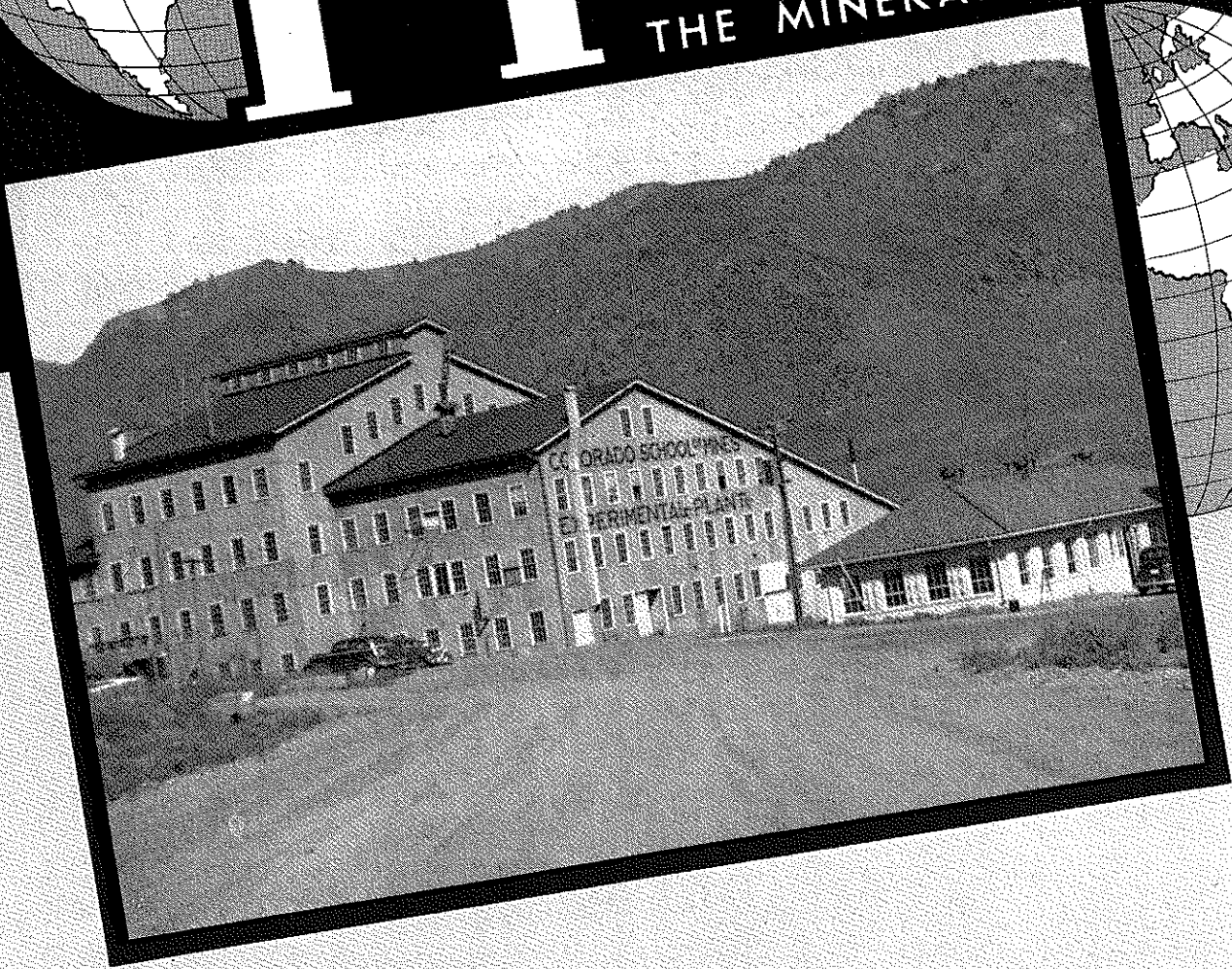


THE MINES MAGAZINE

AROUND THE WORLD WITH
THE MINERAL INDUSTRIES

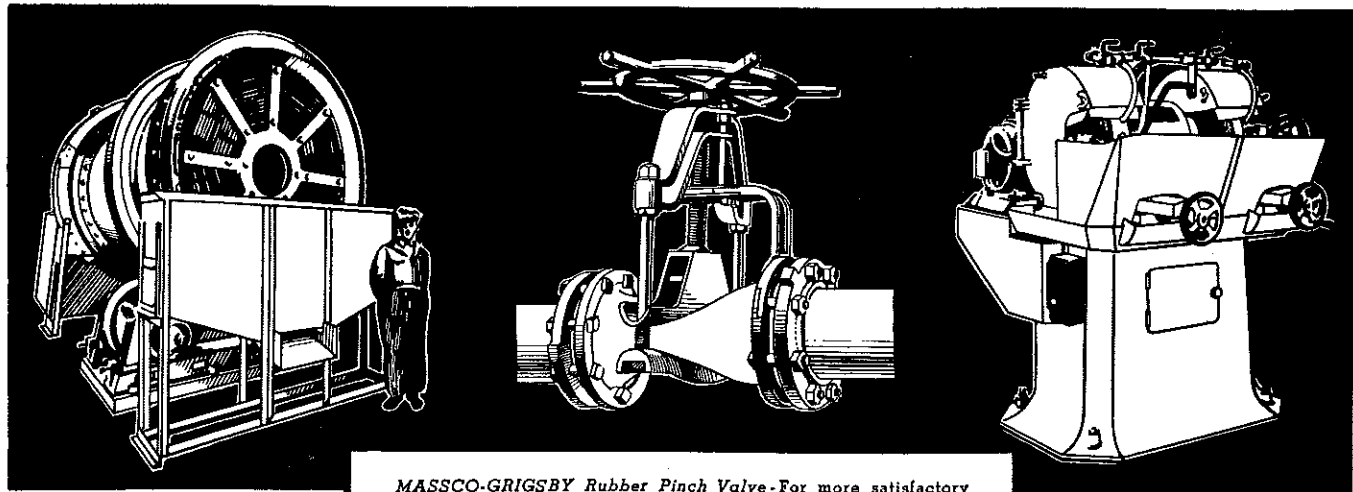


APRIL • 1940

VOLUME XXX

NO. 4

ALUMNI NUMBER
CELEBRATING THE
30TH ANNIVERSARY OF
MINES MAGAZINE



MARCY Ball Mills, Rod Mills and Tube Mills - Low discharge open end and enclosed types engineered for maximum output, low per ton cost and long life with minimum maintenance.

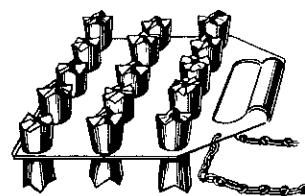
MASSCO-GRIGSBY Rubber Pinch Valve - For more satisfactory handling of corrosive and abrasive pulps and solutions. Many sizes

Greetings to MINES Men

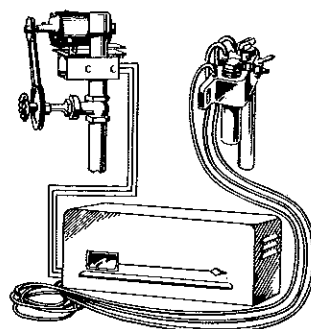
On the occasion of this 30th Anniversary of Mines Magazine "Mine and Smelter" wishes to express appreciation for the cooperation of Colorado School of Mines and Mines Alumni everywhere.

Both the school and its former students have, thru their helpful cooperation contributed much to the development of Massco products. Mines and Mines Men, we salute you!

★ **Genuine Wilfley Tables, Gold Traps, Amalgamators, Clean-Up Barrels, Belt Feeders, Placer Machines, Dredges; ASSAY EQUIPMENT AND SUPPLIES, MINE AND MILL SUPPLIES, COMPLETE MILLING PLANTS.**

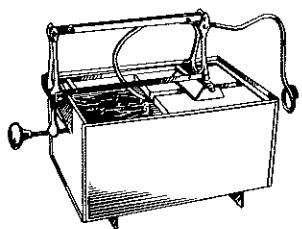


MASSCO Rock Bit Carriers - Stop bit losses; increase footage by ending over and under use of bits. A progress record for shift boss.

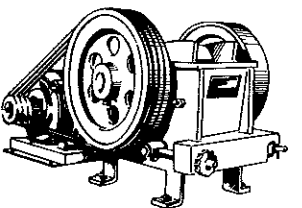


MASSCO-ADAMS Density Controller - Automatically controls both percentage of solids and size of finished product. Keeps grinding unit at optimum efficient capacity; gives visual notice of any change in mill feed. Eliminates constant checking of circuit and hand regulation of water. This machine establishes proper relation between tonnage and metallurgy. Pays for itself quickly.

MASSCO Rock Bit Grinder - The No. 38 Super Model gives big operators many speed and efficiency features not to be had in any other grinder. Other types to meet the needs of plants of all sizes.



ADAMS Reagent Feeder - A self-contained portable unit without prime movers, speed reducers, belts, pulleys or connections. Adaptable to many types of reagents used in ore mills and other metallurgical plants. Provides a wide range of flow, from one drop in 63 seconds on up. One simple micrometer adjustment screw. Set it up anywhere. Avoids deterioration of reagent due to agitation.



Improved 4x6 MASSCO Lab Crusher - Weighs only 435 lbs. but has ample strength for steady, heavy-duty laboratory crushing. It has no shims, set screws or toggle adjustments. All jaw and cheek plates are made of manganese steel. The jaw plates are reversible, top to bottom. V-belt motor drive. This sturdy, compact and efficient laboratory crusher is priced right.



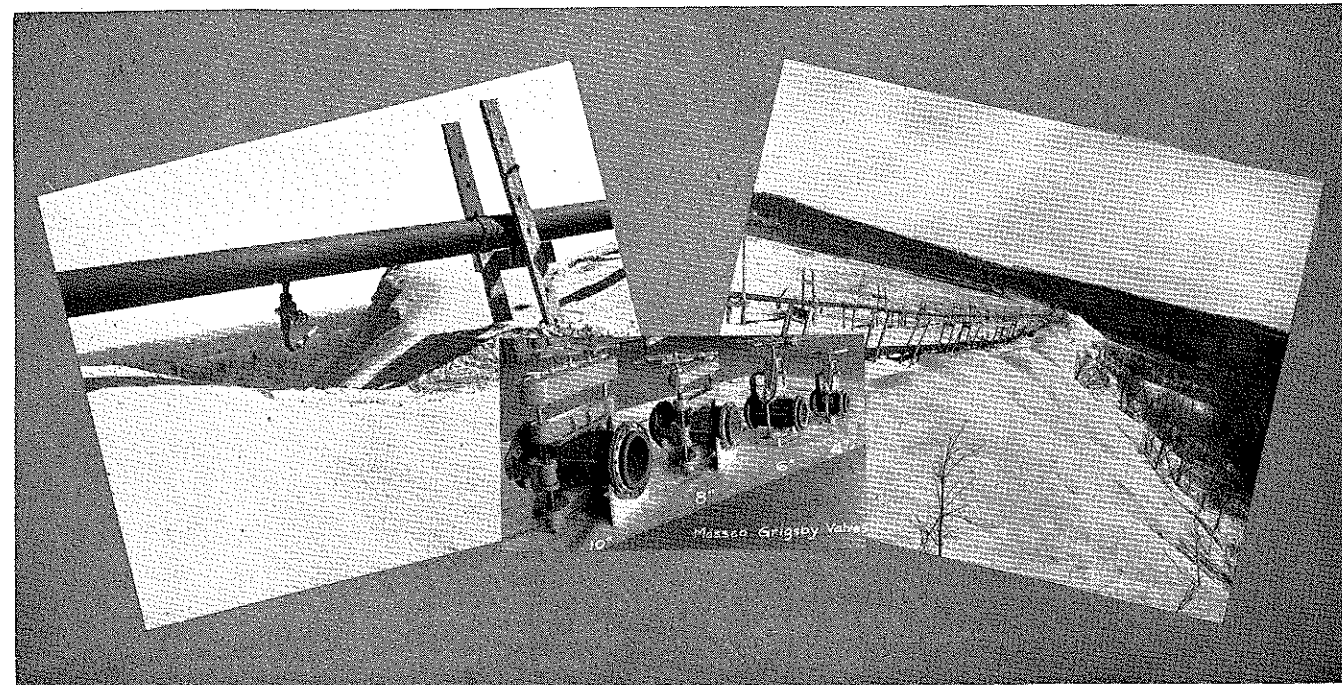
Send for Special Bulletins

Send for Special Bulletins

DENVER
SALT LAKE CITY
EL PASO
SAN FRANCISCO
SEATTLE
NEW YORK CITY

THE
Mine & Smelter
SUPPLY CO.

CANADIAN
VICKERS, LTD.
Montreal
EDW. J. NELL CO.
Manila, P. I.
W. R. JUDSON
Santiago, Chile



GRIGSBY PINCH VALVES . . .

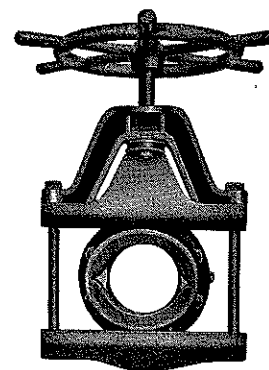
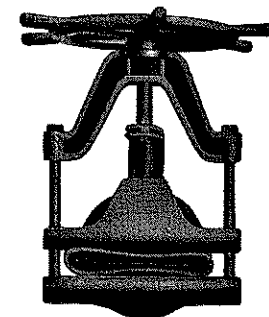
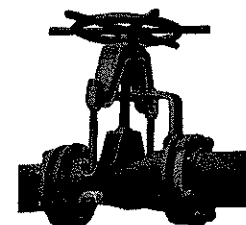
The Grigsby Pinch Valves are rapidly being adopted as standard equipment for ore dressing, in cement plants, dredging operations, and in all industries where severe conditions exist in the transportation of wet materials, such as heavy thick pulps or corrosive mixtures which are often injurious to the metal type valves.

The advantages of the Grigsby Pinch Valves are in their simplicity, ease of operation, long life under severe conditions, and excellent control. They involve practically no wear on the moving parts. No packing glands cause difficulty from leakage or excessive wear. No working parts come in contact with the pulp or fluids. It is easy to close the valves tight, even on coarse products, because the rubber will compress around any particles, and this overcomes the troublesome difficulty encountered with metal valves. Because of the rubber construction of the Grigsby Pinch Valves they can be used in exposed locations in freezing weather, where metal valves give trouble from frost.

The rubber sleeve is reinforced with heavy fabric to withstand a pressure up to 150 pounds per square inch.

High pressure or special lining hoses are available for certain chemicals and solvents which are injurious to rubber.

The Grigsby Pinch Valves are available for immediate shipment in sizes 4", 6", 8" and 10".



G. G. GRIGSBY
E.M.
C.S.M. 1914

The
Mine & Smelter
Supply Co.
SALT LAKE—DENVER, COLORADO—EL PASO



A stitch in time!

Typical repairs and patches made with Flexco HD Rip Plates.

THOUSANDS of men in industrial plants, mines and mills all over the country are doing just what this man is doing. They are cutting costs by repairing conveyor belts with Flexco HD Rip Plates.

WRITE TODAY FOR BULLETIN F-100 that shows how easy it is to repair rips, to strengthen soft spots and to put in patches by using Flexco HD rip plates. The bulletin also shows how to make tight butt joints in both conveyor and elevator belts with Flexco HD Belt Fasteners. These fasteners are made in five sizes. Furnished in special analysis steel for general use and in various alloys to meet special conditions.

FLEXIBLE STEEL LACING CO.
4628 Lexington St., Chicago, Ill.

FLEXCO HD BELT FASTENERS
Sold by supply houses everywhere

Letters

Your letters are welcomed for publication in this column every issue. Send along your bouquets, your suggestions, your news, your problems, your criticisms. You like to read them and so do others. These are a good start, let's hear from others.—Ed.

FLOWERS TO LIVING

From W. M. HART

In line with my life-long policy to give "flowers to the living", I pass these on to the Magazine. To make the picture complete, I start at the beginning . . .

TO the standing of the SCHOOL, throughout the civilized globe . . . and to loyalty of men to the institution that gave them fundamental knowledge!

The first gave the Mines Magazine opportunity; the second placed heavy responsibilities on the shoulders of its founders, and on those who would have charge of it!

If the SCHOOL didn't rank high, the paper could have no real right to exist. And if an able, intelligent, editorial job was not being done, the Alumni couldn't respect it. A man, in other words, puts up with family and friends. But when the latter wins and retains the man's respect, then the individual is "proud" of the relationship!

As an Agent, I must watch and analyze publications our clients can profitably use, honestly and in a "hard-boiled" way. In this spirit I've studied The Mines Magazine.

The Publication combines "personal" and "business" in an admirable fashion. It's a hard job! "Grads" eat up the first because it bands them together. Too often it is overdone! The second they expect. Your articles on proven processes, developments, and the like, make the paper vitally interesting. And the combination of the two elements makes the paper a potent force in the lives of big men, already well established and doing big jobs, in their respective communities all over the world. As such, MINES MAGAZINE is an "influence" that manufacturers can profitably use—which I know from experience—and one which they cannot very well afford to ignore!

