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VALVE NEW EQUIPMENT AND CATALOG NEWS

From Deere Company

Many articles of interest

From Charles G. Clarke

I wish to compliment you on the fine job you are doing with Mining Magazine. Even though my work outside one largely to the Eastern Seaboard, I find many articles of interest, and through the magazine I have been able to keep posted on the activities of many old friends and acquaintances.

From R. G. B. Manus

From F. F. (Bill) Bassendine IV

I know I should have belonged all these years, five of them. Did for a year in San Francisco. The answer, of course, is “No excuse, sir."

From Major F. M. S. Johnson

He is still, as he always has been, one of the best Miners I know. He’s a very busy man, with his duties as 1st Corps area activities of many old friends and acquaintances.

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To meet a large demand, a two-volume edition is now published, for greater facility in the use of the book in the field. Covers mining and metallurgy, and allied subjects, necessary to the mining engineer, and such data on machinery, power, and other equipment as can be had in the field.

Second Edition

Robert Peale, Editor-in-Chief

Previously Published in the Mines in August, Columbus University

With a Select of Specials

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A Man! That's Metallurgy!

Card Wheels have deep, wear-resistant chill at the rim ... tough spokes or plate ... strong, machineable hub.

Furnished to any unpatented manufacturer.

The C.S.I. Iron Works
Denver, Colorado
(Continued from page 287)
Commencement Address, particularly best equipped and, in many ways, the American engineer has always been seen to run into American mining the important mining fields through their way into high positions in all for the individual, and where the as this institution, which came into engineers in the development and management was President of the Institution of societies of the Empire—1 might say Mining & Metallurgy while, at the companies operating within the Empire, where the great majority of your engineers an accord and understanding between as well as ours, for it serves to create it will remain this way, for your sakes in the world, at war, we all do some wonder­ and, indeed the greater part of the world, the benefit of which can happen—the requirements for metals and minerals will not decrease. Dur­ hing open and, in view of this, my message to you today, if I fail put that way, is There is Plenty of Room at the Top.

Men are not equal by any means, and no matter how some may work and plod, they are able to get only so far, while others will continue up the ladder and reach the top. The field of certain engineers is so wide and varied that there is no set formula for reaching this goal, but I will try and give you a few of my ideas that I hope may help you along the road.

It is possible that some of you may drop out of mining at an early date because something has cropped up which seems to offer better prospects, for some reason or another, and in this case, the education which you have received here will, I am sure, stand you in good stead in whatever field of en­ deavour you should happen to follow. However, if you choose to follow the mining profession, and many of you will come to the top and hold important positions throughout the world, you will have to decide sooner or later whether you wish to become a specialist in a particular mine or branch of the industry, and I think it would be wise for you to leave this decision for the mining engineer's report quite un­ relevant to the mining engineer and will be asked for information regarding the business, the property might be sold, purchased by other interests, and become inaccessible. When writing reports, my sugges­ tion is that you make them as brief as possible, so long as all the essential points are covered—executive engi­ neers will almost certainly be found; in such cases and, dependent upon the management of the company considered the business, the property might be purchased by other interests (or terms are suitable) in expectation of a method of treatment being worked out.

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profits we are making; we probably are to he unnecessarily high, he replied "Well, after all, look at the huge and outside opinions. I call to mind that you are operating your property and lead you to the management of a mine making a large and wide one, which may lead you to the management of a mine making a good one.

In addition to the thrills there is the romantic side of your profession but, before I speak of this, let me say a few words regarding romance of a personal character, and of which most of you, no doubt already had thoughts. One of the most important decisions of every man's life is, of course, his choice of a life partner.

To the mining engineer, however, this is a particularly important matter. If, in his younger days, he will probably be living in small mining towns, later, and if he is successful, he will most likely reside in some of the large cities. In the small mining communities, the right type of wife can be of very great assistance to his engineer husband, in helping to promote harmony and good relations between the employers in the camp; while a wrong kind might stir up trouble that would jeopardize the husband's position—this latter statement is no exaggeration whatever. In later years, your life partner, if she is the right one, will be a great help to you and will assist in maintaining contacts, which may be of considerable importance to you in your wider field of engineering endeavor. So, you see, this question of selecting a partner is, as I stated above, going to be a very important decision in your life.

Now there is the romance which comes to you in your engineering profession and, in this connection, I can hardly do better than tell you of a few of my own experiences.

Some years ago, I became associated in a small way with an American mining engineer who had obtained what is known as gold mining concession in Arabia, from King Saud. If you proceed about half the way up the Red Sea from Jidda and then get off the boat, on the Arabian side, and travel 200 miles inland from the coast, you will reach the concession by a recently built road which skirts the sacred City of Mecca.
canga formation does not guarantee the presence of diamonds, nor do the diamonds necessarily have to be found in the conglomerate. In most instances, however, the canga is the actual diamondiferous material. The actual diamondiferous material is known as river, valley, and plateau garimpeiro works with his shovel and dirt in the river bed sometimes yield thousands of carats. In a small hollow of the junction between the Rio Ribeira do Inferno and the Rio Jequitinhos near Diamantina 8,000 to 10,000 carats were revealed in a short time; yet, the neighboring section of the river was very poor and did not yield much in diamonds. It is in larger areas when the entire course of a stream is diverted that greater quantities of diamonds are procured from the river beds. The river diamonds are generally well water worn, and decrease in size and number as the stream flows away from the plateau areas.

The valley gravels are not as rich as the river deposits, although diamonds are less water worn. The beds are nothing but remnants of an old stream bed which have been preserved as terraces, resulting from stream rejuvenation. Because of the frequent presence of diamonds, the valley beds are not worked with great success.

Most interesting yet least of all in importance are the plateau deposits. In some respects the topography resembles a dissected plateau, causing the plateau to be a ancient terrace. Here, diamonds are larger and well crystallized, being embedded in a broken conglomerated mass strongly cemented with hard limonite. Although the deposit is definitely secondary, the diamonds show slight evidence of river action. The deposits, which are variable in thickness, rest upon bedrock. Erosion has been active on the elevated beds for ages, causing the formation to be extremely spotted. Without any doubt, the diamonds of both the valley and stream deposits have originated from the erosion of the much earlier elevated plateau deposits. To account for the origin, the source rocks of this oldest deposit constitute a problem far from being solved.

A strange deposit exists in the region of Grão Mogol, 180 miles north of Diamantina. Diamonds occur in a white laminated sandstone of the Itaehome formation interbedded with Silurian limestone. The laminated sandstone is caused by scales of sandstone, sometimes so constructed as to cause flexible sandstones known as “flexible sandstone.” This sandstone, which is more like a quartzite in texture, varies considerably and often resembles a fine conglomerate. Because of the age of the beds, early geologists believed that it was the source of diamonds, but the evidence of well water-worn diamonds in the sandstone is proof enough that they were laid down with the grain of sand. Rarely are the diamonds large or of fine quality; they are more often small boulders. The manner of extracting the sandstone is simply to shuffle the sandstone by a blast and to seek the principal. The amount of diamonds secured is very small; the greatest supply is obtained by working the near by streams for eroded stones.

Some evidence as to the origin of the river-diamonds has been found, but it is not definitely convincing. In some localities in the vicinity of Diamantina, diamonds are found in variously colored clays, with other minerals interbedded with the quartzite. These clays are cut with veinlets of quartz which contain small crystals of titane, todorokite, magnetite and other minerals. The minerals, which are found with the diamonds, are the same as found in the canga of the river deposits. Sometimes, the diamond crystals show impressions of other crystallized minerals; even inclusions, such as magnetite and titane or titane are present. The diamonds of the soft clays may have had their origin in the quartz veins, although an actual diamond in the quartz matrix has not yet been obtained.

In another region near Diamantina, a definite pipe formation is being worked with success. It is an oval-shaped deposit roughly 600 x 2,000 feet completely surrounded by white sandstone and exposed at the surface on the elevated plateau. (Fig. 2) The pipe material is made of vertically aligned diamond crystals which have been found called “mause” descending to unknown depths. American capital has been spent on a strong jet of water to wash the masses from the flumes to fine screens, a small ball mill and finally a test jagetable concentrates the diamonds to such a fine grade that can be removed by hand from a small concentrate of hematite pebbles. The production ranges about about 10,000 carats per month of diamonds less water worn. The valley beds are not worked with great success.

