

David Cunningham, Company A, 115th Engineers, has passed successfully the examination for aviator and is expecting a commission soon. And every soul in the engineer's division is boosting for him too, which is a recommendation that ought to bring him a major's insignia, at the least.

"Biddy" Gollightly, Company A, 115th Engineers, who plays the violin like an angel and uses language at times which burns the fuzz from his upper lip, has been keeping his company awake at nights with his playing. And when we remark that not once has a shoe been thrown at his tent you may appreciate our statement that "Biddy is SOME fiddler."

Not only are the boys of the Engineer battalion, late of Golden, giving their service to the country, but they are also backing up themselves and Uncle Sam by buying Liberty Bonds. In three days the boys of the

battalion subscribed \$19,000, and of that a company alone took \$6,100. It is estimated that the soldiers in Camp Kearney will take a half million dollars in bonds. The soldiers are purchasing the bonds at five dollars per month, and all of them seem glad of the chance to invest a part of their pay in these securities.

The 115th Engineers, feeling that they are not yet hardened to all the rigors of camp life, such as digging, grubbing brush, etc., are spending their spare time in preparing an athletic field. They still maintain, however, that their spirits are just about par.

John Rabb, Company A, is raising a mustache. We understand that it is to strain the harsh words that sometimes leap from him when things are going wrong and the mood for crabbing is strong upon him.

While the 115th Engineers has always been distinguished for the quantity as well as the quality of the music its members can produce, the palm undoubtedly goes to the string orchestra composed of Corporal Gollightly, violinist, Company A; Corporal Ramsdell, violinist, Company B; Private Rabb, mandolinist, Company A, and Corporal McCoy, guitar, Company B.

Corporal Quinn, Company A, 115th Engineers, the only thoroughly domesticated saxophonist at Camp Kearney, is said to be improving in his use of that instrument at the rate of six or seven notes per day. And when we say improvement we say it with a full consciousness that we do not like a saxophonist!

"The army Y. M. C. A. is wonderful, and all the compliments given it are well deserved. They have six buildings in the camp, each one 80 by 100 feet. They work up all sorts of amusements for the boys, including vaudeville, movie shows, etc., and once a week there is a 'stunt night' to give the men a chance to show their ability.

"The Y. M. C. A. has listed the famous two-and one-half million trio—Charlie Chaplin, Mary Pickford and Douglas Fairbanks—to appear here in person and give an entertainment for the boys."

Football is one of the main diversions at Camp Kearney, and some great elevens are being developed from the old college players. Walter Camp, Jr., formerly of Yale, has been chosen athletic director at Camp Kearney. The Engineer battalion alone can put out a team which would make all others sit up and take notice. Among the football men who are in the battalion are the following: Pete Nelson, former captain of the U. of C. team; Dave Davenport, former center of U. of C.; Clarence Ackel, U. of C.; Jesse Fushey, Mines; L. R. Van Burgh, Mines; Fitch Robertson, Mines; Smith, Mines; Ham Cooper, U. of C.; Dave Cunningham, Mines; John Menke, Mines; Albert Townsend, Mines; Eubanks, University of Michigan; McCarty, University of Virginia, and Webster, star Quarter for the Missouri School of Mines.

Light practice has been held, but real

work is to begin when the grounds are in first class condition. The Engineers cleaned up every team in camp at baseball and expect to make a name for themselves at football.

Major Joseph Taylor and four other officers of the Colorado Engineer battalion at Camp Kearney went to Spring Valley, the last week in October, to witness a demonstration of tunneling and mining at the plant of the Independent Stone Company. The blast at the stone company was strictly in the way of business, the interest of the military men being attracted by the similarity of the work to engineering operations on the western front. Under the direction of J. P. Cushing, engineer of the California Trojan Powder Company of San Francisco, a fifty-foot tunnel had been dug into the side of the mountain, and at the end of the tunnel a fifty-foot crosscut. Eight tons of powder were placed in these tunnels, and when the blast was discharged the whole side of the mountain was moved. Engineer Cushing estimates that 85,000 tons of rock were displaced by the explosion.

#### EX-MINES PERSONALS.

'07.

Ralph W. Shumway, Chief Engineer Victor American Fuel Company, is at Canon City, Colorado.

'08.

A. F. Richards is leasing for himself in Nevada. Address Box 57, Montello, Nevada.

'10.

Theodore Pilger has just returned from Alaska to Butte, where he is employed as mining engineer by the Butte and Superior Mining Company, from an extended trip through Alaska, examining mines in the Willow Creek Free Mining Gold District, sixty miles north of Anchorage, and also of coal mines at Matanuska and Chitkaoon, along the new Government railway. His wife accompanied him.

'11.

Maurice E. Hoyt is Superintendent of the acid plant at Anaconda, Mont.

'13.

Chas. H. Reed is now at the Hilltop Mine, Paradise, Arizona.

'14.

E. W. Westerhoff is now Superintendent for the Hobson Silver-Lead Mining Co. at Yuma, in Nelson Mining Division of British Columbia.

'15.

C. T. Todd is back in Butte, Montana, where his street address is 127 Adams Ave.

F. P. Merty is at Berkeley, New Mexico.

'16.

Francis H. Gehl is at the Missouri School of Mines at Rolla, and expects to graduate this year.

William Morris Sapp died at his home in Galena, Kansas, October 27, 1916, after a lingering illness. He was buried with the family in the cemetery at Main Street, Sunday, October 29, 1916.

William Morris Sapp was born in Galena, May 4, 1891. He attended grade school at Woodstock, Illinois, and attended the Western Military Academy at Upper Alton, Illinois, for two years. Then two years at Howe Military School at Howe, Indiana, graduating from there with high honors.

He then entered Mines and spent two years here, followed by one year at the Kansas School of Mines, located at Weir City.

He held a position at Kansas City until early in this year when he had to give up on account of ill health. In July he underwent an operation at Kansas City that seemed to improve his health a little, but soon afterwards grew worse and suffered constantly until his death.

He leaves a mother, Mrs. W. F. Sapp, two sisters and a brother.

'17.

Oscar E. Hanno is Assistant Engineer at the Sunnyside Mine, Eureka, Colorado. He motored from Arizona to Eureka, stopping over at the Grand Canon and other places of interest, making it a delightful trip.

'18.

Alvah C. Starkey is back at the Missouri School of Mines, at Rolla, after a summer spent at Great Falls, Montana. His address is Box 705, Rolla, Mo. Starkey expects to return to the C. S. M. next Fall if Uncle Sam doesn't get him in the meantime. As Starkey is somewhere in the neighborhood of seven or eight feet tall he would hardly do in the trenches, but he might be of great service in the signal corps.

#### MINERALS WANTED AT MINES.

The Geology and Mineralogy Department of the School will always welcome the gift of good crystals in any quantities for the working collections. Also any especially fine or rare specimens for the show collection. For the working collections quantities of any silver, nickel and cobalt minerals, either crystalline or massive, are desired. Also massive topaz or good fossils. The School will gladly pay express or freight.

President Victor C. Alderson has secured for the School of Mines an Empire Prospectors' Drilling outfit, manufactured by the New York Engineering Company. This drill is used for testing placer mines and can be easily used by the students of the School in their practical work. It will give them actual field experience so that they will be able to prospect placer ground efficiently. Dr. Alderson's ability to secure recognition of the School of Mines is well known and this is the first notable achievement since its return.

A wife is as good as a mine, but remember you are not a wife in need.

What good is a man when his wife's a widow?

# Colorado School of Mines Magazine

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**CLASS EDITORS.**

R. F. WHITE.....1918  
 CLAUDE AMIDON.....1919  
 DONALD L. BAILEY.....1920  
 J. E. EDGEWORTH.....1921

**ATHLETIC EDITOR.**

LINDLEY M. REITH.....1918

**VOL. VII. NOVEMBER, 1917. No. 11**

**NO MORE RECEIPTS MAILED.**

Commencing November first no more receipts will be mailed for subscription and alumni dues where the payment is made by check or money order and the account is closed, unless especially requested.

The cancelled checks and money orders receipts are accepted as sufficient receipts by most large businesses everywhere. Perhaps we can buy another Liberty Bond with the money saved on postage, printing and stationery, not to mention the saving of time.

**ALDERSON WINS IN SUPREME COURT.**

By John C. Vivian.

The Supreme Court of Colorado has affirmed the decision of the District Court of the City and County of Denver wherein the complaint of certain citizens of Golden and Alumni of the Colorado School of Mines seeking to restrain the Board of Trustees of that institution from electing Dr. Victor C. Alderson to the presidency thereof, was dismissed. The lower court held that the plaintiffs had no cause of action. This was affirmed in toto by the Supreme Court. An application was made for a supersedeas by the plaintiffs, after their cause had been dismissed in the lower court. The action of the Supreme Court, Monday, denied the right and ended the litigation.

It was hard for the lawyers, let alone laymen, to understand how this action was

brought. It was not in any sense an injunctive proceeding. The complaint of the plaintiffs asking for an injunction to restrain the Board of Trustees from doing their bounden and lawful duty as set forth in the statutes of the State, did not set up a cause of action under the code of Civil Procedure of Colorado. Many people asked the question, how a court could restrain a board of trustees from doing that which the law directed and required its members to do.

An injunction is an extraordinary proceeding in equity for the relief of extraordinary conditions, where there is no legal remedy. An injunction issues when irreparable damage may result and not otherwise. Most lawyers and laymen alike predicted the result as it was announced. They could not see how it could be otherwise.

During the course of the hearing in the District Court before Judge Cooper, many members of the bar strolled into the court room to listen to the case. Without fail they were heard to remark to one person or another that the procedure was very peculiar and at least out of the ordinary. It was the first time that any of them realized that an injunction would lie to prevent a state board from doing its duty. The District Court wisely decided that it had no jurisdiction in the matter; that it had no right to interfere with the legal duties of a board of trustees of an educational institution. Had it decided otherwise, it would have usurped the functions of the board of trustees and the deliberations of that body would have been a nullity.

Now that this peculiar litigation has been settled and the plaintiffs may have come to the conclusion that their action was hasty and ill-advised, it is to be hoped that the School of Mines and its board of trustees may be unhampered in the future conduct of the school. There has been enough unpleasant publicity. The School of Mines and the people of Golden are entitled to peace of mind from now on, so that their common interest may flourish in the way of education. It is to be hoped that the last chapter has been written in this unfortunate litigation.—Golden Globe, October 27, 1917.

**The Drawback.**

A good Methodist asked John Wesley to advise him in regard to a certain woman well known to both.

The great preacher told the man that he never would be happy if he married her.

"But she is a member of your church, isn't she?"

"Yes," was the reply.

"And you think she is a Christian woman?"

"I do."

"Well, then, why should I not marry her?"

"Because," replied Wesley, "the Lord can live with a great many people that you and I can't."

Carelessness is the short-cut to the grave.

# FOOTBALL

Lindley M. Reith, '78, Athletic Editor.

## MINES, 52; WYOMING, 3.

The student body and most of the faculty, along with several enthusiasts from the town, accompanied the Mines team to Cheyenne on October 13th. It was a masterly invasion. All expected a hard game and it was not surprising to learn that the University of Wyoming was confident of winning since their game of the previous Saturday had netted them a victory over the Colorado Aggies.

Mines was fortunate at the toss and chose to receive the Wyoming kicking against a strong wind. Before the cowboys had their headgears fitting snugly little "Chuck" Schneider put over a touchdown, leaving the bewildered pack 35 yards in the year. Pittser failed to kick the goal. After a series of end runs our team helped Pittser across from the four-yard line for the second touchdown. The second attempt to convert the goal was fruitless, the strong wind proving a great disadvantage. The first quarter ended with Mines having 12 and Wyoming 0.

In the second quarter Mines continued their end runs with effectiveness, and these attacks, together with several forward passes resulted in a touchdown from a pass. The goal was not kicked. Score 18 to 0. Wyoming then received, but could not make progress, and a bad pass on the fourth down went over the Mines' goal line, where the ball was recovered by a Wyoming man, who was tackled in his tracks, giving the Mines credit for a safety. About this time Wyoming began to get a good start and managed to deliver the ball to the Mines' twenty-yard line, from which position Layman kicked a field goal for the opponents. This was Wyoming's only score. Score, 20 to 3.

The third quarter brought forth several punting contests between Pittser and Layman, with honors even. Dickinson, Mines' safety man, did well to gain more ground on running back the punts than did the Wyoming safety, which gave the advantage in nearly every case to the Mines. "Chuck" came through with some more speed and skirted the Wyoming end for a forty-yard run to a touchdown. Attempt to kick the goal failed. Later Pittser went over for another touchdown after Bunte had run thirty-five yards on a forward pass. Goal failed. The third quarter ended with Mines 32 and Wyoming 3.

The fourth quarter developed into a routing for the Wyoming team, which now consisted of many substitutes. "Snick" Schneider got away with two long runs, one for forty yards, the other for fifty, both resulting in touchdowns. Attempts to convert goals were successful in one case. Another touchdown a little later and a successful goal kick were the only other scores made. The

game soon ended with final score of 52 to 3, in favor of Mines.

The Mines team played splendid football in spite of the weakness of the opponents. Wyoming was at a loss to check our team's line rushes or to solve the interference on end runs.

The Wyoming team, though outplayed, never gave up. They fought all the time, and even if they did make several costly fumbles, it cannot be said of them that they did not try.

Captain "Snick" Schneider played exceptionally hard and made some feature runs. Pittser did some good work, smashing the line with much effectiveness. Dickinson, at quarter back, engineered the plays quite creditably. It was in this contest that "Dick" received injuries which necessitated his retiring from the game for the rest of the season. "Chuck" Schneider featured with several spectacular getaways.

The lineup follows:

MINES.	WYOMING.
Lee .....	C..... Crawford
Benbow .....	L.G..... Tucker
Mulford .....	R.G..... Burns
Houssels .....	L.T..... Covert
Clough .....	R.T..... Buchanan
Linderholm .....	L.E..... Nelson
Bunte .....	R.E..... Larson
H. Schneider (c) .....	R.H..... Ferris
C. Schneider .....	L.H..... Simpson
Dickinson .....	Q.B..... Soule
Pittser .....	F.B..... Layman

Substitutes: Wyoming—Shaw for Nelson, Jensen for Ferris, Lundgren for Simpson.

Mines—Hardy for Lee, Gifford for Houssels, H. Miller for C. Schneider, Poulin for H. Miller, Gallucci for Clough.

Referee—Clem Crowley.

## MINES, 0; COLORADO U., 12.

Union Park, Denver, October 20.

Colorado won the game! However difficult it is for this fact to be realized by those Mines supporters who did not see the game, the fact is not altered—Colorado won. They won fairly, too. Regardless of which might have been the better team, Colorado played the better football that day. Their interference was good, while Mines', as a rule, was not. Mines men were, with few exceptions, very poor at tackling. In fact, most of our men did not try, it seemed. Their playing, in general, seemed loose, and there appeared to be a lack of sufficient team work. In other words, that old Mines' FIGHT was not there, although at times there were promises of its developing, but these occasions, in most instances, proved disappointing. Colorado made more first downs than Mines did, and the ball was in Mines' territory a greater part of the time.

It is true most of our men are new material and many may have been extremely excited and overcome by realizing that the game was to be a crucial one. Still, Colorado had few veterans, too. Then, there must be considered the fact that the squad had been

training intensively for five weeks under the able guidance of Coach Parsons. Many effective forms of tactics have been followed by the squad in their practice. It is scarcely possible to believe that the men were unqualified, lacking in understanding or incapable. In fact, the Wyoming game proved the ability of our men.

It was an off-day for Mines, whether avoidable or unavoidable is now useless to discuss, and the reward was defeat.

Incidentally, this game was played for the possession of the goat, which, at the time of playing the game (and for sometime previous), was in Colorado's hands.

A summary of the game follows:

Colorado kicked off to Mines, and after zig-zagging back and forth with both teams kicking occasionally, by necessity, the ball finally landed on the Mines 35-yard line in Colorado's possession. From this position Eastman kicked a perfect goal, making the score 3 to 0 in favor of Colorado. Mines then received the kickoff again, ran up to their 20-yard line, then gained 30 yards in two downs, but their progress ended here, and they were forced to kick. Colorado advanced the ball to their own 40-yard line, and the first quarter ended. Score: Mines 0, Colorado 3.

Soon after the second quarter began, Colorado tried another place kick, but the ball was blocked, to be recovered by a Colorado man. Failing to gain, they kicked. Mines returned the kick. In three downs Colorado advanced the ball to the Mines' 20-yard line, from which point they tried another field goal. This attempt was also blocked, the ball being recovered by Mines, who kicked to the center of the field. Colorado returned the kick to Mines' 20-yard line. Mines carried the ball 60 yards on downs, when an intercepted pass put the ball in the center of the field in Colorado's possession. They started a march down the field, making their first downs three times in succession. The second quarter ended with the ball on the Mines 15-yard line in Colorado's possession with first down. Score: Colorado 3, Mines 0.

The third quarter started with a kickoff by Mines. Colorado failed to make their downs and kicked from their 35-yard line. After unsuccessful attempts to gain Mines also kicked, but the ball was blocked on their 30-yard line. Mines recovered. A drop kick by Pittser failed. A kick out of bounds brought the ball into play again on the Mines' 40-yard line in Colorado's possession. They made one first down, but failed to progress in the next four downs, thus forfeiting the ball to Mines, who were unable to advance so kicked. Several more punting duels intercepted once when Colorado made another first down constituted the main features of the play up to the close of the third quarter. Score: Mines 0, Colorado 3.

A short time after the last quarter opened two penalties put Mines behind their own goal. They kicked. Colorado signaled a free catch, but their kick was blocked, to be recovered by one of their own men. The ball was now on the Mines' 35-yard line.

Fulghum kicked a drop which passed between the goal posts and Colorado had three more points. Score now: Mines 0, Colorado 6. Mines received the kickoff, made two first downs, but was then forced to kick. Colorado returned the kick. At this stage Mines tried four forward passes, all failing. A little later another forward pass by Mines was intercepted by Fulghum on Mines' 35-yard line, and the ball carried to a touch-down. The goal failed. The game ended with the score of 12 to 0 in favor of Colorado.

The game was clean, and the conduct of both teams was a credit to both schools. The contest lacked snap and ginger and the playing of either side did not show any real punch.

"Snick" Schneider worked hard on defense and made several good gains, too. Pittser did well also, his punting being a feature of the game. "Chuck" Schneider played a good game, too.

Lineups:

MINES.		COLORADO.	
Hardy	.....C.....	Franklin	
Clough	.....L.G.....	Trowbridge	
Mulford	.....R.G.....	Yegge	
Coulter	.....L.T.....	Williams	
Houssels	.....R.T.....	V. Adams	
Linderholm	.....L.E.....	Noggle	
Bunte	.....R.E.....	Samuelson	
Bailey	.....Q.B.....	Costello	
C. Schneider	.....R.H.....	Eastman	
H. Schneider	.....L.H.....	W. Adams	
Pittser	.....F.B.....	Fulghum	

Substitutes: Mines—Bell for Pittser, Poulin for C. Schneider, Mechin for Hardy.

Colorado—Dickerson for Costello, Kelly for Samuelson; Scheidegger for Franklin.

Referee—Courtney. Umpire—Bansbach.

MINES 58; SOUTH DAKOTA SCHOOL OF MINES, 6.

Union Park, Denver, October 27.

Our team staged a real comeback and played great football against their opponents, thus satisfying the hopes of their many supporters. If this brand of football is maintained in the remainder of their games, Mines will have a fair chance to get a look-in for championship honors. There was much improvement shown in tackling and in developing interference. The field was muddy and there were several large water puddles which made it difficult for either team to get in any very fast work.

During the first half the plays were mostly of the straight football variety, with an occasional forward pass. During the second half passing was tried considerably by both sides, but, in general, the passes were not successful. The ball being slippery, was hard to control, and many of the passes were wild. In spite of the wet field big gains were not uncommon. The punting of both teams was practically even, but our team gained on many of the exchanges. Pittser kicked two perfect drops in the first half.

An outline of the game follows:

Scoring started early after the Mines kicked off to South Dakota. The visitors were unable to gain, so kicked to the center of the field. Mines then started their offensive. Aided by a 20-yard run by "Snick" Schneider the ball was brought to South Dakota's 10-yard line, from which point Mines made a touchdown, the first score of the game. They kicked the goal. Mines then kicked off to South Dakota's 10-yard line. The ball changed hands several times without either team gaining much until Mines got the ball to their opponents' 30-yard line, where Pittser tried a drop kick which failed. South Dakota failed to gain and lost the ball. Mines carried it to the visitors' 25-yard line, where Pittser manipulated a successful drop kick. Score: Mines 10, South Dakota 0.

Mines again kicked off, but South Dakota, failing to gain sufficiently on downs, was forced to kick. Poulin made a good return, but Mines could not gain in four downs, so their opponents took the ball on their own 40-yard line. A forward pass was intercepted by Linderholm, who carried the ball to the 30-yard line, where Pittser made his second successful drop kick. Score: Mines 13, South Dakota 0. There was no more scoring during the first quarter.

In the second period Mines booted to the Dakota 5-yard line. The visitors kicked on the first down, giving Mines the ball in the center of the field. By a series of straight bucks and end runs they made two first downs. Here a forward pass succeeded and the ball went to the 5-yard line, from where Mines went over for a touchdown, but the goal failed. Score, 19 to 0. Then H. Schneider and H. Miller on end runs, and Pittser on line plunges caused another touchdown, the goal failing. Shortly after this, after the ball had changed hands several times, Wurtsbaugh, South Dakota's half-back, caught one of Poulin's attempted forward passes on Mines' 4-yard line, and rushed to a touchdown. They failed to kick the goal. The half ended with the score: Mines 25, South Dakota 0.

During the third quarter Mines scored three more touchdowns, kicking one goal. The South Dakota Miners at this stage were badly crippled and without available substitutes. The score at the end of the third quarter was 44 to 0.

After four minutes of the last period had elapsed all of the Mines men who had not been in the game yet were put in. They made two more touchdowns, kicking the goals in both cases. In the quarter South Dakota had the ball on the Mines' 10-yard line, but could only make 3 yards in four downs. A little later they got the ball back near the goal, but a fumble spoiled their chances of scoring. The game ended with the score of 56 to 6 in favor of the Colorado Mines.

Regardless of the large score it was a better game than the one of the previous Saturday. South Dakota played hard right up to the end of the contest. Their strong-

est man, Halfback Sweeney, could not make the trip. Crabtree, their quarterback, did some sensational open field running. Hall, their captain, played a fine game on the line, while Wurtsbaugh was their star back.