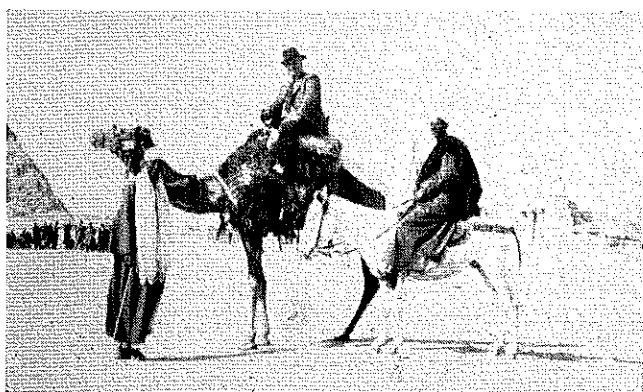
President, W. M. Hart Company, York, Pennsylvania

◇ M ◇

GOOD WISHES FROM EGYPT

From GEORGE B. SOMERS, '30

Had a fine trip over—26 days. We spent nine and a half days at Gibraltar just waiting, then had a big day in Genoa and another in Naples. Went to the top of Vesuvius and then thru Pompeii.



Finally arrived in Cairo and have been seeing the sights ever since. Do not know how long I'll stay here as I'm not under contract but that is a minor worry.

My best to the bunch and many wishes for a very Happy New Year.

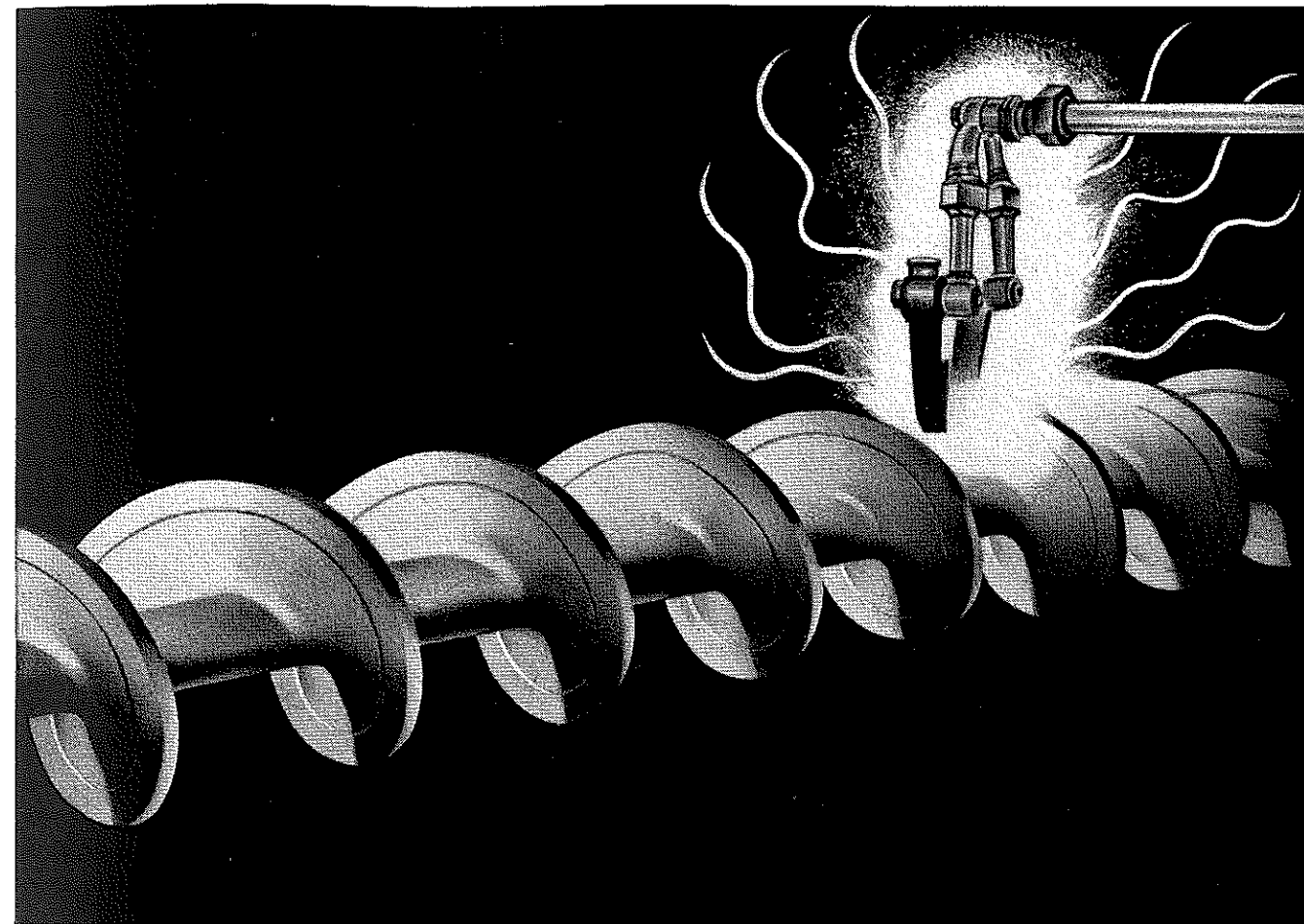
Socony-Vacuum Oil Co., 62 Sharia, Itrhim Pasha, Cairo, Egypt

◇ M ◇

HATS OFF TO UTAH SECTION

From OTTO HERRES, '11

I am enclosing a copy of a letter from Mr. F. B. Garrahan, manager sales promotion, The Eimco Corporation, in reply to my letter of March 14, advising that Eimco is taking a full-page, (Continued on page 150)



LENGTHENING THE LIFE OF EXPENDIBLE PARTS

The replacement of expendible parts has a persistent way of blocking the path to mine operating economy. By the same token, it offers a great opportunity for cost reductions.

For example: a mine was having plenty of trouble with conveyor screws for handling cinnabar. Requisitions for replacements were coming along all too frequently.

Chromium-Molybdenum cast steel screws solved that problem. A simple preliminary heat treatment gives the screws strength and toughness to withstand

heavy pressure and impact loads. Flame hardening the flights to 630 BHN gives them the ability to stand up for long periods under the severely abrasive action of the ore.

The records show that the Chrome-Moly screws last three times as long as others previously used which were actually higher in cost.

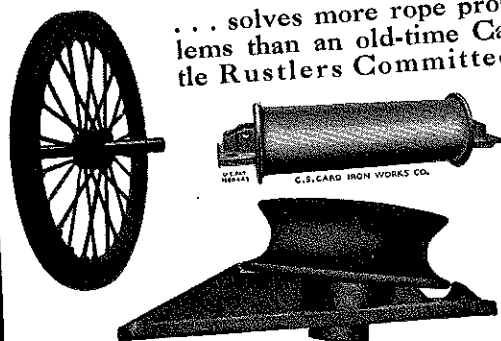
Rechecking your own parts specifications may disclose opportunities for similar savings. Our technical book, "Molybdenum in Steel", is sent free on request to interested production executives and engineers.

PRODUCERS OF MOLYBDENUM BRIQUETTES, FERRO-MOLYBDENUM, AND CALCIUM MOLYBDATE

Climax Molybdenum Company
500 Fifth Avenue · New York City

A CARD Rope Haulage Equipment

... solves more rope problems than an old-time Cattle Rustlers Committee!



Wide choice of sizes, styles, and bearing units—sheaves, rollers, bicycle spoke sheaves. Available from Denver stock.

C.S. Card Iron Works Co.
2501 West 5th Ave.
Denver, Colorado.

APACHE



Owned by metal mining companies of Arizona, New Mexico, Old Mexico, Montana, Utah and Nevada, with a board of directors of mine managers, the APACHE POWDER COMPANY factory has the distinction of being the only plant of its kind in North or South America entirely controlled and operated by mining men.



On the board are: P. G. Beckett, Vice-President, Phelps Dodge Corporation; H. M. Lavender, General Manager, Phelps Dodge Corporation; F. W. MacLennan, Vice-President and Consulting Engineer, Miami Copper Company; T. H. O'Brien, General Manager, Inspiration Consolidated Copper Company; R. W. Thomas, Manager, Ray Mines, Nevada Consolidated Copper Company.



Covering nearly 700 acres of land with 141 buildings, a monthly capacity of more than one and one-half million pounds (equal to a trainload of sixty cars) of high explosives—DYNAMITES, GELATINS, QUARRY, AGRICULTURAL and PERMISSIBLE BLASTING POWDERS, produced under the supervision of mine operators and a highly trained staff of skilled technicians, APACHE POWDER goes forth in a degree of perfection to meet any requirement a condition might demand.



POWDER

APACHE POWDER COMPANY

General Office—Mail and Telegraph
Benson, Arizona

R. R. Station and Telegraph
Works
Curtiss, Arizona

Los Angeles Office
Mail & Telegraph
Title Guaranty Bldg.
411 West 5th St., Michigan 9745

Letters

(Continued from page 148)

two-color advertisement in the special April issue. If there is any credit to the Utah section for this ad, I would suggest it be retained for the good of the Alumni Association.

Combined Metals Reduction Company, Stockton, Utah
◇ M ◇

APPRECIATES VALUE OF MINES MAGAZINE

MR. OTTO HERRES
Combined Metals Reduction Co.
Stockton, Utah

Dear Mr. Herres:

In reply to your letter of March 14th addressed to Mr. C. J. Peterson, we take pleasure in advising that arrangements have been made for a full-page, two-color Eimco advertisement, as per the enclosed reprint, to appear in the April 1940 issue of The Mines Magazine.

We fully appreciate the great industrial purchasing power represented in the membership of the Colorado School of Mines Alumni Ass'n., but our limited advertising appropriation does not permit advertising in all of the publications in which we would like to be represented. We do feel, however, that an advertisement in this special issue should be very valuable and appreciate your having called it to our attention.

Very truly yours,
The Eimco Corporation
F. B. GARRAHAN, Mgr., Sales Promotion
◇ M ◇

FROM THE WILDS

From LOUIS BARTHOLOMEES, '32

From this isolated corner of the Orient all seems well. At this camp are Johnny Barnes, '34 and Dick Spencer, '34. Not far away is Lepanto where John Carpenter, '35, has invaded a hive of Arizonians to be the only Colorado miner there, he recently transferred from the Hong Kong mines of the same company.

Do not get into Baguio but once in a long while but when there do stumble across some of the boys. Have received several notices of meetings in Baguio but have not been able to attend any of them as yet, I still have hopes.

I hope that 1940 will be the best year yet for the Alumni Association.

Suyoc Consolidated Mining Company, Box 218, Baguio, Philippines.
◇ M ◇

FROM BRAZIL

From FRANCIS N. BOSCO, '35

I will probably be on the "high seas" when you get this—though I don't know what steamer. I plan to return to Denver for a few months. I remember your saying there is a dearth of Petroleum Engineers in Colorado. I presume you know I received my license to practice in Colorado, effective January 1, 1940?

I am staying in a mountainous place called "Pogos de Caldas" in Minas Gerais. I hike around a bit, and am also taking the "steam" baths which are famous in this locality. These should soak the heat of the Gulf Coast, Venezuela, and Brazil, out of my system.

Looking forward with pleasure to seeing you again, and to renewing some early friendships.

P.S.—Harvey S. Benedict is with Seismograph Service Corp., c/o Y. P. F. Buenos Aires, Argentina.

Rua General Jardim 876, Sao Paulo, Brazil.
◇ M ◇

30 YEARS A LONG TIME

From HUGH SHARP

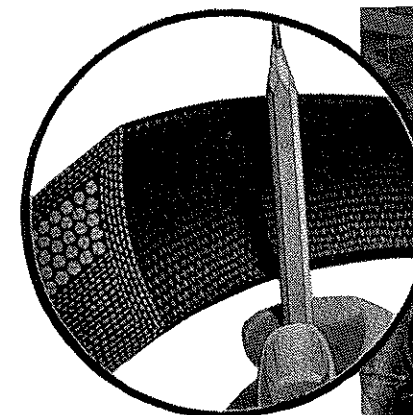
We add our congratulations to those of your many friends in the mining and equipment industry on the occasion of your 30th anniversary.

Thirty years is a long time for any publication and the fact that you have survived through good years and bad is indication of the worth of your estimable magazine.

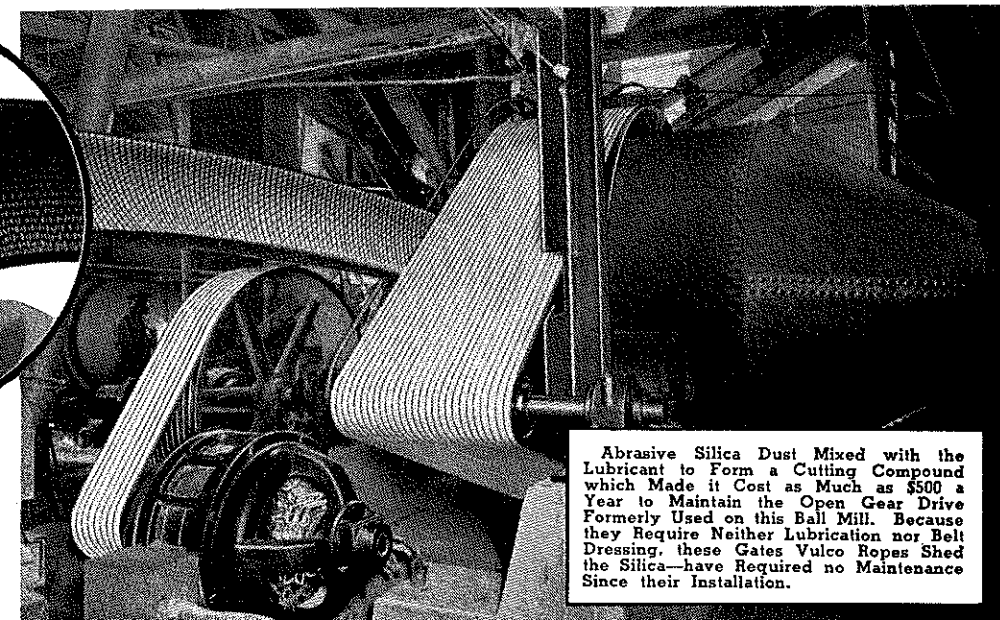
We at Stearns Magnetic receive many industrial papers as a matter of course, but we can say that Mines Magazine is one paper always carefully read because of the unusual merits of its editorial contents.

We wish you many more years of successful publication. We feel sure you will always maintain the same high standards that have characterized your interesting magazine.

Advertising Manager, Stearns Magnetic Mfg. Co.,
Milwaukee, Wisconsin
(Continued on page 152)

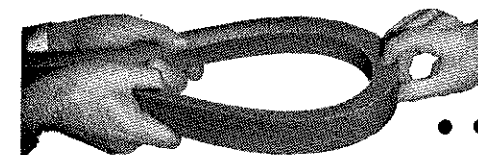


The
Concave Side
IS A GATES PATENT



Abrasive Silica Dust Mixed with the Lubricant to Form a Cutting Compound which Made it Cost as Much as \$500 a Year to Maintain the Open Gear Drive Formerly Used on this Ball Mill. Because they Require Neither Lubrication nor Belt Dressing, these Gates Vulco Ropes Shed the Silica—have Required no Maintenance Since their Installation.

Make This Simple Test See for yourself just how the Concave Side makes A BIG SAVING ... in your V-Belt Costs

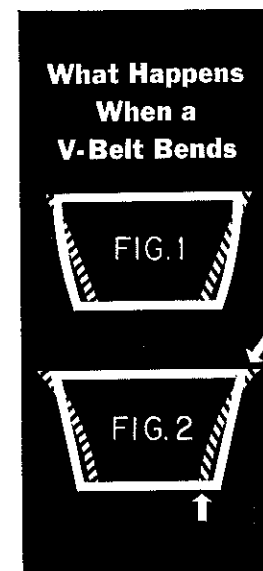


Here's a simple and interesting test that tells an important story:

Take any V-belt that has straight sides. Bend that V-belt while you grip its sidewalls between your fingers and your thumb. You will feel the sides of the belt bulge out—as shown in figure 1 on the left. Clearly, that out-bulge gives the belt a shape that does not fit its sheave groove.

Now look at figure 2. There you see what happens when you bend a belt that is built with the patented concave sides. You get a similar change in sidewall shape—but what a different result! The precisely engineered concave side becomes perfectly straight. There is no outbulge—the full side-width of the belt uniformly grips the sheave groove wall. This means uniform wear—longer life. Again, this full side-width grip on the pulley carries heavier loads without slippage—a big saving in belt costs and a saving in power too!

The Gates Vulco Rope is the only V-belt built with the patented concave side.



It's the sides of a V-Belt that do all the gripping and get all the wear. That's why longer life for the sides means longer life for the belt.

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

- CHICAGO, ILL., 1524 South Western Ave.
- HOBOKEN, N. J., Terminal Building
- BIRMINGHAM, ALA., 1631 1st Ave., S.
- LOS ANGELES, CAL., 741 Warehouse St.
- DENVER, COLO., 999 South Broadway
- DALLAS, TEX., 2213 Griffin Street
- PORTLAND, ORE., 333 N. W. 5th Ave.
- SAN FRANCISCO, CAL., 2700 16th St.

LINK-BELT

Conveying and Power Transmission

EQUIPMENT

• CONVEYORS

Belt, Pan, Apron, Screw, Flight, Bucket, Overhead, for handling all materials.

• FEEDERS

of all types for handling ores.

• CHAIN DRIVES

Silent and Roller Chain Drives . . . Malleable Iron, Promal, Steel, Bronze and Stainless Steel Chains.

• POWER TRANSMISSION EQUIPMENT

Anti-Friction Roller and Ball Bearing and Babbitted Bearing Pillow Blocks, Base-Plates, Gears, Pulleys, Take-ups, Clutches, Hangers, Couplings, Collars, Shafting, Grease Cups.