THE MINES MAGAZINE • JUNE 1940

Over the Air — KOA — March 24, 1940

GEOPHYSICAL EXPLORATION

PART I. Locating Minerals

Announcement: The Colorado School of Mines presents “Man and Minerals.”

Announcement: The secured a faculty address at the Colorado School of Mines in Golden, Colorado, where we find Dr. A. S. Adams and Coach Mason in conversation.

Announcement: Well, Doc, every time I come over here you always talk about being in a pile of papers.

Announcement: That’s on lie!

Announcement: Who are all those fan mail?

Announcement: Give me five, John, give me time. Fan mail or not, we do get some interesting letters once in a while.

Announcement: For instance?

Announcement: Well, here’s one I’d like to have you look at.

Announcement: (Reads)—

Announcement: Well, John, what do you make of it?

Announcement: Not bad. You know, Doc, if we could do all the things this fellow talks about.

Announcement: We would be nothing short of that.

Announcement: No, you and it.

Announcement: You know, I can see why people think nothing is impossible in science—what with the seeming miracles performed almost every day in medicine, the engineering and man-made physics.

Announcement: The fellow who wrote that letter is looking for a miracle all right. You ought to show it to Mason.

Announcement: I should say so.

Announcement: Says, isn’t he about due here?

Announcement: There he is now.


Announcement: Hello, Doc, glad to see you. We were just talking about you. Here is something I want you to read.

Announcement: What is it?

Announcement: An inquiry addressed to the couple—right down your alley.

Announcement: Go ahead.

Announcement: (read) Colorado School of Mines, Gentlemen: I have heard that the river has perfected what I believe is called a geophysical device—one that will find iron, gold, copper, dollar bills and oil. Please send me further details. Also, please include a blue print as I want to make one of these machines myself.

Announcement: Very truly yours, . . .

Announcement: The dollars bills are a new wrinkle. Otherwise, this sounds a lot like some other inquiry the Geophysical Department is getting almost every week.

Announcement: Come, now—is that all the comment we’re going to get out of you?

Announcement: You ought to invent a gadget like that.

Announcement: And tell me about it.

Announcement: I promise not to tell anyone else what we both hear.

Announcement: Now wait a minute. I see something here in this letter that ought to be possible.

Announcement: A miracle?

Announcement: Yes, the story in the wife of one of the leaders of the prospecting campaign ought to be possible.

Announcement: You mean, finding iron?

Announcement: That’s it. I should imagine anything that technology ought not to be too hard to pick up.

Announcement: That’s right. You know, magnetic prospecting for iron ore was used in Sweden as much as 300 years ago.

Announcement: I certainly didn’t know Geophysics started as early as that!

Announcement: Did they have any luck with it?

Announcement: Yes, quite a few large ore bodies were found in this way.

Announcement: What do you do, just go over the ground with a compass?

Announcement: That’s about the size of it—except that a special variety of compass was built for this particular purpose.

Announcement: Did every miner or prospector have one?

Announcement: At first, yes, until they found out that these instruments did not work because of electromagnetic interference and other factors affecting or ore bodies from stray attractions due to certain types of barren rock.

Announcement: Wait a minute—didn’t you tell me a yarn once about an unbeatable woman being found quite accidentally—by a prospector’s wife?

Announcement: Yes. The girl in the story was the wife of one of the leaders of a prospecting campaign in the Soviet Union.

Announcement: Yes, it certainly was an unusual story.

Announcement: Tell me: when, where, and how did all this happen?
Erik: She must have guessed we were here.
Erik: Where?
Christina: On this job you’ve got to live in the country, if you can.
Erik: Hello, Christina, sure glad you’re here.
Christina: Olaf, you wouldn’t believe what happened—

Olaf: Maun have found a lot of berries—I’ll be glad to get my hands on them—
Christina: Look, Olaf, it’s not about berries—it’s much more important than that—listen—
Erik: (disgustedly) Well, honey, it was nice of you to bring another compass, but we really don’t need one.
Christina: But that’s where you are mistaken, Olaf—you always I carry my compass with me.
Erik: Yes?
Christina: See that patch of trees over there near the lake?
Erik: Yes?
Christina: That’s where I went berry-picking—and all of a sudden the needle started jumping around—
Erik: It did? ! !
Erik: That’s the best news yet—
Christina: On, Olaf, that sounds wrong looking into mass—
Erik: I’ll bet you want to work on that right.

Erik: Yes, Sir! They worked late into the night making that induction. In this way the large Vipto iron orebody was discovered.
Mass: Well, I guess the Sweden had it. Any work been done over here that’s like that?
Erik: Yes, in New York and New Jersey, rather early too, in the nineteen hundreds.
Mass: That’s convincing enough as far as iron goes. You really have a lot of iron sold on that?

Adams: But let’s get back to our letter. Can you produce a gold-finder for us?
Mass: Sometimes we can find gold.
Adams: I don’t quite see how. Gold usually doesn’t look like big chunks like an iron orebody.
Mass: That’s quite correct, and yet there is a way to find it some times—Do you remember Dr. Boyd talking about them weeks ago?
Adams: Yes, I do. They’re river gravel deposits.
Mass: Yes, that’s right, and the gold is usually found at the bottom of these, near bedrock.
Adams: At places where the speed of the river is slackened. Mass: And at the same places other heavy minerals are usually deposited too.
Adams: Iron minerals, such as magnetite?
Mass: Quite so. Therefore, by picking up these magnetite concentrations, we can trace the gold associated with them.
Mass: I don’t quite see how that could be done with an ordinary compass—

Mason: Wait a minute, there’s something I don’t quite see. How do you get current into the ground? It’s rather an involved process in the headphones between two points, it means that no current flows between—
Mason: What means that mean?
Mason: That means if you tie up all these points and use them on a map, you would get straight lines that are parallel with the bare copper wire—
Mason: And you pick that up with a compass?
Mason: You’ve got alternating current in your orebody and the compass wouldn’t work with it. Try again.
Mason: How about picking it up like this, with the hum of a power line?
Mason: That’s what we do, in a way. We go over the ground with a detector coil wound on my turns of wire, hooked to a pair of headphones.
Mason: Then the observer gets the loudest buzz, we’ll say, right over the orebody.
Mason: You held your coil vertical, you would. Actually, the field procedure is quite a little more slow.
Mason: That’s complicated enough for me. I don’t think you could do that a lot simpler.
Mason: How, coach?
Mason: Well, if I was doing it, and had these headphones in my hand, in the ground, I sure’d tap it at every tenth foot to find out where most of it was.
Mason: You mean by sort of putting up a pair of spikes to the ground and looking them up with a—some headphones?
Mason: How good, very good. We’ll make geophysicists out of you fellows now.
Mason: No fooling—is that method any good?
Mason: Yes, and to be more precise, the kind you have found you are using long bare copper wires that they hook to their headphone—
Mass: How far apart are these wires?
Mason: About half a mile, so arranged that the supposed orebody would come between them.
Mason: That’s true, particularly when you have got a sulphide form. Then they can be detected by electrical means.
Mason: What does that mean—these sulphides occur in big chunks, veins, or what have you?
Mass: They do, and are usually very good electrical conductors.
Mason: That means one coil can’t conduct electricity too?
Mass: Yes, but not very well.
Mason: Well, then, if you pass an alternating current through it, it would be sort of concentrated by a sulphide orebody, wouldn’t it?
Mass: Yes.