"Snick" Schneider maintained his usual hard playing and succeeded in making some good gains. "Chuck" Schneider made a good showing also. Pittser was strong on hitting the line, and did exceptionally well at booting, too, while Poulin did considerable good work in running back punts. The whole Mines' line held well, and all of them played hard all the time.

The line-ups:

MINES.	SOUTH DAKOTA.
Mechin .....	C. .... Sands
Benbow .....	R. G. .... March
Clough .....	L. G. .... Lintz
Coulter .....	R. T. .... (c) Hall
Houssels .....	L. T. .... Saxer
White .....	R. E. .... C. Platt
Linderholm .....	L. E. .... Harvey
Poulin .....	Q. B. .... Crabtree
H. Schneider .....	R. H. .... Jagoe
C. Schneider .....	L. H. .... Wurtsbaugh
Pittser .....	F. B. .... Perrigo

Substitutes: Mines—Hardy for Mechin, Mulford for Clough, Sisson for C. Schneider, Bunte for Benbow, Gallucci for Coulter, Gifford for Houssels, Garnett for Linderholm, Bailey for Poulin, H. Miller for Sisson, G. Miller for H. Schneider, Bell for Pittser.

Referee—Crowley. Umpire—Kingford.

#### MINES FRESHMEN, 7; SACRED HEART COLLEGE, 27.

Sacred Heart College defeated the Mines' Freshmen, 27 to 7, Saturday, November 3rd, on the former's grounds in a hard-fought contest. The college, although seemingly well matched with the Mines showed far more skill and teamwork. The freshmen put up a stiff fight, but their team bore evidence of first-year material, which lacked consistency, although they played brilliantly at times. The seven points obtained in their favor were the first scored on Sacred Heart this season. In the first quarter Mines showed its strength by holding the college for downs three successive times on the one-yard line.

Faber, Snyder and Dunn of the college, and Farlow of Mines, were the individual stars and point gainers of the day. The first score was made in the second period by a tackle back formation and a 30-yard run by Faber. Dillon failed to kick goal. In the same quarter Dillon caught a pass and dashed 15 yards for a touchdown.

The third period showed the teams seeing each other back and forth with no result, a few unsuccessful forward passes being attempted.

In the fourth quarter, after a series of unsuccessful backs, carried the ball to the 5-yard line, Faber making it over. The Mines could not get into the end and only score after a fumble in the end, a recovery and long run by Rover. The Mines then made their score to 14, and Farlow carried the pigskin



through the goal posts. Bower failed to make goal.

The Sacred Heart final score occurred when Fahey recovered a fumble on Mines' 35-yard line, and, in a brilliant exhibition of open field running, annexed the last tally. Hopkins of Mines sustained a broken rib in the last few minutes of play.

Sacred Heart showed their superiority in many ways. Every long gain was made by the assistance of excellent interference, and their line-back formations worked like a charm. Mines, on the other hand, was inclined to go to pieces at the most crucial moment, and this lack of confidence is the probable reason of their defeat.

The line-up:

MINES.		S. H. C.	
Harroun	L. E.	Keans	
Johanson	R. T.	Dillon	
Catffe	R. G.	Morrissey	
Allan	Center	H. Dunn	
Vogel	L. G.	Mosk	
Boatwright	L. T.	Fahey	
Bower	L. E.	Snyder	
Strock	R. H.	Raegan	
Hopkins	L. H.	Collins	
Farlow	F. B.	Dablitch	
Kay	Q. B.	P. Dunn	

Officers: Referee—Hannifen. Umpire—McIlwee.

Scoring: Sacred Heart—Touchdown, Fahey 2, Snyder, Raegan. Goals from touchdowns—Dillon 3. Mines: Touchdown—Farlow.

Substitutes: Sacred Heart—Chapman for Mosk, Toner for Fahey, Webber for Dablitch, Fahey for Collins, Mosk for Chapman, Dablitch for Webber, Collins for Fahey. Mines—Hamilton for Harroun, Harroun for Hopkins.

**MINES SCORES.**

Date	Mines.	Opponents.	
October 6	54	Fort Logan	0
October 13	52	Wyoming	3
October 20	0	Colorado U.	12
October 27	58	South Dakota	6
Totals	162		21

**STANDING OF CONFERENCE TEAMS.**

Following is the standing of the Conference Teams November 5, 1917:

Team.	Won	Lost	Pct.
Denver U.	3	0	1.000
Utah U.	2	1	.666
Colorado U.	2	1	.666
Mines	1	1	.500
Colo. College	1	1	.500
Wyoming	1	3	.250
Colo. Aggies	0	3	.000

**MINES FOOTBALL SCHEDULE.**

November 10—Colo. College at Denver.  
 November 17, Denver U. at Denver.  
 November 24—Colo. Aggies at Denver.  
 November 29—Open yet. A game will be arranged for later.

**SOME OTHER CONFERENCE SCORES.**

Colo. U. 54; Teachers College of Greeley 0.  
 Colo. U. 18; Colo. College 17.  
 Colo. U. 0; D. U. 7.  
 D. U. 10; Colo. Aggies 6.  
 D. U. 33; Montana Aggies 7.  
 D. U. 18; Wyoming 0.  
 Colo. Aggies 0; Wyoming 6.  
 Colo. College 21; Utah, 0.  
 Utah 25; Colo. Aggies 12.  
 Utah Aggies 21; Montana State 6.

**OLD FOOTBALL TROPHY.**

J. R. Shanley, Jr., '15, sent to the School, to ornament the Integral Club ceiling, the Mines-D. U. 1913 football that won the game for us to the score of 49 to 7. All the names of the players are on this football which is now added to the collection. If any of the readers have footballs used in Mines winning games, please send them in to complete the collection.

**FRESHMAN NOTES.**

J. E. Edgeworth.

The freshman class held their election October 18, 1917. This, no doubt, was rather late, but in waiting this length of time we feel sure that we have elected to office four of the most efficient and capable men of our class.

The man who is to guide us through thick and thin is E. E. Bowers. The next man in line is A. K. Seeman, who is our vice-president. Then we had a hard time trying to decide who would be the man who could best fill the requirements of a treasurer, but the minute the name of W. P. Hopkins was mentioned, we had no trouble at all. Last, but far from the least in line, comes R. M. Edwards, better known as "Fluffey the Ruff," who is our secretary.

With these men manning the "Ship of 1921" (which emerged from the Frosh shore September 5, 1917, on a trip that will take about four years), we are sure that it will land at its first coaling station without a mar. For one year the ship will be in Frosh waters, and all other ships have the right of way over it. At times these ships have rocked high, and many of the passengers dropped off into the ocean of life; others got off at the first coaling station and waited for the next ship. We feel sure that nothing like this will apply to our ship.

Of course, every person in school is well acquainted with the problem that is confronting the Frosh class at the present time, that of making arrangements for the Freshman dance. In spite of war prices we intend to have a dance that will surpass any that have been given in the past, or that might be given in the future.

**Progress.**

"Are you interested in food control?"  
 "I've gotten away past it. What I'm interested in now is appetite control."

## MISCELLANEOUS.

Prof. L. W. Martin has resigned as assistant professor of English and modern languages.

Funds for the purchase of "M" blankets for the School of Mines football squad have been subscribed by the Golden business men.

Prof. L. F. Miller, formerly of the School of Mines faculty, is now assistant professor of physics at the University of Minnesota, located at Minneapolis.

Prof. Victor Ziegler was the principal speaker at the weekly luncheon of the Denver Real Estate Exchange at the Metropole Hotel, Denver, November 1st.

Professor Horace B. Patton has opened an office at 817 Fifteenth St., Golden, Colorado, with a view to practicing his profession as consulting and field geologist.

Special attention will be paid to oil and gas, and to metalliferous deposits.

Prof. J. C. Bailar, of the School of Mines, Golden, visited Central City Wednesday and Thursday of this week for the purpose of talking with the mine operators and acquainting them with the fact that in connection with the School of Mines is a well equipped plant to make practically any kind of mineral tests. A moderate fee is charged to cover the actual cost of labor and material. The School wants to assist the operator in every way possible in determining just what process is best adopted to the treatment of his ore and Prof. Bailar is calling upon as many of the mining men as he can during his brief stay, and invites correspondence with anyone desirous of making ore tests at the Golden plant.—Central City Observer.

## GOLDEN PEOPLE FOR ALDERSON.

"What of Victor Alderson—what do the people of Golden think of him?" we asked a prominent Golden business man a few days ago for the purpose of determining the truth of the vicious attack made on him by the Denver Post. "Golden is practically a unit in welcoming him back," replied the Golden man. "He is a big, able and broad-minded man. He is no sissy and doesn't spend his time sticking his nose in little things that don't concern him, but he was a force for good when he was president before, and we who are closely in touch with the school are more than glad to have him back."—Greeley News.

## An Emphatic Assurance.

"If you don't marry me," exclaimed the suitor, "I'll join the army."

"Let me tell you something," answered the girl. "If you don't join the army you won't even be well enough acquainted with me hereafter to ask me to marry you."

Any fool can take a chance; it takes thought to be careful.

## ALUMNI

## PERSONALS.

'86.

Chas. A. Gehrman, Lawrence House, Springfield, Ill.

'93.

P. M. Collins has left Silverton. Who knows where he is?

'97.

Louis Cohen is back in Denver where his address is 228 West Irvington Place.

J. N. McLeod became associated with the Arizona Sampling and Reduction Company the first of October. Address Box 1043, Wickenburg, Arizona.

'02.

Following are abstracts from the report of a Red Cross benefit football game at Tucson, Arizona. Dean G. Montague Butler '02 and Alan Kissock '12 took part on opposing teams.

Due to the watchful activity of the Red Cross nurses and the Red Cross ambulance squad, the University Club won the football contest from the faculty of the University of Arizona yesterday by a score of 9 to 0.

If the Red Cross had taken half as good care of the University Faculty, that team would have scored. However, all an injured member of the Faculty team got when he received an injury was a jab with the air pump and a musty peanut to chew until he felt better.

Andrus, Hatcher's partner, and Wingo, of the University Club, made the big noise of the University Club team. They put up as good an exhibition of football as has ever been seen on the grounds. Dean Butler, who has not played for fifteen years, put up a cracking game for the Faculty.

Barnes is credited with playing the whole game for the Faculty. Williams and Dean Butler were holding secondary light. The others played academically, willing, but the old timers of the Club were there ahead of them.

The game drew the largest crowd that has been on the grounds this year. Everybody rooted for everybody and there were \$250 collected.

The Club demonstrated old time football rushes and tried even to put over the forward pass but failed.

The University Club made six points in the first quarter with Kissock as star. Wingo drop-kicked for three points in the third quarter. No one was in the game who had played football in six years.

Each player was escorted in the field, if he were a member of the Club team, by at least two Red Cross nurses. Thereafter, when a member of the Club team was injured, the ambulance, supplied by Shad Bowyer, was run into the game for first aid. The Faculty went to slaughter unattended.

Butler wrote that it was lots of fun though he was so sore he could hardly walk for a week after the game.

J. V. Richards has joined the Army and his mining engineering practice is in the hands of Ernest Levy, who was for years Manager of the Josie mines at Rossland, B. C., Canada.

'03.

W. B. Rhodes has returned to Colombia where his address is as formerly. Care Olimpo del Valle, Mangangue, Colombia, South America.

'04.

W. D. Kilbourn, who is now assistant superintendent of the U. S. Metal Refining Company, East Chicago, Ill., was in Denver with his bride during the early part of October.

Wallace Lee is at the Fort Sheridan Training Camp, First Battery, Ft. Sheridan, Ill. Permanent address 519 Board of Trade Bldg., Kansas City, Mo.

'05.

Douglas Muir is Superintendent of the Nevada Austin Mines Company, Austin, Nevada.

Howard Spangler is at Ellamar, Alaska. We neglected to announce the arrival July 26th of William O. Chamberlin, Jr., at the suburban home of W. O., Senior, Denver.

E. M. Rabb and Geo. P. Robinson '04 called at the School October 25th to congratulate Dr. Alderson on his election. They had both just returned from a trip to Old Mexico. Robinson returned to Mexico about November first where he will be Superintendent of the Velardena plant of the A. S. & R. Company at Asarco, Coahuilla, Mexico. Rabb will take a short vacation at his home, 3535 W. 24th Ave., Denver.

R. L. D'Arcy has left Oatman, Arizona, and his present address is unknown. Please send it in if you know it.

Charles M. Rath, 4537 Tennyson St., Denver, Colo.

'06.

Hugh R. Van Wagenen is at Pioche, Nevada, again.

James L. Libby is Superintendent of the Peerless Coal Company, at Castle Gate, Utah.

'07.

W. B. Phelps is Superintendent of the Tom Reed Gold Mines Company at Oatman, Ariz.

'08.

Thos. S. Harrison, care Midwest Refining Company, First National Bank Bldg., Denver.

Word has reached us that Percy Jones, Jr. has joined the Army. Where is he?

Gary E. Block is Captain of Engineers, U. S. R., 314th Engineers, Camp Funston, Kans.

'09.

C. B. Hull is shift boss for the Butte & Superior. Address 401 Leonard Hotel, Butte.

Joseph J. Weisz has changed his street number in Chicago, Ill., to 2600 Leland Ave.

Where is C. H. Carpenter? He has left Checotah, Okla.

'10.

Where is Guy P. Watson?

A. E. Perkins, Western Manager for the Colonial Steel Company, has opened new offices at 308 Kearns Bldg., Salt Lake City, and will be there a great deal of his time during 1918. He still keeps his Denver office. Perkins' personal address is University Club, Salt Lake City.

K. P. Campbell has been promoted to the position of Assistant Superintendent of the Cia Met. Nac., at Metahuala S. L. P., Mexico.

Duane C. Kelso is now Manager of the Mines and Mill of the Whale Mines L. & D. Company at Grant, Colo.

E. F. Jones, Camp Funston, Kansas. Mail address care E. R. Jones, Box J, Eagle Pass, Texas.

Otis W. Swainson is First Lieutenant of the U. S. Coast Artillery with headquarters at Fortress Monroe, Va. All engineers with the U. S. G. S. have been transferred to the army service.

'11.

Otto Herres, Superintendent of the U. S. Fuel Company at Hiawatha, Utah, visited the School October 26th and attended the Mines-Colorado football game October 27th, while on a short vacation to his old home in Denver.

R. E. Snow is Superintendent of the Alta Montana Mine at Corbin, Montana. Mail address, Basin, Montana.

Emory M. Marshall has been transferred to the Ordnance Department, Camp Kearney, Calif. Permanent address care N. B. Laughlin, Santa Fe, New Mexico.

R. G. Bowman is First Lieutenant, Engineers Officers Reserve Corps, now with Co. 3, E. O. T. C., Fort Leavenworth, Kans. Permanent address 309 C. St. N. W., Washington, D. C.

'12.

E. E. Hughes' address in Canon City, Colo. is changed to 502 Greenwood Ave. Hughes is flotation engineer for the Empire Zinc Co.

L. M. Banks has just returned to his old position as agent for the Grant Leasing Company at Metcalf, Arizona. Box address 211. While the mines were closed on account of the Clifton-Morenci strike, Banks has been working in the Warren District. He wrote from Warren, October 17th, as follows:

"Referring to the trouble involved in seating Alderson in the President's chair, I wish to contribute the following:

"I have talked over the matter with every Golden man in the Warren District. They are one in the opinion that he is the only man fitted to save the School from destruction and again place it on a high scale of standing. Included in these, are men like myself who had no end of trouble with him while in School, but are able to overlook that fact in the belief that he can and will save the School if not harried to death by outside opposition."

Here is what another 1912 graduate, located at the opposite side of the continent, thinks of Dr. Alderson's election. This abstract is from a letter dated October 19th, written by A. L. Toenges, who is in charge of all the mine investigations and all mine work for John B. Guernsey and Company, of Roanoke, Virginia. Their specialty is iron, coal and manganese. At present they are operating two blast furnaces and two manganese mines:

"I was glad to hear of the reelection of Dr. Alderson to the Presidency of the School. You will please remember me to him. Personally, I think that the School had had enough notoriety, and I think that it is up to every one to pull together and boost for 'Mines.' Only yesterday I was talking to one of the biggest men in the profession, and he said that it was a shame that such a School as ours should be pulled into politics and 'downed' so. Let us get behind 'Prexy' and push the School so that its reputation gets back to where it was five or six years ago, when it was the best School of its kind in the country."

'13.

Edmund Stein is now at his home address, 811 Main Ave., San Antonio, Texas, though he expects to leave about the middle of November for a position as Junior Explosive Engineer with the U. S. Bureau of Mines, at Bruceton, Pa.

C. E. Prior is a First Lieutenant in the Infantry now detailed with the motor transportation unit at Washington, D. C. His permanent address is care Penna. Textile Corp., Madison Ave., New York City.

We understand that Carl E. Frey is in one of the second officers training camps in California.

A. C. Bigley is in the U. S. Army at Camp Lewis, American Lake, Washington.

Rastus Ransom, Jr., who has been in Portugal and Spain for the past six months investigating tungsten deposits, returned to the U. S. October 7th, arriving in Golden October 25. He sailed from Lisbon on a French line steamer, but sighted no submarines on the voyage, though he has no regrets for the failure of the Germans to show him a periscope. Ransom is connected with the James Ore Concentrator Company at 35 Runyon St., Newark, N. J., and expects to return east with his wife and baby after a short mine examination trip to British Columbia. He reports conditions in Portugal and Spain as very bad and expects a revolution in Spain inside of six months. There were six revolutions in Portugal during his stay there. He said that outside of the larger towns and cities in Portugal practical anarchy reigns with conditions nearly as bad as they have been in Mexico. Here is a copy of a letter written by him to Dr. Alderson before his return to this country:

"Lisbon, Portugal, Sept. 20.

"My Dear Dr. Alderson:

"I have heard with pleasure of your reappointment as president of the Colorado

School of Mines, and congratulate the school on obtaining your services.

"I feel sure that under your direction, the School of Mines will regain its former prestige and again take its place as one of the leading institutions of the world.

"I have been in Portugal for the last five months on metallurgical work and am making extended examinations of tungsten mines. I expect to return shortly to America. With best wishes, I am,

"Sincerely yours,

"RASTUS RANSOM, JR."

'14.

A. F. Carper is mine engineer for the Tonopah Mining Company at Tonopah, Nevada. Address care of the company.

E. R. Crutcher is Superintendent of the Judge Mining and Smelting Company Zinc Plant at Park City, Utah.

Word has been received that Chas W. Hammen has joined the Aviation Corps, and is in training near Chicago. His permanent address is 2219 Dayton Street, Chicago.

Frederick W. Foote, who has been with Ransom in Portugal, returned to the U. S. with Ransom, and is now in New York City. Address care Moore and Schley, 80 Broadway.

Karl L. Koelker is in business with S. P. Warren at Baxter Springs, Kan., in general engineering and management of properties. P. O. Box address, 476. They report Baxter Springs as promising to develop into a very big zinc camp.

W. L. Beck is now in the army. He was first sent to Camp Funston, Kansas, but is being transferred to Camp Kearney, Calif.

Samuel Z. Krumm has changed his street address in Anaconda to 311 Maple.

Frederick S. McNicholas' address is Hotel Casa Granda, Santiago de Cuba, Cuba.

P. S. Moses has returned to the U. S. from two years in Belgo Congo, stopping in New York on his way home. His permanent address is care A. F. Moses, Manager Mutual Life Ins. Co., Savannah, Ga.

'15.

Lieutenant G. H. Van Dorp is assisting as instructor at the new Engineer Officers' training camp at Fort Leavenworth, Kan. Use his permanent address, 1115 Polk St., Topeka, Kansas, for mail.

W. W. Simon is with the U. S. Naval Radio Co., 19 Harvard University, Cambridge, Mass. He writes he finds good use for happy Hazard's electrical notes. So many of the students at Harvard joined the U. S. Service that the whole university was turned over to the government, and is one vast training camp.

D. D. Hinman has been promoted to First Lieutenant, C. A. C., Regular Army, Fortress Monroe, Va.

A. E. Bolam, who is with the Consolidated Copper Mines at Kimberly, Nevada, is living and receives his mail at Ely, instead of Kimberly.

Phillip J. McGuire is coke oven foreman

for the Utah Fuel Co. of Sunnyside, Utah. Address care of the company.

G. S. Davis is now at his home in Trinidad, Colorado. Address care O. L. Davis Lumber Company. Davis enlisted at Los Angeles several months ago, getting by the recruiting captain all right. Later the captain of the company to which he was assigned discovered that Davis was hard of hearing and turned him over to the Medical Department. After three months treatment at Monterrey and the Letterman Hospital at the Presidio of San Francisco, they discharged him from the service as they could not cure his hearing. It is hard luck to want to go and can't.

'16.

W. M. Traver, Jr., who is with the Empire Zinc Company, has been transferred to Kelly, New Mexico. Address care of the company.

Wayne A. Harrod, 25th Co., 7th Bn., 166th Depot Brigade, Camp Lewis, American Lake, Washington.

Mr. and Mrs. Howard L. Minister, of Denver, visited in Golden Saturday and Sunday, October 6th and 7th.

J. J. Burns, Research Department, Butte and Superior Mining Co., Ltd. Address Leonard Hotel, Butte, Mont.

Roy H. Miller, Co. D, 316th Supply Trains, Camp Lewis, American Lake, Wash.

Murray E. Garrison, Assistant Engineer for the East Butte Copper Mining Company, arrived in Golden October 8th for a two weeks' vacation. He attended the Mines-Wyoming and Mines-Colorado games October 13th and October 20th, returning to Butte soon after the latter game.

'17.

George Goldfain has left Ray, Arizona, and is now Assistant Chief Chemist for the Great Western Sugar Company at Gering, Nebraska. Box address 42. He wrote from Ray about the first of October as follows:

"Have been reading considerably here about the trouble that a few individuals have been making for the School and we all hope it will be discontinued. All of the alumni members here are of the same opinion, i. e., that less publicity and more loyalty to the President, whoever he is, is the best thing possible. We are all hoping to see this settled at once and avoid any more of the blemish that has indirectly been put upon the School and its reputation."

We mixed the temporary and permanent address of Albert K. Chan in the October magazine. His address is 1812 Fourth St. S. E., Minneapolis, Minn.

P. C. Yuan is at Breckenridge, Colorado.

Y. K. Chiang is a post graduate student at Lehigh University. Address Section E, Taylor Hall, So. Bethlehem, Pa. Permanent address An-yo, Szechuen, China.

R. P. Oliveros is engineer for the Boundary Red Mountain Mining Company at Sardis, B. C., Canada. Address care of the Company. He is forty miles from railroad and when the snow comes it is difficult to get in or out.