Catalogs sent upon request.

LINK-BELT COMPANY

Chicago Indianapolis
San Francisco

Philadelphia Atlanta
Toronto

DENVER, 521 BOSTON BLDG.

7590

You Can Save Money

By Using Electric Power
in All Mining Operations

Our interconnected system of transmission lines and plants guarantees an abundance of electric power at low cost.

And we have made ample provision for mining equipment—transformers, meters, poles and miscellaneous materials—that we may render the best possible service to all our customers.

SOUTHERN COLORADO POWER COMPANY

Letters

(Continued from page 150)

MORE INTEREST IN FOOTBALL

From W. E. BURLISON, EX-'36

I certainly enjoyed picking up the papers to see Colorado School of Mines football team in the head lines. My disappointment was that they could not play Boulder this year.

Ohio, Colorado

◇ M ◇

SATISFIED WITH RESULTS

From P. H. GRAY

We had occasion yesterday to check through several issues of your magazine published a few years back. I would prescribe this course of treatment for anyone who wishes to note the remarkable progress and improvement of Mines Magazine.

Definitely, you people are to be congratulated on that progress.

Two of our clients, The Denver Fire Clay Company and the C. S. Card Iron Works Company, have been consistent advertisers in Mines Magazine for many years—with consistently good results.

We have all been well satisfied with the Magazine's general quality, reader interest and bona fide, well-selected circulation. But in view of the obvious improvements made, our satisfaction was never more real than at present.

Ball & Davidson, Inc., Denver, Colo.

◇ M ◇

FAVORS BOOK DEPARTMENT

From C. D. FROBES, '24

I am very glad that the alumni can obtain books through your office and hope that you will occasionally publish a list of books, particularly books on modern practices with reference to both technical and economic problems confronting business management at the present time. Whoever had the original idea of putting an agency for books in the alumni office should be congratulated.

With kindest personal regards.

Edgar Brothers Company, McIntyre, Ga.

◇ M ◇

APPRECIATION

From EDWARD H. KRAUS

Many thanks for sending me a copy of the September, 1939, issue of *The Mines Magazine* in which you used the radio address I gave last June on "New Uses for Old Minerals". I am very much pleased that you found the same of sufficient interest to reprint it in your journal.

Dean, University of Michigan, Ann Arbor, Michigan.

◇ M ◇

MAGAZINE DOES SPLENDID JOB

From PAUL WIGTON

It must be gratifying to you to be associated with such a splendid magazine. We contact many alumni, not only in the United States but through correspondence in many foreign mining regions, and it is obvious from our correspondence that the alumni look forward to the receipt of every issue of the magazine. We do not know of any alumni association that is so closely welded together as the Mines Alumni. Your magazine does a splendid job in keeping the alumni in close contact with the activities at Golden.

We consider it a very splendid advertising medium, and are glad to have had the opportunity to take a minor part in the progressive steps that the Mines Magazine has taken during recent years.

Best wishes for your continued success.

Morse Bros. Machinery Company, Denver, Colo.

◇ M ◇

FROM DISTANT ISLES

From R. H. SPENCER, '34

Have started trying to photo the more interesting people, things and places. On a short trip to Bontock a few weeks ago I saw some of the most unusual sights (to me) that I've seen in my life—the rice terraces of Bontock and Banaue—later I'll send you a snap shot of them, but expect that they will lose a lot, if not all of their beauty.

Glad to hear that Mines went to town in football—in fact more than glad. Even over here all of us follow the results of those

(Continued on page 154)

Our School of Mines Men

INITIATE - DO NOT IMITATE

A CREED FOR PROGRESS

And they asked us how we did it, and we gave 'em the Scripture text,

"You keep your light so shining a little in front o' the next."

They copied all they could follow, but they couldn't copy our mind,

And we left 'em sweating and stealing a year and a half behind.

The little piece of verse above, paraphrased from Kipling, represents our industrial philosophy. We deal in better methods of Agitation, Classification and Thickening. But the distinguishing feature of our products is that we initiated them ourselves—did not imitate the creations of others.

No engineering school has played a greater role in our growth than the Colorado School of Mines. No group of men have been with us so long and risen so high in our executive ranks as Mines Men. No minds have been more closely attuned to our philosophy of "Initiate, Don't Imitate".

It is a pleasure to call the roll of Mines Men on our staff and thus to pay honor to their alma mater.

Our C. S. M. Roll Call

Administration

Elmer R. Ramsey—CSM '12

Director and Executive Assistant to the President. Twenty-six years service in many capacities and now in charge Executive Office, New York.

Philip M. McHugh—CSM '11

President, Petree & Dorr, Inc., New York, Specialists in continuous processing in the cane sugar industry. Twenty-nine years in Dorr organization and its first General Sales Manager.

Metallurgy

Charles W. Burgess—CSM '09

Dorr resident engineer, Manila, Philippine Islands, since 1933 and responsible for much of the mill modernization in this booming gold field.

Donald Dyrenforth—CSM '12

Assistant Manager Metallurgical Division, Denver, a former manager of Export Division, New York, and one-time Dorr resident engineer in the South African gold fields.

K. S. Stansmore—CSM '29

Metallurgical engineer, Dorr-Oliver Company, Ltd., London, and contact man with many British mining companies, operating in Australia, South Africa and other British domains.

Research and Development

Frank A. Downes—CSM '13

Director and manager of the Development Department, New York. Twenty-one years of Dorr service, largely in charge of research, development and testing.

Field Service

J. M. Bilisoly—CSM '23

Manager of the Field Engineering Division of the Engineering Department, New York, in charge of the inspection of equipment after erection, and the supervision of initial operation.



THE DORR COMPANY INC.

ENGINEERS • 570 Lexington Ave., New York

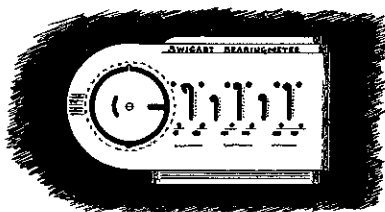
ATLANTA • TORONTO • CHICAGO • DENVER • LOS ANGELES

DORR TECHNICAL SERVICES AND EQUIPMENT ARE ALSO AVAILABLE FROM THE FOLLOWING COMPANIES:
NETHERLANDS: Dorr-Oliver N.V., The Hague • ENGLAND: Dorr-Oliver Company Ltd., London • GERMANY: Dorr Gesellschaft, m. b. H. Berlin • FRANCE: Soc. Dorr-Oliver, Paris
ITALY: S. A. I. Dorr-Oliver, Milan • JAPAN: Sanki Eng. Co., Ltd., Tokyo • SCANDINAVIA: A. B. Hedemora, Hedemora, Sweden • AUSTRALIA: Crossie & Duff Pty. Ltd., Melbourne
ARGENTINA: Luis Fiore, Buenos Aires • SOUTH AFRICA: Edward L. Bateman Pty. Ltd., Johannesburg • BRAZIL: Oscar Taves & Co., Rio de Janeiro

Do You Have Surveying Pains?

... then this new automatic bearing calculator is your doctor.

Accurate,
Quick,
Durable,
Easily
operated.



Works for both the azimuth and back-angle methods of survey, with angles turned from the north or south either to the right or left.

Answers in degrees and minutes, or in degrees, minutes, and seconds.

Correct quadrant appears automatically with each bearing.

Saves time and brainwork by the elimination of sketches of each setup and errors in addition and subtraction of angles.

Nothing to get out of order. Conveniently sized for use in the field, (8"x4 1/2"x3/8" thick). All numbers clearly visible.

Attractive design. Made of plastic. Your choice of blue, green, brown, red, or ivory cover.

Shipments will begin May 1st; mailed C.O.D. \$2.75. Satisfaction guaranteed.

Mail your order for the Swigart BEARINGMETER to

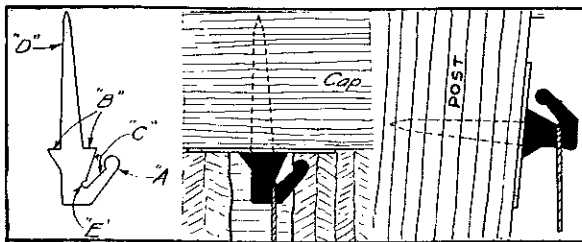
THE HUART COMPANY

206 Parkside Drive

Peoria, Illinois

SALASCO SPADS and TAGS

Engineer's Spads and Station Tags, for all underground surveying. Just what every Engineer is looking for.



Properly and scientifically designed by,
F. B. Harris, E.M., 1913

Hook "A" eliminates threading of plumb bob cord. Cord falls into exact position "E".

Shoulders "B" prevent driving spad too far. Holds tag in place.

Design of inside faces "C" forces cord into exact position when used either in vertical or horizontal positions.

The small eye at "E" is exact position of plumb bob at all positions of spad.

Length and design of point "D" is right for any plug or timber point.

Offset position of hook gives strength to withstand bending or closing of eye or hook when driven into position.

Non-corrosive material used in spads insures long life.

Write For Samples and Prices

SALT LAKE STAMP CO.

65 WEST BROADWAY

SALT LAKE CITY

Letters

(Continued from page 152)

games with plenty interest even if we do learn the results such a long time later.

So far have not been able to make one of the Baguio Alumni meetings but look forward to doing them and meeting several School friends.

Suyoc Consolidated Mining Co., Box 18, Baguio, P. I.

◇ M ◇

MINES MAGAZINE SELLS EQUIPMENT

From J. S. BRADFORD, '10

Regarding the results obtained from advertising in Mines Magazine, I would like to say that Chiksan Tool Company advertises from time to time, particularly in the petroleum edition of the magazine. We know these adds have resulted in direct sales. We also feel that there have been other orders, which we have received indirectly, that were due to our advertisements in "Mines".

For this reason we recommend the magazine to others in a similar line of work.

President, Chiksan Tool Company, Fullerton, California.

◇ M ◇

MINES MEN GOOD CUSTOMERS

From C. E. HERINGTON

On the occasion of the celebration of the Thirtieth Anniversary of your fine magazine and the Special Alumni Number which you are publishing, I should like to extend to you, on behalf of member foundries of the Meehanite Research Institute, our sincere congratulations.

Among our members and among our many good customers are men who are members of your association and whom you serve so admirably.

Although I am not a member of the Alumni Association, I see your magazine frequently and have always been impressed by its interesting editorial and advertising content.

Again, best wishes for many more successful years!

Director of Sales Promotion, Meehanite Research Institute, Pittsburgh, Penna.

◇ M ◇

MINES MEN STICK TOGETHER

From G. M. KINTZ, '20

I am heartily in sympathy with the problems that you and other members of the publication committee are up against, and I believe most of the Mines men who have the interest of the school and the Association at heart fully realize the extreme difficulty there is in getting the majority of any school's alumni to take an active part in supporting the school or the Association.

As you know, there are a number of Mines graduates here in Dallas, so naturally we meet each other at infrequent intervals, and when we do meet, everyone speaks of the splendid work you, Mr. Volk and others are doing; so don't any of you feel discouraged and I assure you that you have the support of all the Mines men with whom I have had a chance to talk.

United States Department of the Interior, Dallas, Texas

◇ M ◇

BEST WISHES FROM SOUTH AMERICA

From FRANK M. ESTES, '02

For many years my work has been administrative and legal, with the result that I have lost close touch with the technical part of mining. Furthermore I am not a camera fiend and have no interesting pictures of the various places where I have worked and visited. However should I run across any thing that might be of interest to the readers of the MINES MAGAZINE I'll proceed to collect data and forward them.

With best wishes for the MINES MAGAZINE and kindest personal regards.

Compania Minera Choco Pacifico, S. A., Andagoya, Choco, Republica de Colombia, S. A.

◇ M ◇

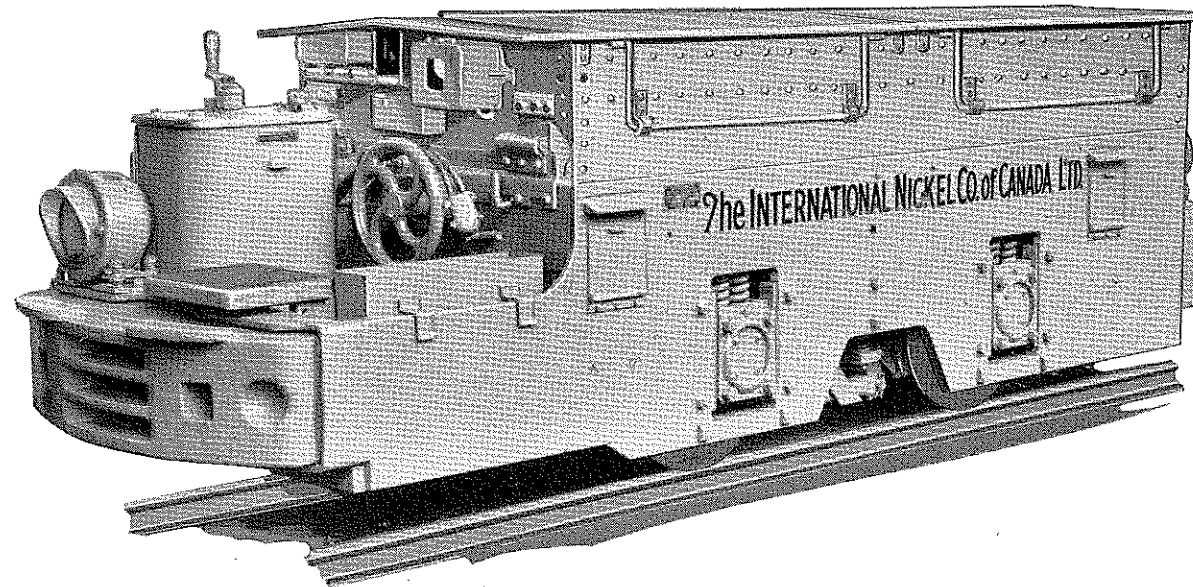
DOING A BETTER JOB

From E. O. SHAW

Coloradans should be proud that in our own Colorado School of Mines we have the world's highest rated mining school. We should also be gratified to see "Mines", steadily progressing. Unquestionably "Mines" has contributed much to the development of the mining industry, both in our own country and internationally.

In saying these things, a word of commendation should be spoken for Mines Magazine. Today it is doing a better job than

(Continued on page 230)



This is one of a fleet of Goodman locomotives in service at a well known metal mine.

Goodman locomotives are wholly reliable, and their successful performance is being demonstrated in every section where metal and coal are mined. They are built in a variety of types and sizes to cover the entire range of mine service . . . but in every instance they are built to meet the particular service condition.

• MINES MEN are employed in various capacities in the Goodman organization.

GOODMAN

MANUFACTURING COMPANY — HALSTED STREET AT 48th, CHICAGO

Denver Office . . . 704 Denver National Building

LOCOMOTIVES · COAL CUTTERS · LOADERS · CONVEYORS

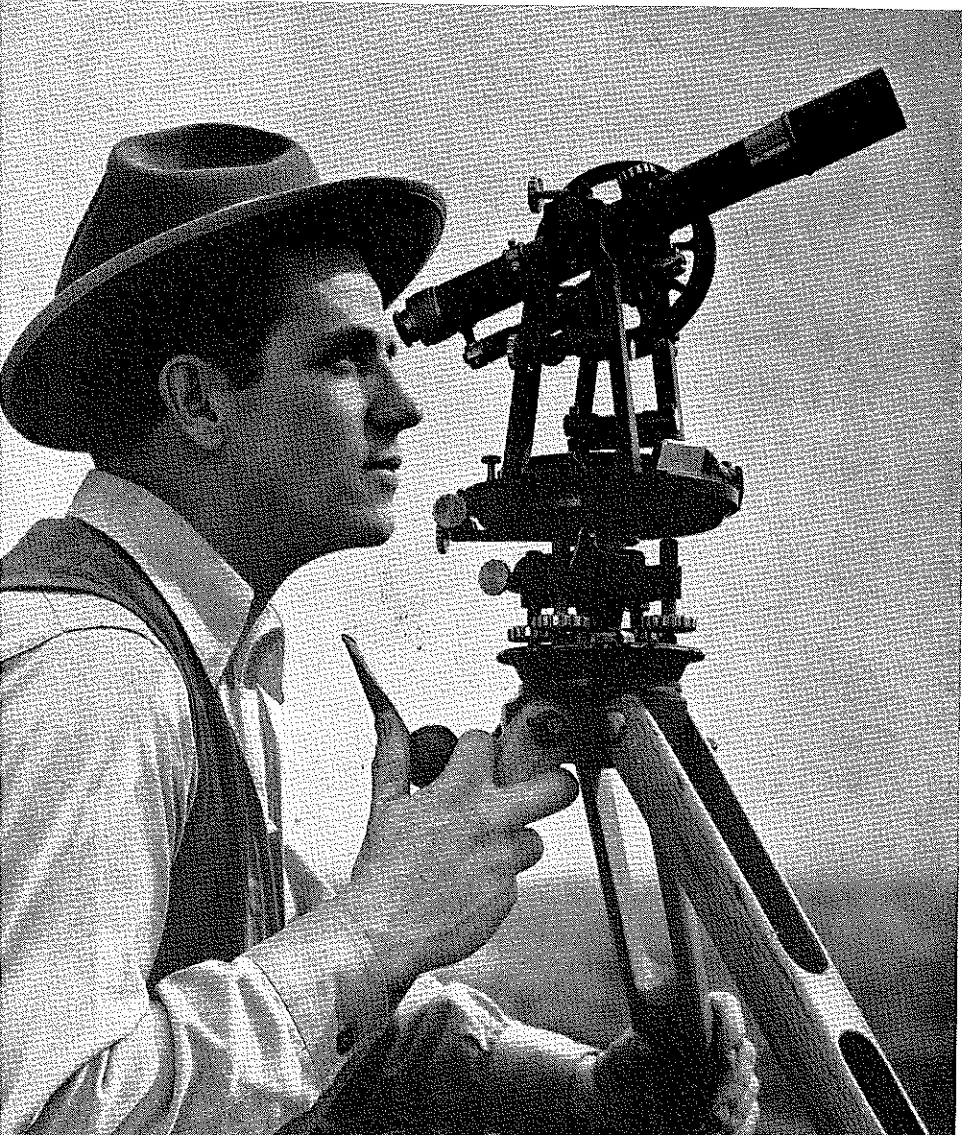
Through the Transit *...and Through the Years*

MINES MEN

have played an important part
in building the character of ...