Adams: It seems to me that’s rather a slow procedure.
Mason: Has it had any success?
Mason: While I have been rather successful in prospecting for shallow ore in Sweden and Canada.
Mason: Just the same thing, while we have bore and are asking a lot of questions.
Mason: Seems to me that’s rather a slow procedure.
Mason: What’s that?
Mason: Yes, which would seem to me that from what I remember about so that it is a little heavier than all the barren rock around it.
Mason: That’s quite true.
Mason: But can’t make use of that fact somehow?
Mason: We do, and that brings us to one of the most recent geophysical methods applied in mining.
Mason: You mean you can actually hear this thing?
Mason: Precisely.
Mason: By George! If that is so, why can’t I just go myself a balance and see if I can’t find a match along with the hill.
Mason: You need a very sensitive balance.
Mason: How sensitive?
Mason: Oh, one that would weigh a weight of one c.mm. J wish we had a scale.
Mason: Right you visualize that.
Mason: Well, let’s explain it in some other way. See this piece of paper?
Mason: Yes, it’s ordinary typewriter paper.
Mason: Yes, and I think ten sheets of this would—
Mason: All right. Now take each sheet and divide it up into say, five, twenty-five, a hundred, and a thousand.
Mason: How many squares do you get then out of your ten sheets of paper?
Mason: About ten million squares.
Mason: I see it now. That balance has to be sensitive enough so that when you’re weighing ten sheets of paper on this your balance would be one of those little squares put on or taken off.
Mason: Entirely correct.
Mason: A gravimeter, eh?
Mason: All right, have it your own way.
Mason: How does one of these things work?
Mason: Yes, how do you weigh an orebody with that?
Mason: Visualize a weight hung from a spring balance, and provided with some sort of a magnifying device, so that very small placements of the weight can be detected.
Mason: Then the weight goes down where the pull of gravity is greater, and the result is less.
Mason: Precisely. And as you count a heavy orebody, the force of gravity usually increases in the orebody—gravimeter or gravimeter for that.
Mason: Seems to me I’ve read some where that the gravimeter was first developed by the geophysical exploration.
Mason: Yes, it was.
Mason: Oh, that reminds me—our letter writer wanted to know whether we have a gadget for finding oil.
Mason: No, there would like tell him some more about that.
Mason: Suppose we do that, but I’m afraid we won’t have time for it now.
Mason: Well, between now and next week, I’m going to figure me out some of the news that are coming.

Announcer: You have just listened to another program prepared and presented by the Rocky Mountain Radio Council by the faculty members and students of the Rocky Mountain School of Mines, an institution devoted exclusively to the teaching, research, and training of student engineers. Heard on this program were: C. A. Heiland, head of the Geophysics Department; Dr. S. A. Adams, head of the Geophysics Department; Dr. C. A. Heiland, head of the Geophysics Department; Dr. S. A. Adams, head of the Geophysics Department; Dr. S. A. Adams, College Mason, Ed. Sawickie, Herb Tilich, and Ralph Trench. Tune in next week at the same time and the same station for another program in physical Exploration. Address any questions you may have about this program to the station to which you are listening.

The demand for free access to mineral resources by Germany was one of the important underlying causes of the Great War. It was declared by Italy as one of the chief reasons for taking Abyssinia; by Germany in occupying Austria, Czechoslovakia, and part of Poland; and by Japan in its expansion in East Asia. The need for raw materials is now specifically recognized by all nations as a primary grievance in the present war, and the control of raw materials, therefore, is likely to be the principal factor determining its outcome.

Since the last world war, international controversies of growing intensity, not satisfied merely with free access to raw materials, have taken many forms, notably Germany, Italy, and Japan as one of the chief reasons for taking Abyssinia; by Germany in occupying Austria, Czechoslovakia, and part of Poland; and by Japan in its expansion in East Asia.

**The Miners' Settlement**

By C. K. Leith

Professor of Geology

University of Wisconsin

In preparation for the Peace Conference in Paris in 1919, Mr. Bernard M. Baruch, who headed the Economic Section of the American Commission to Negotiate Peace, told it very much in mind that something should be done in the way of equalizing access to raw materials. The French and English representatives to the Economic Section of the Peace Conference submitted similar proposals, but the subject was given little or no consideration by the Peace Conference.

The problem was raised again in a resolution of the Miners Congress held in Geneva in 1920; in the International Chamber of Commerce in 1921; in the Economic and Financial Conference of the League of Nations in 1922; by the Diplomatic Conference of the League of Nations in 1927, and by many other individuals and groups. An insistent call is now coming from many quarters for a clearer idea of the purpose of the war. Many individuals and groups are working on the subject, but, as far as I know, the question of access to raw materials has not yet been included in the public or official statements of war objectives by the Allied governments. In view of the fact that the question of equalities of access to raw materials has been steadily urged to the front for so long, the consideration of this subject can hardly be omitted from any adequate program of peace settlement. Without anything to set up to them in order to prevent or correct the present war only is one of the symptoms of the collision of opposing forces, and it is not likely to settle the problem of access to the world’s mineral supply with any permanence.

No one can now pretend to know specifically what should be done about improving access of the “have-not” nations to raw materials. The various proposals which have come forward in recent months are largely on paper. The war is still in very many quarters, and lack the detail and focus necessary for any real planning. Why? Why do we not bodily tackle the problem of access to raw materials? The answer on the part of the more aggressive “have-not” nations is that they have better developed sources of supply and a better developed system for distribution. Why do we not bodily tackle the problem of access to raw materials? The answer on the part of the more aggressive “have-not” nations is that they have better developed sources of supply and a better developed system for distribution.

In the argument over the question of raw materials, it is not likely to be based on any one of the following sections.

**1. Maintenance of the status quo**

The salient feature of the status quo is a control of about three-fourths of the raw materials of the world by the United States and the British Empire in the course of commercial control of minerals outside their own domains. Also, the United States has, in large measure, completely controlled the seas over which the trade passes. This can only be moved—not only on its own but also by those controlled by other nations. France, Great Britain, and other powers have been ranked with the “have” nations, though relatively her supplies are not adequate, may be ameliorated and her desirability to the maintenance of world peace, if necessary, on her own but also by those controlled by other nations. France, Great Britain, and other powers.

**2. Possible changes in the status quo**

We may study more carefully than we have done before the position of the “have-not” nations to see how far they may be ameliorated and how far self-sufficiency can be brought about. There are three ways to make concessions, and (3), that is, to make reasonable concessions, in no case more reasonable, or seem cheaper than the following sections.

**3. It has been proposed that there should be a proposal that the exportable products of the “have-not” nations should be handled in the same way as the “have" nations.**

This would mean a more considerate province, for the purpose of making the world better off if the “have” nations should help the “have" nations to accumulate stockpiles of needed materials for the countries in emergency to obviate the possibility that these nations may feel compelled to go out and acquire raw materials by the acquisition of new territory.

**4. One of these possibilities has been adequately explored, nor have they been reviewed as a whole.**

This problem needs extensive study from the standpoint of each of the raw materials industries and from the standpoint of each point of a single country.

**5. There has been much discussion of the redistribution of colonies of putting colonies under mandates with equality of access.**

Even if this were politically possible, the mineral reserves of the colonies are much too small to solve the problem.

**6. It has been proposed that we consider the practicability of some sort of collective ownership of mineral supplies, both in war and peace.**

There have been in the past.

The use of all three of these methods, as the “have" nations to see how far they may be ameliorated and how far self-sufficiency can be brought about. There are three ways to make concessions, and (3), that is, to make reasonable concessions, in no case more reasonable, or seem cheaper than the following sections.

**3. Mineral sanctions**

A third alternative is to use the power now inherent in the control of mineral resources. It is true that we have not had the power. The policy of the "have-not" nations is that they have better developed sources of supply and a better developed system for distribution. We may study more carefully than we have done before the position of the “have-not” nations to see how far they may be ameliorated and how far self-sufficiency can be brought about. There are three ways to make concessions, and (3), that is, to make reasonable concessions, in no case more reasonable, or seem cheaper than the following sections.

**4. Other nations have been used for international control of minerals, and therefore to control the world.”**

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NON-METALLIC MINERALS

By
KENNETH E. HICKOK, '26
Instructor, Department of Metallurgy, Colorado School of Mines

Part III—Sand and Gravel

Sand and gravel are probably the most familiar of all the non-metallic minerals. It is doubtful that a single adult person could be found in these United States who is not familiar with sand and gravel. In fact, these extremely essential materials are so common that we are prone to look upon them as being in the same classifications as salt and water, because we find them so plentiful and cheap.

However, the fact that these materials are low in price and plentiful in quantity probably has had more to do with their widespread use than any other factor except their eminent suitability to their many applications. The widespread production of almost unbelievable quantities of sand and gravel has resulted in a far-flung industry which has a yearly tonnage production of almost unbelievable proportions.

Specifications on sand and gravel vary over such wide limits, depending on the application, that it is almost impossible to state a clear definition that will hold for various localities and singular classes of applications.

Mr. J. R. Thomsen of the U. S. Bureau of Mines supplies us with the following definition: "Sand is the unconsolidated, granular material, coarser than $\frac{1}{2}$ mesh and finer than $\frac{1}{4}$ inch, resulting from the natural disintegration of rocks. Gravel is the similar unconsolidated granular material, coarser than $\frac{1}{4}$ inch but finer than $\frac{3}{4}$ inch, resulting from the same cause."