J. H. Winchell, Jr. resigned as engineer for the Demming Mines Company to enter the U. S. G. S. as Junior Land Classifier. At the present time he is stationed at Sterling, Colorado. Permanent address, Box 562, Route 2, Edgewater, Colorado.

S. S. Small has been promoted to First Lieutenant, C. A. C. Reg. Army, and is at present stationed at Fortress Monroe, Va., where he is an instructor in mechanical maneuvers.



HERBERT E. GOODMAN.

Herbert E. Goodman, vice-president and general manager of the Goodman Manufacturing Company, died in Chicago, October 3d, at the age of 55 years.

Mr. Goodman not only founded and built up a large manufacturing business, but was so closely identified with the development of the use of electricity in coal cutting and mine haulage from its earliest experimental days that his name and personality are impressed upon its whole history.

His connection with the mining industry began in the year 1888, when he entered the position of secretary in the newly incorporated Sperry Electric Mining Machine Co., formed to manufacture the electric pick machine designed by Elmer A. Sperry, then a young electrical engineer and now known widely as the inventor of gyroscopic compass by which navigation has been made independent of the earth's magnetism.

The undeveloped condition of things electrical in those early days of the late '90's and a lack of knowledge as to the best way of dislodging coal from its ages-old beds, led inevitably to disappointments in successful application of the machine to mine work and—also inevitably—to financial setbacks. Electrical experts, however, saw the promising possibilities of success in application of electricity to mining work, and financial support for the continuation of experimental development was supplied by Mr. W. D. Ewart and Mr. A. D. Dana, both of the Link-Belt Machinery Co.

Improved machines of the pick type were made and installed in various mines, with varying degrees of success. Electric locomotives were also built and placed in operation.

Early in 1893 the Thompson-Houston interests absorbed the Sperry Electric Mining Machine Co. and Mr. Sperry became associated with those interests. Mr. Goodman, with his other associates, organized the Independent Electric Co. and purchased the patents and equipment of the Lechner Mining Machine Co., of Columbus, Ohio. Active work proceeded in the development of the chain type of coal-cutting machine.

From this period dates the history of real efficiency in machine mining practice, the traveling chain with inserted bits quickly demonstrating its superiority to any type of pick machine—which at best was only an attempt to make a mechanical pick miner, rather than a real mining machine.

Construction work was done in rented space at the factory of the Link-Belt Machinery Co. at Chicago. The "Independent" chain machine won its way slowly.

In January, 1895, the Link-Belt Machinery Co. established what was known as its Electrical Department for handling the mining machinery business of the Independent Electric Co. Of this department Mr. Goodman was made manager, continuing as such when later the Link-Belt Machinery Co. took over the entire business by purchase of the Independent interests.

The business was rapidly developed and became firmly established under the aggressive management of Mr. Goodman. The mining machinery business was, however, a

side issue in the regular Link-Belt field of elevating and conveying equipment, so when in January of 1900, Mr. Goodman proposed forming a separate company and taking over the mining machinery department, the Link-Belt Machinery Co. was wholly willing, and aided by most favorable terms and personal assistance.

Thus in April of 1900 the business was taken over by the newly formed Goodman Manufacturing Co.

The new company prospered continuously, forcing increases of capitalization and manufacturing facilities from time to time until today the industry is one of the most important in connection with the mining field.

In every important detail of the advancement in the industry and of the growth of his company Mr. Goodman has had an interested and personal part. His personality has always been an inspiration in every project, both within and without his own company.

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Golden, Colorado

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GOLDEN, COLORADO

# COLORADO SCHOOL OF MINES

## MAGAZINE

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No. 12

### Mill Sampling and Estimation of Tonnages

By W. B. Rhodes, '03.

#### SAMPLING.

This subject has been quite extensively covered in the past by many authors; however, a few added remarks may not be considered as detrimental at this time.

As a general rule it is quite well established that the lower the grade of an ore the easier is the operation of sampling by means of dry methods. As the grade of the ore increases, this operation presents many difficulties, and becomes more serious when a small tonnage of ore is milled daily.

If it were possible to crush dry through the sampling machines, all ore treated, to the same degree of fineness as that passing the stamps, chileans, ball mills, etc., the difficulties of dry sampling would be largely overcome. As this cannot be done and is not easily accomplished by stage reduction in sampling works, it would seem but natural to take samples at those points where a desirable degree of comminution can be obtained in order to overcome the aforesaid difficulty.

Working along these lines has lead me to adopt as the most desirable point for the taking of head samples, the discharge products of stamps, ball mills, chileans, etc., as at these points in milling operations, the desirable degree of comminution of an ore can be obtained.

The factors to be taken seriously as affecting sampling operations, are (1) the specific gravity of the ore or dry solid, (2) the volumetric weight of the pulp. When these two factors are well taken care of, the rest of the operation should be quite successful. In order to obtain quickly the specific gravity of the ore or dry solid, a daily determination made as follows: A small quantity of the ball mill product, say one pound, is dried, and then thoroughly mixed. To a graduated cylinder add first 100 cu. cm. of water, and then 100 gms. of the dried sample. Shake gently for five seconds, and then add 100 cu. cm. of water or clear lime solution on top of the mixture. Let stand five minutes and read.

Then,  

$$\text{Specific Gravity} = \frac{\text{Weight Ore Taken}}{\text{Reading} - \text{Cu. Cm. Water Added}}$$

After drying the ore samples, this operation does not take five minutes in all, and

furnishes a very reliable method of determining the specific gravity of the ore in question.

Where the ore is being crushed in cyanide solution, the following factors must be determined.

- (1) Assay of milling solution before use in crushing.
- (2) Assay of solution after use in crushing.
- (3) Specific gravity of the pulp after crushing.
- (4) Assay of washed ore in the pulp sample.

To obtain these factors correctly the samples of the solution entering the crushing machines, and the pulp samples of the discharge from the crushing machines, should be taken at regular intervals and preferably by an automatic sampling device; also as in practically all cyanide plants, tables containing percentage relations between solution and dry slime or ore, are always on hand, the following deduced formula presents no difficulties.

Let,

- A = Weight or percentage of solution passing crushing machine.
- B = Weight or percentage of ore passing crushing machine.
- W = Assay of solution before passing crushing machine.
- X = Assay of ore before passing crushing machine.
- Y = Assay of solution after passing crushing machine.
- Z = Assay of washed ore after passing crushing machine.

Then,

$$AW + BX = AY + BZ$$

And,

$$X = \frac{A}{B} (Y - W) + Z$$

From the specific gravity of the pulp discharge of the crushing machines, the percentage values of A and B are readily obtained from the above mentioned tables. In the case of machines crushing in water, this formula becomes,

$$X = Z$$

The proper sampling of tailing discharged to waste or otherwise, has also come in for its share of comment, and many make-shift

methods have been devised for the assay of the same.

Many years ago I tried out the method of assaying discharges by careful evaporation, but in all cases found this method unsatisfactory due to mechanical losses of gold and silver. I then devised the following method, which has rapidly replaced all others and which gives good satisfaction.

A sample of the tailing for assay is obtained by hand or automatic sampler as the case may be. The specific gravity of the pulp is obtained, and percentages of solution and solid worked out from formulae, or obtained by use of the aforementioned tables. Another portion of the same sample is thoroughly washed, dried and assayed. A further portion of the sample is deprived of its solution by filtering or vacuum pump and the solution assayed by some satisfactory method. With these four factors at hand, the following can be applied.

Let,

W = Assay of solution in the pulp sample.

X = Assay washed solid in the pulp sample.

A = Percentage solution in the pulp sample.

B = Percentage solid in the pulp sample.

Y = Assay of the mixture.

Z = Assay of the dried residue.

Then,

$$WA + XB = Y (A + B)$$

$$Y = \frac{WA + XB}{A + B}$$

Since the value of tailing depends directly upon the total value discharged per unit or ton of dry solid, the quantity (A) disappears from the denominator of the above fraction and becomes,

$$Z = \frac{WA + XB}{B}$$

$$Z = \frac{A}{B} W + X$$

**TONNAGE.**

The estimation of mill tonnage is also an interesting problem, and here again the wet methods surpass the dry ones. At some convenient point of the mill flow, a tilting box with a revolution counter attached, can be placed to take the whole flow or a certain portion of the same. At the same time it is well to arrange for the taking of an automatic sample by placing a pipe where the contents of the tilting box will dump over it. The quantity of pulp passing through the pipe, gives an automatic sample from which specific gravity and assays of solution and solid are obtained. The wetted cubic foot contents of the tilting box or other measuring device is computed. Then for each twenty-four hours of running time,

(Cu. Ft. Contents Box) times (Indicator Reading) equals Volume in Cu. Ft. of Pulp Flowing.

Then since,

V = Volume in cu. ft. of pulp per twenty-four hours.

G = Specific gravity of pulp.

G<sub>1</sub> = Specific gravity of dry solid.

S = Percentage of dry solid in pulp.

$$\text{Tons pulp per twenty-four hours} = \frac{V G}{32}$$

And,

$$\text{Tons solid per twenty-four hours} = \frac{V G}{32} \times \frac{S}{100}$$

Since S is represented by the equation

$$\frac{100 G_1 (G - 1)}{G (G_1 - 1)}$$

Tons solid per twenty-four hours is equal to,

$$\frac{100 G_1 (G - 1) G V_1}{G (G_1 - 1) 3200} = \frac{V (G - 1) G_1}{32 (G_1 - 1)}$$

And as,  $\frac{G_1}{32 (G_1 - 1)}$  is a constant (C) for each particular ore.

The above formula becomes C V (G - 1).

In a plant treating sand, slime and concentrate separately, it is best to divert the sand or a portion of the same to a box of known dimensions, and observe the time of filling.

Then if,

V<sub>1</sub> = Volume of box in cubic feet.

T = Time of filling in minutes.

G = Specific gravity of wet sand.

G<sub>1</sub> = Specific gravity of dry sand.

Tons of wet sand per twenty-four hours =

$$\frac{1440 (V_1 G)}{32 T}$$

Tons of dry sand per twenty-four hours is

$$\frac{1440 (V_1 G)}{32 T} \times \frac{S}{100}, \text{ where (S)}$$

= per cent of dry solid.

Or,

$$\frac{1440 V_1 G}{32 T} \times \frac{100 G_1 (G - 1)}{G (G_1 - 1) 100} = \frac{1440 V_1 (G - 1) G_1}{32 T (G_1 - 1)}$$

Which is equal to a Constant (C)  $\frac{(G - 1)}{T}$

Another interesting problem where tube mills follow preliminary crushing machines,



is the determination of the tonnage passing through these mills each hour or each twenty-four hours. We will suppose that a Dorr, Ovoca, Aiken or other classifier is used in circuit with the tube mills.

Then if,

$G_1$  = Specific gravity of inflow into classifier.

$G_2$  = Specific gravity of overflow from classifier.

$G_3$  = Specific gravity of underflow from classifier.

$V_1$  = Volume in cubic feet of inflow into classifier.

$V_2$  = Volume in cubic feet of overflow from classifier.

$V_3$  = Volume in cubic feet of underflow from classifier.

We have,  $V_1 = V_2 + V_3$  (1)

And  $V_1 G_1 = V_2 G_2 + V_3 G_3$  (2) Multiply (1)

by  $G_1$  and,  $V_1 G_1 = V_2 G_1 + V_3 G_1$

From these two equations,

$$V_2 = \frac{V_1 (G_1 - G_2)}{(G_1 - G_2)} \quad \text{And, } V_3 = \frac{V_1 (G_1 - G_3)}{(G_1 - G_3)}$$

In order to find the percentage of pulp overflow or underflow as a percentage value of the total inflow ( $V_1 G_1$ ) which is 100, we substitute the above value of ( $V_2$ ) or ( $V_3$ ) in equation (2). Proceeding thus we obtain the two following parallel sets of equations.

Underflow Pulp.

$$V_3 G_1 = \frac{V_2 (G_1 - G_2) G_2}{G_1 - G_2} + V_3 G_3$$

Overflow Pulp.

$$V_1 G_1 = \frac{V_2 (G_1 - G_2) G_3}{G_1 - G_2} + V_3 G_3$$

Underflow Pulp.

$$V_3 = \frac{V_1 G_1 (G_1 - G_2)}{G_1 (G_1 - G_2)}$$

Overflow Pulp.

$$V_2 = \frac{V_1 G_1 (G_1 - G_3)}{G_1 (G_1 - G_3)}$$

Percentage of underflow pulp and overflow pulp is expressed integrally as follows,

$$\frac{V_3 G_3}{V_1 G_1} = \frac{100 (G_1 - G_2) G_3}{G_1 (G_1 - G_2)} \quad (3)$$

$$\frac{V_2 G_2}{V_1 G_1} = \frac{100 (G_1 - G_3) G_2}{G_1 (G_1 - G_3)} \quad (4)$$

In order to find the percentage values of total underflow and total overflow solids in terms of total inflow solids,  
Let,

$S_1$  = Percentage of solids in the underflow.

$S_2$  = Percentage of solids in the overflow.

$G$  = Specific gravity of the ore.

$$S_1 = (100) \frac{G (G_1 - 1)}{G_1 (G_1 - 1)} \quad S_2 = (100) \frac{G (G_2 - 1)}{G_2 (G_2 - 1)}$$

$$“(S_1 = (100) \frac{G (G_1 - 1)}{G_1 (G_1 - 1)})”$$

Underflow solids.  
Equal to  $V_3 G_3 S_1$

Overflow solids.  
Equal to  $V_2 G_2 S_2$

As a percentage of total inflow are equal to,

$$\frac{V_3 G_3 S_1}{V_1 G_1 S_1} = \frac{(G_1 - G_2) G_3}{(G_1 - G_2) G_1} \times \frac{(G_1 - 1) G_1}{(G_1 - 1) G_1}$$

$$\frac{V_2 G_2 S_2}{V_1 G_1 S_1} = \frac{(G_1 - G_3) G_2}{(G_1 - G_3) G_1} \times \frac{(G_2 - 1) G_1}{(G_1 - 1) G_1}$$

And expressed integrally equal respectively,

$$= 100 \frac{(G_1 - G_2) (G_3 - 1)}{(G_1 - G_2) (G_1 - 1)} \quad (5)$$

$$= 100 \frac{(G_1 - G_3) (G_2 - 1)}{(G_1 - G_3) (G_1 - 1)} \quad (6)$$

About six years ago, while operating a plant in Mexico, I found it convenient to obtain tube mill tonnages, by the method just described, in preference to measurement by boxes or screen tests, the latter being a somewhat uncertain in the hands of the ordinary Mexican laborer. An example involving equations (3), (4), (5), (6), is as follows:

Let,

Specific gravity of inflow into classifier ( $G_1$ ) = 1.15.

Specific gravity of overflow from classifier ( $G_2$ ) = 1.05.

Specific gravity of underflow from classifier ( $G_3$ ) = 1.86.

Then as the total pulp inflow, total solids inflow, and total solution inflow, into classifier are equal to (100) per cent, respectively, when dealt with separately, we obtain the following:

Overflow pulp = (80.) per cent of total inflow pulp.

Overflow solids = (29.2) per cent of total inflow solids.

Overflow solution = (93.2) per cent of total inflow solution.

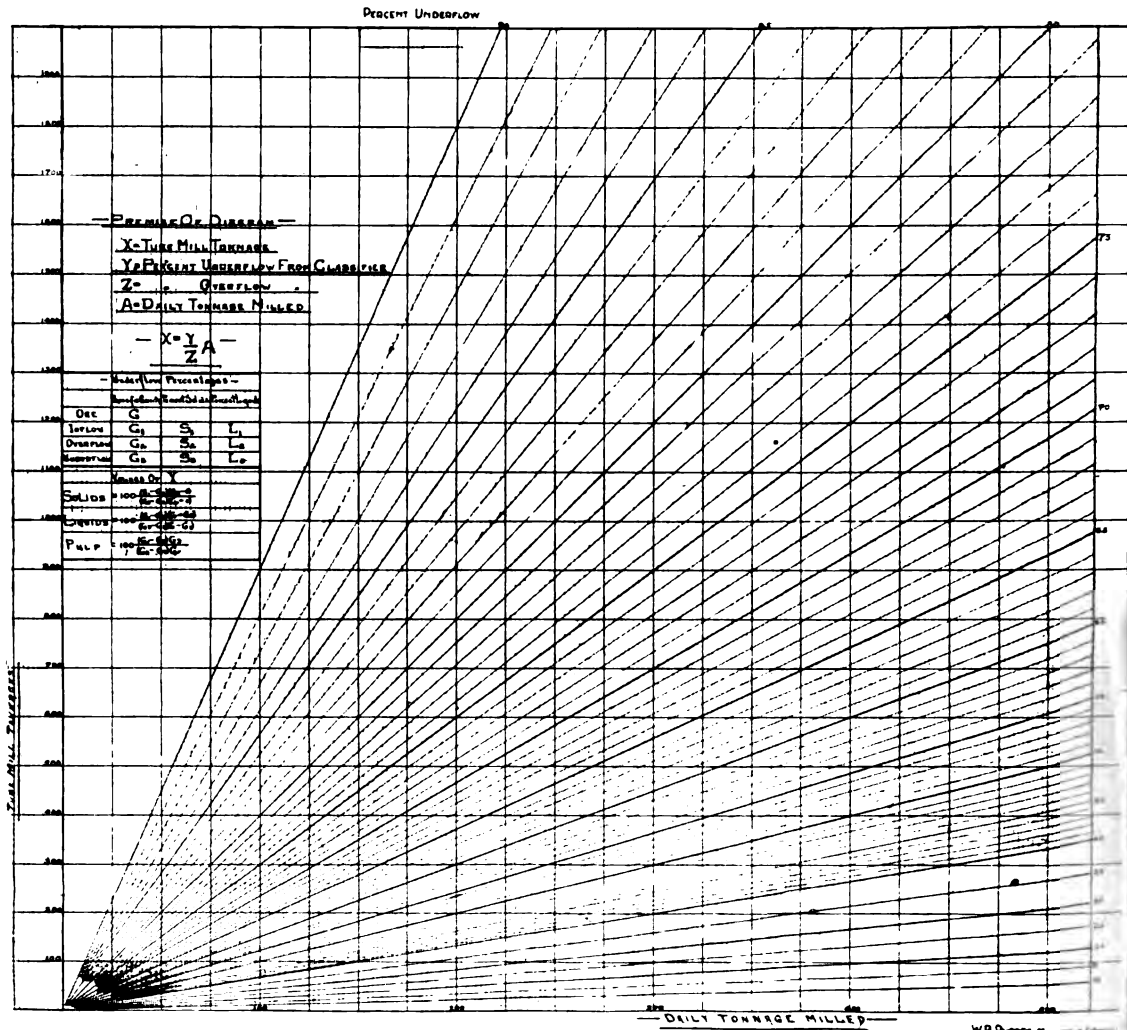
Underflow pulp = (20.) per cent of total inflow pulp.

Underflow solids = (70.8) per cent of total inflow solids.

Underflow solution = (6.8) per cent of total inflow solution.

Suppose the tonnage milled daily is (100) tons, and that it plus the solution flows into a classifier which has no product returned to it, and which divides the inflow into overflow and underflow. Then the above percentages of pulp, solids and solution represent exactly the overflow and underflow tonnage, respectively, from the classifier.

When a tube mill takes the underflow from a classifier, and which after regrinding is returned to the classifier, this returned tonnage must be considered as a part of the



inflow and affects the specific gravity of the same. An actual example of conditions when a tube mill is in closed circuit with a classifier is as follows:

$G_1 = 1.37$ ,  $G_2 = 1.15$ ,  $G_3 = 2.28$ . Daily tonnage milled = 100.

Overflow solids = (32) per cent.  
Underflow solids = (68) per cent.

Let,  
 $X$  = Tube mill tonnage.  
 $A$  = Daily tonnage milled.  
 $Y$  = Per cent underflow.  
 $Z$  = Per cent overflow.  
 $Y + Z = 100$  (7)

And,  $X : Y = A : Z$        $X = \frac{Y}{Z} A$  (8)

Substituting the value of the above example in equation (8), we get,

$$X = \frac{68}{32} 100$$

$$X = 212.5$$

That is, 212.5 tons of solids are passing through the tube mills per twenty-four hours, or 8.85 tons per hour.

From equations (7) and (8) we obtain the following table of underflow tonnages:

**Underflow Tonnage.**

Daily Tonnage Milled	Percentage of Underflow				
	10	20	30	40	50
100	11.1	25	42.8	66.6	100
200	22.2	50	85.6	133.2	200
300	33.3	75	128.4	200	300
400	44.4	100	171.2	266.4	400
500	55.5	125	214	333.3	500

Daily Tonnage Milled	Percentage of Underflow			
	60	70	80	90
100	150	233.3	400	900
200	300	466.7	800	1800
300	450	700	1200	2700
400	600	944.2	1600	3600
500	750	1166.5	2000	4500

It will be seen in the above table that the tonnage values in the vertical columns

are arithmetical progressions, and which can be plotted as straight lines. With this in mind we obtain the following "GRAPHICAL SOLUTION OF TUBE MILL TONNAGES" Tonnage milled can be interpreted as, total solids, solution or pulp inflow from preliminary crushing machines. Underflow tonnage can also be interpreted as total solids, solution or pulp from classifier. As an example take the above cited case. Entering the diagram at daily tonnage equal to (100) and following vertically to the radial line (68) equal to percentage underflow, and then horizontally left to underflow tonnage, we find that the intersection lies at (212.5), and which corresponds to the tonnage of dry solids passing through the tube mills per each (24) hours.

I give here also a solution of underflow liquids and overflow liquids, in case these are to be calculated

Let,

$G$  = Specific gravity of the ore.

$L_1$  = Per cent liquid in the inflow.

$L_2$  = Per cent liquid in the overflow.

Per cent liquid in the underflow.

$$100) - S_1 =$$

$$\frac{(100) G (G_1 - 1)}{G_1 (G - 1)} = \frac{(100) (G - G_1)}{G_1 (G - 1)}$$

$$00) - S_2 \text{ which equals } \frac{(100) (G - G_2)}{G_2 (G - 1)}$$

$$00) - S_3 \text{ which equals } \frac{(100) (G - G_3)}{G_3 (G - 1)}$$

$$\text{low liquids equals } (V_1 G_1) \frac{L_2}{L_1} (100) =$$

$$\frac{(G_1 - G_2) G_3}{G_1 (G_1 - G_2)} \times \frac{(G - G_2) G_1}{(G - G_1) (G_3)} =$$

$$100 \frac{(G_1 - G_2) (G - G_2)}{(G_3 - G_2) (G - G_1)} \quad (9)$$

$$\text{ow liquids equals } (V_2 G_2) \frac{L_2}{L_1} (100) =$$

$$\frac{(G_2 - G_1) G_3}{G_1 (G_2 - G_1)} \times \frac{(G - G_2) G_1}{(G - G_1) (G_3)} =$$

$$100 \frac{(G_2 - G_1) (G - G_2)}{(G_3 - G_2) (G - G_1)} \quad (10)$$

LONESOME.