COLORADO Forged Steel GRINDING BALLS

BOTH HAVE RECORDS OF SERVICE



MINES MEN *hitting the ball with* **CF&I**

DENVER

James D. Sullivan, Ex-'31
Sales Manager, Special Steel Products

PUEBLO

Harold H. Christy, '22
Superintendent, Water Department

James Colasanti, '35 Metallographer

James A. Davis, '39 Metallurgist

Harold V. Gumma, '37 Metallurgist

T. H. E. Jones, '31
Supervising Inspector, Wire Mill

Dorsey E. Mayhugh, '21 Foreman

Francis W. Page, '39 Industrial Engineer

Ralph J. Price, '38 Metallurgist

Myron L. Sisson, '20 Mining Engineer

William W. Stephens, '39 Metallurgist

Charles C. Tappero, '35
Engineer, Industrial Department

Robert R. Williams, '29
Blast Furnace Practiceman

John R. Zadra, '35 Plant Metallurgist



CF&I is almost as old as Mining in Colorado. About the time gold was found in California Gulch at Leadville, the steel mills opened in Pueblo. The two industries have practically grown up together. Steel products, made in the West for western mining, continue to serve dependably.



The Colorado Fuel and Iron Corporation

GENERAL OFFICE: DENVER, COLORADO

STEEL WORKS: PUEBLO, COLORADO



Akins Classifiers

... have *many* advantages
in addition to INCREASED
TONNAGE and IMPROVED
METALLURGY.

Birthday Greetings to MINES MAGAZINE

When Mines Magazine published its first issue 30 years ago, Colorado Iron Works Co. was celebrating its 50th anniversary. Colorado School of Mines was then nineteen years old. Since the school's founding in 1879 many of its graduates, former students and faculty members have participated in the development and improvement of products manufactured by Colorado Iron Works. This company was among the first to advertise in Mines Magazine and has continued to do so because, for the most part, Mines Magazine is our best means of keeping in touch with Mines men.



Send for Bulletin 24-H

This bulletin is a conservative presentation of AKINS Classifier performance, based upon operating data supplied by users, together with detailed explanation of AKINS principles. Write or wire for a copy.

Here are some of the *outstanding* advantages:

Greater overflow capacity per foot width, with substantial saving in floor space; ability to operate at 4" in 12" slope without backslip or surge of sand load; low power requirements; no stalling, even under overload; ability to produce extremely fine overflows; efficiency at high density. These coupled with increased tonnage and decidedly improved metallurgy are the reasons why more new AKINS Classifiers were placed in operation last year than in any preceding twelve months period.

With production costs what they are, any reasonable prospect of reducing them deserves the careful consideration of management and mill operators. Our engineering department would welcome an opportunity to discuss AKINS modern classification with you and your consultants.

We also manufacture: Lowden Dryers; Skinner Multiple Hearth Roasters; Ball, Rod and Tube Mills; Smelting Equipment; Crushers and Rolls; Diaphragm Pumps.

COLORADO IRON WORKS CO.

Main Office and Works, DENVER, COLORADO, U. S. A.

Canadian Locomotive Co., Ltd., Kingston, Ontario, Can.
Vancouver Iron Works, Ltd., Vancouver, B. C., Can.
Marsman Trading Corp., Manila, P. I.

Head, Wrightson & Co., (So. Africa) Ltd. Johannesburg
Head, Wrightson & Co., Ltd., Stockton on Tees, Eng.
The Clyde Engineering Co., Ltd., Granville, N. S. W.

The Mines Magazine

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APRIL, 1940

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Colorado School of Mines Experimental Plant and U. S. Bureau of Mines Field Station at Right.

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Official Organ of the Colorado School of Mines Alumni Association. Copyright 1940. Entered as Second Class Matter at the Postoffice at Denver, Colorado, under the Act of Congress of March 3, 1879. Subscription price \$3.00 a year. Single copies 50 cents. No additional charge for foreign subscription. Published every month in the year by the Colorado School of Mines Alumni Association. Address all correspondence, including checks, drafts and money orders to Frank J. Nagel, Secretary, 734 Cooper Bldg., Denver, Colo. Address all correspondence relating to Mines Magazine to Frank C. Bowman, Editor, 734 Cooper Building, Denver, Colo.

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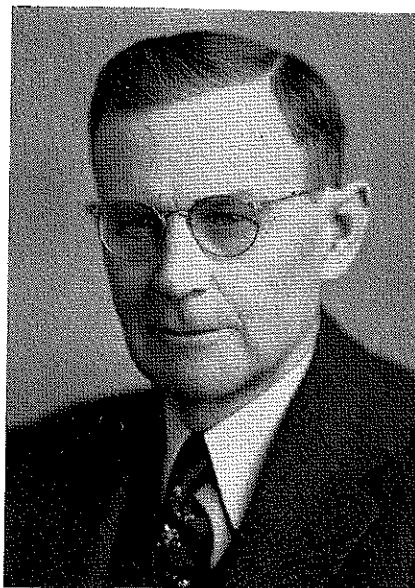
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A. F. BECK, '25

PERCY JONES, JR., '08

Thirty Years Service

By FRANK C. BOWMAN, '01
Editor and Publication Director



FRANK C. BOWMAN

Thirty Years—not long when compared with the life of many publications. Just a good start. It is time enough though to show whether your existence is justified by the service rendered. Serving one master may be difficult in itself but when the task is multiplied many times by the different branches of the mineral industries and their large variety of interests, then it presents a problem not so easy of solution. That industry requires engineers with at least the fundamentals of every branch of engineering, and with this goes a large diversity of interest.

The reader of any magazine has a right to expect and to find material of interest in every number otherwise he will not give it his attention for any length of time. It is fortunate that the broad scope of the mineral industries furnishes a large variety of fascinating material of interest to almost everyone from the layman to the engineer or even the specialist.

In the early days "Mines" attempted to cover the principal branches of engineering, including that of civil, electrical, mechanical, mining and metallurgical. Later they confined their efforts to training engineers for the mineral industries which required, broadly speaking, mining,

geological, chemical, metallurgical, and petroleum engineers. Today we find that "Mines" is the only educational institution in the world devoted exclusively to the training of engineers for the mineral industries.

Thirty years ago a small group of "Mines Men," members of the Colorado School of Mines Alumni Association, had a vision of a greater "Mines," built through the education of men to serve the mineral industries. They believed that to assist in building a greater "Mines," a publication was needed to not only keep "Mines Men" in closer contact with the needs and service of the institution but to get the story to others who were interested in the progress and growth of the industry. It was this need that furnished the impetus to create "Mines Magazine," first a modest 16-page publication filled mostly with college news that went to a few loyal "Mines Men" readers.

With the growth of "Mines" and the broadening of its scope, it was only a natural sequence that "Mines Magazine" should expand and increase its coverage. "Mines Men" became important factors in mining, geology, geophysics, chemistry, metallurgy, petroleum production and refining, research and invention, manufacturing, sales and distribution, education, and many of the various ramifications of the mineral industries in this country and all over the world. They lead in the creation of new processes and methods for utilizing our vast mineral resources.

During this period of progress "Mines Magazine" told the entire world what "Mines Men" were doing, and how they were serving the mineral industries. It furnished the ties so necessary to keep this scattered group of workers in touch with each other and the institution that had instilled in them the fundamentals that were needed for great accomplishment. These men wanted to know what was going on at home; what was being done in the many branches of the mineral industries; and what progress was being made in education, in new methods, in research, in invention and the manufacture of new

equipment. Naturally they looked to "Mines Magazine" to keep them informed on all this progress. In attempting to meet these requirements "Mines Magazine" grew from a strictly college publication, into a class all its own; one that cooperates with the man in the field, the man in the factory, the man who is interested in the mineral industries because it is essential to the progress of civilization, and to the young man at "Mines" who is learning how to carry the banner of accomplishment on and upward.

In celebration of the thirtieth anniversary of "Mines Magazine" we know of no more appropriate way than to dedicate this number to the Colorado School of Mines Alumni Association. An attempt has been made to convey to the reader a picture of the accomplishments of "Mines Men" and the important part they have played in bringing our mineral industries to its present important state of usefulness in making our high standards of living possible. It is only through the hearty cooperation of our many loyal friends that this number has been made possible. To these we extend our sincere appreciation for the support and courage they have supplied.



FRANK J. NAGEL, '03
Secretary Alumni Association

Your Alumni Association

By
E. J. BROOK, '23
President, Alumni Association

Your Alumni Association is a unique organization. Based upon collective effort, it is composed of members fundamentally individualistic in attitude and action. The entire membership, scattered to the far corners of the earth, is numerically inferior to a single graduating class from some of our larger universities. Despite these contradictory factors, which are the enigmas of similar organizations, our association shows a remarkable strength and solidarity of purpose.

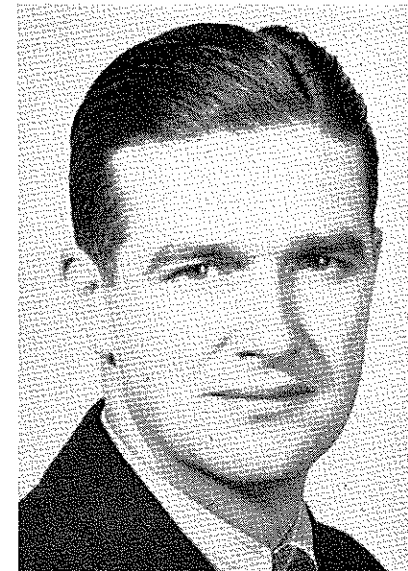
The actual work so well as determination of policies of the association are performed by officers who receive no pecuniary remuneration for their services. These men without exception are relieved of the responsibilities of business life neither by great inherited wealth nor by indifference to personal security. They accept responsibilities to their fellow members by their own initiative and industry in addition to their ordinary business pursuits. Their reward is pride of accomplishment in unselfish service to the organization.

Your Alumni Association is neither a technical society nor a fraternal organization. The broad purpose of the organization is based upon service to the graduates and former students of Mines, regardless of their stations in life or the particular occupational pursuits they may be following for a livelihood.

It is to elucidate more fully a true conception of that service that this particular issue of Mines Magazine is dedicated to Mines Men and their Alumni Association. Through the pages of the publication your officers are endeavoring to reveal the tremendous potential possibilities your organization possesses to be a vital factor in the life of each Alumnus.

Your officers believe that the service your Association can perform for Mines Men is expressed in the desire on our part to keep the fires of friendships formed at Mines brightly burning. It is expressed in the desire to safeguard and enhance the reputation of our Alma Mater as a practical, economic value to the degree of each Alumnus; it is expressed in our desire to perpetuate the ideals and traditions of our college in the student body.

This service finds expression in our



E. J. BROOK

hope to help each Mines Man reach his maximum capabilities and earning capacity through our Capability Exchange. The mistaken idea that a man should avail himself of this service only when "out of a job" is at variance with its true function. That function is to provide better positions for employed Mines Men as they become qualified through experience and post-graduate training. This service cannot be effective unless our members cooperate in advising the Capability Exchange of "positions available" which some Mines Men can fill, so well as thinking of the service only when the occasion "position wanted" arises.

Your Association believes it has made a definite contribution toward helping to solve the perplexing youth problem in a small way through sponsoring Alumni Scholarships. These scholarships make it possible for worthy young men to obtain a college training, who otherwise would be denied this opportunity. The sum our members have contributed to the Student Loan Fund has greatly aided this worthwhile project. As the nature of this program becomes more apparent to our membership, we are certain the Student Loan Fund will receive the unanimous support of our group.

The officers of your association are confident of the cooperation of our members in lending a "helping hand" to the young graduates in their trying period of adjustment after entering business or professional life. The old

idea that such action was a sentimental display of initiative-killing paternalism has been superseded by an interest in the welfare of our "new alumni" by the older members. The latter do not feel that their own struggles and vicissitudes should necessarily be duplicated by the new generation. We believe the Mines graduate of today is a splendidly trained youth who is worthy of our interest and help.

The progress and welfare of our Alma Mater is of more concern to the Alumni than a mere sentimental interest. One of the chief functions of our group is to extend a full measure of support and cooperation to furthering the interests of the school. The Association can and should render valuable assistance in helping the administration at Mines solve such problems in which the school cannot effectively engage. The Association believes that this aid to the school is not only a duty but a valuable asset to the economic value of the degree held by the individual alumnus.

The scope of the Alumni Association cannot be covered in a few paragraphs or in a magazine. Its theoretical operation, shown in artistically delineated charts, is valueless unless those operations be proved by action and results. To be understood, its problems, its frustrations, its triumphs must be shared by the membership. Interest in our progress must extend down "to the grass roots", to the individual member, if we are to accomplish our mission.

Today, as never before, your Association needs the name of each Mines Man on the membership roster. It exists not as an agency to carry collegiate "Rah! Rah!" into the business world but as an instrument to help each Mines Man help himself. Your Association offers all non-members the privilege of identifying themselves with our organization.

The Colorado School of Mines Alumni Association should and can be a definite asset to each member. It should be worthy of the gamble of the price of a membership to each Mines Man. Throughout the years an agency has been created to serve the alumnus in a broad scope of activities rightfully the function of an alumni organization. It can be great, not through any single factor but through an integration of all of them. It can be as great as the membership desires it to be!

ALUMNI ASSOCIATION ENDOWMENT

The Colorado School of Mines Alumni Association is probably the most unique organization of its kind in that it is not subsidized and controlled by the College from which it originated. It was organized by graduates of the Colorado School of Mines in May 1895 and it was incorporated under the laws of the State of Colorado in 1935 by its duly elected officials. It is an independent organization, receiving no gratuities of any kind. It receives the support of Mines men everywhere and it commands the respect of everyone. It voices the views of its members on all questions pertaining to the School of Mines. It carries on a continuous service for its members to elevate them in their professions. It is building the Colorado School of Mines to still greater heights. It maintains that no Mines man is so great that he cannot be greater and also that the Alma Mater, no matter how great it may become, can always be improved. It is an active militant organization that does not "pass the buck." It recognizes that certain work must be done and has set about to do it. It has taken the responsibility of improving the Alma Mater as well as improving the status of the Alumnus. It is making steady progress in these matters and each year finds that it has more accomplishments to its credit.

There is no need for me to set out here the growth of the Alumni Association, nor of its Mines Magazine, nor of its Capability Exchange, nor of the influence of the Association with the Colorado Legislature and the general public in all matters concerning the School of Mines and higher education in Colorado.

The Alumni Association is proud of the School of Mines—it is proud of the graduates and the record they have made in the profession, it is proud of the Administration, Faculty and Student Body. The Alumni Association is always on the job advising with trustees regarding policies affecting the school—conferring with the faculty regarding improving the curriculum—and assisting students in various ways. The Alumni Association established a Students' Loan Fund which has been of benefit to many students, it has raised money to help pay off the indebtedness on Brooks Field, it has two members on the Athletic Board of Control at the

By
C. LORIMER COLBURN, '07
Chairman Alumni Association
Endowment Committee

School and has helped the athletic situation in many ways.

In addition to all the activities mentioned above the Alumni Association has organized and is fostering a Foundation for the School. This move was made by a nearly unanimous



C. LORIMER COLBURN

vote of the members of the Association. What other Alumni Association of its own volition and in its own independent way has taken over the Herculean task of creating a Foundation for its Alma Mater?

The Colorado School of Mines Foundation was established by the Alumni Association on May 17th, 1928. Since that time \$7,000 in cash has been put into the Foundation treasury. The first subscription was a \$1,000 gift, secured by W. D. Waltman and presented to the Foundation at the time of its organization. All other gifts were of small sums, mostly \$2 or \$3 contributions made from time to time by members of the Alumni Association.

Seven thousand dollars donated over a 12-year period is not an impressive sum but it was given by many Mines Men and it is a substantial start. The officers of the Association

and the Administration at the School have done much in promoting the Foundation but their work has been handicapped by lack of funds to follow up promising leads. Several larger gifts have been lost because the Alumni Association did not have the money to send a man from headquarters to present the needs of the School. Mines Men at a distance from Golden cannot keep informed on the urgent needs of the School and they cannot therefore make a successful appeal for a gift when the opportunity presents itself. In such cases a man should be sent from headquarters who can make an enthusiastic presentation of the claims of the School of Mines for support. The Alumni Association needs an executive manager, a full time man, with salary and expenses assured so that he can swing right into this Foundation raising problem. There is no way for the Association to secure the services of such a man until it is sufficiently endowed.

The steady and consistent growth of the Alumni Association has been due to the unstinted work of a number of volunteer workers. They have received no financial reward for their services. Theirs has been a work of love which cannot be evaluated in dollars and cents. The Association will always have to depend upon a large amount of volunteer work from its members but it must also have a well paid executive manager. Such a man could work wonders with the present set-up.