As will be noted from the above definition, unlimited variety is allowed as to mineral composition and make up, as well as shape of the individual grains comprising the sand or gravel. Thus, the individual grains may result from the disintegration of any kind of rock, sedimentary, metamorphic, or igneous, and the shape of the grains may vary from angular to spherical.

This not to be interpreted that all sand or gravel is equally suitable for every single application because such a statement is not true. Many uses have specifications that relate to grain shape as well as mineralogical characteristics.

Production

The widespread use of sand and gravel in commercial deposits are so variable that each deposit requires individual consideration as to the most suitable means of exploitation.

A broad classification of types of deposits would include, beaches, pits, beds, and bars. These would be further classified as to location, whether wet or dry, stratification or segregation of different sizes, and many other features.

Depending on the type of deposit, mining could be done with shovels, ditches, bulldozers, carryalls, stacker, line cableways, dredges, or hydraulic mainlows. Each particular type of equipment would be suited to some individual deposit while being useless for another type. One thing common to all deposits is that the mining and transportation method used must be flexible, low cost. In many cases screening to size and dewatering. Some plants crush the oversized material and route the crushed product through the regular sizing equipment.

It is obvious that little beneficiation can be practiced on a product that averages only 47 cents per ton in value.

Geographical Distribution and Political Control

Sand and gravel deposits of commercial value are widely distributed throughout the world. It is probable that every state in the Union has some usable sand and gravel deposit. Every civilized country has ample supplies of these materials so that it is impossible for any nation to attempt political control of these very necessary non-metallics.

Beneficiation

Beneficiation of sand and gravel makes it necessary to simple and low cost. In many cases screening is the only treatment that can be practiced on a product that averages only 47 cents per ton in value.

It is necessary to note that the gravel, sand and gravel plant near Denver.

Uses and Market

The major use for sand and gravel is in construction work of all kinds. As an aggregate for concrete work and gravel used for the crushed product through the regular sizing equipment. With the return of prosperity this use should increase to the winter months, except in the southwestern deserts.

The big increase in non-commercial production, that is, sand and gravel sold by cities, counties, state or federal as airfield, is common practice. In many cases screening to size and dewatered. Some plants crush the oversized material and route the crushed product through the regular sizing equipment.

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E. R. Harrington

GRANBY DAM SITE

Granby reservoir is to be the largest of the project and is located between Granby and Grand Lake. It will be more than eight miles long and will have a capacity of 482,000 acre-feet. Granby dam, therefore, although not the highest on the project, will be the most important. As may be seen from Fig. 13, the rock for rock-fill and riprap will be obtained from the North Park formation of Miocene age. The engineer is interested in the permeability of the rocks though none of the sedimentary rocks are involved in the dam site. The reservoir will be created by the upper dam, Xetlah, Fig. 13, which will be constructed of concrete, and by the lower dam, Long Lake, Fig. 13, which will be constructed of earth fill.

Structure:

The overburden at Granby dam site consists of rock, glacial gravel, and slope wash, the latter consisting of a mixture of soil, sandy clay and rock fragments which range in size from boulders to gravel. The slope wash is found in abundance on the outcrop but core drilling indicates that they are wide-spread south of the spillway and outlet tunnel and in the pervious zone of the dam. Other areas in the vicinity were tested but found unsatisfactory mainly on account of the internal structure of the material. Composition products from the North Park clays.

Materials for the pervious zone may be obtained from required excavation to bedrock in the river bottom. Rock for rock-fill and riprap will be obtained from this source. Three methods of excavation will be necessary to remove the overburden: (1) drilling, (2) blasting, and (3) open cut. All three have been used to advantage in past work. Open cut has been in favor of the three for the work in the river bottom. Three of the three companies, including the National Lead Company, have been stymied by a practical attitude. Four dikes will be required to span the river bottom.

MORRIS

He was graduated from the Albu- querque High School in 1920. After spending two years at the Colorado School of Mines and two years at the University of New Mexico, Harrington received his degree in geology and physics and mathematics.

Harrington is a good example of what "mines persistence" and determination will do.

BY ROSS L. HEATON

The dam site was carefully mapped and examined, and the overburden cannot be reproduced here due to its size. The rocks at the main dam site are强硬ness, pegmatite, gneiss, and schist. In the unaltered state they are strong rocks except for the silts which are sometimes composed largely of biotite and are very soft. They are almost entirely abundant on the outcrop but core drilling indicates that they are wide-spread under the overburden.

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Structure:

Faulding, shearing or any process which may weaken the rocks of the foundation are very important, especially in the case of a rock, shed, or earth dam. The engineer is interested in the strength and elasticity of the rocks much more than in their nature or mineral composition.

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It is now filled with outwash sand and gravel, with some till, to an unspecified depth. One of the test pits went to 80 feet and shown in the cross section without blocking the bedrock.

The nature of the foundation for this dike might lead to the suspicion that it would be a source of serious leakage but the percentage of till, together with the high permeability, is reassuring. However, precaution will be taken to blanket the upstream toe of the embankment with a permeable material.

The dike No. 5 is to be 1900 feet long and 55 feet high. The materials will be derived from Borrow Area No. 3.

On the main dam and the dikes and natural spillway, 127 pits, trenches and dike holes were dug. Thirty-eight core bores were drilled, some of which were inclined, the two deepest being approximately 550 feet in depth.

Fig. 9. View along line of cross section of Figure 8. M—Morrison shale; D—Dakota formation; F—upper porphyry sill.

Fig. 9. View along line of cross section of Figure 8. M—Morrison shale; D—Dakota formation; F—upper porphyry sill.

Fig. 10. Stripping operations, left abutment. G—glacial drift; R—top of lower porphyry sill; E—base of basaltic chain covered by coffin dam cut-off wall at left on dip slope. Shows Morrison shale slipped into depression.

Fig. 11. Escaping in elongated depression in top of porphyry sill, left abutment. Shows Morrison shale slipped into depression.

Fig. 12. Granby dam site. View looking upstream into reservoir site.

Fig. 12. Granby dam site. View looking upstream into reservoir site.

It is proposed to restore this lake, but the formation involved in the eastern slope reservoirs is shown in the table on the second following page.

Some of the formations shown in the table are a departure from orthodox usage and are descriptive of the geologic column and cross sections.

The Lykins formation consists of red shales and sandy shales with two or three thin limestone members in the lower part. The Lyons is a hard, buff colored, slubby, cross bedded sandstone. The Santas is an alternation of red shales and sandy shales with thin beds of light colored sandstone. The Ingleside is a coarse, light red sandstone and the Fountain consists of arkose sandstone and conglomerate with some red shale and a few thin nodular limestones. The lower part of the Dakota, Morrison and Sundance formations may be seen in the geologic column and cross sections, Figure 16.
SOLDIER CANYON DAM SITE

Soldier Canyon is the northernmost dam site in the Dakota hogback ridge on the east side of Horsetooth reservoir. The dam is to be an earth and rock-fill structure with a height of 190 feet above bedrock and an up and downstream length of 1060 feet. The crest length will be 1050 feet. The embankment will have an upstream slope of 1:2 and a downstream slope of 1:3 and a downstream slope of 2:1 to 1 and a downstream slope of 2:1 to 1. No spillway or outlet tunnel will be involved once the reservoir outlet is to be at Horsetooth dam.

Geology:
The only formations directly involved in the Soldier Canyon site are the Dakota and the upper part of the underlying Morrison. The Dakota is 315 feet thick and consists of three massive sandstones separated by shales. The upper 160 feet of the Morrison is shale which is lumpy in places. The thicknesses, normal to the bedding planes, of all the strata involved in and near the site, are shown on the geologic column (Fig. 16).

Structure:
The dip of all of the strata is downstream but decreases in amount from 30 degrees at the upstream toe to 23 degrees at the downstream toe. This change in dip is shown in Section C-C of Figure 16 which also shows the successions of strata present under the dam embankment along line C-C on the Location Map. Cross Section A-A, on the axis of the dam, is practical to the conclusions of this study, except that they and there are, therefore, shown as nearly horizontal. Their thickness is shown as being greater than in the geologic column because the cross section is vertical and the strata are inclined. Cross-section B-B is a developed section along the proposed cut-off trench and the strata are therefore shown as nearly horizontal in the center and inclined at the ends. The dip of the beds is also shown on the Location Map by means of structural contours drawn on the top of the upper sandstone of the Dakota group. There are no faults cutting across the rocks of the dam site although some slipping has occurred between the layers of sandstone during the tilting process, resulting in numerous slickensided surfaces.