“sir! I can tell you it doesn't take long to get an idea into my head.”  
“Very likely not, but what does it do after a there?”

PROFESSOR LAKES DIES.

Was Former Mines Professor and Prominent Geologist.

Arthur Lakes, for many years a professor at the School of Mines and a prominent citizen of Golden, died at Nelson, B. C., November twenty-first. He had reached the age of 73 years. Prof. Lakes was one of the foremost geologists of the State.

Professor Lakes is credited with having accomplished more for his State in gathering useful geological data and making surveys of the mineral deposits than any other one man. He located the coal fields in the Durango and Gunnison districts, also made the preliminary surveys of the Aspen district, and in 1892, accompanied by Captain James T. Smith, he went to Cripple Creek and made the preliminary examination of that district. His report on the mineral deposits of the region was favorable and the government survey afterward confirmed all his results, characterizing his study of conditions as remarkably accurate for a preliminary research.

Arthur Lakes was born at Martock, Somersetshire, Eng., Dec. 21, 1844, and came to the United States in 1862. While acting as professor of geology at the School of Mines in Golden he married Miss Edith Slater of Trinidad, Colo. After resigning from the School of Mines, he became a Mining Engineer, was connected with the United States Geological Survey and edited several mining publications. He was Western editor of Mines and Minerals, and wrote a number of books on State Geology which are still standard works. Among them are "Geology of the Colorado Coal Fields," "Geology of Colorado and Western Ore Deposits," "Prospecting for Gold and Silver in North America," "Geology of Cripple Creek Ore Deposits" and "Geology of Western Ore Deposits."

About twelve years ago he retired from active work and has been living with his son, at Ymir, B. C., near Nelson.

The School of Mines contains a large store of his discoveries and specimens. Among other discoveries made by Professor Lakes was that of the bones of an atlasaurus, the largest known prehistoric animal, between Golden and Morrison.

Professor Lakes was professor of free hand and mechanical drawing, professor of geology and drawing, and curator of the museum at the Colorado School of Mines, from the time of its opening in 1874 until he resigned in 1893.

It doesn't require any genius or talent to abuse or insult a man; but it does to give him credit for what he is actually worth.

"If you possess wisdom you cannot conceal the fact. People will find out without your telling them, too."



**VICTOR C. ALDERSON,**  
President.

- 1885 A. B. Harvard College
- 1887 Superintendent of Public Schools Denver, Col.
- 1888-90 Inspector Edgewood High School, Chicago, Ill.
- 1890-92 Professor of Mathematics, Armour Institute of Technology, Chicago, Ill.
- 1893-95 Dean, Armour Institute of Technology, Chicago, Ill.
- 1895-96 President Colorado School of Mines, Colorado, and U. S. Engineer
- 1897 President Colorado School of Mines

I do not know I have ever seen  
 the same woman look away  
 When some would say "Oh, how wide"  
 Some will and a girl!

I have seen many of the best men  
 who have ever lived in society.



**REGIS CHAUVENET,**  
President Emeritus,  
Special Lecturer in Metallurgy and  
Chemistry.

- 1892 A. B. Washington University.
- 1894 A. M. Washington University.
- 1897 B. S. Harvard.
- 1898-1901 Analytical Chemist, St. Louis, Mo.
- 1902-1907 Chemist in Missouri Geological Survey and U. S. Inspector.
- 1908-1910 President and Professor of Chemistry and Metallurgy Colorado School of Mines
- 1911-1912 Mr. Chauvenet resigned to devote his attention to practice as mining engineer.
- 1913 Special Lecturer Colorado School of Mines
- President Emeritus Colorado School of Mines since 1917.

And there is one of the best articles  
 of those that are not worn in society.



**HARRY JOHN WOLF,**  
Professor of Mining.

- 1902; Assayer and Chemist, The San Miguel Con. G. M. Co.; Surveyor, The Ella Gold Mining Co.
- 1903; E.M., Colorado School of Mines.
- 1903; Mining Engineer, The Ella Gold Mining Co.; Mining Engineer, The San Miguel Con. G. M. Co.; Mining Engineer, The Gold King Con. G. M. Corporation.
- 1904; Superintendent, The Nellie Mine, Ella G. M. Co.; Engineer, The Telluride Power Co.; U. S. Deputy Mineral Surveyor; County Surveyor and Engineer, San Miguel County (2 terms); City Engineer, Telluride, Colorado (2 terms).
- 1905; Asst. Electrical Engineer, The Telluride Power Co.; Power Line Superintendent, The Telluride Power Co.
- 1906; Chief Engineer, Camp Bird Mine, Camp Bird, Limited.
- 1907; Superintendent, The Stanley Mines Company; Director, The Stanley Mines Co.; Consulting Engineer, The Western Metals Co.; Secretary and Asst. Treas., The Stanley Mines Co.
- 1909; Secretary, Treasurer and Director, The Western Metals Co.; Consulting Engineer, The Stanley Mines Co.
- 1909; General Manager, The Japan-Flora Mines and Tunnel Co.
- 1911; Manager, The Stanley Lease; Consulting Engineer, The Japan-Flora Mines Co., The Stanley Mines Co.
- 1912; Professor of Mining, Colorado School of Mines.
- 1913; Consulting Engineer, companies operating in Clear Creek, Gilpin, Teller and San Miguel Counties, Colo.
- 1913; M.S. Colorado School of Mines; Examining Engineer for Pennsylvania capitalists, in Colorado, Nevada, California and Washington; Head of the Department of Mining, Colorado School of Mines.
- 1916; Consulting Engineer for Boston, New York, Pittsburg, and Denver capitalists with properties in Colorado.

Fellow American Association for the Advancement of Science, Member American Institute of Mining Engineers, American Electrochemical Society, Colorado Scientific Society, Society for the Promotion of Engineering Education, American Academy of Political and Social Science, American Mining Congress, Colorado Metal Mining Association, Rocky Mountain Coal Mining Institute, Teknik Club of Denver, Rocky Mountain Club of New York, Chemists' Club of New York, and Associate American Institute of Electrical Engineers.

Some men try to hide their light under a bushel and some others try to make the world believe they are the whole dynamo.



**IRVING ALLSTON PALMER,**  
Professor of Metallurgy.

- 1887; B.S. in Chemistry, Lafayette College, Easton, Pa.
- 1890; M.S., Lafayette College, Easton, Pa.
- 1887-98; Assayer, Chemist, Electrometallurgist, Pennsylvania Lead Co., Pittsburgh, Pa.
- 1898-1911; Assayer, Chemist, Assistant Superintendent, Superintendent, American Smelting & Refining Co. at Pueblo and Leadville, Colo., and Chihuahua, Mexico.
- 1911-12; Metallurgist and Superintendent, United Zinc and Chemical Co., Springfield, Ill.
- 1912-16; Consulting Metallurgist and Superintendent, United States Smelting, Refining and Mining Co., with assignments at Midvale, Utah, Southern Arizona, Torreon, Mexico, and Altoona, Kansas.
- 1917; Professor of Metallurgy, Colorado School of Mines.
- Member: American Institute of Mining Engineers, American Association for the Advancement of Science.



CLAUDE C. VAN DUSE

Professor of Physics

- 1901 A.B. Yale Univ. Class. Philom. S. C.
- 1907 B.S. in Mining Engineering, Swell
- Indiana School of Mines
- 1908 A.M. Columbia University New York
- 1908-09 Instructor in Physics Swell Indiana
- School of Mines
- 1909 E.M. Swell Indiana School of Mines
- 1909-11 Professor Physics and Electrical
- Engineering Swell School of Mines
- 1911 Professor of Physics



M. F. CALKINS

Professor of Chemistry

- 1901 B.S. in Science, Colorado School of
- Mines, Golden, Colo.

- 1902-05 Instructor in Chemistry, Colorado
- College
- 1906 M.A. Columbia University New York
- 1906-08 Assistant in Chemistry, Columbia
- University
- 1907-11 Professor of Chemistry, Swell
- Indiana School of Mines, Rapid City, South
- Dakota
- 1911-14 Commercial Research Work at the
- Massachusetts Institute of Technology
- 1915-17 Assistant Professor of Chemistry,
- Case School of Applied Science, Clevel-
- and, Ohio
- 1917 Professor of Chemistry, Colorado
- School of Mines



CHARLES DARWIN TEST

- Assistant Professor of Analytical Chemistry
- and E. I. H. Purdue University
- 1916 A.M. Analytical Chemistry, Purdue
- University
- 1916 Chicago University
- 1916-17 Fellow in Chemistry, Colorado
- School of Mines
- Assistant Professor of Chemistry since 1913
- 1917-18 on leave of absence. Spent time in
- Germany, spent one semester at Univer-
- sity of Göttingen and the remaining time
- at the Technical School at Charlottenburg.

How's Emotion

... had arrived at the age  
 ... showed no inclina-  
 ... at college or in  
 ... his father's busi-  
 ...  
 ... what I will ever make of  
 ... complained his  
 ... man.  
 ... found himself yet con-  
 ... friend  
 ... that way?  
 ... the father "Well, I  
 ... get a damned  
 ... at it him."—Harper's



**CHARLES R. BURGER,**  
Professor of Mathematics.

1892; Ph.B., University of Colorado.  
1893; A.B., Harvard; post-graduate course  
in Mathematics.  
1894-1902; Instructor of Mathematics, East  
Denver High School.  
1902; Fellow in Mathematics, Clark Univer-  
sity, Worcester, Mass.  
1902; Instructor in Mathematics.  
Professor of mathematics since 1903.

1905-06; Principal St. Andrews' High School,  
New Brunswick.  
1906-07; Instructor Mathematics, Horton  
Collegiate Academy, Nova Scotia.  
1908-09; Instructor in Mathematics, Colo-  
rado School of Mines.  
1909; Assistant Professor of Mathematics.  
1914; Associate Professor of Mathematics.



**JAMES LYMAN MORSE,**

Professor of Mechanical Engineering.

1900; Diploma in Electrical and Mechanical  
Engineering, Highland Park College, Des  
Moines, Iowa.  
1900-02; Machinist and Engineer with Ker-  
rihard Foundry and Machine Company,  
Red Oak, Iowa.  
1902-04; Superintendent of Highland Park  
College Shops and Power Plant, Des  
Moines, Iowa.  
1904-07; Instructor, Mechanical Engineering  
Highland Park College, Des Moines, Iowa.  
1907-10; Salesman and Engineer, Otto Gas  
Engine Works, Philadelphia, Penn.  
1910-16; Instructor, Mechanical Engineering,  
Michigan State Agricultural College, East  
Lansing, Mich.  
1916; B.S. in Mechanical Engineering, En-  
gineering Division, Michigan State Agri-  
cultural College, East Lansing, Mich.  
1916-17; Assistant Professor, Mechanical En-  
gineering, Michigan State Agricultural  
College, East Lansing, Mich.  
Summer, 1912; Special Work, Engineering  
Department, University of Michigan.  
Summer, 1913; Special Work, Engineering  
Department, Ohio State University.  
Summer, 1916-17; Designing and Drafting  
Nono Engine Company, Lansing, Mich.  
1917; Professor of Mechanical Engineering,  
Colorado School of Mines.



**GEORGE E. F. SHERWOOD,**

Associate Professor of Mathematics.

1904; A.B., University of Nova Scotia, Can-  
ada.  
1908; A.B., Harvard University.  
1913; A.M., Harvard University.  
1904-05; Principal Bloomfield High School,  
New Brunswick.



**HARRY MUNSON SHOWMAN,**  
Professor of Mechanics and Civil  
Engineering.

1910; E.M., Colorado School of Mines.  
1910-12; Instructor in Mathematics.  
1912-17; Assistant Professor of Civil En-  
gineering, Colorado School of Mines.  
1917; Professor of Mechanics and Civil En-  
gineering, Colorado School of Mines.



**VICTOR ZIEGLER,**

Professor of Geology and Mineralogy.

1908; A.B., University of Iowa.  
1909-1910; Fellow in Mining Geology Colum-  
bia University.  
1910; A.M., Columbia.  
1910-1911; Instructor in Geology and Min-  
eralogy, School of Mines, State College,  
Pennsylvania.  
1911-1913; Assistant Professor of Mineralogy  
and Petrology, South Dakota School of  
Mines.

1913-1914; Professor of Mineralogy and Pe-  
trology, South Dakota School of Mines.  
1914; Assistant Professor of Geology and  
Mineralogy, Colorado School of Mines.  
1917; Professor of Geology and Mineralogy,  
Colorado School of Mines.



**FRANCIS M. VAN TUYL**

Assistant Professor of Geology and  
Mineralogy.

1911; A.B., University of Iowa.  
1911-12; Assistant in Geology, University of  
Iowa.  
1912; M.S., University of Iowa.  
1912-13; Fellow in Geology, Columbia Uni-  
versity.  
1913 (Summer); Geologist, Iowa Geological  
Survey.  
1913-14; Assistant in Geology, Columbia  
University.  
1914 (Summer); Geologist, Iowa Geological  
Survey and Assistant U. S. Geological  
Survey.  
1914-15; Engaged in research work at Uni-  
versity of Chicago for State Geological  
Surveys of Iowa, Illinois and Missouri.  
1915 (Summer); Geologist, Iowa Geological  
Survey.  
1915-16; Instructor in Geology, University of  
Illinois.  
1916 (Summer); Geologist of University of  
Illinois, Hudson Bay Exploring Expedi-  
tion.  
1916-17; Instructor in Geology, University of  
Illinois.  
1917 (Summer); Geologist, Iowa Geological  
survey and Field Work in Medicine Bow  
and Big Horn Mts. of Wyoming.  
1917; Assistant Professor of Geology and  
Mineralogy, Colorado School of Mines.



Fellow of the American Association for the Advancement of Science; Fellow of the Illinois Academy of Science; Fellow of the Iowa Academy of Science; Member of the Paleontological Society of America; Member of the New York Academy of Science.



**JAMES COLE ROBERTS,**  
Professor of Safety and Efficiency  
Engineering.

1884; Ph.B., University of North Carolina.  
1885; Post-graduate work in Chemistry and Metallurgy, University of North Carolina.  
1886; Railroad work in North Carolina.  
1887-88; Chemist and Superintendent Wood Pulp and Paper Mill in North Carolina.  
1888-89; Chemist and Metallurgist Woodstock Iron Co., Anniston, Alabama.  
1889-91; Chemical Laboratory, Examining and Reporting on Phosphate Properties and Fertilizer Plants in Florida. Headquarters at Tampa, Florida.  
1892; Post-graduate Course at Columbia University, New York.  
1892-95; Operating mining properties in Colorado.  
1895-97; Chemist and Assistant Metallurgist, Globe Smelter, Denver, Colo.  
1897-1901; Chair of Metallurgy and Director of Chemical Laboratories, Colorado School of Mines, Golden, Colo.  
1901-03; Consulting Engineer for Detroit Capitalists with Properties in Colorado, Utah, South Dakota and Mexico.  
1903-06; Electro-Chemical and Metallurgical work in Niagara Falls, N. Y., and Canada, on fixation of atmospheric nitrogen, production of Barium Hydrate, etc.  
1907-10; Engineer in Charge of Construction and Operation of the U. S. Government Testing Stations at St. Louis, Mo., Norfolk, Va., and Pittsburg, Pa.  
1910-15; Mining Engineer in Charge of the U. S. Government Mine Rescue and Mine

Investigation Work in Coal and Metal Mines of the Western Portion of the United States with Headquarters at Denver. Professor of Safety and Efficiency Engineering since 1915.



**WILLIAM JONATHAN HAZARD,**  
Professor of Electrical Engineering.  
1891-93; Armature Winder and Inspector of Industrial Motor Equipment, Los Angeles Consolidated Electrical Railway Co.  
1893-95; Special Course in Mathematics and Chemistry at Denver University.  
Summer work for Sheets Electric Co.  
1897; E.E., Colorado School of Mines.  
1897-00; Instructor in Physics and Drawing, C. S. M.  
1901-04; Assistant Professor of Physics and Drafting.  
1905-09; Assistant Professor of Electrical Engineering.  
Professor of Electrical Engineering since 1910. Associate, American Institute of Electrical Engineers.  
Member, National Electric Light Association.  
Member, Denver Branch A. I. E. E.

**PARSONS MADE ATHLETIC DIRECTOR  
OF MINES AND OFFICER IN U. S.  
ENGINEER CORPS AT SAME  
TIME.**

At the moment he was being elected athletic director of the Colorado School of Mines and coach of the football squad, Charles L. (Boss) Parsons received word that he has been awarded a lieutenant's commission in the United States army. He will be assigned to the engineers.

Lieutenant Parsons is listed as a reserve and until the time he is called for service he will remain at the School of Mines as a faculty member and athletic coach. The board of trustees of the school formally, November 8th, elected Parsons, and his salary has been fixed at \$2,000 a year.



**JOHN CHRISTIAN BAILAR,**  
Special Extension Work.

1901; B.S., University of Colorado.  
1901-03; Professor of Science, Cripple Creek High School.  
1903-05; Instructor in Chemistry and Metallurgy.  
1905; A.M., University of Colorado.  
1906; Assistant Professor of Chemistry.  
1916; Chemist, Research and Testing Department.  
1917; Special Extension Work.



**JOHN C. WILLIAMS,**

Assistant Director, Experimental Plant.  
1913; E.M. (Met. Course), Colorado School of Mines.  
1913; Sampler, The Oroya Leonesa, Ltd., Matagalpa, Nicaragua, C. A.  
1914; Amalgamator, Liberty Bell Mill, Telluride, Colo.; Chemist Stag Canon Fuel Company, Dawson, New Mexico.

1915-16; Assistant Superintendent Radium Plant, U. S. Bureau of Mines, Denver, Colo.  
1917; Chemist with Von Schulz and Low, Denver, Colo.  
1917; Assistant Director Experimental Plant.



**CHARLES L. PARSONS.**  
Athletic Director and Coach.

Parsons graduated from the engineering school of the University of Iowa in 1914. He was a member of the football, basketball and track teams during his entire period of attendance there, making his "T" in every branch of the sport.

For the past three years, until September, 1917, he was connected with Trinity College at Sioux City, Iowa. His work there in taking a school that never boasted of athletics and had never before played football and putting it in the front rank of colleges in Iowa, South Dakota and Nebraska, speaks well for his ability. Parsons took hold of a bunch of green men in 1914 and whipped them into one of the most formidable football teams in that section of the country.

**Gangway, Please.**

He—Gee, the new dance hall has a peach of a floor.

She—Then why do you dance on my feet?

And many a man has repented at leisure who never married at all.

## SCHOOL OF MINES TO TEST DeBEQUE OIL SHALE.

By Clifford J. Laube.

Tests now in progress at the experimental plant of the State School of Mines at Golden to determine whether or not the extensive oil shales of the DeBeque district in western Colorado can be profitably treated on a commercial scale for their oil content, bid fair to result in the establishment of a new and important industry in Colorado.

Trial treatments already carried out in a small way at the plant have given such encouraging results that President Victor C. Alderson, in company with Dr. Victor Ziegler, professor of geology at the school, will leave tomorrow to make a personal investigation of the extent and character of the DeBeque deposits, and to make arrangements for the shipment of a sufficient quantity of the shales to the plant to enable more elaborate experiments at extraction processes.

"If the DeBeque shales can be successfully treated, as now seems highly probable," said a School of Mines official last night. "the outgrowth will be an industry as big as anything in the State, for there are miles and miles—yes, whole mountains—of the shale in the DeBeque vicinity. Our task is to find out if the oil with which the shale is more or less saturated can be extracted on a commercial scale at a profit. Men who ought to know say this can be done. It has already been done successfully in Scotland, and what can be done in Scotland can be done in Colorado. We are going into the investigation energetically and are confident of being able to demonstrate that the shale is the basis for the creation of a great oil extraction industry in Colorado."

### Equipment is Complete

Those engaged in making the tests will have the advantage of what is one of the most complete and modern laboratory and experimental equipments in the world. The Golden plant, erected under an appropriation of \$100,000 by the state legislature, and completed in 1913, has the distinction of being second to no establishment of its kind in the country. The only plant like it in the world is said to be the Royal School of Mines in London.

The world-wide recognition of the exceptional experimental facilities which the Golden plant affords is seen in the fact that at present a party of mineralogists from Holland, headed by J. Caron, a technical expert in the service of the Dutch government, is conducting exhaustive tests on certain refractory ores shipped to this country from the island of Sumatra. Thirty heavy crates of the ore, consigned through the Dutch consul at San Francisco, arrived at the plant about two months ago, since which the Dutch experts have been working to find a process under which it will profitably

yield up its values. The ore is said to be rich in manganese and silver, but rebellious to treatment. Officials of the national bureau of mines at Golden, as well as the School of Mines experts, have placed every facility at the disposal of the Hollanders for the purposes of their mission.

### Is Nationally Noted.

The success which Dr. R. B. Moore, rare metal expert of the national bureau of mines, and director of the Colorado station of the bureau, has had in extracting radium bromide from Colorado pitchblende ores at the Golden experimental plant, is already nationally noted. His labors there so far advanced the methods of reducing radium bearing ores that it is said the bureau now regards the process of extracting radium developed there as being scientifically established and past the experimental stage.

The mines bureau, in conjunction with the school, is working on a new metallic product called "mesotherium," which has a self-luminosity of sufficient permanency to render the substance valuable in the manufacture of luminous dials for watches, clocks, chronometers and similar instruments. Mesotherium is a radio-active substance and is said to possess many advantages over the materials now generally in use for their luminous properties.

The Golden plant is equipped with almost every ore-dressing and treating machine known to modern metallurgical science and permits of all the present known processes of preparing ores for smelting. Gravity separation, cyanidation, magnetic separation and flotation can be carried on with equal convenience. The crushers, rolls, stamps, jigs, classifiers, tables, vanners, amalgamators, and other machines are so arranged that they can be used independently or co-ordinately, permitting unlimited variation in processes, according to the character of ore to be treated.

### To Take Up Problems.

Speaking of the work contemplated for the immediate future, President Alderson said yesterday: "We are going to take up some of the larger problems now besetting mining sections of the state that are troubled with complex ores. For instance, we are about to start work on certain refractory ores sent in from Burrows Park, twenty miles east of Lake City, in Hinsdale County. Experiments will also be energetically conducted on ores from Idaho Springs, Silverton, Rico, Creede, and in fact every section of the State that has a surplus of ores not marketable in the crude state or capable of profitable separation by the ordinary methods.