The Colorado School of Mines has also been progressing. The ever increasing number of students has put a strain on every facility at its command. Several million dollars are needed right now, for special purposes not included in state support. If the School is to get the gifts so badly needed, the Alumni Association must furnish the initiative and the driving power to get those gifts.

The Alumni Association's income is derived solely from dues of members, earnings of its Mines Magazine, and the income from its "Life Membership Fund". The income from these sources is not sufficient to support the active progressive program that the Association has adopted. The Alumni Association has a perpetual job to perform and it must have a substantial endowment so it can more successfully cope with the numerous problems confronting it.

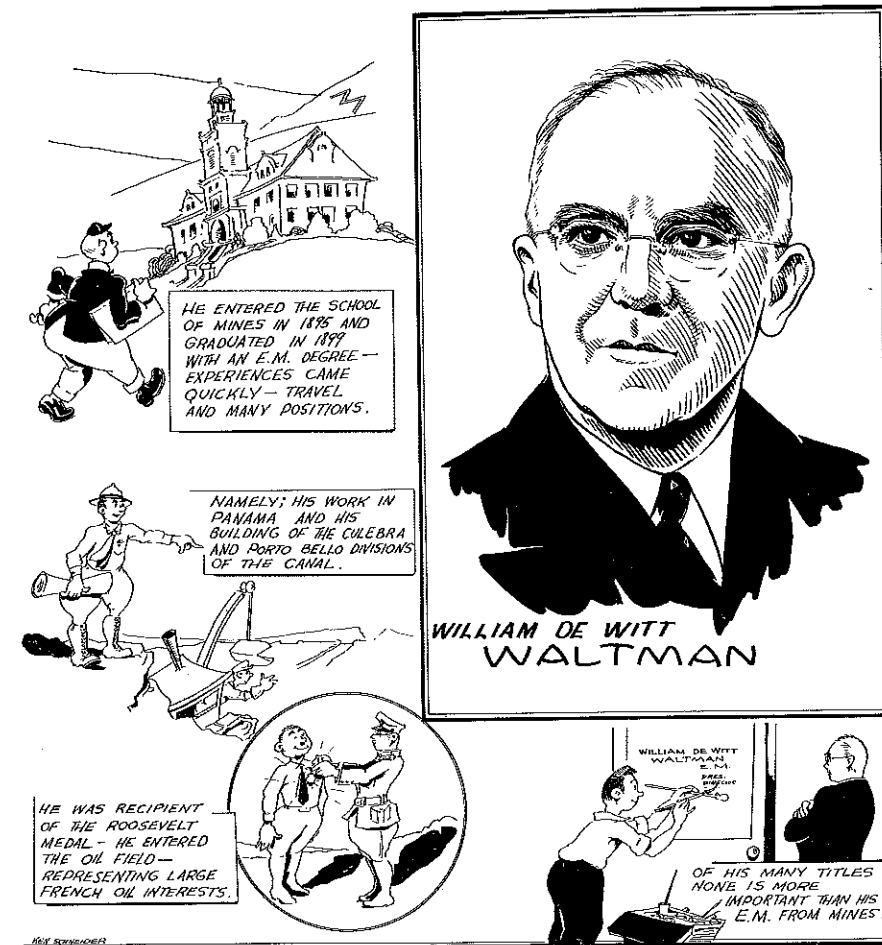
WILLIAM DE WITT WALTMAN

There is a large, plainly furnished office in the suite of rooms occupied by the Franco-Wyoming Oil Company in the beautiful, modern Edison Building in the heart of downtown Los Angeles. In the office is a massive, well ordered desk, and a few chairs. The only decorations on the walls are autographed pictures of men—men who have made "Who's Who". Among them is the only living ex-president of the United States, a former vice-president, the commanding general of the American Armies in France during World War I, and others equally prominent in the political and business life of the nation. These men have autographed the photographs for their friend who occupies the massive desk.

Their friend has also been listed in "Who's Who". He has truly won his "M" in life by sheer hard work and ability. Mines Men are proud of him because he has never forgotten his alma mater, despite all his worldly success. He is never too deeply engrossed in his responsibilities to shirk service to the school, or to lend a helping hand to fellow Mines Men. In 1938 he established a trust which provides an annual award to one of the outstanding graduates. He has rightfully earned a place in "Mines Who's Who". The man at the desk and at the controls of the organization he directs is William De Witt Waltman '99.

Born in Kendallville, Indiana, February 8, 1875, the son of Martin Van Buren and Catherine Huff (Aler) Waltman. In 1889, the family moved to Colorado Springs, Colorado, where Mr. Waltman attended the old Liller School. In 1895, at the age of 20, Mr. Waltman entered the Colorado School of Mines at Golden, from which he graduated in 1899 with an E.M. degree.

The following year, he began his first work as a Mining Engineer at Cripple Creek and spent an intensive 2 years on the preparation and editing of Hills Manual of Cripple Creek Mines. In 1901, he was engaged as principal Assistant City Engineer in Colorado Springs, where he remained for 3 years. In 1905, he received an appointment which took him to Panama where he spent 2 years as superintendent of mining and 3 years as superintendent of construc-



tion on the Culebra and Porto Bello divisions of the Canal. He was a recipient of the Roosevelt Panama Medal. Impaired health necessitated his leaving the Canal area and following his return to Colorado in 1910, he accepted the position of Chief Engineer for the Costilla Estates Development Company, then engaged in the construction of the Sanchez Dam near San Acacio, Colorado.

In 1911, Mr. Waltman met Mr. P. E. de Caplane who was in Wyoming, representing large French oil interests in that area. The subsequent development of that friendship marked Mr. Waltman's entrance into the field of petroleum engineering. Engaged at that time to head the field engineering work for the French interests, Mr. Waltman soon entered into the administrative directorship of the extensive French holdings in the prolific Wyoming oil fields.

Mr. Waltman is now a Director and Executive Vice President of Franco-Wyoming Oil Company, the parent organization, and President of that company's several operating subsidiary companies, namely: McElroy Ranch Company, operating extensive oil and cattle properties in West Texas; Franco-Western Oil Company, operating oil properties

in California; Franco-Central Oil Company, operating oil properties throughout Kansas; and Franco-Wyoming Securities Corporation. Mr. Waltman is also President of Isolantite, Inc., a related interest engaged in the ceramic business in the East.

Mr. Waltman is a Captain in the Chemical Warfare Reserves, U. S. Army, and an active member in the following societies: American Institute of Mining & Metallurgical Engineers, American Society of Civil Engineers, Canadian Institute of Mining Engineers, American Society of Petroleum Geologists, American Petroleum Institute, Society of Military Engineers, American Association for the Advancement of Science and the American Numismatic Society. Mr. Waltman is a past president of the Board of Trustees of the Colorado School of Mines. He is a Republican, Methodist and Mason.

He married Eula C. Hamilton of New York and has one son, William De Witt Waltman, Jr., a petroleum engineer with the Gulf Oil Corporation in West Texas.

EDITOR'S NOTE: This is the first of a series of articles devoted to outstanding "Mines Men." It will feature Mines alumni who have achieved prominence in the professional or business world. Our members are invited to send their nominations for "Man of the Month" to the editor.

WHAT "MINES" HAS TO OFFER THE YOUNG MAN

By
DR. M. F. COOLBAUGH
President, Colorado School of Mines

Since the legal establishment of the Colorado School of Mines in 1874, approximately 8,000 men have matriculated. Of this number, in May of this year, 2,381 will have received degrees. This fact alone establishes the premise that Mines has had and still has something attractive and specific to offer to the young man.

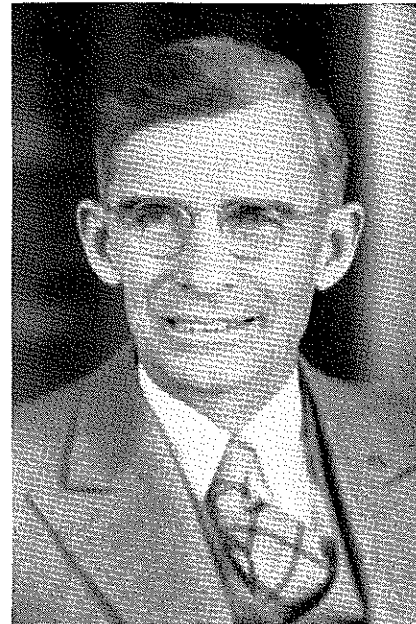
Man is so constituted that he is strongly favorable to something which is essentially different. "Mines" is the one school in America which limits its field of endeavor to one type of engineering—that of the mineral industry. It is devoted exclusively to the discovery, the recovery, and the treatment of the minerals of the earth and their adaptation to the use of man. The moment that a boy decides on his life interest, at that moment he begins to look for the best place in which to train for that life work. If that interest is in mining, metallurgy, petroleum, geology or geophysics, a thoughtful investigation will direct him to the Colorado School of Mines because of the opportunity for highly specialized training.

One of the ideas uppermost in the mind of a virile young man is, "When I finish my training can I get a job?" In 1939 of a class of 133, every graduate had been offered a job by September first.* There is always a job for the well trained, willing, and reliable individual.

This training at Mines consists of the basic fundamentals of engineering together with a practical application in the field which gives especially ef-

*Commented on by N. Y. paper last fall.

fective results. The major portion of three summer vacations is spent in field work where the student learns to do as well as to think. This work



DR. M. F. COOLBAUGH

is organized and supervised by faculty men, who are not only thoroly trained academically, but who are recognized by industry as men who are superior in their fields. This type of training is definitely an asset when the student begins to look for a job.

The Colorado School of Mines is comparatively a small school. This offers a distinct advantage in personal contact with the faculty and in a closer association of students. Freshmen are counseled and taught by professors who are heads of departments. There is an opportunity for exchange of experiences between students from

all parts of the world. They freely discuss world economic conditions, forms of government, trade relations, and problems of labor. The student from Australia discusses the mining methods in his country as compared with those of America. The Venezuelan gives of his knowledge of the oil fields in exchange for that of the man from Persia or Turkey who is also interested in this field. Students from China and Japan and the Philippines add their contributions to this fund of worldwide experiences. All this gives the student a wealth of knowledge and an enlarged vision which is invaluable.

There are three factors vitally essential to the life, growth, and perpetuation of an educational institution—the faculty, students, and the alumni. Each student of the Colorado School of Mines, upon becoming a graduate, automatically inherits an alumni organization which is active thruout the world. This group of Mines men has already paved the way for every new graduate from the school by establishing for him a reputation in advance. The recent graduate must live up to this already acquired distinction and in addition must render a service necessary to uphold this renown.

While the Colorado School of Mines has much in general to offer the prospective student, yet specifically, the most important factors are: the highly specialized training in the mineral industries; the feeling of security in receiving a job; the attainment of a basic engineering training plus an opportunity for practical application; an ideal relationship of students and faculty and of students with students; and lastly, a well organized and functioning alumni association.



▼ Guggenheim Hall at left and Gymnasium at right.

Mining Murals TO "MINES" MUSEUM

By
J. HARLAN JOHNSON, '23
Associate Professor of Geology and
Curator of the Museum
Colorado School of Mines

Mines alumni and friends will be delighted to know that the School has received the famous Hoffman mining murals which were painted for the mining exhibit at the Golden Gate International Exposition of 1939. They were displayed in the Hall of Minerals leading to the mining exhibit of Treasure Mountain.

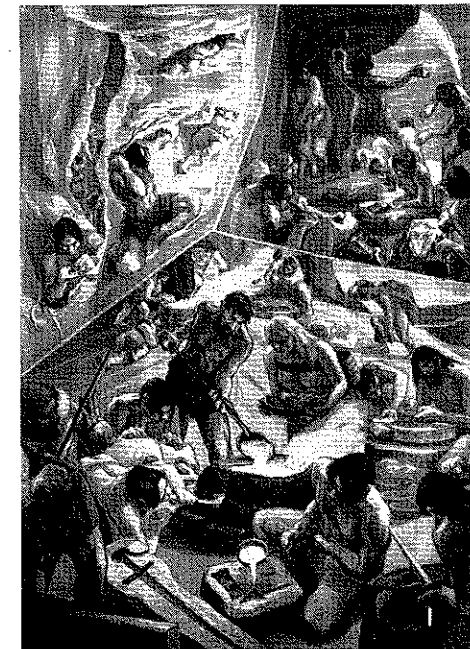
The Artist*

Born in Boston in 1901, Irwin D. Hoffman received his training at the school of the Museum of Fine Arts in that city. In 1924 he was awarded the Page Traveling Scholarship, and for the following two and a half years traveled and studied in various parts of Europe. Returning to this country in 1927, he took a studio in New York City, where at intervals he has exhibited.

His interest in mining arose from the fact that both his brothers are mining engineers. With them he visited most of the mining camps in the United States and Canada, and several in Mexico.

Shortly after the discovery of the famous Noranda mine in Quebec in 1922, he spent the summer of 1924 prospecting in this area and participated in an old-timers' gold rush with plenty of excitement but not much

*The statement about the artist and the detailed descriptions of the murals are taken with very little or no change from the well written article "Mining Exhibits, Inc. secures the Hoffman Murals" published in the Western Mining News, February, 1939. The cuts used were courteously loaned to the Mines Magazine by the Western Mining News, through the efforts of Frank Hayward, President of the Bay Cities Section.



gold. However, the experience formed the background of an interest which has been increasing with the years until today his etchings, paintings and murals of mining activities and men are winning for him sure and substantial recognition.

Unlike others who have attempted mining subjects, Hoffman's work in addition to an outstanding virility and artistry, is authentic in all its technical mining aspects. His work soon came to the attention of mining men, and as a direct result he was invited to become a member of the American Institute of Mining and Metallurgical Engineers in 1936. The secretary of the organization wrote as follows: "According to the published records of your training and position, you have the qualifications for membership, and

I herewith extend to you an invitation to apply."

The Murals

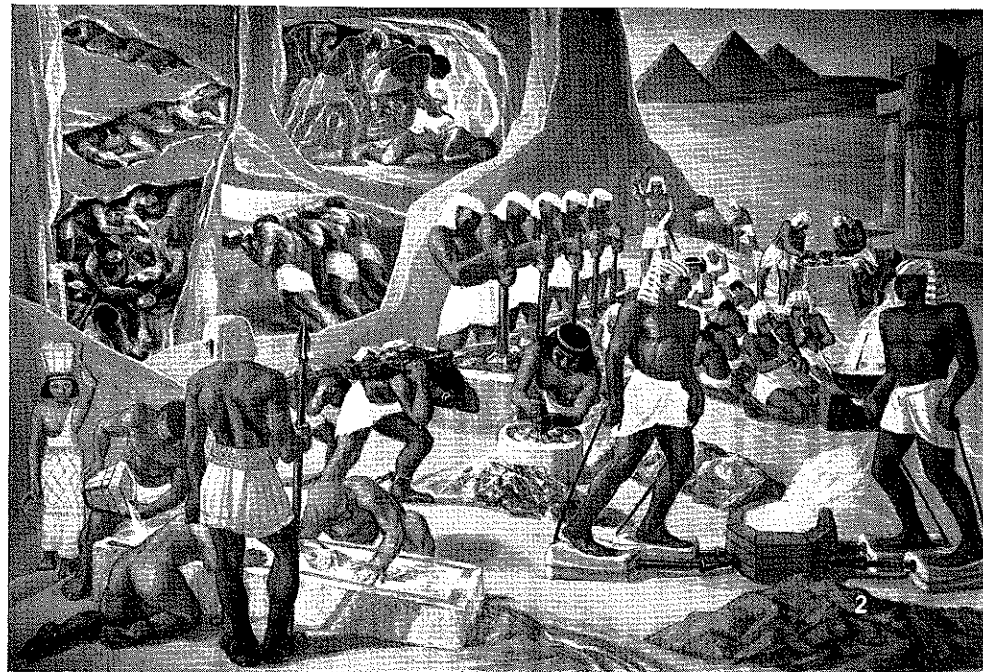
The murals are six in number and show vividly various stages in the history of mining.

Panel I

This panel depicts the three early stages in the development of mining (Fig. 1). In the upper left corner we see a group of Piltown miners working stopes for flint. As far as we know, this is the earliest recorded mining operation in the history of man (about 50,000 to 125,000 years ago). At Obourg, in Belgium, a series of prehistoric underground flint workings have been discovered. These have been freely described by T. A. Rickard in his notable work "Man and Metals". Their tools may be seen in the Royal Museum of Natural History in Brussels, Belgium.

In the upper right section is shown the beginning of the Iron Age. The Cave Man discovers that meteoric iron can be recovered and fabricated into implements by heating and forging. This was his only source of metal for the thousands of years that preceded the discovery of copper and tin.