Overburden:
The depth of overburden ranges from 1 to 30 feet and is, as a rule, thiner on the upper slopes and thicker on the lower slopes and in the stream bottom. The thickness of overburden is shown on Figure 16.

Percolation Tests:
Since all of the strata dip downstream, possible seepage loss through porous beds is a matter of some concern. The formation which is thought to present the greatest possibility for seepage is the Sundance sandstone. It is 200 feet thick as shown by the log of drill hole No. 201, although none of it is exposed at the surface. The overburden in the stream bottom consists of sand and gravel with rounded boulders of quartz schist from the mountains to the westward.

Percolation Tests were taken for every five feet of the sandstone in drill holes No. 201. The losses in the lower part of the hole were very slight, but in the lower part they ranged from 9.75 to 21 gallons per minute under a pressure of 85 pounds per square inch in a three inch diameter hole. These losses, of course, are not excessive. Laboratory tests on blocks from an outcrop of the upper part of the sandstone showed a percolation rate of .23 foot per year, under unit conditions, parallel to the bedding planes and .04 foot per year across the bedding planes. The conclusion was reached that there will be some loss while filling the pores of the sandstone in the dry zone near the surface but that it will then be considerably less than the loss by evaporation. The sandstone is well blanket through the length of the reservoir.

GEOLOGIC FEATURES OF OTHER EASTERN SLOPE DAM SITES

Dixon Canyon and Spring Canyon dam sites are almost identical with Soldier Canyon except that at Spring Canyon the overburden is heavier and, due to peculiarities of erosion, the
axis of the dam is to extend between outcrops of the middle Dakota sandstone instead of the upper Dakota as at the other two sites. Horsetooth dam will be 1460 feet long and 90 feet high and will extend across the upturned edges of the strata instead of parallel to the strike. One end will rest on the Lyons sandstone and the other on the shales and limestones of the lower Morrison formation. The Sundance and Lykins will underlie the main body of the dam and an outlet tunnel will be built near the center, under the embankment.

The crest of Arkins dam will extend from the lower Dakota sandstone on the south side to the middle Dakota on the north. The crest of the main dam at Carter Lake will connect middle Dakota outcrops on each side of the canyon. The beds dip at angles of only 13 or 14 degrees. Of the other two smaller dams at Carter Lake, one will extend across upturned beds between the Lyons and Morrison formations as at Horsetooth dam. The beds dip more steeply at Carter Lake, however, and the dam will, therefore, be much shorter, having a crest length of only 1060 feet. Its height will be 65 feet. The other dam or dike will be built at the north end of Carter Lake and span a wide, shallow depression in the reservoir rim which is a structural as well as a topographic saddle. The foundation rock will be the Lyons sandstone with practically no overburden. This dike will be 1150 feet long and 36 feet high.

CONDUIT TUNNELS

There will be many tunnels along the canal lines varying in length from a few hundred feet to more than two miles. The location of these tunnels is shown on the layout map (Fig. 1). The first one below the east portal of the Continental Divide tunnel is the Giant Track tunnel. It will be 6500 feet long and nearly all in granite. Below Estes Park on the north side of Big Thompson River there will be several short tunnels in granite and quartzite with the conduit to the power plant at the forks of the Big Thompson, although this canal is not included as a part of the present construction program.

The first tunnel north of Big Thompson River is the Carter Lake inlet tunnel which will be driven across the Fountain arkosic sandstones for 1600 feet, the Intermont side sandstone for 350 feet, and the batholith shales and sandstones for 650 feet. The tunnel direction will be directly with the dip of the beds which is uniformly fifteen degrees. Rabbit Mountain tunnel is on the
When ordinary switches are employed, the full load, capable of operating ma­
chines, is used. This load is often carried through the switch. In such cases, where small switches are oper­
ated, small pumps, fans, etc., at the face during shutdown periods, the small load is also carried through the large switch. Thus, when the switch load is suddenly increased, more load, the switch does not open, and the higher amper­
age burns out the motors, resulting in ruined mechanisms and equipment. Chas. V. Goodell, who also mapped the project the writer was assisted by and was chief engineer of the Colorado-Big Thompson Project, the fourth largest reclamation project in the world. The Bureau of Reclamation is in the Department of the Interior, Harold L. Ickes, Secretary. All Bureau work is under the direction of John C. Page, Commissioner; R. F. Walter is the Chief Engineer of the Bureau; S. O. Harper is the Asst. Chief Engineer, and J. L. Savage, is Chief Designing Engineer.

New Switch

A new Auxiliary Section Insulator Switch, designed to minimize electrical loss, has been developed and is being used in mining equipment in mines, has recently been placed on the market by the Denver Laboratory Mineral Jig, Inc., Denver, Colorado. By using a new type switch, the writer was assisted in preparing maps and cross sections of the liquid in the tank. As the bed of sand is opened and the smaller one closed during shutdown periods, the small load is not cut out, and the higher amperage is not carried through the large switch. Thus, when the ampere load is suddenly increased, the switch does not open, and the higher amperage does not cut it out, and the higher amperage burns out the motors, resulting in ruined mechanisms and equipment.

Improved Design of Sand Filter Clarifier

The Denver Laboratory Mineral Jig is designed with the idea of being a self-contained unit, and is well adapted to meet the needs of the mining and processing industries. The unit is constructed for the purpose of separating and purifying the liquid in the tank. As the bed of sand is opened and the smaller one closed during shutdown periods, the small load is not carried through the large switch. Thus, when the ampere load is suddenly increased, the switch does not open, and the higher amperage burns out the motors, resulting in ruined mechanisms and equipment.

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**The Mines Magazine • June 1940**

**CATALOGS AND TRADE PUBLICATIONS**

**FOR YOUR CONVENIENCE**

- **Gardner-Denver**, 14 pages, illustrated. Full instructions for using the Gardner-Denver two or four pole, 125 or 250 volt shunt or series wound electric motors.

- **Maxwell S. Moore**, Muskegon, Michigan, contains 18 pages, illustrating the principle, features, modifications and available ratings of various types of starting switches.

- **NATIONAL OILFIELD EQUIPMENT BULLETIN**, Nos. 30-000, April 1940, by Westinghouse Electric Corporation, Toledo, Ohio, contains 24 pages describing and illustrating wagon trucks, pumps, tongs, and precipitation equipment.

- **SUCKER RODS**, Bulletin 272, National Supply Company, Toledo, Ohio, contains 24 pages describing and illustrating the different types of sucker rods, whether solid or hollow, the operating torque, and immunity to heat and cold and indicates the price ranges, speeds.

- **ALL-WHEEL-DRIVE FORKS**, designed by the raining group of engineers under the direction of Mr. Bucher, described in detail in the June, 1940, edition by Gardner-Denver Co., Quincy, Ill. The bulletin gives detailed construction of large coupled engine, descriptions and illustrations of many types of starting switches, descriptions and illustrations of a vacuum tube time delay starter, and further describes the advantages of oilfield equipment.

- **GEAR BOXES**, Bulletin 500, National Supply Company, Toledo, Ohio, contains 24 pages describing and illustrating the different types of gear boxes, whether solid or hollow, the operating torque, and immunity to heat and cold. The bulletin also describes the advantages of oilfield equipment.

- **GARDNER-DENVER EQUIPMENT**, Bulletin No. 605, Gardner-Denver Company, Quincy, Ill., giving detailed construction of large coupled engine, descriptions and illustrations of many types of starting switches, descriptions and illustrations of a vacuum tube time delay starter, and further describes the advantages of oilfield equipment.


- **SHRINKER SHARPENERS, INSTALLING AND USING**, 6 pages describing and illustrating wagon trucks, pumps, tongs, and precipitation equipment.

- **DREDGE SHARPENERS** by the Eimco Corporation, Salt Lake City, Utah. Contains drawings of several types of screens and details of various types of starting switches.

- **SYNCHRONOUS MOTORS**, Bulletin GEA-1368D, Eimco Corporation, Salt Lake City, Utah. Illustrations showing how to operate this equipment for the best advantage.

- **ELECTRICAL APPARATUS**, Bulletins GEA-1412B, 1368D, 3223 by General Electric Company, Schenectady, N. Y. Illustrations and construction details of various types of starting switches. The bulletin also describes the advantages of oilfield equipment.