"We are desirous of making the School of Mines experimental plant the center of the metallurgical research activities of the entire State. Our plant, if properly worked, will not only be of tremendous assistance to the mining industry in general, but will give

Colorado new industries and add unlimited wealth to the State."

John C. Williams, a graduate of the School of Mines, is at present in charge of the plant as assistant director for the school.

J. C. Roberts, professor of safety and efficiency classes and instructor in coal mine rescue work, has charge of the ore-dressing and laboratory departments. (Denver Times, Nov. 22 1917.)

#### COLLEGE MEN AND THE WAR TAX LAW.

(From the Patriotic News Service of the National Committee of Patriotic Societies, Southern Edg., Washington, D. C.)

By Daniel C. Roper,  
Commissioner of Internal Revenue.

College men can perform a practical patriotic service in connection with the War Tax Law. If the Government is to obtain the full amount of revenue authorized by Congress it is essential that every taxpayer shall know how to compute the amount of taxes he must pay and the time, place, and method provided for its payment.

The new Income Tax Law will reach more than 7,000,000 persons who have never before paid a Federal Income Tax. Every unmarried person who had a net income in 1917 of more than \$1,000 and every married person whose net income was more than \$2,000 is required by law to make a return to the collector of Internal Revenue for his district. He must not wait for the collector to call on him or send him a notice. He must voluntarily apply to the collector for the Income Tax form. If college men will familiarize themselves with the War Revenue Act and point out to their parents and others with whom they come in contact what the law requires them to do they will be rendering a patriotic service.

The purpose of the War Tax is identical with that of the Liberty Loan. Its patriotic appeal is even stronger, for instead of an investment it calls for a contribution. The bond buyers loans—the taxpayer gives—to the cause of Liberty. The splendid success of the Liberty Loan was achieved through the co-operative effort of patriotic leaders everywhere in the dissemination of information and the fostering of patriotic sentiment.

As we press forward in this great war struggle sustained by the hope of a victorious peace, we must bear in mind that only by meeting in the fullest degree our individual responsibilities as citizens can we insure ourselves against the unthinkable consequence of defeat. The War Tax Law imposes an obligation which no loyal American will seek to evade. College men can serve their country by giving expression to this thought at every opportunity.

The fellow who sows his wild oats deserves to reap a grass widow.

#### GOLDEN MAN IS EXPLOSIVES DIRECTOR

Jail Awaits the Violators.

After November fifteenth any person found with explosives in his possession, without having a government license, will be taken into custody and held, pending advices from Washington.

Dr. R. B. Moore, chief of the Golden branch of the United States Bureau of Mines, has been made acting director of explosives for Colorado, and all dealers and manufacturers of powder in any form, as well as mine foremen and others whose work or business requires the use of dynamite must immediately get in touch with Dr. Moore.

"The public should bear in mind," said Dr. Moore, "that every person having anything whatever to do with the buying, selling, delivering, storing or handling of explosives must be listed with the director."

All federal, state, county, city and town officers have enlisted to help Dr. Moore in his work. As can be readily seen, the object of the government is to prevent illegitimate use of explosives in any manner that will assist the enemy.

Dr. Moore has given out the following regulations regarding explosive licenses:

"A—Manufacturers' license, authorizing the manufacture, possession and sale of explosives and ingredients.

"B—Vendors' license, authorizing the purchase, possession and sale of explosives or ingredients.

"C—Purchasers' license, authorizing the purchase and possession of explosives and ingredients.

"D—Foremen's license, authorizing the purchase and possession of explosives and ingredients and the sale and issuance of explosives and ingredients to workmen under certain specified conditions.

"E—Exporters' license, authorizing the licensee to export explosives, but no such license shall authorize exportation in violation of any proclamation of the president issued under any act of congress.

"F—Importers' license, authorizing the licensee to import explosives.

"G—Analysts', educators', inventors' and investigators' license, authorizing the purchase, manufacture, possession, testing and disposal of explosives and ingredients.

"All persons who come under the above classification, such as vendors, foremen, exporters, importers, etc., must keep itemized records of sales, issues of explosives, pending receipt of detailed instruction from the bureau of mines. Meanwhile there should be no suspension of the production of coal or other necessities involving the use of explosives, but it is extremely important that all persons using explosives shall keep records as indicated above."

A fool and his money are soon parted, and many there be who want a part.

# Colorado School of Mines Magazine

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*Editor and Manager Colorado School of Mines Magazine; Manager of Capability Exchange.*

Address all communications to the Assistant Secretary and Treasurer, Golden, Colorado. Make all checks payable to the Assistant Treasurer.

**CLASS EDITORS.**

R. F. WHITE.....1918  
 CLAUDE AMIDON.....1919  
 DONALD L. BAILEY.....1920  
 J. E. EDGEWORTH.....1921

**ATHLETIC EDITOR.**

LINDLEY M. REITH.....1918

**VOL. VII. DECEMBER, 1917. No. 12**

**DON'T LET EDUCATIONAL I. W. W. PROPAGANDA MISLEAD YOU.**

Many of the graduates and other friends of the Colorado School of Mines who are not in close touch with the circumstances of the recent troubles at the School have been much concerned over the numerous attacks that have been made upon the School, the Trustees and the President, by the "Educational Wreckers" through editorials and articles in technical journals, court proceedings, the "yellow" press of Denver and worst of all, through making "dupes" and "catspaws" of a few graduates of the School who ought to know better and whose loyalty to the School ought to be unquestioned.

Perhaps we can make a few brief statement of facts that may give our readers a little insight into the real cause of the trouble.

Among the technical papers the Mining and Scientific Press was the first to misstate or confuse the facts. Mr. T. A. Rickard was a guest of H. C. Parmelee during his (Rickard's) "investigation" of the trouble. One of the Professors largely responsible for the trouble with the students last spring is a close friend of Mr. Rickard's and is now on the staff of the M. & S. P.

The editor of the Mining American was dropped as a Professor of the School because of incompetence.

The editorial in the Engineering and Mining Journal was a mere abstract of a letter written to Mr. Ingalls by H. C. Parmelee while the latter was still "technically" president of the School.

Upon leaving the School Mr. Parmelee assumed his old position as western editor of the Metallurgical and Chemical Engineering and recently was made acting editor. This might explain the authorship of previous items in that paper under the Denver head line and the recent editorial in the November 15th issue under the heading "A School of Mines Debauched." It might be difficult to prove that our School of Mines has not been "debauched", but there is considerable argument as to just who is responsible for the "debauching."

One of the owners of the "yellow" newspaper of Denver referred to above made the remark, when appealed to by a graduate to stop his paper's attacks on the School, "What the hell do I care about your School, it's news I'm after." Incidentally we understand he is "after" the Governor of the State who was unfortunate enough not to "please" this paper. The possible wrecking of one of the biggest institutions in the State is of small concern in "dirty politics."

Among those who have brought "charges" against the Trustees and Dr. Alderson, you will readily note, is a goodly number of "ex" professors, etc., who have left the School for various reasons. If Dr. Alderson was vindictive or wished to air the School's "dirty linen" some of these "exes" would "hunt their holes" or other States very promptly. As to the few graduates who have been "duped" into taking part in these attacks on the School or who have "duped" themselves into such action through prejudice or lack of correct information, we know that some, and we hope all, really believe they are loyal to the best interests of the School. In other words, while their vision may be distorted their "intentions" are good and they "think" they are aiming at the enemy when they pull the trigger.

Like the darkey who was watching a cross-eyed man take aim at a target and suddenly demanded, "Look yer, white man, is you all aimin' whar you is pintin' or whar you all is lookin'."

You know about the paving blocks the Devil uses.

**RESOLUTION ADOPTED BY THE BOARD OF TRUSTEES AT THE NOVEMBER MEETING.**

Whereas, two suits have been brought against Victor C. Alderson, President of the Colorado School of Mines, in the District Court of Jefferson County, by the people of the State of Colorado, upon the relation of Herman Fleck and James H. Steele, respectively; and

Whereas, said suits attack the right of Victor C. Alderson to occupy the position of President of the Colorado School of Mines to which position he has been duly, formally, and legally elected; and

Whereas, said suits are calculated to injure the morale, discipline, reputation, and

standing of the School and tend to its disruption and demoralization; and

Whereas, it is a matter of vital public interest to the State of Colorado that the officers of its educational institutions should be permitted to administer educational affairs without constantly recurring molestation and interference.

Resolved, that the Board of Trustees of the Colorado School of Mines, firmly believing that the defense of these suits is a matter of vital public interest, request the Attorney General of the State of Colorado to defend said suits in behalf of Victor C. Alderson as President of the faculty, and the Board of Trustees of the Colorado School of Mines.

(Signed) F. G. Willis,

President of Board of Trustees.

(Signed) Jas. T. Smith,

Secretary of Board of Trustees.

#### COMMUNICATIONS.

Kelly, New Mexico, Nov. 23, 1917.

Editor Colorado School of Mines Magazine,  
Golden Colorado,

Dear Sir: I am in receipt of a communication from Mr. Geo. A. Kennedy under date of November 14th with a printed enclosure containing a tirade against Dr. Alderson. His letter says it is not his intention to make a personal fight against Alderson, and if this is the case he must have sent me the wrong paper.

I cannot view such action as Mr. Kennedy and his associates are taking in any light other than that they are trying to harm the School. I attended Golden for four years while Alderson was President and was always accorded the best of treatment and cannot cite one instance of unfair treatment to any one while I was there. When we are of college age we are all prone to consider ourselves wiser than our seniors and frequently imagine ourselves very much mistreated and abused. I hope I am enough of a man not to hold any such fancied indignities in my craw for six years after graduation. I consider that Dr. Alderson has done more towards building up the Colorado School of Mines than any other man and I believe that he is the best man for the place at the present time, and that such propaganda as Mr. Kennedy and his associates have distributed over the country can do no good and will do more to drive students away from School than Dr. Alderson ever did with his alleged disloyal letter. Notice the small number of students now as compared with the times when Dr. Alderson was President, and this in the most prosperous era ever known to the mining industry.

It is, of course, to be regretted that Dr. Alderson took the carpet tack and window shade when he left as is alleged in the slander sheet that was sent me in error. I wonder if the discontented ones have searched the janitor's domicile.

If Mr. Kennedy, Mr. Steele, et al., have gotten themselves into a jackpot and incurred some debts in their attempt to discredit the School (he says it is not a war against Dr. Alderson), let them go somewhere else for their money. I will not give them \$25, \$10, \$5 or one cent, and I believe other loyal alumni will look at it in the same light. I am for the School first, last and all the time.

Sincerely,

T. H. Garnett, '11.

Green River, Utah, Nov. 22, 1917.

Mr. Orville Harrington, Secretary, C. S. M.  
Alumni, Golden, Colo.

Dear Harrington: Mayer and I received today a request or rather an appeal from some of the self-appointed members of the Alumni, for money to carry on a sort of propaganda work against the present Board of Trustees of the School. They say not against Dr. Alderson in their circular but all of their literature seems to be nothing more or less than a lot of petty charges, not one being specific, against Dr. Alderson. When I say none being specific I do not refer to the many little grievances that ex-janitors, ex-electricians and in fact ex-everything else have scraped together and which all taken together would not amount to enuf to speak about except by a man with an axe to grind.

I personally worked for Doctor Alderson during the year 1916 in one of the many projects that he was able to finance. I have sat in the cool of the summer evening on the porch of our cabin, and in the cold of the winter nights before the warm stove and have had many a heart to heart talk with Dr. Alderson. In all of these conversations I can truthfully say I found the Doctor to be heart and soul with Golden, meaning our School. We have discussed many times the trouble that he encountered with different men, and though he has had ample grounds to have done some of them harm he has, in many cases, repaid evil with good. When he showed the proper spirit in which a successful business must be conducted and dismissed the men who have always been antagonistic to him and his administration, he has called down the vile attacks that are now being made upon him.

One has only to review the history of our School during the administration of Dr. Alderson. Guggenheim Hall, Stratton Hall, Assay Laboratory, Power Plant, Testing Plant and the Gymnasium were all erected. (What constructive effort has been made since he left?) The Mines was spoken of by Engineers all over the country as second to none. Since Dr. Alderson's time the fair name of our School has been dragged in the dirt of rotten politics and to the satisfaction of some of the so-called reformers. At the present time when a man says with pride—for we still feel proud of our School—"I am for Golden," the party spoken to

usually answers, "Well, they surely have let the School of Mines run to the dogs since 1913." Now we all know that Golden will be Golden when all the rest are done up, but the outside world doesn't know this, and I feel that to subscribe to a movement that will give our School further unfavorable notoriety is nothing short of disloyalty to our institution.

I think that the Alumni Association should prevail upon Steele and his association of men to forget it. I think that a letter should be written to the Denver Post, signed by the Alumni Association through the executive committee, asking the Post to please refrain from giving the School of Mines any further notoriety, not as an aid or appeal in behalf of Dr. Alderson, for I believe that he will be the most surprised man in the world to see a letter like this from me, but that the State of Colorado, which naturally feels proud of its great Mining School, as well as the graduates of the Colorado School of Mines, can stand up with pride and say **WE HAVE THE BEST MINING SCHOOL IN THE U. S. A.**, and that means the best in the world.

Now then, all boost for Golden. Get behind Alderson and push UP, not down, as some are doing. Let us all forget all of the past nonsense that the same rotten politics, that has hurt Colorado, is trying to put upon our School.

Hoping to hear from you in the near future that the trouble is going to be allowed to settle, through the good that you can do with these belligerent members of our School, who would allow their love for a few professors to overbalance their loyalty to the whole institution, I remain with kindest regards to you from Mayer and myself, I am,

Sincerely yours,

Arthur N. Zwetow, '11.

Norristown, Pa., Nov. 24, 1917.

Mr. Orville Harrington, Golden, Colo.

Dear Harrington: It was with some surprise I found out through the enclosed circular I received today that the fight against Dr. Alderson is still being carried on by a few of the alumni of the School. Just why these few should persist in this persecution is very hard to understand. It certainly cannot be on account of the charges enumerated in this circular, which they could not prove, and most of which are ridiculous and show plainly personal animosity rather than any desire to do good for the School.

As far as I know them I endorse the recommendation made by the Doctor for his faculty with possibly two exceptions who may improve under different influence. They were none too loyal to the Doctor when I was in School, but I certainly want to endorse his action in failing to make certain recommendations, as I always placed much of the disruption, between the student body and the faculty, to the action of those members. They, behind closed doors, made

the trouble which later was to fall upon the shoulders of the President.

I note on the enclosed sheet that "In April of this year there developed great dissatisfaction among the students over the action of the faculty in suspending several students for terms of one or two years. This is no place to pass upon the justness of this suspension." To my mind this is the very time to pass upon the justness of this suspension, as this was the key to the whole situation.

It was by these same methods that those whom the "Pueblo Chieftain" advisedly calls "Educational Wreckers", who, in the second year of Dr. Alderson's career at the Mines, tried to put him in disrepute. The attempt was a fizzle. Nothing daunted, these Wreckers tried the same trick in the following years, and it was only by the diplomacy for which Dr. Alderson is justly famed that he extracted himself from a situation very similar to the one under which President Parmelee went down. As Dr. Alderson by that time had his eye teeth cut, other methods had to be employed to accomplish his removal. Other methods were employed which ended in his being undermined by the Wreckers in 1913.

Referring again to the circular; they refer to Prof. Patton's fame as scholar and teacher, etc. Prof. Patton deserves his fame as a scholar, but he was far from being a teacher even when I was in college and I doubt whether the last few years has added anything to his ability in this line. Prof. Patton has long been a disrupting influence on the faculty and he and his followers were used by other members of the faculty who were not so willing to lay aside their ambitions, "other than those for fame and scholarship."

Continuous endeavor alone will not bring success. Along with it you must be in a just cause. A cause which sacrifices an institution like the Colorado School of Mines and its President, whoever he may be, to satisfy one's own selfish end is not a just cause and will not prosper.

I sincerely hope and do believe that the election of Dr. Alderson and the faculty of his own selection for the School of Mines of Colorado will make it what it should be, a Mining School second to none in the world.

Get behind your college and your President, and boost. Even though you did not put him there, he is your President. Dr. Alderson has ability, that has been proven, and will go far to make your college a success with your backing.

These are my sentiments, and as an alumnus I have the privilege of stating them for the benefit of the other alumnae who have not been so fortunate in having the opportunity I have had in observing the course of things, both as student and alumnus. I spent several years as a student under Dr. Alderson and was in fairly close touch with the Alumni Association in

Denver, Colo., until 1913, at which time I came east. The sending out of circulars like the one enclosed should be stopped, as they may fall in the hands of someone, who not knowing the full conditions, would read and believe them. Kindly return enclosed circular to me as I may have future use for it.

Sincerely yours,

Wm. C. J. Rambo, '09.

#### PRELIMINARY REPORT IN SMELTER INVESTIGATION.

O. R. Whitaker, '98, who has been engaged all summer on a thorough investigation of the smelting industry of Colorado in behalf of the special committee appointed by the last legislature, has presented a preliminary report to the committee. Many carefully prepared charts accompany the report.

The report will be embodied with the findings of the committee, to be announced later, and the entire matter submitted to the Colorado public utilities commission before the first of the year. Provision is made for 1,000 copies or more of the complete report.

Part of Whitaker's report, which covers the smelting industry from 1912 to 1916, follows:

##### Text of Report.

"Concentrating plants, mills and all other classes of reduction works handled a total of 13,423,281 tons of Colorado mined crude ores. Of this amount over one half, or a total of 7,730,276 tons went to gold and silver mills and not to smelters.

"The copper, lead and zinc ores reduced by Colorado smelters amounted to 3,874,706 tons. While Colorado produces considerable zinc, most of it was shipped out of the State in the crude form to be reduced in smelters in other States where the zinc ores can be handled more economically.

"The total number of tons of Colorado mined ores handled during the five years mentioned by the smelters, exclusive of mills, was 3,874,706; the average value of ore stock on hand in the smelters was \$1,695,400; average value of products in transit, \$2,300,000; difference between date of settlement with the producer and realization (average), 60 days; taxes and interest per ton of ore handled, 61 cents; average profits per ton of ore handled, less depreciation, interest and taxes, 95 cents.

"The value of the smelting plants in Colorado is \$2,700,000.

"The question of what percentage of metals is lost in reduction has always been a mooted one. On this subject charts will be found of more value to the miner than written explanation.

"No metallurgical process recovers all the metal values from the ores. The losses incidental to smelting are slag, volatilization and mechanical. The losses of gold are small and are due to slag and mechanical. The copper loss is in the slag; the lead losses are in the slag and in the flue dust.

"The use of the fire assay for determining the lead in an ore is only approximation; the inaccuracy is increased by overheating and the presence in the ore of other metals. The fire assay for copper is seldom used, the wet assay being the basis of settlement.

##### System of Reporting Values.

"It is the custom of assayers to report to the miner the value of his ore as the sum of the various metals at their respective market quotations at the time of the assay. This is decidedly misleading.

"Account must be taken of such factors as freight, treatment, refining, marketing of products and profit for treatment, in order to arrive at the ultimate returns which the miner may reasonably expect. In figuring the value of an ore or a metallurgical product, the basis used should be the price per standard unit of quantity of the refined metal at some principal market center at the time the valuation is made. New York being the center used, then the value of an ore to the miner is the sum of the selling price of each metal at New York times its unit of quantity, less the combined cost and expense of treating the ore and marketing the recovered product."

##### Replies Invited.

The ore buying and smelting industry will be given an opportunity, if it so desires, to come in and make explanation concerning any portion of Mr. Whitaker's report which it may feel to be unfair or unjust.

The members of the committee are Senator Slewors Fincher of Breckenridge, chairman; Representative H. P. Nagel '04, of Victor, secretary; Senator W. J. Candler of Leadville, Representative Don J. McDonald of Idaho Springs, and Representative A. P. Ardourel of Boulder. Mr. Ardourel, who is now serving as a lieutenant in the United States army, will not be present to take part in formulating the final report.

##### PRAISES MINES EXPERIMENTAL MILL.

Paul Whitefield Gaebel, a prominent mining engineer of Boise, Idaho, was in Golden Wednesday, November 14th. He has been examining a mine at Grant, in Clear Creek County, for Eastern capitalists, and may have the ore tested in the School of Mines experimental plant. Mr. Gaebel, after an inspection of the experimental plant, declared it is one of the best and most complete plants of its kind that he has ever seen, being of full commercial size and with equipment strictly up-to-date.

He declares that the plant offers great advantages to the mining industry of the state by providing facilities for treatment of ore by operators desiring to make efficient tests before establishing plants of their own.

He characterized the work of Dr. Alderson in establishing the plant as a work of incalculable value to the mining industry, as well as to the School.



### POPULAR LECTURES ON GAS AND OIL GEOLOGY.

Prof. Victor Ziegler is giving a course of lectures on oil and gas geology open to the general public. Three of the lectures have already been given and have proved very popular, many coming up regularly from Denver to attend.

The lectures are given in the Geological lecture room in Guggenheim Hall. They are given in simple language and whenever technical terms must be used full explanation is given so that the layman will have no trouble in understanding them. The remaining lectures will be given December 12th.

Prof. Ziegler is expanding these lectures somewhat, collecting photographs and making drawings for a popular oil and gas geology for the general public. It will probably contain as an appendix a description of the Middle West Oil fields and should be on sale about the first of the year.

Prof. Ziegler is also preparing a more elaborate technical oil and gas geology that he hopes to have out this winter or early next spring.

### MISCELLANEOUS.

H. B. Patton was in Steamboat Springs on a business trip the latter part of November.

Mr. T. Otsubo, Mining Engineer for the Mitsubishi Copper Company of Tokyo, Japan, visited the School and Experimental Plant November 26th.

President Alderson returned Tuesday, November 13th, from a trip to the Geneva Basin, in the interest of the School of Mines. While there he made arrangements for a lot of ore from the Sill mine, to be treated experimentally in the Mines testing plant.

Fedor M. Foss, a representative of the Russian Ministry of Commerce and Industry, was a visitor at the School of Mines Tuesday, November 22nd. After being shown all the equipment and through all the buildings, he said the local School excelled any similar institution he had ever seen.

Members of the Kappa Sigma Fraternity from the School of Mines, State University, Colorado College and Denver University attended the annual banquet at Boulder, Saturday evening, November 3rd. It was announced that more than 1,000 members of this fraternity are now in the army or navy service and resolutions were adopted pledging the support of the Colorado Chapters to the government.