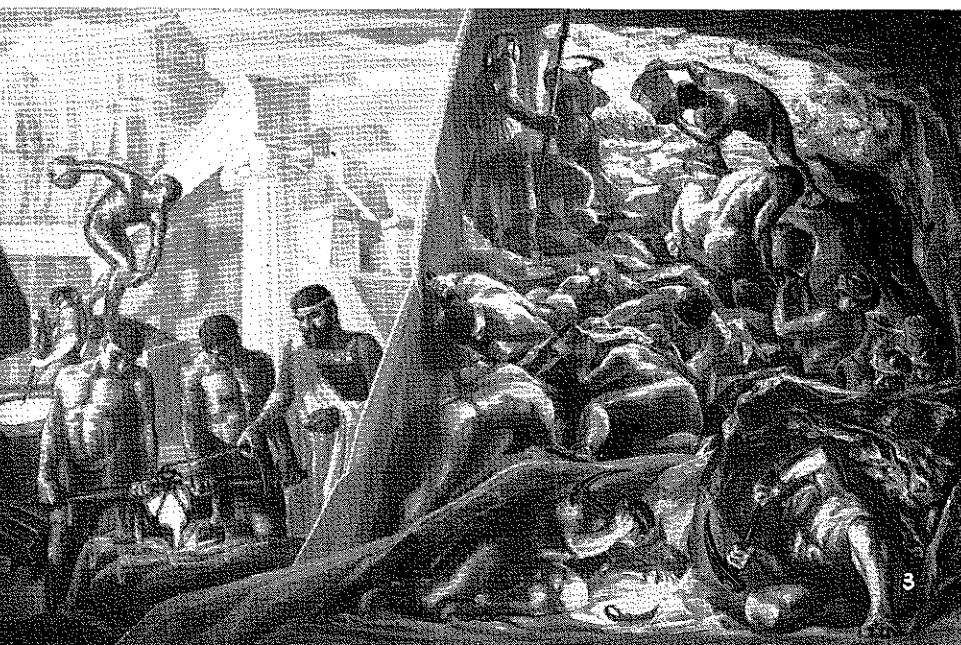
In the lower half of the panel is shown the first smelting and casting operations of primitive man and we find ourselves in the Bronze Age. This period coincides with the last periods of glaciation some 20,000 years ago. The Cro-Magnon man represented here was our real progenitor and resembles us closely. He was about six feet tall and had a brain capacity fully as great as ours. In the building of his fires he discovered that some of the stones with which he built his hearth would melt and then congeal into a spongy substance that could be fashioned into implements of various shapes by pounding. His natural intelligence soon led him to the discovery that this substance, copper, could be melted in a specially constructed furnace and poured into moulds which were cut into stone, and in this way he discovered the principles of casting. Thus we see in the center of this panel the primitive smelter, pumped to a smelting heat by the man with the blow torch and his companion pressing on primitive bellows which were probably made of the hides of animals. In the left foreground, is a sword being taken from the case, and hatchets and spearheads are being poured. The man in the lower right foreground pounds his sword on an anvil to temper it to proper strength. Directly behind him, we see the potter's wheel which was also developed by primitive man at about this time. Eventually he learned to use his potter's skill to construct moulds for casting.



Panel 2

This panel (Fig. 2) is devoted to the mining and metallurgical operations of the Egyptians. There have been excellent descriptions of Egyptian mining methods left to us in bas reliefs and hieroglyphic accounts. Men, women and children slaves performed all the labor necessary to extract, reduce and refine the ore. The fullest description of Egyptian mining, however, is given us by an ancient Greek, one Agatharchides, who visited Egypt in 50 B. C. He says in part:

"for the Kings of Egypt collect condemned prisoners, prisoners of war and others, who, beset by false accusations, have been . . . thrown into prison; these sometimes with their entire family, they send to the gold mines. . . . Those who have been thus consigned are many, and all are fettered; they are held constantly at work by day and the whole night long without any rest and they are sedulously kept from any chance of escape. The hardest of the earth that contains the gold is exposed to a fierce fire, so that it cracks and then they apply hand labor to it. . . . Of those who are condemned to this disastrous life such as excel in strength of body pound the shining rock with iron hammers . . . and they drive galleries . . . in the direction taken naturally by the glistening stone; these then, on account of the windings of these passages, live in darkness, and carry around lamps attached to their foreheads . . . and this they do without ceasing to comply with the cruelty and blows of the overseer. The young children make their way through the galleries and throw up with great toil the fragments of broken stone and bring it to the ground



Panel 3

This panel is devoted to the mining methods used by the ancient Greeks and Romans (Fig. 3), which were followed for centuries until the use of gun powder. In the right section is shown the operation of fire-setting. A fire was kindled against the face of the rock until it reached a certain intensity; then the rock was well doused with water by a bucket brigade, causing the rock to contract and crack. After this it was pried loose by the miners and pounded into small enough fragments to be carried out of the mine. In the left section we see the uses to which the Greeks put their precious metals. A bronze statue is being cast (probably in the studio of Phidias) and further back we see a perfect example of bronze casting (copper and tin). In the background is the Acropolis, crowned by the Parthenon. All this was made possible by the treasure which the Athen-

the women and children until the ore is crushed to powder. Then it is washed on the wash table (lower left corner) and brought to the smelter operated by two slaves working foot bellows (lower right). The bellows were made of pigskin and the smelter of fashioned brick. The matte (the smelted ore) is then put into the crucible immediately behind the smelter, where it is further refined by the process of the blow-torch. Directly behind the crucible we see the pouring of the unrefined gold into earthenware pots. The craftsmen mix into this a proportionate lump of lead, grains of salt, and a little barley bran (forming a carbon) and then the mixture is put into an oven. The gold emerges purified.

outside the entrance. . . . There is no forgiveness or relaxation at all for the sick, or the maimed, or the old, or for women's weakness, but all with blows are compelled to stick to their labor until worn out they die in their servitude."

Thus we see in the upper left of the mural the miners crawling through their galleries, pushing the ore out; the ore being passed by means of an endless human chain; the miners beaten as they work by their guards; the treadmill, showing their only means of power. In the middle background is shown the human stamp mill, men crushing the ore with iron pestles, which process is repeated by

ians derived from their silver mines at Laurium.

In his book, T. A. Rickard recounts that during the wars which the Athenians fought, the enemy would attack the valuable silver mines at Laurium. The miners would invariably desert to the enemy because of the excessive cruelty of their masters. Then Athens would go into a sharp decline until the mines were recaptured from the enemy and put back into working order. Thus the economy and social order of Greece was directly influenced by their mining industry.

Panel 4

Surface mining is here indicated (Fig. 4) in its various phases, from the two forty-miners panning nuggets from the stream to "rocking" in the lower left hand corner, hydraulicking and finally dredging.

Hydraulic mining and dredging which originated in California, survived from the early days of placer mining with dredging rapidly replacing hydraulicking. We see a bull dozer below the dredge clearing the ground of vegetation and debris preparatory to the oncoming of the dredge. Again is illustrated the ingenuity of man.

While the basic elements of placer mining are retained in the dredge, the modern monster is capable of treating millions of yards of gravel of low grade material which in the old days were beyond the power or knowledge of the pioneers to exploit.

In the upper right hand corner is depicted an open cut mine which shows the ore and waste in huge quantities, the ore being conveyed by a railroad, the track being laid in a series



of benches. No project is too large or complicated in its operations for the modern miner who is becoming more and more expert in extracting the treasure of the earth.

Panel 5

This is devoted to modern mining and reducing operations (Fig. 5). While the basic principles of mining and smelting of the ancients have endured, the various processes have been greatly developed and amplified. Mining highlights the story of man's emancipation from backbreaking labor by his development of horse power. With the coming of power, machinery and chemicals, the old laborious hand

methods have been replaced forever.

We see men in the left foreground drilling into a rock face. Two men are loading drill holes preparatory to blasting. In the center is illustrated the method by which broken ore is drawn from the stopes thru ore chutes and loaded onto cars driven by motors. The ore is conveyed to the shaft or tunnel adit ready for crushing and treatment. A conveyor belt in the right middle foreground shows how the ore is taken to a reducing plant or mill where it is crushed and finely ground by means of a power-driven ball mill.

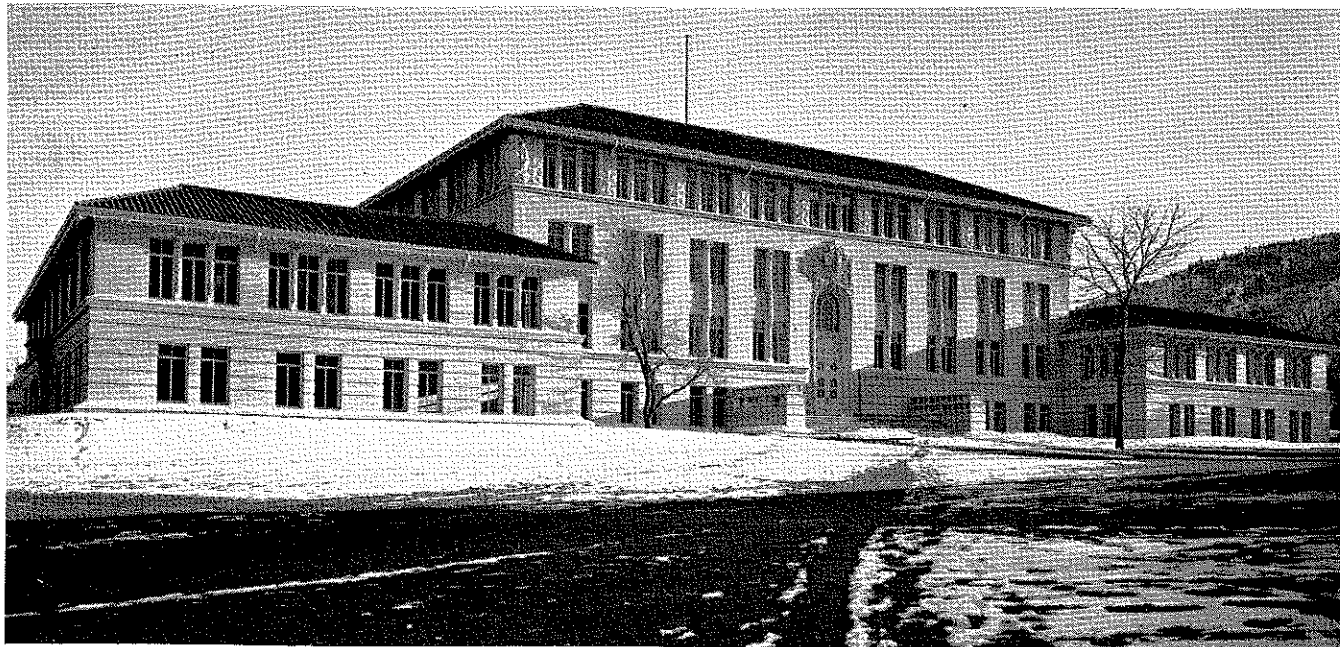
The next process is the extraction of metallics from the ore by flotation or gravity methods, cyaniding, if necessary, to remove the gold, after which follows the final stage of smelting and refining concentrates in the huge furnace (shown in the upper right hand corner.)

Panel 6

This panel (Fig. 6) sums up the story of man and metals. The miner is holding a piece of ore in his hand, surrounded by all that this has made possible, such as the modern city, the ocean liner, the stream-lined train, the automobile, power, industry. The movie industry depends on silver and the radio would be impossible without copper. Around the microphone are lips suggesting some of the many and varied voices which make up the radio programs of today. Overhead is seen an ultra-modern airplane, and ironically enough, in the lower left hand corner is an anti-aircraft battery manned by a crew protected by gas masks. The panel suggests the might of

(Continued on page 170)





COLORADO SCHOOL OF MINES NEW GEOLOGICAL MUSEUM

By
J. HARLAN JOHNSON, '23
Associate Professor of Geology and
Curator of the Museum
Colorado School of Mines

Our readers have heard reports and read notices from time to time regarding the new main unit of the geology building¹, above, and more recently on the wing which was added to it for the Geophysics Department.² That wing was completed late in December, enabling the Department to move in during the latter part of the Christmas vacation and get organized in time to start its classes at the beginning of the second semester (February 1, 1940).

The west wing, intended to accommodate the Geological Museum (Fig. 2), was designed by T. H. Buell and Company, Architects, who planned the rest of the Geology-Geophysics building. Plans and specifications were first advertised on January 31, 1939, and the bids were opened on February 21. The Mead and Mount Construction Company, which had erected the central unit of the building, was awarded the contract on a bid of \$144,000 to construct both the Museum and Geophysics wings. The total cost of the build-

ing and wings with equipment was \$454,000. The Museum Wing was not turned over to the school until the middle of January, 1940, while the Geology Department did not commence moving into it until about February 1.



J. HARLAN JOHNSON

General Floor Plans of the Museum Wing

The wing measures approximately 62 x 115 feet and contains a basement and main floor. The floor plans are shown by Figures 3 and 4. The long side of the wing is oriented in an approximate north-south direction with

the west side facing Maple Street (Fig. 2). A west entrance from Maple Street opens on the main floor and the main exhibition room of the museum. Figure 3 shows the arrangement of the ground floor or basement. This is on a level with the ground floor of the Geology building and of the Geophysics Wing. No. 1 represents the hallway entrance into the main building; No. 2 is the stairway to the main floor; No. 3 is a large room intended to be used later for the exhibits; No. 4 will house the reference collection of fossils, No. 5 the reference collection of minerals. No. 6 is the shipping and receiving room, while Nos. 7 and 8 are store rooms and 9 and 10 rest rooms.

The main floor, as shown in Figure 4, contains the main exhibition hall (11) and two small store rooms (12 and 13). No. 14 represents the entrance opening on Maple Street, and No. 15 the hall and doorway leading into the main Geology Building.

All the rooms are well illuminated by natural or artificial light. In the main exhibition hall the new fluorescent lighting has been used with very pleasing effect.

Curator

Dr. J. Harlan Johnson has been appointed curator of the museum in addition to his other duties as Associate Professor of Geology. He will be assisted by the other members of

the Geology Department in preparing the exhibition collections and will be advised by the heads of the degree-granting departments relative to the most efficient use of the museum for educational purposes.

Functions of a Museum

The desired functions of the museum are visualized to be those listed below:

1. To collect material.
2. To exhibit material.
3. To build up research collections and stimulate research.
4. To actively assist in the teaching work of the school (a) by having exhibits to illustrate subjects taught, (b) by having reference research collections, and (c) by the personal activities of the curator in supervising research and graduate work based on material in the museum collections.

5. To publish and otherwise disseminate information to the public.

In time, the School of Mines Museum hopes to serve the institution by accomplishing all of these functions.

Exhibits

In the museum there will be both exhibition and non-exhibition collections. In planning the exhibits, it must be remembered that the Colorado School of Mines is a mineral industry school and that geology is the basic science in mineral industry since it deals with the origin, occurrence, and discovery of mineral supplies. Three ideas are being kept in mind in preparing the exhibits: (1) To present material to illustrate courses taught in the school, especially mineralogy, economic geology, petrology, historical geology, and paleontology. (2) To supply plenty of charts, diagrams and explanatory texts with the exhibits and to word them so as to be easily understood, and to make the collections as inter-

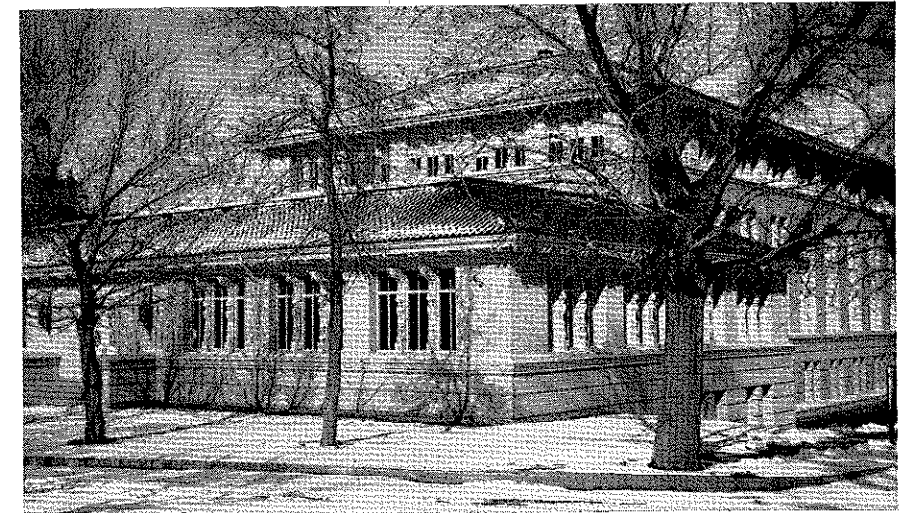


Fig. 2. Museum from the southwest.

esting as possible to the layman and visitor as well as to the students so as to stimulate popular interest. (3) To illustrate and emphasize associations and economic importance and applications.

Non-Exhibition Research Collections

These are collections for the use of advanced students, specialists, and others. They are not to be on exhibition, but to be kept in drawer cases in special rooms (Fig. 3, Nos. 4 and 5) where they may be studied. These collections include:

(a) The type mineral collection. A systematic collection showing samples of each mineral and variety, from every locality from which we can obtain specimens.

(b) Paleontological collections. Under this heading are collections of fossils from Colorado and adjoining states arranged by formation and period, and collections of identified

material from other areas for comparative studies.

(c) Ores and non-metallics of economic importance from producing districts and areas.

(d) Specimens illustrating unusual geological features. In time these non-exhibition research collections should assume an importance as great or greater than the exhibited collections from an educational viewpoint, especially if the School of Mines develops as a graduate school.