- **PORTABLE PLACER MACHINES**, Portable Placer Machine, its advantages and other features, 6 pages describing and illustrating wagon trucks, pumps, tongs, and precipitation equipment.

- **DRILL SHARPENERS, INSTALLING AND USING**, 6 pages describing and illustrating wagon trucks, pumps, tongs, and precipitation equipment.


- **ELECTRICAL APPARATUS**, Bulletins GEA-1412B, 1368D, 3223 by General Electric Company, Schenectady, N. Y. Illustrations and construction details of various types of starting switches. The bulletin also describes the advantages of oilfield equipment.


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OFFICERS OF ALUMNI ASSOCIATION

EDWARD J. BROOK, '31
FRANK C. BOWMAN, '15
FRANK C. NAGEL, '21
GEORGE B. TAYLOR, '31
FRED C. CASTERFORD, '10
CHARLES D. PARKER, '23
M. EDMUND CHAMANN, '21

COMMITTEE CHAIRMAN

BRUCE L. LAFFETTE, '22

EXECUTIVE COMMITTEE

JAMES W. STORY, '25
ALAN J. CRAIG, '41
DAVID H. DUGEON, '21
ARTHUR W. BUELL, '08
DONALD DYRENORTH, '12
FRANK C. BOWMAN, '10
CHARLES W. HENDERSON, '30
HUBERT A. STRINGER, EX-'34
HAROLD BUSLGER, EX-'41
ERLAND E. ANDERSON, EX-'28
OSCAR W. CARLSON, EX-'29
DON PEAKER, '32
MICHAEL IVANOFF, '25
GLENN R. STEPHENS, '27

PUBLIC COMMITTEE

BRUCE L. LAFFETTE, '22
J. HARLAN JOHNSON, '23
CHARLES W. HENDERSON, '30
FRANK C. BOWMAN, '15
JOHN H. WINCHELL, '12
CLAUD I. BAKER, 36
RUSSELL W. VOLL, '56
W. A. WALDSCHMIDT, Faculty

EXECUTIVE COMMITTEE MEETINGS

1st Thursday in each month, Alumni Office, 7:00 P.M.

Alumni Council Meetings

1st Thursday in each month, Argonaut Hotel, 6:30 P.M.

Publication Committee Meetings

2nd Thursday in each month, Alumni Office, 7:40 P.M.

Magazine Staff Meetings, Alumni Office on call.

NEW ASSOCIATION MEMBERS

MAY, 1940

Alumni

MERRILL D. WYATT, 21 - Newark, Ohio
ALFRED S. WEBER, 21 - Frankfort, Ky.
W. F. SHANKLIN, 17 - Taft, Ohio

Alumni Foundation

CHARLES W. HENDERSON, '30 - Denver, Colo.
ARTHUR W. BUELL, '08 - Omaha, Neb.
JOHN H. WINCHELL, '17 -Shortly, Colo.

Alumni Association

EDWARD J. BROOK, '31 - Denver, Colo.
HARKER BOWMAN, EX-'41 - Cody, Wyo.
ALEX W. CARLSON, EX-'29 - Los Angeles, Calif.
CLARK B. CROWELL, EX-'40 - Chicago, Ill.
ALBERT J. DUTTON, EX-'30 - Denver, Colo.
BRYCE E. SIMMS, EX-'40 - Texarkana, Tex.
FRANK C. BOWMAN, EX-'16 - Eureka, Calif.
ROBERT M. MEYER, EX-'37 - Greeley, Colo.
HUBERT A. STRINGER, EX-'34 - Cody, Wyo.
GEORGE E. STARK, EX-'51 -Alaska

REPORTS

Executive Committee Meeting

The regular, monthly meeting of the Executive Committee was held in the Alumni Office on Monday, May 20, 1940.

Members present: E. J. Brook, President; Frank C. Bowman, Vice-President; George W. Thomas, Treasurer; Frank J. Nell, Secretary; Charles O. Parker, Committee Chairman; Bruce L. Laffette, Publications; James W. Dudgeon, Athletics; Russell F. Volk, Member; T. C. Doolittle, Budget; Donald Dyrenforth, Public Relations; C. Lorimer Colburn, Alumni Association Endowment; Allen Craig, Capability Exchange, Guests: Kent Lay and E. E. Perkins.

Alumni Foundation

Treasurer Thomas reported that the treasurer's fund is in a secure condition and is increasing more rapidly than has been the case during the past several years due to outstanding membership efforts in the past winter months. The greater portion of our alumni membership is young and in the position to make larger contributions. From this point of view, the Alumni Association is in a strong position to provide financial assistance to the College of Mines.

Alumni Association Endowment

Chairman Lorimer Colburn spoke of the activities of this committee and all alumni were asked to keep in mind this fact for active participation at the proper time.

Publications

Chairman Bruce Laffette advised that the Special Alumni Number was being printed and that all efforts are being made to put the press but that it had been well received by all alumni. Chairman Colburn regarding a report of the Association Can be sold to Mines Men as it has been sold to others; if, in the judgment of the Committee, it shall be found advisable, the Association will make it available to all interested members.

Alumni Association Endowment

Chairman Colburn informed the members of the Alumni Association that the Executive Committee has been considering the possibility of the establishment of an endowment fund for the benefit of the College of Mines. The Executive Committee has decided to urge the alumni to support this fund and to invite contributions from all sources.

Annuity Fund

Dr. Arthur Adams has consented to accept the position of Treasurer, and the Association will issue a bond to the College of Mines in the amount of $1,000,000. This bond will be sold to the College of Mines and will be used to finance the construction of a new building on the campus of the College of Mines.

Alumni Endowment

Chairman Lorimer Colburn reported that the Alumni Association is making progress in its efforts to raise funds for the establishment of an endowment fund for the College of Mines. The Executive Committee has been considering the possibility of the establishment of an endowment fund for the benefit of the College of Mines. The Executive Committee has decided to urge the alumni to support this fund and to invite contributions from all sources.

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MINES ANNUAL ALUMNI BANQUET

By FRANK J. NAGEL, Secretary

On Thursday evening, May 23, at 6:30 P. M., there assembled in the University Club in Denver, from far and near, Mines Men for their annual evening of fellowship and welcome to the new brethren of the Class of 1940. The Mining Engineer was sung before sitting down. No time was lost by the waiters in serving the food. And the Wandering Minstrel thumming his guitar promptly got the crowd into a singing mood. Between bites all the popular songs were rendered, harmony filled the air. The excellent meal had been disposed of in the "Mines" Dining Room.

Mr. and Mrs. Guggenheim established the Executive Alumni Association of the University of Denver in memory of their son, John Simon Guggenheim, who died in 1922. This Foundation provides scholarships for advanced studies abroad. For many years the name of Simon Guggenheim has been closely associated with the mining and metallurgical developments of Colorado. In 1923 he was named United States Senator from Colorado and during his term as senator devoted his entire time to the service of his state and constituents.

From early manhood Simon Guggenheim has been active in promoting the interests of Colorado and of the Colorado School of Mines. His confidence in and respect for the School has been further shown by the selection of Mines' graduates to serve in important assignments on his staff.

Simon Guggenheim has gained distinction as a mining engineer, a captain of industry and as a mining man.

President Brook then took the floor and extended a welcome to all present. He welcomed the class of 1940 into the ranks of the Alumni Association and reminded them that from now on into the future they would have responsibilities to fulfill, not the least of which is their responsibility to the Alumni Association and to their Alma Mater.

He then stated that acting upon a petition from the membership of the Alumni Association the Executive Committee had unanimously voted to confer an Honorary Membership in the Association upon Simon Guggenheim. Mr. Guggenheim had been invited to be present at the banquet but was unable to accept. President Brook presented the certificate of Honorary Membership to the secretary, asking that he read the qualifications embodied therein and, after the meeting to mail the certificate to Mr. Guggenheim.

The qualifications were as follows:

1. Simon Guggenheim has been a benefactor of the Colorado School of Mines by donating to this institution Guggenheim Hall which is now its Administration Building. He has shown an unusual interest in education and in everything relating to the betterment of mankind. Mr. and Mrs. Guggenheim established the Simon Simon Guggenheim Memorial Foundation in memory of their son, John Simon Guggenheim, who died in 1922.

2. The Foundation provides scholarships for advanced studies abroad. For many years the name of Simon Guggenheim has been closely associated with the mining and metallurgical developments of Colorado. In 1923 he was named United States Senator from Colorado and during his term as senator devoted his entire time to the service of his state and constituents.