The Denver Post has lost its fight against Victor Alderson, head of the Colorado School of Mines, and it would seem proper, if the Post is to make good its claim of always having the good of the State at heart, for it and those Denver men who have joined in its unwarranted campaign against Mr. Alderson to call a halt. The State School of

Mines is too important an institution to be dragged continually in the dust by a few disgruntled persons whose habits of mind prevent them from appreciating the ability of America's foremost mining educator—Fort Lupton Press.

Two prominent mining engineers from Japan were visitors at the School of Mines Tuesday, November 13th. They were I. Gotoh, metallurgist for the Mitsubishi Goshi Kaisha mines, at Tokyo, and C. Yabe, mining engineer for the Sumitomo Besshi mine. They were shown through the buildings and laboratories of the local School and expressed themselves as greatly surprised at the wonderful equipment here.

Captain Godfrey L. Garden, of the United States Coast Guard, was in Golden Sunday, November 18th, to talk to the students of the School of Mines about applying for entrance to the U. S. Coast Guard Academy at New London, Conn. Cadets who successfully complete the course at the Academy will obtain commissions as third lieutenants, the ranks corresponding to that of second lieutenant in the army and ensign in the navy.

Signers are Lacking For Alderson Charges.

In answer to a request as to procedure in the investigation of charges filed against the Trustees of the Colorado School of Mines from Gov. J. C. Gunter to Attorney General Leslie E. Hubbard, the latter stated that the charges contained no signatures, and that the governor has in reality nothing before him. It was found that the charges against President Victor C. Alderson and the Trustees had no signed names whatever, the petition merely containing the typewritten name of the firm of Quaintance, King and Quaintance.

### May Open New Mining District.

Dr. Victor C. Alderson, President of the School of Mines, and Captain James T. Smith, member of the Board of Trustees, were at Lake City early in November and found in the Burros Park region a large body of complex ore. A shipment of this ore will be treated at the experimental plant to see if a method of local treatment can be found. If this method can be found it means the opening of a new mining district in the State.

### Students Get Painting Practice.

Students of Denver University did two jobs of painting recently and can now qualify for an art degree. The first job was Friday night, November 23rd, when an auto load of them went to the big "M" and liberally daubed it with D. U. colors, red and yellow. They came again Monday, November 26th, by day light, and covered their colored paint with white. Profuse apologies also came from the D. U. student body and the faculty. The letter from the student body stated that they regretted the breaking of the agreement between the two schools and that the offenders would be severely punished for their vandalism.



- Hemberger, Charles, Ex '07.  
Second Lieutenant Infantry (home address, Red Cliff, Colo.)
- Higgins, Robert, '17.  
Co A, 28th Engineers, Camp Meade, Md.
- Hinman, Dale Durkee, '15.  
First Lieutenant, U. S. Coast Artillery Corps, Fortress Monroe, Va.
- Howbert, Van Dyne, '16.  
Engineer U. S. Training Camp, Fort Riley, Kan.
- Jacques, Henry L., '08.  
Captain Engineering Section, U. S. O. R. (Box 435), San Fernando, Calif.
- Jeuck, John William, Ex '13.  
U. S. A., Camp Funston, Kansas.
- Jones, Chester H., '12.  
Second Lieutenant, Field Artillery.
- Jones, David L., Ex '19.  
Second Lieutenant, Artillery, U. S. O. R.
- Jones, E. F., '10.  
Camp Funston, Kan. Mail address, care E. R. Jones, Box J., Eagle Pass, Texas.
- Jones, Percy, Jr., '08.  
U. S. Army.
- Kimball, Neil W., Ex '20.  
Sergeant Co. C, 115th Engineers, Camp Kearney, Calif.
- Kinsley, Arthur C., Ex '18.  
First Lieutenant, Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Kistler, Erle O., former Coach.  
Major, U. S. O. R.
- Knepper, C. M., '17.  
Retired Captain U. S. Navy.  
Government Inspector for the Navy, Bethlehem, Pa.
- Koenig, Samuel A., Ex '12.  
First Lieutenant Coast Artillery (home address, Golden, Colo.)
- Krier, Edw. J., Ex '18.  
U. S. Army.
- Lakes, Arthur, Jr., Ex '08.  
Officers Training Camp, The Presidio, San Francisco, Calif.
- Lee, Wallace, '04.  
First Battery, Ft. Sheridan Tr. Camp, Ft. Sheridan, Ill.
- Levy, Milton M., '16.  
Second Lieutenant, 315th Engineers, Camp Travis, Ft. Sam Houston, Texas.
- Light, Victor A., '13.  
U. S. A., Fort Riley, Kansas.
- Locke, D. R., Ex '18.  
Second Officers' Training Camp, Camp Funston, Texas.
- MacNeill, Neil M., '14.  
Sergeant Company F, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Marshall, Emory M., '11.  
Ordnance Department, Camp Kearney, Calif.
- Maxson, H. F., Ex '19.  
U. S. Aviation Corps.
- Maynard, John B., Ex '08.  
Lieutenant, U. S. Coast Artillery, Galveston, Texas.
- Meacham, Standish, Ex '13.  
War Y. M. C. A. Secretary, 31 Rue Montaigne, Paris, France.
- Menke, J. G., Ex '18.  
Sergeant Company C, 115th Engineers; Master Engineer, Camp Kearney, Calif.
- Mewhirter, Sydney A., '17.  
First Lieutenant, E. O. R. C., 314th Engineers, Ft. Riley, Kansas.
- Miller, Roy H., '16.  
Co. D, 316th Supply Trains, Camp Lewis, American Lake, Wash.
- Moses, P. S., '14.  
First Lieutenant, U. S. Army.
- Murphy, Joseph A., Ex '12.  
Co A, 23rd Engineers, Camp Meade, Md.
- Murphy, William J., '17.  
Sergeant Company A, 115th Engineers; Master Engineer, Camp Kearney, Calif.
- Nolan, Phillip E., '13.  
Aviation Section, Signal Enlisted Reserve Corps (Perm. address, care of Mrs. J. J. Arrey, 516 So. Van Buren St., Green Bay, Wisconsin).
- O'Malley, John J., Ex '18.  
Second Lieutenant Aviation Corps. In Canada or France.
- O'Neill, Frank E., Ex '18.  
Second Lieutenant, C. A. C., Reg. Army, Ft. Howard, Md.
- O'Reilly, Walter T., Ex '18.  
West Point Military Academy, Annapolis, Md.
- Page, W. C., '15.  
First Lieutenant, Infantry, U. S. O. R. Corps.
- Parker, J. Merrill, Secretary of the Mines Y. M. C. A.  
Marine Barracks, Mare Island, Vallejo, Calif.
- Pearce, James W., '14.  
Company C, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Phillips, L. V., Ex '19.  
Sergeant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.
- Poullin, John A., Ex '20.  
U. S. Aviation Corps.
- Price, Harold C., '13.  
First Lieutenant, Coast Artillery Reserve Corps, Ft. MacArthur, San Pedro, Calif.
- Prior, Charles E., '13.  
First Lieutenant Infantry. Detailed with Motor Transportation Unit, now in Washington, D. C. Mail address, care Penna. Textile Corp, 25 Madison Ave., New York City.
- Rabb, John H., Jr., Ex '18.  
Corporal Company F, 115th Engineers, Camp Kearney, Calif.
- Reynolds, K. W., Ex '18.  
U. S. Army, Fort Riley, Kansas.
- Richards, J. V., '02.  
U. S. Officers' Training Corps. Mail address, 1024 Old National Bank Bldg., Spokane, Wash.
- Richardson, Carleton, Ex '19.  
Corporal Company A, 115th Engineers, U. S. A., Camp Kearney, Calif.

**Rietedt, Ernest J., '09.**  
First Lieutenant in the Reserve Corps of Engineers, U. S. A.

**Robertson, Fitch, Ex '18.**  
Corporal Company A, 115th Engineers, Camp Kearney, Calif.

**Roehrig, George F., Ex '08.**  
First Lieutenant Field Artillery (home address, 1257 Fillmore, Denver, Colo.)

**Robinson, H. A., Ex '18.**  
Lieutenant, U. S. O. R. Corps.

**Russell, Donald O., '09.**  
English Army, Somewhere in France.

**Schade, Roger M., Ex '18.**  
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**Schoensiegel, A. D., Ex '17.**  
Marine Barracks, Mare Island, Vallejo, Calif.

**Simon, W. W., '15.**  
U. S. Naval Radio, Co. 19, Howard University, Cambridge, Mass.

**Skeen, Leslie C., Ex '18.**  
U. S. Army.

**Small, Sidney S., '17.**  
First Lieutenant, C. A. C., Reg. Army; Second Officers' Training Co., Fortress Monroe, Va.

**Snedaker, Eugene G., '14.**  
First Lieutenant Engineers Corps, U. S. Army, Vancouver Barracks, Washington.

**Solomon, Irwin R., '13.**  
First Lieutenant, O. O. R. C., Sandy Hook Proving Grounds, Fort Hancock, New Jersey.

**Stedman, A. W. Jr., Ex '17.**  
First Lieutenant 6th Reg. Infantry, Ft. Oglethorpe, Ga.

**Taylor, C. C., Ex '17.**  
First Lieutenant Coast Artillery Corps, Fortress Monroe, Va.

**Taylor, Ilo I., Former Professor.**  
In charge of Engineer Depot at Fort Lee, Petersburg, Va.

**Thurstin, Robert A., '17.**  
U. S. Army, Officers' Training Camp.

**Tolman, Crit. C., Ex '14.**  
U. S. Aviation Corps.

**Tongue, Walter B., Ex '18.**  
Second Lieutenant Aviation Corps. In Canada or France.

**Townsend, Albert, Ex '19.**  
Sergeant Company A, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.

**Trounce, Henry D., Ex '12.**  
Lieutenant, English Army.

**Van Burgh, Lisle R., '17.**  
First Lieutenant, 115th Engineers, U. S. A., Camp Kearney, Linda Vista, Calif.

**Van Dorp, G. H., '15.**  
Second Lieutenant, 507th Engineers, Service Bn., Camp Travis, San Antonio, Tex. Mail address, 1115 Polk St., Topeka, Kansas.

**Vorck, Charles R., '16.**  
Corporal Company A, 115th Engineers, Camp Kearney, Calif.

**Whitehurst, John W., '10.**  
First Lieutenant Field Artillery (home address, Salida, Colo.)

**Williams, Wm. H., Ex '18.**  
Second Lieutenant, U. S. O. R. Corps, Ft. Riley, Kansas.

**Witte, H. G., Ex '20.**  
115th Engineers, Camp Kearney, Calif.

#### CAMP KEARNEY.

The following interesting letter from Camp Kearney was written by Richard Goetze, native Golden boy, who is now supply sergeant for Company A, the Golden Company of the 115th Engineers:

"The weather is sure great, cool at night and like July during the day.

"The drafted men have been coming in at a good rate. All the boys are kept busy and you can rest assured that there are no dull moments here.

"Three Y. M. C. A. buildings are now located in camp and another going up near our quarters. Believe me the "Y" is doing a great work which no other organization could do. Every night the "Y" buildings are packed full. In order that the men may be provided with clean entertainment there is a lecture or movie every night. Then there are stunt nights and you would be surprised the talent there is in camp. Band concerts are given occasionally. In fact all the amusement a fellow wants is right here.

"The fellows in charge of the Army Y. M. C. A. are fine ones. I learned the other day that one in charge here gave up a fine position in order to be here with the boys in camp. He tried to get into the service, but was turned down for some slight defect and in order to do his "bit" became associated with the Army Y. M. C. A.

"You would be surprised at the amount of work that has been done of late. Electric lights are being placed in the tents and sides boarded up part ways.

"Company A made a record on the Liberty Bond. How does \$7,000 sound to your Goldenites. You never hear any one in camp doubting them as an investment.

"The clamp sure has been put on women and booze. The moral welfare of the men is looked after in great shape. The United States is trying to avoid a repetition of what they have in Europe—one-fourth of the men in the hospitals are there because of disease. Here is where the "Y" gets in its good work by providing wholesome amusement for the men when they are off duty.

"We took the physical examination today for the "bugs", which means that the lung specialists gave us the once over. I understand there are some more examinations ahead.

"A small fire occurred some place in camp last night about ten o'clock. You should have heard all the bugles "fire call" at one time. Some noise.

"I understand that there will be a big Y. M. C. A. drive next week to raise \$35,000,000. No doubt Golden will do its share, and don't be a "tight wad" when they get your number." (Colorado Transcript, Nov. 15, 1917.)

# FOOTBALL

Lindley M. Reith.

## DENVER UNIVERSITY TIES UTAH AGGIES FOR CHAMPIONSHIP.

Denver University and the Utah Aggies stand at the top of the list in the Rocky Mountain Conference. D. U. has played more games, but there is no reason to expect them to claim the championship until they play and defeat the Aggies.

Mines holds down fourth place, with the University of Colorado in third.

### MINES 16; COLORADO COLLEGE 7.

Union Park, Denver, November 10, 1917.

Coach Parsons had prepared the Mines team for a strategic start, the execution of which was a great success. Colorado College kicked off to "Chuck" Schneider who made no attempt to gain ground, but ran across the field passing Pittser, near the goal posts, to whom "Chuck" slyly delivered the ball. Pittser made a quick return punt which passed over the heads of the C. C. men who were all sweeping down to stop the advance of the Mines. "Chuck" had remained behind Pittser making himself eligible to get possession of the ball whether C. C. touched it first or not. The moment the ball left Pittser's toe "Chuck" was going and he kept on going until he grabbed the ball after a hard swift run down the field. The C. C. players had been fooled and Mines had the ball on their opponents 30 yard line. In four plays Mines had a touchdown, before the game was three minutes old. Pittser kicked the goal. Score: Mines 7; C. C. 0. Mines now had a good start which all were thankful before the game had progressed many more minutes, because it was soon evident that the Tigers were going to put up a strong fight.

C. C. came close to scoring later when Mimmack dropped back for a Princeton from the 33 yard line; the kick was blocked and recovered by Pittser who gained 17 yards. Mines was soon forced back to their 25 yard line from where an attempt to pass lost 10 yards. Mines punted, C. C. running the ball back to Mines 40 yard line, from which place they tried a pass which was intercepted by "Snick" Schneider. The quarter soon ended. Score: Mines 7; C. C. 0.

### Second Quarter.

Neither side making any effective gains at straight football a punting duel was resorted to by Pittser for Mines and Flegal for C. C. "Chuck" finally broke loose for a 10 yard gain around left end, then "Snick" sprinted down the field for 30 yards; "Chuck" made 9 more, putting the ball on the College 17 yard line. A line smash by Pittser and an end run by "Chuck" put the

ball very near the goal line. C. C. lined up to receive a strong line attack, but "Snick" forward passed to "Chuck" and the second touchdown was made. Pittser failed to kick the goal.

Here C. C. began to show a terrific attack, which caught the Miners a little off guard and the Tigers commenced gaining consistently, but they soon resorted to forward passes with no success and were forced to punt. Mines now started some effective offensive but a fumble put the ball in the hands of a C. C. man. They carried the ball to Mines' 18 yard line. Then short gains and a penalty of 5 yards put the ball on the 5 yard line. C. C. was confronted here with a stonewall and tried a pass but there was no one to receive it and the ball went to Mines on the 20 yard line. Mines were forced back to their 15 yard line when the half ended. Score: Mines 13; C. C. 0.

### Third Quarter.

There was a good deal of punting at the beginning of this quarter, Mines getting the better of the contests. Coulter blocked one of C. C.'s attempts, and another attempt on C. C.'s part only gained them 10 yards, the ball crossing the side line. "Snick" soon made a 23 yard pass to Coulter, then Mines lost 4 yards on a play and 5 for offside, but these losses were made up again when Pitts successfully passed to Poulin for a 10 yard gain. On the next play Flegal broke through and nailed "Snick" 5 yards behind the line. Pittser tried to drop kick from the 45 yard line the ball falling short and went to C. C. on their 20 yard line. The Tigers were soon forced to punt, Pittser made a return punt which was followed down by Coulter who nailed the receiver the instant he caught the ball. Here the College made a successful pass of 35 yards, followed by another successful pass which put the ball on Mines' 20 yard line. The quarter ended. Score: Mines, 13; C. C. 0.

### Fourth Quarter.

C. C. tried a forward pass from the Mines 20 yard line with no success. Then they seemed to concentrate their strength, for by straight football efforts they put over a touchdown. The goal was kicked. Score: Mines 13; C. C. 7.

The Tigers again struck out for the goal line but were halted on the 15 yard line by a fumble and the Mines' supporters breathed easier. Mines soon put over a great play, when "Chuck" broke away from the C. C. 20 yard line on one of the most spectacular plays Coach Parson had framed up. Poulin made a clever deception of receiving the ball and struck out for a long end run to the right, huddled up like he was concealing the ball. Most of the C. C. men headed for him. But "Chuck", unnoticed, carried the ball around left end and sped down through a clear field to a touchdown. But the referee, possibly overcome by the clever deception and swiftness of execution of the play coupled with its unexpected appearance,

ruled the play out of order and the ball came back to the starting point. The Mines roofing section was in a turmoil. The Mines players were undoubtedly disheartened, but aside from the necessary confusion of questions and explanations, which lasted several minutes, they bore the decision with a sportsmanlike spirit. Pittser kicked to C. C.'s 40 yard line where a fumble gave the ball to Mines. A couple of downs took the ball a few yards further, then Pittser booted a perfect drop for the final points of the game. Score: 16 to 7. Mines carried the ball from the kickoff to C. C.'s 18 yard line, from where Pittser made 17 yards. "Chuck" was held gainless. Then "Pitts" took the ball, but the line had piled up in a heap in front of him and he hurdled. The referee adjudged the maneuver illegal and it cost Mines a penalty of 15 yards for unfair tactics. The Mines were momentarily disconcerted. An attempted forward pass fell into the opponents hands and they swiftly carried the ball to safe territory. The game lasted but a few moments longer. Final score: Mines 16; C. C. 7.

This was by far the greatest football game of the season. Both teams put up excellent exhibitions. There were no dull moments and many tense ones, some exceedingly so. The Mines team was in top notch form. Pittser, "Chuck" and "Snick" all played stellar ball. Coulter gave a splendid account of himself at right tackle being many times on the job at receiving forward passes and frequently breaking them up for the

Tigers. Linderholm spoiled many chances for the other side. Not a few times did Mechin figure in breaking up plays. Poulin played his last game for Mines this year. Without a doubt he will be missed as his job was always well handled. With but few exceptions everybody did mighty well throughout the entire game.

The lineups follow:

MINES.	POSITIONS	COLORADO
Linderholm	L. E.	Flegal
Gallucci	L. T.	Tucker
Clough	L. G.	Ainsworth
Mechin	Center	Thomas
Benbow	R. G.	Ed. Hughes
Coulter	R. T.	Brumfield
Bunte	R. E.	Thompson
Poulin	Q. B.	Sheppard
H. G. Schneider	L. H.	Mimmack
C. Schneider	R. H.	Verner
Pittser	F. B.	Walt Hughes

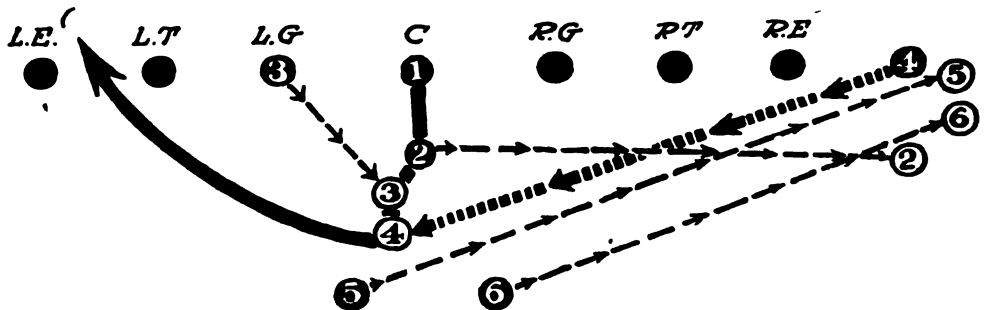
Substitutes—Mines: White for Bunte, Bunte for White. Houssels for Gallucci. Colorado College: Wildie for Hughes, Waugh for Mimmack.

Scoring—Mines: Touchdown, Pittser, C. Schneider. Goal from touchdown: Pittser. Drop Kick: Pitts. Colorado College: Touchdown: Mimmack. Goal from touchdown: Mimmack.

Officials—Jack Coffey (Fordham), referee; Ted Stuart (Michigan), umpire; Stutsman (Iowa), head linesman.

Timekeepers—Mines: Frank Reinhard; C. C.: Shorb.

## HOW MINERS PLAYED HIDDEN BALL TRICK ON C. C.



The Miners' "Hidden Ball" Trick Play Diagrammed. The black circles indicate the players lined up in scrimmage. The white circles show same players at a moment after the ball has been put in play, indicating only those who take a conspicuous part in the deception. The heavy line from center and then to different players shows course of ball; dotted lines indicate courses taken by players. Center (No. 1) passes ball to quarterback (No. 2), who in turn passed it to left guard (No. 3) and he turns, hiding ball in bosom and waits for No. 4, stationed at extreme right end of line. Nos 5 and 6 with No. 2 run to right, pretending No. 2 has the ball and when defensive team has swung around to the Miners' right side, No. 4 is in place to take ball from No. 3 and run through unguarded left end of his line. That is how the Golden team made the play. Referee Coffey did not allow the resulting touchdown because he said the center passed the ball to the left guard and omitted the formality of the quarterback receiving it, which, under the rules, is illegal.

**MINES, 0; DENVER UNIVERSITY, 51.**

Union Park, Denver, November 17, 1917.

By superior playing Denver University treated Mines to a severe defeat. The Denver team was in excellent form and they played as though they had been waiting for this game to show just what they could do. Their attacks by Gibson and Anderson were the causes of most of the havoc. With few exceptions these two were consistent gainers and were mighty effective on defense. Gibson made six touchdowns himself. Both he and Anderson are big fellows and their weights were considerable assets to them.

Though one-sided and not enjoyed, perhaps, by the Mines' rooters, the game afforded many interesting features in the way of sensational plays. Mines was awfully close to a touchdown in the first half when "Chuck" ran back a punt for a gain of 50 yards, taking the ball to D. U.'s 25 yard line. By a pass and two line bucks Mines got the ball to the 3 yard line, but here a nasty fumble was recovered by D. U. who immediately kicked out of danger.

Without the intention of crabbing, nor being neglectful of the proper spirit of a good loser it is only fair to say that the Mines team was not in very good shape. No insinuation is made that if the Mines had been in normal condition they would have beaten D. U., but when one regards the various injuries of some of the men it can reasonably be stated that with everybody in the form he was in when the Mines played C. C., there would have been a closer score. "Snick" was handicapped with an injured leg and a lame arm and could not put up his usual fight. Pittser was in poor condition, relieved once, but trying again later. The fact that it was necessary to take time out several times for him is evidence that he was not in good form. Mechin wasn't in very good shape either. Coulter had a shoulder that wouldn't stand any hard playing, especially tackling.