Equipment

New museum cases to equip approximately half of the main exhibition room were obtained with the building. These were built by the

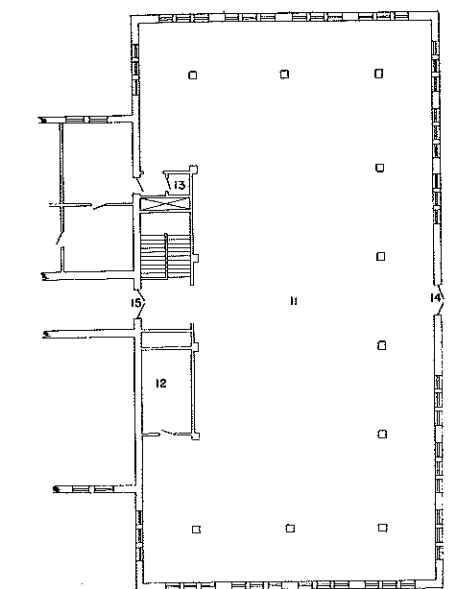


Fig. 4. FIRST FLOOR PLAN

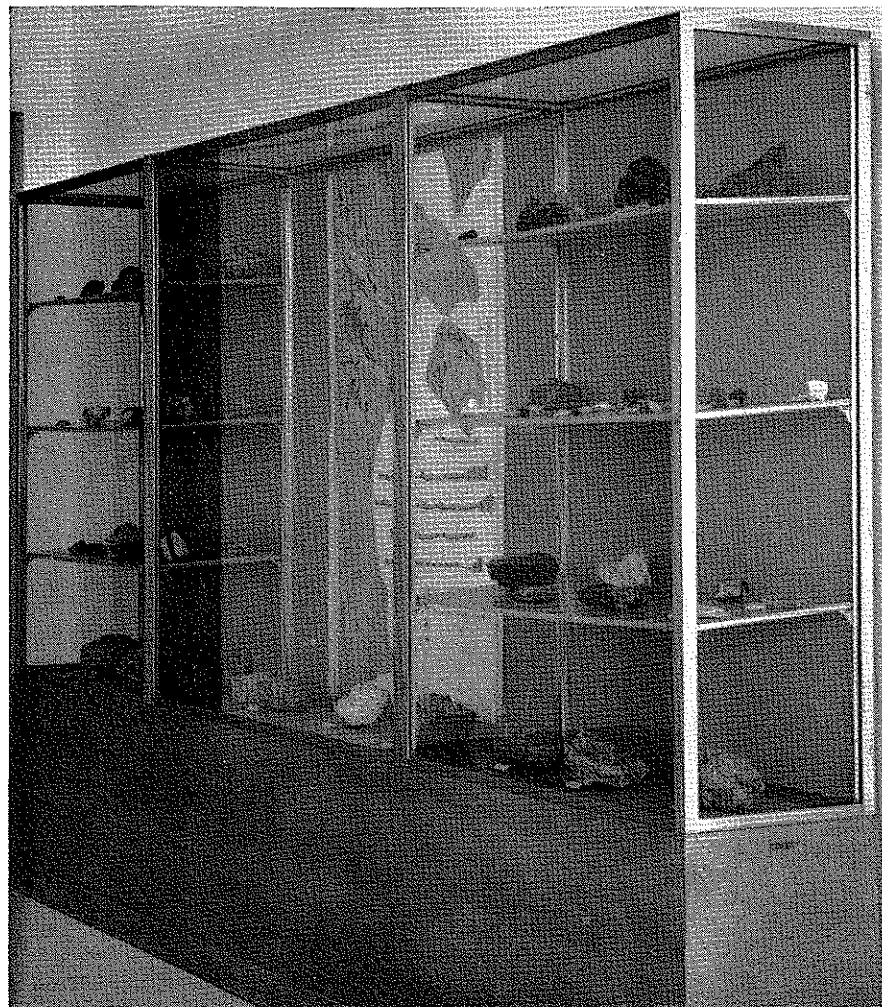
Remington-Rand Company and are of modern design and of the best construction obtainable. They include 7 table cases 8 feet long x 4 feet wide, (Fig. 5) 2 wall cases 10 feet long, (Fig. 6) and 8 tall center cases 10 feet long. (Fig. 5) They are of plate glass with metal corners and



Fig. 5. Center and table specimen cases.

¹Mines Magazine, vol. 28, pp. 121, 219, 330, 377, 461.

²Mines Magazine, vol. 29, pp. 272-273, June, 1939.



▼ Fig. 6. Wall case for mining district exhibits.

oak bases. They are similar in type to those used for the mineral exhibit at the American Museum of Natural History in New York City. These will occupy the south half of the hall and will contain the exhibits of minerals, ores, and rocks.

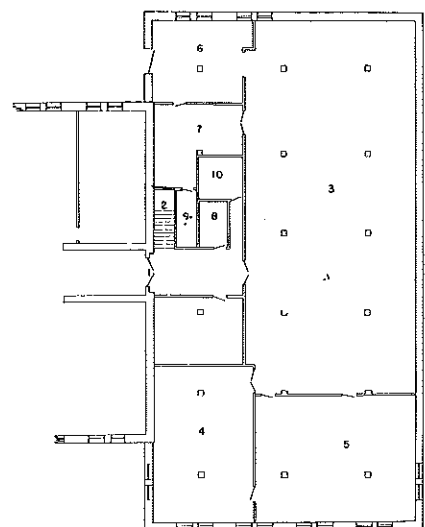
Old furniture inherited from Guggenheim Hall will be used in the north half of the main exhibition room until new cases to match the others can be obtained. These will contain the exhibits illustrating invertebrate fossils, historical geology, and the non-metallic economic products.

The basement rooms 4 and 5 are equipped with tall drawer cases to contain the reference collections of minerals and fossils.

Specimens Available for the Collections

The school has a large amount of material available, especially mineral specimens. Much of the material because of lack of space has been packed in boxes and barrels and stowed away in basements and attics for years. No single person has as yet ever seen all the collections as some boxes were packed away before any members of the present faculty joined the Geology

Department. At present, the material is being unpacked and many interesting things are coming to light. It is expected that the unpacking will be completed during April, and exhibits will be ready to display to the public by Commencement Day (May 24, 1940) though it will probably be several years before the collections will even approximately attain the standard and character ultimately de-



▼ Fig. 3. BASEMENT FLOOR PLAN

sired. However, by Homecoming Day next Fall, the cases will be filled with worthwhile exhibits having considerable color and interest.

Materials Needed

The collections lack many needed and desired items especially rare and not spectacular minerals for the reference mineral collection, and fossils, ores, and economic non-metallics as well as showy specimens. As soon as the Geology Department has unpacked the material available and roughly assembled tentative exhibits, it is planned to publish in the Mines Magazine lists of specimens needed for the collections in the hope that alumni and other friends of the school may be able to help build up a museum with collections that will be a valuable and outstanding educational feature of the Colorado School of Mines.

Murals—

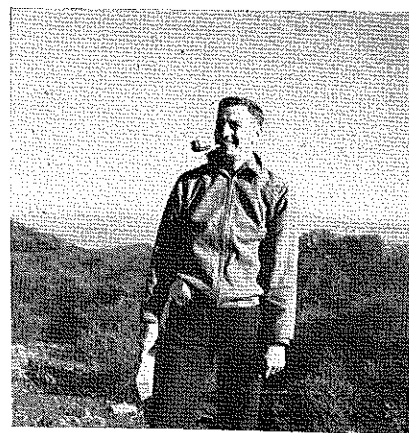
(Continued from page 167)

man's achievement through the ages, with mining the key which has opened up this treasure vault. There is also a suggestion that civilization has reached the crossroads. Will the processes of development and construction outstrip the forces of destruction?

How Mines Obtained Them

Early in the summer of 1939, Mr. Irwin Hoffman visited the Colorado School of Mines in Golden and at that time suggested that the School should endeavor to secure the murals at the conclusion of the Golden Gate International Exposition. It was suggested that the murals would be an excellent decoration for the new Geology Museum then being constructed. This suggestion appears to have been the starting point of efforts to obtain the murals for Mines. The President, the Board of Trustees, and the Alumni all worked toward that end. Dr. Coolbaugh, Dr. John T. Barnett, President of the Board, and the Bay Cities Section of the C. S. M. Alumni led by Frank Hayward co-

(Continued on page 176)



FRANK HAYWARD

THE MINING ENGINEER AND THE FUTURE

By

FRED C. CARSTARPHEN, '05
Consulting Mining Engineer
Denver, Colorado



FRED C. CARSTARPHEN

At this time of the year, many young men in our high schools are brought face to face with the choice of a career and the college for perfecting the decision. For several years the student has known that he must decide, ultimately whether he is to be an engineer, or seek advancement in the law, medicine or some other profession. We cannot always run away from weakness, sometimes we must fight or perish, and if that be so, why not know, where we stand?

To choose a profession is the same as announcing that one seeks the benefits of a higher education. An education must be defined. If we can visualize life as a pathway reaching from the infinity of the past to the infinity of the future:—If the power be granted to us to scan this pathway we will see that most of it lies in drab shadow, occasionally broken by some brilliant flare that represents some extraordinary advance in the welfare of the human race. An observer is impressed by the great emptiness of this pathway. It is deserted, for the men who stand upon it have time only to know that they are a part of life, when they must make way for others. In a cloud of dust spread over the plain beneath us we see action. In the cloud and beneath it we see children born, youth develop, and surging forward, seize the torches of human knowledge and wisdom from the uplifted hands of their elders, who being weak, falter, and fall by the way side.

The wisdom of the race is

locked in our libraries. The imparting of it is intrusted to our teachers, but its accomplishment is the reward of individual effort. The strange part of life in its general aspect, is its organization. A generation of men in power, the aged, passing, and youth coming on. Three generations dovetailed, exemplify the living representatives of humanity, and are the custodians of its ideals, its aims, its hopes and ambitions. If human effort is directed toward some goal, it is imperative that each generation attain as complete a knowledge of the experiences of previous generations as possible. It is necessary not only to know the history of mankind, but to ponder upon past experiences to plan the next advance toward the goal of truth and perfection.

Our forefathers believed in the education of youth so strongly that it was a social obsession. Nine colleges were endowed privately, before the American Revolution. The philosophy of today advocates the expenditure of national savings upon the aged to the neglect of youth and educational programs. It remains to be seen whether our educational systems brought forth this Frankenstein or whether the ideals of past generations will prevail. This brings the difference between civilization and culture to our attention.

Hardly three generations have passed since our great grandfathers were settling New York State. Then, there was nowhere in the world, a railroad, or a telephone, or a telegraph. There were no refrigerators, no plumbing, no sewing machines. There were no matches to light fires with, or coal ranges to light them in. For three generations we have been giving our attention to the building of a vast complex of implements, by means of which to live. Possibly we have been contemptuous of ideas, but amorous of devices. Now mankind stands with its hands filled with devices, but less sure and more bewildered about its destiny than ever before.

Back in the 19th century, we Americans were optimistic. Progress was our real religion. We lived in the time of perfection of the most astonishing devices, and life became an eager standing on tiptoe, wondering what new marvel would arrive before night fall. We thought we were successfully headed toward our place in the sun as a great nation. We have brought forth a marvelous civilization, rapid communication, speedy transportation, and millions of implements, and the question grows insistent:—To what end will mankind use them? The answer is to be found not in our civilization, not in our mass aggregates, but in our culture. This is the realm of our individual contributions to spiritual ends, as expressed in our art, literature, morals and religion, for which at best we live.

As young men you are interested in your material advancement and in seeking a place in the materialism of life do not overlook the importance of thought and culture.

Mr. Gerard Swope, retiring President of the General Electric company remarked a year or so ago that "in the United States over a period of time and particularly recently, we have made rapid changes in the reduction of the work week, and increased rates of pay, which industry has been enabled to absorb thru the simplification of designs, better methods and greater mechanization of industry,

and the ingenuity of management. As an example of our progress, in the short space of my own active life there have been great changes. When I started work in 1895 our work week was 56 hours at 12½¢ per hour, or \$7 per week. Today a young man of about the same grade would work 40 hours (25% less) and receive 70¢ per hour or nearly six times as much". He pointed to the fact that these changes have not ruined American Labor or Industry for they were advances within the fabric of society and not the result of political and racketeer agitation. The following table gives the comparative amount of labor that the average European workman of 1938 had to expend to obtain the essentials of living as compared with a workman in the United States.

	Europe Av. 8 Countries	United States
Number of months work to pay a year's rent...	2.8	2.2
Number of hours work to purchase a unit of five foods	5.7	1.7
Number of months work to purchase an automobile	16.3	4.5
Number of months work to purchase an electric refrigerator	3.7	1.0
Number of months work to purchase a radio set	0.8	0.2
Number of minutes work to purchase 1 kilowatt hour of energy.....	24	3.6
Number of hours work to purchase on incandescent lamp	2.0	0.2

These facts illustrate the superior standard of wages and living achieved by American Industry, labor and engineering, through intelligent co-operation and understanding. The record would be better if this brain work and understanding functioned continuously without interruption by parlour pinks and racketeering demagogues. The record is sufficiently impressive that we may continue to have faith in the future.

As a high school graduate you face life with reasonable chances of attaining success. In fact these chances have been estimated by a careful scrutiny of statistics that center in the offices of our large insurance companies. Some of the important deductions are as follows.

You have an even chance to live to be 69. During the last 100 years the average span of life has increased 20 years. It is expected to increase more than this figure. Of all the children born this year, 75% will be alive at the age of 50, 25% at the age of 78.

Your chances of getting a job, are better than 4 out of 5, and as an average young man you have a 50-50 chance of attaining an income adequate to a fairly high standard of living, namely \$2,000 per year.

The chances are 9-10 that you will marry, and within 5 years, but you may not marry your present sweetheart, because the average man marries at 25, and the young woman at 22. Since your present girl is 20 she may not wait for you. The chances are always against a man marrying a girl of his own age or older. After you are married, the chances of escaping divorce are 4 out of 5, although the rate is rapidly rising, your protection is children. You will have half as many children as the average father of the past generation. He had 6 you may have 3.

You will die sooner if you do not get married. The home environment is more healthy. If you marry happily at 25, with a wife of 22, you will have 3 chances in 4 of celebrating your silver wedding anniversary.

These chances in life of a high school graduate may not satisfy you. Ambition surges within your manly chest, and you scrutinize the records of the college graduates. We do not have the space to discuss the records of all types of educated men, but the following data about engineers are of interest. It is understood that the engineering graduates, were first high school graduates and therefore have added chances of success beyond that of the high school graduate.

A recent survey disclosed that out of 54,000 officers of some 500 typical industries studied, the college man is 7 times more likely to be an official than the non-college man, and the engineering graduate is 30 times more likely to be an officer than the graduate of a non-engineering college. The advantage of the engineering graduate over the non-engineering graduate applies to all positions. He has 12 times the chance of becoming president, 5 times the chance to be treasurer, 30 times the chance to hold positions in production, 174 times the chance in engineering, and 24 times the chance in sales. The engineer bridges the gap between science and the public, and his responsibility is the development of the applications of science in such a manner that they may fit beneficially into the existing social order.

High school graduates are turning to higher education, and engineering colleges are not being neglected. For instance in the year 1936-37 there were 70,030 engineering students in 118 of the 150 engineering schools in the United States. In 1938-39 there were 87,760 students in 119 schools. This is an increase of 25% in two years, for all engineers compared with a 34% for the mineral technology group. In this latter group in 1938-39, 9,619 students were resident in 53 mining schools in the United

States; and Canada, contributes 1,014 students in her 6 schools.

This is the largest enrollment ever recorded, and represents a gain of 34% over 1936-37 and 117% over 1932-33. This enrollment compares with that of other major engineering undergraduate groups in the United States and Canada, as follows for 1939. Mechanical engineering, 20,004, electrical 13,135, chemical 12,438, civil 10,585, whereas we repeat that the mineral technologists total 10,633.

Of the 9,619 mineral technology students in the United States 37% are taking courses in petroleum and natural gas, 25% in metallurgy, 20% in mining, 8.8% in geology, 8.6% in ceramics, ¼% in fuel technology, and 1% were special students.

The reports on the employment status of the 1938 mineral graduates show that out of 951 men who graduated, 668 are filling positions in the mineral industry, 105 are employed in other fields of work, and 110 are attending graduate schools.

It is quite apparent that the next few years will see a great increase in the number of mining engineers, and the capabilities of the leaders of the profession will be greatly enhanced by the competition of these many men. However the field of mining is calling for real mining engineers, as compared with other days when mining was considered to be an easy profession. Mining engineers are confronted with the problem of making all minerals and metals, and products used in industry easily accessible to the place of need. Hitherto in American Mining we have evaded real technical difficulties by turning to the rich deposits that were accessible and easily worked. Such ore occurrences are becoming rare. Our surface deposits are practically exhausted, in common with the petroleum engineer, the miners are working at greater depths than ever before to recover ores of such low grade that they were beneath notice a generation ago.

It was common to listen to engineering graduates criticize the curriculum and vehemently declare that they never found any use for the subjects they studied. This has changed. Most practicing engineers feel that they did not cover enough ground, and they are bestirring themselves to keep abreast of the advances that have been made recently on all educational fronts. The mining industry is demanding better methods of locating ore bodies, reaching, transporting, and processing them.

The petroleum engineers have taken the lead in the discovery of oil,
(Continued on page 202)

WHAT IS A MINERAL ECONOMIST?

An answer with a brief discussion and definition

By
HARRY J. WOLF, '03
Mining Engineer
New York City

From the time the profession of engineering began to evolve convenient and appropriate subdivisions corresponding to its definitely specialized branches, such descriptive professional titles as Civil Engineer, Mechanical Engineer, Mining Engineer, Metallurgical Engineer, Electrical Engineer, and the more general or inclusive designation of Consulting Engineer, have been in common use and their meanings are well understood. However, during the past few decades a tendency has developed in various lines of commercial activity to augment the dignity, or emphasize and exaggerate the importance of the individual, by designating his occupation as some form of "engineering", and by inventing new titles through the simple process of placing a modifying and descriptive adjective before the word "engineer". This propensity was for a time carried to such lengths that many of the newly manufactured titles or designations were more humorous than dignified and were eventually regarded as absurdities, became confusing, and were gradually abandoned.