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4. Simon Guggenheim has gained distinction as a mining engineer, a captain of industry and as a mining man.

President Brook then presented the toastmaster, Dr. Arthur S. Adams, who introduced the distinguished guests, many of whom said a few words.

Mr. Max Scott, President of the Climax Molybdenum Company, told in a few words how lucky smiled on him and brought him to Colorado. Dr. Coolbaugh spoke briefly. Mr. Charles A. Banks of the Bulolo Gold Dredging Company, Ltd., told of his experiences and assured the class of 1940 they had made no mistake in choosing the mining profession. Mr. William Shepherd, Managing Editor of the Denver Post, was called upon but was not present his name wasaplited as a friend of Mines.

Mr. Barney Whatley explained how Mrs. Whatley and he had decided to present the Murals to the Colorado School of Mines. Ex-Governor Jesse McDonald, W. J. Coulter and John T. Barnett were also presented.

Mr. James W. Dudgeon, Chairman of the Athletic Committee, was then introduced and presented Messrs. Katzenstein and Madden with framed cartoon of themselves in football suite.

Coach John Mason was then presented with a fine gold Waltham wrist watch in recognition of his producing a championship football team. The assistant football coaches were lauded.

Mr. John T. Barnett introduced the toastmasters. The speaker of the evening, Mr. L. Ward Bannister, introduced. From his first words it was easy to see that a happy choice had been made for the speaker. He spoke a language the students could understand. Mr. Bannister's subject was "My Country 'Tis of Thee" and pointed out what American Democracy means to the citizens of this country and the reasons why we enjoy the many advantages we have. He analyzed in a very fair and dispassionate manner the advantages and disadvantages of the New Deal, giving full credit for what was progressive and worthy of being retained and pointing out those ideas which had failed and gave his well thought out remedies for an orderly return to normal conditions. Mr. Bannister closed with the plea that everyone should assume his full responsibility as a citizen and that all should rededicate themselves to the principles of democracy.

After hearty applause for the talk of the speaker, Toastmaster Adams introduced Chairman Don Dyrenforth of the Public Relations Committee.

Dyrenforth presented the prizes of the evening. The prime for mileage was a close one between Monterey, Mexico and Los Angeles, California, but it was decided that Los Angeles was the greater distance from Denver and Edward J. Brook received the prime for distance.

Frank D. Aller of the class of 1982 received the award for the oldest graduate present.

The prizes for the absent members went to W. T. Currants of Little Falls, New Jersey, while the lucky ticket holder among those present was F. J. Bacher, Class of 1940.

Mr. Arthur L. Adams and Mr. L. Ward Bannister were also presented with rememberables of the evening.

Mr. James W. Dudgeon, Chairman of the Athletic Committee, was then introduced and presented Messrs. Katzenstein and Madden with framed cartoons of themselves in football suit.

Coach John Mason was then presented with a fine gold Waltham wrist watch in recognition of his producing a championship football team. The assistant football coaches were lauded by Coach Mason and introduced as the course of his remarks.

Toastmaster Adams returned to the mike and extended greetings to the Class of 1915, five members of which were present in celebration of their Silver Anniversary. Ben Ewing made the response and in his talk assured Curt Donoirth of the usual silver contribution to the C. S. M. Foundation. The other four members in attendance were, A. H. Bebee, A. C. Duman, H. W. Kantz and W. S. Stringham, the latter from Mr. Pleasant, Tenn.

There followed an entertainment of the Public Relations Committee.

(Continued on page 320)

THE MINES MAGAZINE • JUNE 1940
various stunts from the Three Range Riders to Professor LeMont, midnight. A perfect evening.


The winner will be announced in the Mines Magazine, 734 Cooper Building, Denver, Colorado.

"As you have been and you go into the mining world you go forth with the best possible training; a grounding from the Colorado School of Mines which be51 years in both appearance and capacity for scaling hills and digging in being able to perform any manual job on the property. And he knows that Art is not to find him on the railroad side, helping to load or unload a box-car, as they are to find him cutting through red-tape in the office. The management is both practical and efficient. His letters to the home-office include bits of practical wisdom and philosophy like the following sample with which he commends the manager; "So, let’s go abroad with it and stop all this ballyhooing."

His only complaint against the march of progress is the invention of that contraption, the typewriter. His previous approach to his work had forced him to synchronize his mind with the relatively slow action of his two index fingers, and he would change the lines in a bull mill than mess with a new typewriter ribbon. He insists he can’t fix anything that weighs less than a ton.

With a shock of snow white hair and a most pugnacious jaw, he presents a formidable appearance to strangers. His gruffness, however, is merely superficial. Everyone who has heard him utter a word to an audience of mining engineers will admit that he has the most impressive voice in pretty serious level to a railroad president. Every man on the job has heard him for the story of his riding five miles at midnight to relay a sorrowful message from beams streaming down his green check.

March received his E.M. from Colorado School of Mines in 1940. He was born in 1896 and was, some 25 years before he received mine. It’s difficult to say whether the moment may be ahead, and this may be particularly true for a young engineer. But, if this is the case, we shall have no trouble in the recognition of the nominee. The Mining Journal will announce to the readers who has won the first award in its second month after publication. Send list of names to the Mining Journal, 734 Cooper Building, Denver, Colorado.

MAY 24, 1940

"As you have been and you go into the mining world you go forth with the best possible training; a grounding from the Colorado School of Mines which be51 years in both appearance and capacity for scaling hills and digging in"
MINES MAGAZINE * JUNE 1940

TRAVEL TRAILWAYS TO ALL AMERICA

See Your LOCAL TRAILWAYS AGENT
at White, Wish or Phone

TRAILWAYS
Passenger Traffic Department

DENVER UNION BUS DEPOT
KE. 2291
501 17TH STREET, DENVER, COLORADO

THE MINES MAGAZINE * JUNE 1940

Dr. F. M. Van Tuyl, head of the Geology department, was appointed to the Preaward Committee con­nection of the Geology Conservation Com­mittee, at the meeting of the Intercollegiate Com­mittee held in Oklahoma City recently.

The new campus does not form the same service with natural gas acting on oil fields as the original Oil Conservation Conservation did with the oil itself. It is intended, primarily, to allow the accumulation of a suitable reserve of oil and gas, and to prevent the wasteful exploitation of the fields now in operation.

Mines Glee Club

The next year will be headed by Mr. Leon S. Ward who takes the place of Dr. A. S. Adams who last year arranged to join the faculty of Cornell University. Dr. Ward is well qualified for the position as he organized the glee club at the Michigan School of Mines when he was associated with that school.

Mining and Metallurgy

official publication of the A. I. M. E. again pays tribute to Mines student body by reason of the school again leading all mining and Metallurgical schools on the continent in number of student associates. This makes the seventh time this has occurred since statistics on the rankings were first compiled.

Mines lists 241 members which was followed by a close second at the A. I. M. E. College of Texas with 240. The latter, however, is composed of many affiliated student societies, not student chapters as is the case at Mines. Nevertheless it will be a nip-and-tuck race for the top this coming year.

Baseball Field

The Mines baseball field has been improved during the summer months. The plot is to cut the field back to the size that it was when it ceased to be used and rock seats will be built on the sidelines. Two drives will be built for cars.

Wild Horse Park

will have in the near future, as well as early as this fall, some tourist traffic that was not there until the road was improved. The rest of the park will be used for educational purposes where it can be used for a natural history museum or a wildlife laboratory.

B. L. McCollum

on leave of absence from the Geology department, has notified Dr. Van Tuyl that he will return to Golden in September to resume his teaching duties. He has been connected with the Argentine government the past year and located in Buenos Aires. He will teach Petroleum Geology, Petrology and Non-Metals.

M. C. Miller

Dr. John Hefl will be given complete charge of Petroleum and will be assisted by Professors Stevens and Leving. Students will take the Structural Geology department with Leving taking all of the laboratory work.

B. B. Van Tuyl

the Philippine government has asked Van Tuyl to continue Dr. Van Tuyl’s connection with the school of Mining and Metallurgy in the Philippines. In his connection he will maintain the company’s connection with the Mines.

Dr. Edward D. Brown

Mr. Brown, former student at this institution, has returned to take the post of assistant professor in Mining and Metallurgy. He is a member of the company, and feels that he cannot give full time to the school.