Mines tried several forms of attack, spread plays, forward passes and straight line plunges, but D. U.'s eleven men were in the way most of the time, preventing consistent gaining. A strong wind made passing dangerous. There were times when Mines would make good gains; especially effective were Pittser's close in center smashes. "Chuck" made some nice gains and if old Tough Luck hadn't been on his side the Mines' score wouldn't have been a goose egg. A summarized account of the game follows:

**First Quarter.**

The game opened with a short kickoff by D. U. which was recovered by them on the 45 yard line. They made one first down then lost the ball. Mines failed to gain, was penalized 5 yards for holding, then Pittser punted. D. U. fumbled on their 20 yards line, Coulter recovering. Mines lost ground and Pittser dropped back to the 40 yard line for a Princeton which failed. D. U.

made four successive first down carrying the ball to Mines' 3 yard line. After three attempts D. U. put over a touchdown. The goal was kicked. Score: Mines 0; D. U. 7. D. U. Kicked off to "Chuck" who advanced 50 yards to their 25 yard line. "Snick" made a long pass to Coulter, the Mines' rooters were in tension ready to explode, but the pass was too high and Coulter couldn't reach it. Then "Snick" made a perfect pass to "Chuck" netting 10 yards. Pittser plowed across for 9 yards and Bailey made it to D. U.'s 3 yard line. Then Mines fumbled, D. U. recovered and the chance was gone. D. U. punted 35 yards, A pass by Pittser landed in the opponent's hands. After going 25 yards Anderson fumbled, Mines recovering on D. U.'s 45 yard line. Here the quarter ended. Score: Mines 0; D. U. 7.

**Second Quarter.**

Mines gained 35 yards then fumbled on D. U.'s 15 yard line where D. U. recovered; they gained 16 yards and punted to Mines 40 yard line. Mines made 25 yards, then two smashes and a pass failing, Pitts booted 20 yards against the wind. D. U. fumbled on the fourth down after gaining 9 yards in three. Mines got the ball on downs, then lost it by a fumble. D. U. made 19 yards in two downs, then Mallet, for D. U., made 31 yards through center, landing the ball on Mines' 14 yard line. They made 8 yards more, then fumbled and Mines recovered on their own 6 yard line. Pittser punted against the wind, gaining only 15 yards. In a few more plays D. U. made another touchdown. The goal failed. "Chuck" received the kickoff and advanced the ball 25 yards. Pittser made 10 yards. Mines was penalized 2 yards for overtime called out. Mines made 13 yards more then tried a forward pass which failed and Pittser booted. The wind carried the ball back for no gain. Gibson and Anderson, alternating, carried the ball 50 yards for another touchdown. Goal was kicked. The half ended. Score: Mines 0; D. U. 20.

**Third Quarter.**

Mines kicked off. D. U. made one first down, then tried passing, and Mines got the ball on the 45 yard line. A successful pass, Pittser to Coulter, made 8 yards. Another attempt at the same pass failed. Pittser made first down through center. Mines failed with two passes. "Pitts" tried a drop from the 45 yard line with no luck. D. U. made 38 yards in seven downs, then Gibson ran 60 yards to a touchdown. The goal was kicked. D. U. kicked off to Pittser who ran clear to the right of the field and then made a long pass to the left to "Chuck" who was in fair position to make a getaway, but slipped and fell in dodging. Pittser kicked 45 yards. After D. U. gained 17 yards on straight football Gibson went around end and ran 40 yards to a touchdown. The goal was missed. D. U. kicked off to a touchback. Mines failed to gain

enough from the 20 yard line so Pittser kicked to the center of the field. D. U. fumbled and Coulter recovered. Mines made 9 yards then lost the ball on an intercepted pass. After D. U. had made ten yards Gibson took the ball for three successive gains of 25, 9 and 45 yards, the latter ending with a touchdown. The goal was not kicked. The quarter ended. Score: Mines 0; D. U. 39.

#### Fourth Quarter.

D. U. started right down the field and did not stop till they had made a touchdown. Goal failed. They kicked off 15 yards against the wind. Mines tried their triple pass which was interrupted before completion. Pittser made 4 yards through center, then tried a drop kick which was blocked, the first time this season a Mines kick has been blocked. "Chuck" recovered and Pittser kicked 60 yards, the wind being in his favor this quarter. D. U. netted 32 yards in five downs, then Gibson went 30 yards for six more points for D. U. They kicked off. Two passes failed for Mines. A punting duel, a short gain by Mines and the party (?) was over. Final score: Mines 0; D. U. 51.

Losing this game put Mines out of the running for the championship.

#### Lineup

Mines		D. U.
Linderholm	..... L. E. ....	Lowestetter
Houssels	..... L. T. ....	Boyd
Benbow	..... L. G. ....	Wilson
Mechin	..... Center .....	Brandt
Clough	..... R. G. ....	Guerra
Coulter	..... R. T. ....	Lendrum
White	..... R. E. ....	Rantschler
Bailey	..... Q. B. ....	Andrew
H. Schneider (c)	..... L. H. ....	Anderson
C. Schneider	..... R. H. ....	Gibson
Pittser	..... F. B. ....	Mallett

Substitutes: Mines—Bell for Pittser, H. Miller for Bailey, Hardy for Mechin, G. Miller for H. Schneider, Pittser for H. Miller, Gifford for Coulter, Mulford for Benbow.

Denver—Mason for Boyd, Bartlett for Mallett, Hosmer for Brandt, Phillips for Lendrum, Lendrum for Rantschler, Flint for Lowestetter, Wyman for Gibson, Huling for Anderson.

Officials: Jack Coffey (Fordham), referee, Ralph Glaze (Dartmouth), umpire; Shaeffer (Ohio State), head linesman; Frank Reinhard, timer for Mines; Robt. Stovall, timer for D. U. Time of quarters, 15 minutes.

#### MINES, 27; COLO. AGGIES, 6.

Union Park, Denver, November 24, 1917.

There was a lot at stake for both sides in this game—they were contesting for the big trophy of the Cellar Championship. Perhaps the Mines realized this more than the Aggies did, for the latter had been in possession of the cup all season and were used to looking at it, while the Mines were horrified to realize the circumstance of having to take it over, especially so when it

was only a week previous that they were battling for a chance at the championship of the top.

#### First Quarter.

The beginning of the game showed that the Mines were not the only ones determined to win the game.

After the kickoff by Mines, Aggies fumbled and Mines recovered, made a short gain, then lost the ball on an intercepted forward pass.

Aggies got the ball to the 30 yard line and then by means of their "million dollar play"—a multiple pass affair—they made a touchdown. The goal was not kicked. Pittser was sent in to relieve Bell and was soon smashing through center, then not being stopped kept on going 60 yards to a touchdown. Pittser has made some mighty big gains on that center rush. He receives the ball from a position just back of the guard, rushing through an opening that has been prepared by the primary men. There was no more scoring during that quarter. Score: Mines 7; Aggies 6.

#### Second and Third Quarters.

In the second quarter Mines used the forward pass effectively and scored another touchdown by this method, but the goal was missed. Throughout the remainder of the second period and all of the third period there was no more scoring by either side. Score: Mines 13; Aggies 6.

#### Fourth Quarter.

In the last quarter the forward pass continued to do the work. During this period our big Mulford made a great play when he rushed among a gathering of Aggie players, leaped into the air and seized a forward pass hurled by Pittser and gathering the ball in with all his might he turned on his toes for a sprint to the goal line 30 yards away. He succeeded in making his way, passed a few of the Aggies but before he had gone far a burly farmer dragged him down, but he had gained 20 yards for Mines. "Snick" received a pass next and started for the goal line. The Aggie safety man grabbed him but "Snick" worked loose and kept on going for a touchdown. Pittser kicked the goal. Just before the close of the game "Chuck" got loose and started down the sideline for 45 yards, taking the ball to the 10 yard line where two line bucks netted 6 yards, then Pittser went over for the last score of the game, just as the pistol popped. The goal was kicked. Final score: Mines 27; Aggies 6.

The Aggies could not develop the punch. At times they would gain a couple of first downs and then they would be unable to budge the Mines' line an inch. Most of the tackling was done by the linesmen.

Though the Aggies repeatedly ran plays over the tackle behind a two-man interference, Coulter would get through and down the man with the ball nearly every time.

There were spectacular forward passes



and a very apparent absence of rough playing, which coupled with the fact that the ball was continually changing hands made the game an exceedingly enjoyable one to look at.

This was "Cap" Schneider's last appearance in a conference game and although badly crippled from previous contests and hobbling about on one foot, he was at all times playing a splendid game, with his offensive work as well as defensive, though there was not much need of the latter, the line did so well.

"Chuck" Schneider managed to keep the excitement almost continuous. Bailey deserves lots of credit for his able managing of the plays. Pittser has forced us to expect a lot of him and he came through and fulfilled all expectations with a little bit more besides sometimes. Coulter played to advantage all the time and spoiled many a play that might have otherwise proved advantageous to the Aggies. Mechin was usually hard to find when an Aggie play got broken up, because he was generally on the bottom and a main part of the cause of it all. Linderholm maintained a consistent defense and at times figuring in the offensive passes. Clough, Mulford, Bunte and Benbow gave lots of trouble to the Aggies and though seldom given the opportunity to feature they figured strongly in most of the plays. Guy Miller gave mighty good service while he had a chance, but unfortunately he came out of the game a little battered up, but will, no doubt, be feeling first rate after a good rest.

Lineup.

MINES		AGGIES	
Linderholm	.....L. E.....	Klemmedson	
Clough	.....L. T.....	Hoerner	
Mulford	.....L. G.....	Peasley	
Mechin	.....Center.....	Strohm	
Benbow	.....R. G.....	Oldemeyer	
Coulter	.....R. T.....	Leiby	
Bunte	.....R. E.....	Gratton	
Bailey	.....Q. B.....	Schiele	
C. Schneider	.....L. H.....	McMillen	
G. Miller	.....R. H.....	Sweitzer	
Bell	.....F. B.....	Kimball	

Touchdowns—Aggies: Gratton. Mines: Pittser 2, Bunte and H. Schneider. Goal after touchdown: Pittser 3.

Substitutes—Mines: Pittser for Bell, White for Bunte, Bunte for White, Houssels for Mulford, H. Schneider for G. Miller, Mulford for Houssels. Aggies: Ray for Oldemeyer. Doehling for Sweitzer, Rhodes for Leiby, Michele for McMillen.

Officials—Crowley (Denver), referee; Bansbach (Stanford), umpire; Aldrich (So. Dakota), head linesman.

Timekeepers—For Mines, Frank Reinhard (Mines, '05). For Aggies, Yersin.

**MINES, 14; CREIGHTON, 34.**

Omaha Neb., November 29, 1917.

Mines ended the season with a trip, going to Omaha, Neb., to contest with Creighton on Thanksgiving Day.

Creighton took the game away from the Mines in the last ten minutes of play. The contest was pretty even up to the middle of the fourth period when the score was 14 to 13 in favor of Mines. At this stage Creighton held Mines near their 20 yard line. A fumble gave the ball to Creighton who went over for a touchdown. Two more fumbles with similar consequences gave two more touchdowns, making the final score 34 to 14 in favor of Creighton.

The contest is recorded by the northern papers as one of the most stubbornly fought football games ever witnessed in Omaha. There seems to be a diversity of opinion as to which was the better team, but reliable information gives Creighton credit for that distinction. It is claimed that the Creighton men were considerably heavier.

Lineup.

MINES		CREIGHTON	
Mechin	.....Center.....	Berry	
Mulford	.....L. G.....	Healy	
Benbow	.....R. G.....	Kolda	
Clough	.....L. T.....	(c) Morgan	
Coulter	.....R. T.....	Coyne	
Linderholm	.....L. E.....	Hull	
Bunte	.....R. E.....	Emery	
Bailey	.....Q. B.....	Harmon	
H. Schneider	(c).....R. H.....	Moonan	
C. Schneider	.....L. H.....	Mullholland	
Pittser	.....F. B.....	Leahy	

Substitutes—Mines: Houssels for Mulford, White for Bunte, H. Miller for H. Schneider, Bell for Pittser.

Creighton—Jones for Healy, Little for Kolda, Martin for Little, Connors for Harmon, Bigelow for Berry, Berry for Mullholland, Carrol for Emery.

Officials—Brennon (Ames), referee; Jones (Yale), umpire; Hascall (Neb.), head linesman; Victor Ziegler (Iowa), Timer for Mines. Time of quarters, 15 minutes.

**OTHER GAME RESULTS.**

- Boulder, 18; Colo. College, 17.
- Boulder, 19; Utah U., 9.
- Boulder, 0; Utah Aggies, 23.
- Boulder, 6; Colo. Aggies, 0.
- Utah U., 25; Colo. Aggies, 12.
- Utah U., 0; Utah Aggies, 14.
- Utah U., 0; Univ. of So. Cal., 51.
- D. U., 18; Wyo., 0.
- D. U., 28; C. C., 7.
- D. U., 20; William Kendall, 19.
- C. C., 7; Colo. Aggies, 0.
- Wyo., 8; Greeley Normal, 0.
- Wyo., 11; Greeley Normal, 0.

**CONFERENCE AVERAGES.**

Team	Won	Lost	Pct.
1. D. U. ....	6	0	1,000
2. Utah Aggies ....	4	0	1,000
3. Boulder .....	4	2	.666
4. Mines .....	3	2	.600
5. C. C. ....	2	3	.400
6. Utah U. ....	2	3	.400
7. Wyoming .....	1	4	.200
8. Colo. Aggies .....	0	7	.000
9. Montana State ...	0	1	.000

### POST SEASON GAME.

When Denver University declined playing a post season game with the Utah Aggies for the benefit of the Red Cross and incidentally to settle the Conference Championship, Coach Parsons immediately informed the Utah Aggies that Mines would gladly play a game for the Red Cross. The Utah Aggies had offered to play D. U., but when D. U. refused the Aggie team disbanded and sent word they could not arrange to play a post season game with us.

### THE COACH.

Some of us may have expected to win the Rocky Mountain Championship, but if we had it would have been due to phenomenal accomplishments. To make a championship team out of twenty-three men, when twenty-one of them never played college football before, certainly could be called a phenomenal development. However, all great accomplishments do not always bring glorious results—right away. Even though our team did not win the championship we have some team and to have some team developed from the nucleus there was to start with here is quite a marvelous feat if it isn't a phenomenal one. Sometimes there is greater genius concerned in developing a team such as ours is and starting with the material Parsons started with, than there is in developing a championship team, in one season, from a bunch of veterans.

With the exception of the D. U. team our team hasn't been beaten by a better team this season. The D. U. team is composed of a good many veterans or perhaps a few who are sufficiently good in themselves to bring false glory to the team as a whole. When we played D. U. our team was nearly half crippled.

Our team has done itself proud this season and we should feel mighty fortunate in having for a coach the man we've got.

If the School is lucky enough to have Parsons here next year and most of the men come back (only two won't be back for sure), the opponents of the Mines will be fortunate if they score against our team.

We're hoping to have the coach with us throughout the basketball and baseball seasons and will be satisfied if he is only half as good as a basketball or baseball coach as he is a football coach, although we will be mighty glad to find out that he is just as good in the coming sports as he was in football.

### The Assistant Coaches.

Mines has been receiving the benefit of the advice of some of the coach's friends who are prominent alumni of Iowa. Dr. Packard (Iowa, '13) graduated in medicine, and besides giving much valuable football instruction to the fellows he has acted as squad physician, all for the simple compensation of "Thank you." This service was

not solicited but came through the mutual friendship of Doc and Coach Parsons, and has been a wonderful aid to us, professionally and financially. Dr. Packard has moved his family to Golden, having taken over Dr. Minnig's practice. We are all glad of Packard's change.

Dr. Farnsworth (Iowa, '17), also graduated in medicine, and along with Dr. Packard has been with the team nearly all season, rendering services that would otherwise have been lost to the squad.

Buckley (Iowa, '13), one of the middle west football stars and an all western end, visited the football field several times during the season, and his instructions to the fellows were invaluable and we are mighty thankful Coach Parsons has such friends.

### THE FOOTBALL MANAGER.

We've got to hand it to R. W. Gibson, our football manager. He has pulled the football team through the season in mighty fine style. He arranged eight games and wound up the season with a trip. We aren't in the hole either, in spite of the fact that two of the games cost around a thousand dollars apiece. Gibby has given football most of his time, very often sacrificing important personal obligations that would have been more profitable and entertaining to him. Managing a football team is no soft snap and Gibson has done his duty and no more can be expected.

### ONLY TWO MEN WILL LEAVE THE SQUAD BY GRADUATION.

Only two of this year's team are slated to be absent from next year's Mines' squad. Captain H. G. Schneider and Roger White will graduate next May. All other members of the squad have one or more years ahead of them here.

Captain "Snick" Schneider has been with football throughout his four years here. As a freshman he was also captain of his class team playing at left tackle. When a sophomore he made the varsity playing left end. His junior year was passed playing left end on the varsity. His ability in this position was appreciated by the critics and he received the honor of all Colorado end that season (1916). This year "Snick" played halfback. He is speedy, strong and a hard player, all of which makes him better qualified to play behind the line than on it. He was unfortunate this season because, after playing only a few games, he received injuries which handicapped a performance in keeping with his ability. In spite of a wrenched leg and a bad bruise under one arm that caused constant discomforture throughout the latter half of the season, "Snick" was one of the stars of this year's team. He has made an ideal captain, maintaining the proper spirit among his teammates, both in the games and in practice. He displayed unusual ability in meeting the problems of the various games and was al-

ways considered a true sport by all his opponents.

"Red" White's career in the padded uniform was a brief one in the point of years, for Roge did not persuade himself to try until this year, which fact is perhaps a regrettable one to the squads of the past two seasons. "Red" showed considerable ability, which, together with his willingness, made him a valuable asset to the team. He played right end and should not be ashamed of his performances there. No doubt with more experience he would have been a phenomenal player, but every man is handicapped more or less until he has gained the knowledge only experience can teach. The fact that he really enjoyed playing made it easier for him to make good.

#### BASKETBALL SEASON STARTS.

Basketball started Monday evening, December 3rd. Prospects are good.

#### AN APPRECIATION.

Because we are likely to unconsciously overlook important things sometimes let us be reminded of a valuable service that has been rendered us. Dave Johnston served us an Athletic Director up to the D. U. game, when Coach Parsons took over the job by action of the Board of Trustees. Dave was not dishonorably discharged by any means. The job is more becoming to the Athletic Instructor and Coach than to any other individual, and as the season opened with a new man as Athletic Instructor and Coach, who was not acquainted with conditions here, Dave willingly offered his services until the time came when the new coach was sufficiently familiar with local affairs to assume the position of Athletic Director himself.

Dave gave us mighty good service during his short tenure, displaying a very creditable business ability. For this service we should all be grateful to Dave. There is lots of work attached to securing and handling the athletic goods and auditing the accounts as well as various other tasks that come before the Athletic Director. Then there is not much glory connected with the job either. I dare say a great many of us do not know there is an Athletic Director here. At any rate most of us do not realize the necessities attending the carrying on of a successful football season and we are apt to fail to appreciate the fundamental things that make it possible for us to have a football team to root for.

The name of Dave Johnston is part of the history of this School—since 1908 anyway. There is no one connected with our institution who has been readier than Dave to always be of service to Mines.

So shouldn't we try in some way, even if by small favors, to show our appreciation? Dave is mighty good natured for which reason some of us who do little thinking eagerly seize the opportunity to make him

the goat whenever the occasion arises. Let's remember this and when three or four or five of us get together around "dat green mat and dem dice" let's not try to entice the house to be represented too often because practically the little stand in the corner could not be possible as a gift counter, which latter it frequently resembles when the ivory cubes turn against their master.

#### COACH PARSONS MARRIED.

##### School Will Get a Dance.

At the last rally we had, Coach Parsons announced when he got married he would give the entire school a dance. Of course, we unanimously accepted the invitation, though few realized the wedding would take place so soon. Some even said that he was just joking about his wedding. Later the announcement gave December 15th as the date.

However, Parsons lived up to his reputation for springing surprises, and was married Saturday, December 1st, to Miss Isabella Hill of Denver.

The wedding was the outcome of a football romance. The Mines coach met his bride in Chicago, her former home, when he was an All-American star with the Iowa team. A fast friendship sprang up, and when the young woman moved to Denver the Iowa star started casting about for an excuse to be in the same neighborhood. The athletic directorship at Golden looked inviting to him. The rest of the story is easy to imagine.

The bride has lived in Denver for three years. She made her home with her brother, James A. Hill, at 1010 Monroe Street.

#### SENIOR NOTES.

This is perhaps the smallest senior class in years, there being only eleven possibilities for graduation. However that number is sufficient to maintain the customs of the institution and carry out the duties that fall to us.

A full schedule has been presented to us and although we are attempting to carry it out in a creditable manner some find time to keep dull care down by administering the "abdominal massage" to the weaker ones. One interesting exception to the weaker ones always being the recipients occurred one morning in the hall at Stratton after Prof. Palmer had finished one of his "talks." Tsen was approached in a kindly manner by Cope but did not have the good judgment to show Cope the proper respect in his conversation, with the result that Snick and Dick were obligated by a triple alliance (previously negotiated) to go to Cope's assistance. Tsen was consequently placed in a horizontal position on the floor with that part of his anatomy uppermost which receives the osteopathic treatment given to rebels, indiscriminate jokers and the like, and the necessary massage was adminis-

tered. To be sure there was great resistance, in fact such a stubborn resistance that the undertaking very nearly proved a failure. But amid heart rending screeches of "no reason, no reason" emitted from the victim, the deed was finally accomplished. Ts'en nearly got revenge on Dick with the aid of a half Nelson but had to give up, overcome with exhaustion. The melee was much enjoyed by all witnesses.

That episode is a reminder of one of a little different nature taking place later in a Pumps lecture. Chiang was copying some material from the board with frequent ejaculations very unbecoming to a young gentleman; the reason for such an expression of the vile could not be learned. Naturally the situation became embarrassing to the chaste ears of those within hearing distance, so Gibby, who was seated right behind Chiang, believing him to be suffering from a temporary malady and unconscious of the discomforture his ill chosen expressions were causing, asked Chiang, in a kindly way, to stop. But Chiang gave no response other than to continue his audible use of corrupt words. Finally Gibby repeated his request. This time Chiang replied, in a warning tone, "Shut off, don't bother." Naturally Gibby was astonished and thinking Chiang misunderstood his intentions he again repeated his polite request at the same time reminding Chiang how offensive his swearing was to the fellows who had to listen. This only aroused Chiang's ire, with a desperate attitude and a fiery glance he turned on Gibby and by a hasty manipulation of his fountain pen he squirted ink all over Gibby, and Snick too, who was sitting beside him. This brought the affair to a climax. But after considerable negotiating Chiang was let off easy by being allowed to simply get a new shirt for Snick and apologize to Gib. So far, however, Chiang hasn't fulfilled the agreement.

Other events of various natures have occurred from time to time, especially noteworthy was a free-for-all rubbing match in the Gym Hall a few weeks ago. It was the seniors against Albi and his gang, the latter consisting of Hardy, Johnson and others of the Sad Class (meaning, of course, the Class of 1920). Needless to mention, the seniors triumphed.

Perhaps another event of interest is one that took place earlier in the term when Albi issued the challenge that no five seniors could wrinkle him. Five of the red bloods instigated a demonstration to prove that Albi was woefully misinformed. Very soon Abe saw where he had erred and retrieved by claiming that no four could get away with it. This statement was also hastily taken under advisement and speedy actions soon suggested to Abe that he was again wrong. He then gamely but hesitatingly announced he didn't think three could manage it. But by the same methods previously resorted to he soon

weakened but finally exclaimed bravely that no one man could wrinkle him. But when he excepted Cope the others began to feel sympathetic for him and did not offer any argument.

Many little occurrences like these are causing our last year to pass by more or less in a diversified fashion, and somewhat hastily too. The draft is causing some anxiety for those who feel that they may be called soon as they are doubtful what course to pursue with regard to School. All want to finish, but those who expect to be drafted near the first would like to affiliate with the branch that appeals to them, before they are drafted. There is a question as to whether we will be allowed to graduate first or not. Dr. Alderson is seeking information on the matter.

Doc. Roberts has asked for a better attendance in his lab courses. To stimulate interest, Wiswall of Denver has had the movie camera here taking scenes of the fellows in various attitude of their work, viz., helmet and first aid, ore dressing, assaying, chemistry, etc. In these numerous demonstrations the following stand way above the rest as movie actors of no mean ability: Copeland, Schneider and Albi.

Chiang has come out with strong praise for the honor system.

The class elected the following officers for this year:

President, Reith; Vice-President, Allan; Secretary, Copeland; Treasurer, Gibson, Editor, White.

#### FRESHMAN NOTES.

J. E. Edgeworth.

On the evening of December fourteenth, 1917, the Annual Freshman Ball will take place in Guggenheim Hall. The greater part of the success of this affair rests upon the president of the class and his committee, which consists of E. E. Bowers, chairman, G. W. Schneider, H. P. Finley, L. P. Rooney, H. M. Connors, C. F. De Bardereben, Jr., L. W. Prentiss, W. P. Hopkins, J. W. Baldwin and N. E. Johansen. The remainder depends upon the class. It is hoped that the class will not in anyway hinder the committee by delaying with their little part. This committee does not have even time to eat. They are on the go all the time, but they can be assured that the class is behind them in their efforts to make the dance a success.

The Coach is no doubt a happy man, but from the sound of the buzz around school, the student body is no doubt just as happy. His cigars were fine, and we are sure that his dance will be better. Hip! Hip! Hooray! "Coach Parsons!"

We are in hopes that Prof. Van Tuyl will follow the same line of celebration should he take a similar step.

"I see Price has joined the army."  
"Good! If he doesn't advance rapidly, he'll be different from all the other prices."

## NEW QUARTERLY.

Volume 12, Number 3, July, 1917, Quarterly, is a revised reprint of an earlier edition describing the School of Mines Experimental Plant. Many new pictures have been added. As this issue is practically a reprint it will not be mailed to the regular mailing list though, of course, any one applying for a copy direct to the School or to us will be sent one.

Prof. Van Tuyl will present three papers at the meeting of the Geological Society of America, held in St. Louis, December 27 to 29. First—Types of North American Paleozoic Oolites; Second—A Revision of the Mississippian Formation of the Upper Mississippi Valley (in collaboration with Professor Weller of the University of Chicago); Third—New points in Ordovician and Silurian Paleo-Geography (in collaboration with Professor Savage of the University of Illinois.).

## EX-MINES PERSONALS.

'06.

O. E. Brown is still with the Hercules Powder Company as foreman, engaged in the manufacture of potash from kelp. Address Box 675, San Diego, California.

'09.

Forrest Mathez is back in Denver at his home address, 3222 W. 24th Ave.

'11.

William Edgar Patterson arrived at the home of Mr. and Mrs. A. L. Patterson, 211 Inez St., Fresno, Calif., on September 13, 1917.

## Intercollegiate Intelligence Bureau.

The Colorado School of Mines Branch of the Intercollegiate Intelligence Bureau has received to date over seventy special calls for young technical men for various branches of the government service. Many graduate and ex-Mines men have been recommended by Harry J. Wolf, '03, the local Adjutant of this Bureau which co-operates with the War, Navy, and Civil Service Departments in Washington, D. C. Hundreds of opportunities have been offered to young men who desire government service, and many of these appointments involve salaries ranging from \$1,000 to \$3,000 per annum. Graduates and ex-Mines men in all parts of the world are registered with the local branch of the bureau. In view of the fact that numerous vacancies may be filled by men who are not technical graduates, but who have had practical experience, the local adjutant will be glad to receive and place on file the experience records of any young men in Jefferson County who would be willing to accept government service. In filing applications for consideration, please state lowest salary you would consider and any other conditions which you find absolutely necessary, so as to save useless correspondence.

## ALUMNI

## NO MORE RECEIPTS MAILED.

Unless especially requested no more receipts will be mailed for subscription and alumni dues where the payment is made by check or money order and the account is closed.

The cancelled checks and money orders receipts are accepted as sufficient receipts by most large businesses everywhere.

The cost in time, postage, printing and stationery of mailing unnecessary receipts is too high a percentage of the amounts received for subscriptions and dues.

## PERSONALS.

'95.

F. S. Titsworth has enlisted in the Brotherhood of St. Andrew during the continuance of the war. His address will be care of Brotherhood of St. Andrew, Church House, 12th and Walnut Sts., Philadelphia, Pa.

'99.

## Fishermen Rejoice.

Fred C. Steinhauer, general superintendent of Denver parks, liberated 206,000 trout in Bear Creek from mountain park pounds Monday, November 26th. The fish were seined from the ponds and placed in large cans and taken to the stream. Virtually the entire day was required to complete the job. The fish were obtained by the park department from State and Government hatcheries last Spring and placed in the mountain ponds to grow to a size that would permit their being placed in Bear Creek. These ponds are the maturing grounds for the fish and they are placed in Bear Creek to afford fishing for the people in open season the following summer. The trout released exceeded two and one-half inches in length.

'01.

Harvey B. Small called at the School and visited friends in Golden on December 1st. He is on his way to Colombia to look after his property there. His address will be Guamoco Mining Company, care of Olimpo del Valle, Mangangué, Rep. of Colombia, So. America.

'04.

Albert C. Frank, Secretary and Treasurer of the Citrus Soap Company of San Diego, California, died at San Diego on Thursday, November 1th.

'05.

Frank J. Reinhard, of Golden, was elected County Chairman of the Jefferson County Division of the National \$35,000,000 War Fund Campaign of the Y. M. C. A. at a meeting of representative citizens and the clergy held Monday evening, November 5th, at the Methodist Church in Golden.

Announcement was made that the allotment of Jefferson County for this War Fund has been placed at \$2,000.00. Mr. Reinhard immediately named the following general committee: H. D. Pratt, W. J. Hazard, '97; S. T. Shipman, George W. Parfet, J. C. Roberts, E. A. Phinney, T. C. Vaughan, Rev. N. H. Lee, Rev. H. C. White, Rev. J. B. Youngblood, Rev. Gustave Lehman, John C. Vivian and D. E. Garvin.

The Jefferson County allotment for this Y. M. C. A. fund was considerably oversubscribed.

R. L. D'Arcy is Civil Engineer at Gilroy, California.

Prof. Richard L. Grider has changed his street address in Lawrence, Kansas, to 1301 Ohio Street.

E. M. Rabb is now Superintendent of the Ajax mine for the Carolina Company at Victor, Colo. Address care of the Company.

L. P. Pressler is Assistant Superintendent for H. W. Johns Manville Company at their asbestos mine about forty miles from Globe, Arizona. He writes that the place is delightful. Address Chrysotile, Arizona.

'06.

Thomas L. Chapman is Superintendent of the Gilsontite mines of the American Asphalt Association at Dragon, Utah.

'07.

Ray B. Emens (String), famous football star for Mines during his time here, was in Golden for a short visit just before the Colorado College game, November 10th. He addressed the rally the Friday night before the game and, of course, saw Mines beat C. C. on the tenth. Emens is Assistant Engineer for the Portland Gold Mining Company at Victor, Colorado.

George P. Moore has changed his address to Corner of Prospect Place and Summer Street, Bristol, Conn.

Gaston A. Bastonchury is President of the Bastonchury Ranch Company at Fullerton, California. The Company is composed of the three brothers, Gaston, Joseph and John. The ranch consists of 2,700 acres, 2,000 of which are in Valencia orange trees from one to seven years old. 400 acres are in lemons. The remainder will be planted within the next year or two. This is the largest citrus orchard under one management in the world. A brief enumeration of some of the details will give some conception of its size. There are 200 miles of pipelines from 16-inch to 4-inch. Monthly pay roll, \$8,000. 1,500 acres in beans this year. Expect to have 2,000 acres in beans in 1918. Several producing oil wells on the property. Seven water wells from which the water for irrigation is now pumped by electricity. Arrangements are being made to utilize the natural gas from the oil wells for pumping and other power. Three railroads touch or run into the property. When the orchard is in full bearing it will ship 2,000 cars of fruit a year. Some ranch, eh!

'08.

The following item concerning a well known Mines man is from the Congress Mining Journal, published in Washington:

"Times of stress bring into prominence those who possess unusual ability. An example of this is the work being done by C. E. Leshner, the geologist who is in charge of coal statistics for The United States Geological Survey. Exceptional demands have been made upon this branch of the Survey's work by the Fuel Administration, the War Industries Board, the Council of National Defense, the committee on coal production, and by the public in general. Not only has Mr. Leshner proven equal to the exacting demands that have been made upon him, but he has convinced all those with whom he has come into contact that more than being an excellent statistician he has a grasp upon the coal industry that causes his opinion to be sought by those charged with the heaviest responsibilities in meeting the unprecedented demands which are being made upon the fuel resources of the United States."

R. R. Bryan has been spending the summer and fall at his large apple orchard near Hotchkiss, Colorado. Bryan had a good crop of apples this year but lost a large proportion through the hard freeze in October. Bryan is now engineer for the Tomboy at Telluride, Colo.

Henry L. Jacques has received a commission as Captain, Engineering Section, U. S. O. R. Not definitely assigned yet. His address is Box 435, San Fernando, Calif. Jacques has been engineer for the Water Department of Los Angeles for years and was in charge of the construction of several of the most difficult sections of the wonderful Los Angeles Aqueduct.

Milton A. Pray is now Mining Engineer and Surveyor at Fernley, Nevada.

'10.

Lester L. Pullen is Superintendent in charge of the development of the property of the Copper Dog Mining Company at Parker Canyon, via Patagonia, Arizona. The Company has a very promising prospect.

S. W. Laughlin resigned as Mining Engineer for the Alpha mine, Consolidated Copper Mines Company at Kimberly, Nevada, to accept the position of Superintendent of the Montreal mine, Milford Copper Company of Utah at Milford, Utah.

O. W. Swainson, Hydrographic and Geodetic Engineer, U. S. Coast and Geodetic Survey, Washington, D. C.

'11.

Charles O. Olsen, 701 Paulson Bldg., Spokane, Washington.

'12.

Carl A. Rockwood is in the testing laboratory, Timber Butte Mill. Address 1430 Evans St., Butte, Mont.

A. S. Richardson of the testing department of the Anaconda Copper Mining Company is now living at 635 West Park St., Butte, Mont.

Walter C. Huntington, care of the Mogollon Mines Company, Crested Butte, Colorado.

'13.

Frank A. Downes is now Corporal in the 346th Engineers at Camp Lewis, American Lake, Washington.

Alfred R. Flinn, who is with the Empire Zinc Company, has been transferred from Leadville to Gillman, Colorado, where his address will be care of the Company.

Phillip E. Nolan has resigned as Superintendent of the Western Nevada property of the Nevada-Douglas Consolidated Copper Company to enlist in the Aviation section, Signal Enlisted Reserve Corps. Until assigned to some school his address will be care of Mrs. J. J. Arrey, 516 So. Van Buren St., Green Bay, Wisconsin.

Mearle W. Wilkinson has left the Western Chemical Company and is now at the Globe Plant of the A. S. & R. Co. His home address is 4260 Julian St., Denver.

Harold C. Price called at the School December 3rd on his way from the Training Camp in California, where he won his commission as First Lieutenant, Coast Artillery Reserve Corps, to Oklahoma. After a brief visit at Bartlesville to straighten out his affairs there he will go to Fort MacArthur, San Pedro, California, for definite assignment and the trip "Over there."

Edmund Stein is back with the U. S. Bureau of Mines as Explosive Engineer and will be actively engaged in the testing of explosives as soon as this section of the Bureau has completed the transference from Pittsburgh to Bruceton. His address is care of U. S. Bureau of Mines, Bruceton, Pa.

R. S. Ransom, Jr., with his wife and baby, left Golden November twenty-sixth for Newark, New Jersey, where they will again make their home. Ransom is with the James Ore Concentrator Co., 35 Runyon St., Newark, N. J.

Irwin R. Soloman, First Lieutenant Ordnance Service Corps, is stationed temporarily at Sandy Hook Proving Grounds, Fort Hancock, N. J.

'14.

Arthur Krohn is now Mine Superintendent for the Missouri Metals Corporation at Mine La Motte, Madison County, Missouri.

'15.

Chas. F. Haselton has joined the army. His home address is 283 Park Ave., River Forest, Ill.

Henry W. Kaanta has been with J. M. Callow, flotation expert, 159 Pierpont Ave., Salt Lake, for several months. Kaanta is now working on a flotation problem for the Burro Mountain Copper Company at Tyrone, New Mexico.

'16.

J. M. Lliteras, from Antioch, Nebraska, was visiting friends in Golden for a few days the last of November.

'17.

Alfred Conrow Levis and Miss Katherine Crook were married on the tenth of Novem-



Alfred C. Levis.

ber at Baltimore, Maryland. At home after December the fifteenth. Homewood Apartments, Charles Street, Baltimore, Md. Levis is in the Metallurgy Department, Bartlett Hayward Company Munition Plant.

Albert K. Chan is now at his San Francisco address, 701½ Jackson Street.

Lincoln Ehnbohm has returned to the U. S. from a mine examination trip to Nicaragua. From a pleasure standpoint the trip was a poor one as weather and accommodations could have been better. After a few days visit in Denver and Golden he left November 22 for Midvale, Utah, to accept a position with the United States Smelting Company. His headquarters will be at Midvale. Address care of the Company.

#### Mines Graduates Who Attended the Recent St. Louis Meeting of the A. I. M. E.

C. J. Adami, '99 (member of committee of arrangements); C. W. Burgess, '09; M. D. Draper, '97; H. W. Hardinge, Hon. E.M., '17; A. C. Terrill, '05; L. W. Trumbull, '04; H. H. Utley, '00; S. P. Warren, '13.

#### STEINHAUER GROWS POTATOES IN PARKS, IN SPITE OF JOKERS.

Fred C. Steinhauer, '99, General Superintendent of Denver parks, has the laugh on those persons who joked him last summer when he planted potatoes in the mountain parks. They said he was loose in the head! He planted 600 pounds of potatoes and has harvested 12,500 pounds. That's where he has the laugh.

When Mr. Steinhauer proposed planting potatoes in sections of the mountain parks many laughed at him. It was the prediction that he wouldn't harvest the seed—that is, that he wouldn't harvest 600 pounds of spuds. He was confident that it was a good plan and despite protests he went ahead with his plan, and now he has shown the results.

The 12,500 pounds of potatoes have been sold to the County Hospital and Mr. Steinhauer is planning to put in a couple of thousand pounds next summer.

**ASSAY SAMPLES NEEDED AT MINES.**

Professor Coolbaugh would like to secure almost any quantity of assay samples of ores or metallurgical products of any kind, particularly when check or control analyses, either partial or complete, can be sent with the samples. If any of our friends can supply such samples please let us know what you have and arrangements will be made to secure the samples.

**A REGIMENT OF MINERS.**

The Engineering Corps of the U. S. Army has recently been authorized to raise a regiment of miners for service in France. If you wish to join make application to the Commanding Officer, 27th Engineers, Office of the Chief of Engineers, War Department, Washington, D. C., giving experience that would qualify you for entrance.

John J. Croston, Ex '17, is First Lieutenant of Co A, 27th Engineers, Camp Meade, Maryland. C. E. Carstens, Ex '16, is also in Co. A. Either of these Mines men probably could give you some information about the regiment or at least tell you where you could get it.

**THE ORES OF COPPER, LEAD, GOLD AND SILVER.**

This is the title of Technical Paper 143, Department of the Interior, U. S. Bureau of Mines, by Charles H. Fulton. Most Mining Engineers will find this a very interesting and valuable addition to their libraries. Order by title and number from the Superintendent of Documents, Government Printing Office, Washington, D. C. Price, five cents.

**WHAT WE HAVE TO BE THANKFUL FOR.**

To be alive; to see the greatest events in human history; to be in a land safe from invasion at a time when ten countries are feeling the tread of an enemy; to have national wealth and prosperity when many nations are humiliated by poverty and failure; to have plenty of food when millions are going hungry; to be in the enjoyment of peaceful homes when thousands of hearths are smoking ruins; to be free when others have been enslaved by a savage conqueror; to be free when millions are prisoners in the hands of the enemy; to be confident of our freedom when other peoples are in fear of subjugation; to be able to fight for freedom for all the world as once before we fought for our own; to have the sinews of war, the material, and the machinery for making the weapons, munitions, and ships needed for successful war; for the gallant men that are able and willing to battle for our cause on land, on sea, and in the air; for the patriotic spirit that united all parties, professions, and classes in common endeavor; for all of these we are thankful, but most of all for the awakening of this nation to a

purpose greater than material success, to the discovery of a soul, undismayed and unconquerable, that shall guide us through this dark hour to final victory and enduring peace. (Editorial, Mining and Scientific Press, November 24, 1917.)

**BACK UP HOOVER.**

1. Eat one wheatless meal a day.
2. Eat beef, mutton or pork not more than once a day.
3. Economize in the use of butter.
4. Cut the daily allowance of sugar in tea or coffee, and in other ways.
5. Eat more vegetables, fruit and fish.
6. Urge in the home or the restaurants frequented the necessity of economy.

**A BOY'S REMARKS TO HIS STOMACH.**

What's the matter with you? Ain't I always been your friend?  
 Ain't I been a partner to you? All my pennies don't I spend  
 In getting nice things for you? Don't I give you lots of cake?  
 Say, Stummick, what's the matter that you had to go and ache?  
 Why, I loaded you with good things yesterday, I gave you more  
 Potatoes, squash and turkey than you'd ever had before!  
 I gave you nuts and candy, pumpkin pie and chocolate cake,  
 And last night when I got to bed you had to go and ache!  
 Say, what's the matter with you? Ain't you satisfied at all?  
 I gave you all you wanted; you was hard just like a ball.  
 And you couldn't hold another bit of puddin', yet last night  
 You ached mos' awful. Stummick, that ain't treatin' me right.  
 I've been a friend to you, I have; why ain't you a friend of mine?  
 They gave me castor oil last night becuz you made me whine.  
 I'm awful sick this mornin' and I'm feelin' mighty blue,  
 Becuz you don't appreciate the things I do for you!

**Vest Pocket Information on the Du Pont Companies.**

There has just been issued a handy little booklet which contains a list of all the products manufactured by the E. I. du Pont de Nemours and Associated Companies; namely, Du Pont Chemical Works, Du Pont Fabrikoid Company, The Arlington Company and Harrisons, Inc.

Of course this booklet does not indicate who uses the products or how used, as does the Du Pont Products Book, but it will no doubt prove of interest as well as of value to many mercantile and industrial men. It is small enough to fit in a busy man's pocket. It will be sent upon application to the home office at Wilmington, Delaware.



**HOOVER'S GOIN' TO GET YOU.**

By Mabel I. Clapp.

The darned old Hoover pledge has come to  
our house to stay;  
To frown our breakfast bacon down, and  
take our steak away;  
It cans our morning waffles, and our sau-  
sage, too, it seems,  
And dilates on the succulence of corn, and  
spuds, and beans.  
So skimp the sugar in your cake and leave  
the butter out,  
Or Hoover's goin' to get you if you  
Don't

Watch  
Out!

Oh, gone now are the good old days of hot  
cakes thickly spread;  
And meatless, wheatless, hopeless days are  
reigning in their stead;  
And gone the days of fat rib roasts, and  
two-inch T-bone steaks,  
And doughnuts plump and golden brown, the  
kind that mother makes.  
And when it comes to pie and cake, just  
learn to cut it out,  
Or Hoover's goin' to get you if you  
Don't

Watch  
Out!

So spread your buckwheats sparingly, and  
peel your taters thin;  
And tighten up your belt a notch and don't  
forget to grin.  
And if, sometimes, your whole soul yearns  
for shortcake high and wide,  
And biscuits drenched with honey, and  
chicken, butter fried,  
Remember then that Kaiser Bill is short on  
sauerkraut,  
And Hoover's goin' to get him if we'll  
All

Help  
Out!  
—Ladies' Home Journal.

**NO ACCIDENT.**

In a small West Texas town out on the  
Cap Rock country, interest was centered  
about the registration booth, and the atmos-

phere was becoming pretty solemn and  
funereal when a well-set-up young cowman  
clicked up to the official in charge and gave  
a well-known name.

Glibly answering the questions put to  
him, he was met with the question:

"Ever have any accidents?"

"Accident? Nope."

"Never had an accident in your life?"

"Nope! Rattler bit me once."

"Don't you call that an accident?" con-  
tinued the questioner, eyeing the easy-going  
young fellow severely.

"Hell No! The damn thing bit me on pur-  
pose!"

**MISCELLANEOUS FAULTY EXPRES-  
SIONS IN ENGLISH.**

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by Dr. Victor C. Alderson has recently been  
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Golden, Colorado

# COLORADO SCHOOL OF MINES MAGAZINE



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