Boots Recommended for One Work­

By Thiel, Stauffer, Allison.

In Petrology and Geology

1940.

By Leggett.

Gold Deposits.

By A. Harker.

A. H. Baker.


Barlow and set your sights on a new one.

THE MINES" BALL.

By Emmons.

Charles H. E. Lees, 1937, University of Chicago Press.

Principles of Petrology.


Mudd to the igneous intrusion of the area, approximately thirty square miles.

The work done at the Park by the students was of an extremely practical nature. Five square miles together to make a complete geological map of the entire area, approximately thirty square miles. This includes a structural outline map, a surface topographic map and an in­

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1940.

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Gold Deposits.

By A. Harker.
A dinner meeting of the Birmingham Section was held on Saturday evening, April 20, 1940. Each member was requested to bring guests with him and alumni of seven different schools were present. Among the alumni of the Michigan School of Mines were the special guests of the evening, having a large group in attendance. Thirty-four men were present, including the members of the Section and the evening proved very instructive and interesting.

Mr. C. E. Abbott, Vice-President of the Tennessee Coal Iron and Railroad Company, presented several reels of movies which he took while on a European tour in 1939. This was of particular interest because it showed sections of the continent included in war areas at the present time.

President T. C. DeSalier, '03, Vice-President of the University of Texas, entertained all those present to a dinner at the University Inn. The feature of the meeting was the showing of the moving pictures of last season's Mines-CC game which everyone enjoyed most thoroughly. The senior class of Petroleum Engineers visited Houston and vicinity May 11-15 and were entertained by the Houston chapter at an "eat as you can" dinner at Jack Saunders' Pier, Saturday evening, May 11. Members of the chapter met with the visitors at the University Inn and the meeting was one of the class party, including Professors Ball and McGhee, Ex-Mines.


The Houston section held its regular monthly meeting on Friday, May 10, at 6:00 P. M., in the cafeteria of the Lamar Hotel. Those attending were:

W. W. Graham, Ex-Mines; C. W. McKenzie, '22; A. W. Beck, '23; T. C. DeSalier, '03; W. C. Chase, Ex-Mines; A. L. Lynne, '06; President; M. B. Frank, '06; Secretary, 4537 Drexel Blvd., Chicago. Meetings upon call of Secretary.


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BOOK REVIEWS


A study of the growth of Fascism, in which the author traces the development of the movement from its origins in Italy to its present widespread influence throughout Europe. The book is well written and presents a clear picture of the development of Fascism. It is a valuable contribution to the study of modern history.

Feb. 1, 1940

SUGGESTED GOLD DREDGE. Patent No. 2,196,280, issued April 9, 1940, to J. L. M. Winton, Alberton, B.C., Canada.

A device for washing gold from placer deposits. The dredge is equipped with a set of buckets which rotate at a high speed. The gold is captured in the buckets and conveyed to the sluice box for recovery.

Feb. 1, 1940

PRODUCTIONS OF THE MINES MAGAZINE. Patents No. 2,196,296, issued April 9, 1940, to C. L. Willard, Sonoma, Calif., and John N. Vincent, Whittier, Calif.

A collection of patents and patent literature related to the mining industry, including patents for mining equipment, mining processes, and mining claims.

Feb. 1, 1940


This patent describes a method for determining the value of mineral properties, including surface and leasehold properties.

Feb. 1, 1940

DRILLING FLUIDS. Patent No. 2,195,196, issued April 1, 1940, to H. J. Reinhart, Denver, Colo., assignor to Redwood Beach, Inc.

A composition for use as a drilling fluid in mining operations. The composition is a mixture of water, clay, and oil.

Feb. 1, 1940

RECOVERY OF SILPHER. Patent No. 2,196,965, issued April 9, 1940, to C. J. S. H. Smith, Los Angeles, Calif., assignor to Standard Oil Co. of California, Los Angeles, Calif.

A process for recovering silver from silpber, a silicate of silver.

Feb. 1, 1940

TOOL GUIDE. Patent No. 2,196,870, issued April 1, 1940, to George W. Kuster, Long Beach, Calif., assignor to Clyde Kitley, Bakersfield, Calif., a cooperator of Daniel B. Monroe, Denver, Colo.

A device for guiding mining tools during drilling operations.

Feb. 1, 1940


A device for dressing the cutting edges of rotary molds used in mining operations.

Feb. 1, 1940


A method for preventing corrosion in commercial meters, which are used in mining operations.

Feb. 1, 1940

METHOD OF MAKING POWER KIT. Patent No. 2,196,724, issued April 1, 1940, to T. J. Terry, South Phoenix, Calif., assignor of one half interest in said power kit to Charles E. Burt, Los Angeles, Calif., a cooperator of Charles E. Burt, Los Angeles, Calif., a corporation of California.

A method for making a power kit used in mining operations.

Feb. 1, 1940


A device for cementing wells in mining operations.

Feb. 1, 1940

WELL CEMENTING, WASHING, AND ACIDIZING MACHINERY. Patent No. 2,196,653, issued April 9, 1940, to C. J. S. H. Smith, Los Angeles, Calif., assignor to Standard Oil Co. of California, Los Angeles, Calif., a corporation of California.

A device for washing and acidizing wells in mining operations.

Feb. 1, 1940


A device for circulating fluids in mining operations.

Feb. 1, 1940


A device for boring holes in mining operations.

Feb. 1, 1940


A device for deflecting bits used in mining operations.

Feb. 1, 1940

TINNITUS BIT. Patent No. 2,197,541, issued April 16, 1940, to George E. White, San Francisco, Calif., a corporation of California.

A device for tinning bits used in mining operations.

Feb. 1, 1940


A device for plugging wells in mining operations.

Feb. 1, 1940


A device for controlling lift mechanisms in mining operations.

Feb. 1, 1940


A device for cleaning wells in mining operations.

Feb. 1, 1940

NEW WILFLEY 5" MODEL "CB" SAND PUMP. Denver, Colo.

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326

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PERSONAL NOTES
(Continued from page 295)

His home address is 455 East 122nd Street. Wm. J. Faughan, '90, chemist for the Shell Oil Co. Ltd., has a new residence, 201 Plover Avenue, Long Beach, Calif.

W. E. Tunnell, '16, is employed by the U. S. Geological Survey at Los Angeles, California in the capacity of chief chemist, Kenneth A. Pick, engineer for the Sinclair Refining Company, resides at 4855 Massachusetts Street, Fort Worth, Texas. L. C. Sperry, '21, is general manager of the Argila Chemical Corporation, 110 East 12th Street, New York City, his residence address is 555 East 9th Street, New York City, Harlow L. Tefft, Esq., '95, has moved his residence to 1618 East 11th Avenue, Denver. He is in the mail service department of the Denver post office.

Charles C. Turley, '94, assistant metalurgist for the Jeffery Manufacturing Company, resides at 1212 Indiana Ave., South Bend, Indiana. J. R. F. Barbey, '17, attorney-at-law, has moved from Los Angeles to Houston, Texas, where his address is 1110 Houston.

Visitors at the Alumni affair recently included: Edwin E. Barry, '97 from Seattle; J. M. Cleary, '91, for the Consolidated Copper Company, Copper City, Michigan; H. M. Young, '98, Conservation Engineer for Los Angeles, Rhode Island, '93, who has been with Phelps Dodge Company in Jerome, Arizona, for the past few years; he recently accepted a position with the Grae Rhob Company and will now reside in Denver; J. C. Wilcox, '14, Dean of Mining and Metallurgy of the New Mexico School of Mines, Socorro, N. M., William E. Squire, '15, engineer for the Big Edge Mines, Inc., Denver, Colorado.

WEDDINGS

Smith-Shaneck

The marriage of Delbert F. Frame, '38 and Miss Naomi M. Shaneck of Oblong, Illinois, took place at St. Louis, Missouri, on April 26th. The couple are making their home in Butte, Montana, where Mr. Frame is employed by the Consolidated Copper Company at Chino, California. When an infant his parents re moved to Butte, Montana, and there his address is 1618 East 13th Avenue, Denver.

WEDDING BIRTHS

From far away Chile comes the news of the birth of Susan Catharine Fernland to Mr. and Mrs. Russell D. Fernland on February 4, 1940. The young lady tipped the scales at 4 pounds. Her father is a

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PENDER'S Electrical Engineers' Handbook, Third Edition

By Max W. Ball, '06

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