In similar manner the term "Economist" for a time began to acquire modifying and loosely descriptive adjectives. Some of these new designations were practical and informative and have become useful. However, when the multiplicity of new titles of this species began to include almost every commentator or writer who assumed the duty of expressing an opinion or producing a paragraph containing the merest reference to money matters or prices of securities or commodities, and having little or nothing to do with the actual science of economics, it is little wonder that the average reader became confused and began to ask for definitions.

During a recent casual discussion of the present high degree of specialization in professional and technical work, attention was called to the fact that the activities of certain large industrial organizations, which had a definite interest in the economic and commercial aspects of various minerals and mineral products essential

to their operations, had led to the gradual creation of a new and specialized profession which was referred to as that of "Mineral Economist". The individual so designated is usually a member of the technical staff of the corporation, and his duties often combine those of a statistician and fact finder, an expert buyer, an exalted stock clerk, and a departmental consulting engineer.



HARRY J. WOLF

About a year ago specific recognition was accorded this profession or designation by the General Land Office, Department of the Interior, when the United States Civil Service Commission announced open competitive examinations for the positions of "Senior Mineral Economist", "Mineral Economist", "Associate Mineral Economist", and "Assistant Mineral Economist". Then someone asked the question, "What is a Mineral Economist?" A general answer to the effect that "a Mineral Economist is a person well versed in the commercial and economic aspects of minerals" might be all right for an abridged dictionary, but it is not as comprehensive a definition as the title deserves, especially if it refers to an expert who is to be nominated as a public servant in a department of the United States Government. With this idea in mind, the following definition and specifications are submitted.

A Mineral Economist

A Mineral Economist is one who has at his command an extensive fund of both general and detailed information regarding metals and minerals, and has the ability to impart such information to others who are entitled to receive it and desire to use it for scientific or commercial purposes. He is an active member of a highly specialized profession, with a scientific background, a distinct flare for research, a thorough understanding of statistics, a clear conception of economics, and a wide acquaintance with the laws of supply and demand as applied to the substances and products which are the basis of his investigations.

In order to render efficient service in the field of Mineral Economy, the economist must have available for ready reference all known facts regarding every identified metal or mineral. This basic fund includes knowledge of the following:

1. Geological conditions under which each mineral occurs, or which favor its occurrence. (Here is where the Colorado Mines man is thankful for his thorough courses in geology and lithology).

2. Mineralogy in detail, including ability to identify important minerals and to discriminate with regard to quality and commercial utility. (Here is where a Colorado Mines man may bring into play his field training, his past association with one of the finest mineral type collections in the world, his unique instruction in crystallography, and his vacation experiences in mines or on geological field trips).

3. Physical, chemical, and other properties of all important minerals. (In this connection a Colorado Mines man would have a chance to apply his practical experience in ore dressing, and his observations in the petrographic laboratory, including his study of mineral sections under the microscope).

4. All known occurrences, classified by countries, states, counties, districts, and individual deposits of special prominence.

5. Quantity and quality available. This involves a comprehensive understanding of the essential characteristics and uses of minerals that are discussed in terms of tons, pounds, ounces, milligrams, or carats; and

whose uses vary from blast furnace flux to delicate optical instruments.

6. Cost of production. Consideration of this point would naturally bring up a comparison of relative costs at various mines, and in widely distant localities with their variations in quality of labor, availability of consumable supplies, transportation facilities, and local political influences, regulations and restrictions.

7. Market price of crude material or refined products. This implies a wide acquaintance with trade conditions, market practices, customs, and characteristic procedure in conducting negotiations and making contracts.

8. Known commercial uses and advantages. Many common minerals have widespread and diversified uses, some of which are appreciated only after technical inquiry and personal contact. For example, consider the great variety of industrial uses of such minerals as sulphur and calcite. New uses for minerals are discovered and developed from month to month, and the engineer who would keep abreast of progress in this respect must maintain contact with important research, available indices of technical literature, and reviews of patents.

9. Processes employed in preparation, treatment or refinement. This implies keeping abreast of latest practice in metallurgy and ore dressing in so far as they may have a bearing on the subject of mineral technology and the preparation of minerals for the market.

10. Results of latest known research. At least a casual contact with the more prominent developments in the realm of pure science may be beneficial when least expected, owing to the fact that important discoveries destined to influence future uses and markets are sometimes closely related to the mechanical, optical, chemical, or radio active quality or characteristic of some mineral.

In order to conduct efficient research and properly accumulate, coordinate and make available for ready reference the most serviceable information, the economist must investigate and classify the users of such information, or the consumers of the minerals. In this connection it is necessary to accumulate and classify the following:

1. The names of those who may use the information either for academic purposes or serious scientific research:

(a) United States Government Departments or Agencies.

(b) Departments of foreign governments.

(c) Domestic manufacturers or research organizations.

(d) Educational institutions.

(e) Libraries.

(f) Individual investigators.

2. The names of users or consumers of metals, minerals or products:

(a) United States Government (Army, Navy, and other departments and agencies).

(b) Domestic manufacturers and consumers.

(c) Foreign governments.

(d) Foreign manufacturers and consumers.

Referring especially to items (c) and (d), it should be noted that considerable tact, prudence, or special regulation or restriction may be desirable in the discussion or transmission of information of this character with respect to foreign governments, manufacturers or agencies.

It is possible that the problems faced by a Mineral Economist may be so numerous and extensive that adequate results can be accomplished only through the aid of a staff of able assistants and correspondents. This implies that the head of the department or organization must have executive ability, and good judgment in the selection of his assistants; also the faculty of developing esprit de corps among his associates and subordinates. All of this means that the staff of a Mineral Economist should have the following qualities and characteristics:

1. Resourceful in the accumulation of data. It should be able to prepare efficient and comprehensive questionnaires, and inspire unselfish co-operation among a wide list of former contacts and professional associates.

2. It should be equipped to handle voluminous correspondence efficiently, and with discretion.

3. It should be competent to conduct research in all available literature relating to its work, either in English or foreign languages.

4. Its personnel should include those competent to conduct field investigations when necessary, prepare and edit monographs, bulletins, circulars of information, and confidential reports.

5. It should develop and maintain a spirit of cordial co-operation with the United States Geological Survey, the United States Bureau of Mines, and other government agencies.

6. It should be equipped to render valuable service to citizens entitled to it, and all government departments and agencies in a position to demand it.

7. It should serve not only as a supplier of available data which is the result of its research, but also as an agency that actually inspires new research along lines that may have been overlooked or neglected.

8. The very strategic position of the Mineral Economist might enable him to convert his organization at times into a veritable nursery of new and novel ideas and discoveries, or at least offer suggestions or problems for research which could be passed on to industrial leaders or technicians, or institutions of learning.

In the light of present world developments, the Mineral Economist should give special consideration to strategic and essential minerals needed by the United States Government in the event of war, or to improve its bargaining position with other countries. He should study deficiencies and all means of correcting them. For example: Antimony, Asbestos, Bauxite, Bismuth, Chromium, Cobalt, Columbium, Cryolite, Diamonds, Graphite, Helium, Iodine, Manganese, Mercury, Mica, Nickel, Platinum, Radium, Tantalum, Tin, Titanium, Tungsten, Uranium, Vanadium, Zirconium; and sources and methods of recovery of various rare elements such as Indium and Gallium.

In addition to cordial co-operation with the Geological Survey and Bureau of Mines, the Mineral Economist should maintain contact with such organizations as the Mining and Metallurgical Society of America, American Institute of Mining and Metallurgical Engineers, American Institute of Electrical Engineers, American Society of Civil Engineers, American Society of Mechanical Engineers, American Association for the Advancement of Science, American Electrochemical Society, the Technical Press (including the Mines Magazine), leading research organizations, and press clipping bureaus.

The working equipment of the Mineral Economist would no doubt include an unabridged card index of:

1. Metals and Minerals.
2. Individual correspondents.
3. Localities and their outstanding minerals.
4. Producers of minerals and ores.
5. Vendors of minerals and mineral products, and data regarding their sources of supply, and their tonnage resources.
6. Agents engaged in the mineral trade, and data regarding their principals.
7. Promoters of mining, metallurgical and industrial enterprises which may have special significance regarding the technique of the industry.
8. Consumers of minerals and ores, with data relating to tonnage requirements, customary specifications, nature of operations, industrial

(Continued on page 187)

RESEARCH AND INVENTION BY "MINES MEN"

By

JOHN WM. BUCHER, '02
Chief Engineer, Colorado Iron
Works Co., Denver

Ever since the dawn of civilization man has been dependent on the various metals for the advancement made in our mode of living. Man's search for truth best exemplified in the engineer's urge for investigation, research and invention has been a prime mover in our quest for an improved culture.

From the days in the early 80's when our first Alumni crossed the threshold of our Alma Mater to begin a life of self existence from the fruits of their own endeavor, in their chosen profession, the urge to do something a little different or in a more economical or practical manner has been the incentive for many of us.

Physical means for practical research in the mining or metallurgical field were limited at Mines until the erection of the Experimental Plant in 1912, with its laboratories in which the students are given practical instruction in ore-dressing and hydrometallurgy; and its research laboratories, with the necessary equipment and analytical facilities for various forms of ore testing.

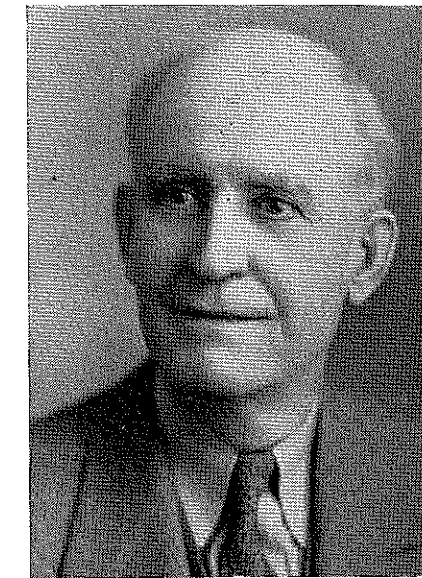
The same was true regarding means for research and invention in the Petroleum Option until Stratton Hall and the Hall of Advanced Chemistry were equipped with the necessary research laboratories and apparatus about 1914. We have today in our most recent acquisition to the campus, namely Berthoud Hall, a unit for Geology and Geophysics which is unexcelled for teaching and research in these branches.

Time has shown that in spite of the fact that our earlier Alumni were not favored with the advantages of research laboratories and apparatus, nevertheless, their training was such that we find one of our ex-students of the class of 1888, Kenneth Hartley, the first person to build a gravity meter for geophysical prospecting capable of measuring the direct pull of gravity, in amounts as small as one millidyne.

In the petroleum industry we find Mines Alumni responsible for such developments as the method of introducing an emulsion breaker in kero-

sene ahead of the acid, in acidizing wells; methods of determining oil zones by means of core analysis and more recently soil analysis as practiced by such companies as the Geologic Standards Co. of Tulsa, Oklahoma.

Many Alumni are employed on the research staff, or in the process laboratories of our leading oil companies. Mr. R. J. Schilthuis of the class of 1930, working in the research depart-



JOHN WM. BUCHER

ment of the Humble Oil and Refining Co. at Tulsa, Oklahoma was recently awarded a gold medal by the A.I.M.E. for his outstanding work in research and masterly exposition of the same in a technical paper submitted on "Connate Waters" in connection with petroleum development.

In the petroleum production field we find many graduates in executive positions, several being Presidents or Vice-Presidents of successful and prominent oil companies. Mines grads are in charge of development and production of foreign fields as for example the Baherin Island in the Persian Gulf where an oil pool with its gathering lines and transportation lines as well as the off-shore loading terminal and refinery were developed and erected by a Mines Alumnus.

William E. Newnam of the class of '96 was the inventor of the "Newnam Hearth" for smelting of lead,

which process has replaced all of the "Scotch Hearths". We find two plants in the U. S. using this process, as well as plants in England, Spain, Germany, Yugoslavia, Russia and the South American Countries.

Mr. Newnam is the inventor of the Newnam system of molding and loading "pig lead". This system is in use today at the following smelters: Bunker Hill and Sullivan at Kellogg, Idaho; International Smelting and Refining Co. at East Chicago, Illinois; American Smelting and Refining Co. at Alton, Illinois; St. Joseph Lead Co. at Herculaneum, Missouri; Broken Hill Associated Smelters, Port Pirie, Australia and several smaller smelters.

In the smelting industry we find an automatic damper for draft control on Reverberatory Furnaces invented by an alumnus of the class of '11. A volatilization process applicable to gold ores invented and patented by an alumnus of the class of '13 in use today by the Chief Consolidated Mining Co. at Eureka, Utah.

In the metallurgical field we find an 1895 graduate, Lewis B. Skinner, the holder of about 35 patents on chemical apparatus and methods, extending over the period from 1903 to 1935, during which time his energies were devoted exclusively to research. One of his developments, the Skinner Multiple-Hearth Roaster, for sulphide ores, was first used by the Western Chemical Co. in Denver, and its use today has spread to many plants in the United States and as far away as the Electrolytic Zinc Co. of Australasia, Ltd.

Everyone familiar with the Cyanide Process of gold and silver extraction knows of the Merrill-Crowe Vacuum Process for precipitation of the gold and silver values from cyanide solutions, which was developed by an alumnus of the class of 1900. Ever since graduation, Thomas B. Crowe has devoted most of his time to research and invention along metallurgical lines and has been the inventor or co-inventor in scores of patents.

The inventor of the "Packed Cell Process" for the manufacture of sulphuric acid, and the co-author with Philip de Wolf of the book entitled "American Sulphuric Acid" was E.

L. Larison of the class of '05 who devoted his life to development and research work. Another member of the class of '05, R. L. Hallett, is the chief chemist and manager of the research laboratories of the National Lead Co. in New York.

From the class of '06 we find another alumnus of whom we may well be proud, as he holds a chair of Senior Fellow in the Mellon Institute of Industrial Research, and is also Manager of Research and Tests for the Duquesne Slag Products Co. of Pittsburgh, Pennsylvania. Under his direction new and profitable uses of slags have developed so that we now find them being used in cement, as aggregate in concrete, railroad ballast, road surfacing and soil liming. We have mineral wool, made from slag, as an insulator in most of our modern homes, also such cast slag products as brick, blocks, slabs, tile pipe, etc., used in the building trades.

Our director of the Experimental Plant at Golden, Arthur J. Weinig, is an alumnus of the class of '08, and under his guidance and supervision research work is carried on by students and alumni for the development of new and improved operating techniques in ore dressing and metallurgy. Mr. Weinig is the author of several exhaustive publications on Ball Mill Grinding in open and closed circuits and on Flotation of Non-metallic minerals, all of which have been published by the School of Mines as Quarterly publications.

If one should go into any of the larger mines in the Butte district, he would immediately note that the shafts appear to be made of reinforced concrete in place of timber. Upon further examination or inquiry, he would discover that the original timbers have been covered with cast concrete slabs and then smooth-surfaced, appearing to the casual observer to be concrete piers. This process of smooth-surfacing mine timbers, as well as a method of conditioning mine air, based on the cooling power of the surface atmosphere, and a method of cooling water by air to a temperature below the wet bulb temperature of the air, are inventions patented by an alumnus of the class of '12, Allan S. Richardson.

When molybdenum sulphide ore was first discovered at Climax, Colorado its commercial value was practically nil. It was necessary not only to work out a practical and economical method of recovery, but also to find uses for the metal and produce a market for the same. There is no doubt that the untiring research efforts in processing molybdenum ores of an alumnus of this same class of '12, Alan Kissock, now Vice-

president of the Climax Molybdenum Co., contributed in marked degree to the outstanding success of this company, which today furnishes about 85% of the world output of this now strategic mineral.

A visit to the central mill of the Eagle-Picher Mining and Smelting Co. at Picher, Oklahoma or to the plant of the American Zinc Co. of Tennessee at Mascot, Tennessee will reveal that these companies are now treating from 3½ to 4 million tons of zinc ore annually by the differential-density cone process, developed by C. Erb Wuensch of the class of '14. This idea was born at a time when the price of zinc was at an all-time low, which caused it to travel over an exceedingly rough path, and it took extraordinary foresight, ingenuity and patience to bring this process out of the laboratory stage to a commercial paying basis.

About the same time another alumnus of the class of '14 was working and received patents on a process covering the use of cyanide in the flotation of metallic sulphides. Today this process is being used by many large mining companies, among which are the American Metal Co. Ltd.; The Anaconda Copper Mining Co.; The Bethlehem Steel Corporation; The Bunker Hill and Sullivan Mining Co.; the Consolidated Mining and Smelting Co. of Canada, Ltd.; the Electrolytic Zinc Co. of Australasia, Ltd.; the St. Joseph Lead Co.; the San Francisco Mines of Mexico, the Utah Copper Co., and the Howe Sound Co.

But why remain within the metallurgical or petroleum branches for Mines men in research? We find one alumnus of 1900 located with the Bureau of Mines whose endeavors have taken more of a philanthropic turn, and who has devoted years of time and effort to improving the health and safety of the miners. The writer can remember as far back as 1906 when Dan Harrington was travelling from one mining camp to another teaching the men the basic principles of mine rescue work. Today industry recognizes safety engineering to be fully as important as any other branch of engineering.

How can we turn to a profit the disposal of the fine coal that is the result of modern coal preparation and cleaning? Ten years spent in research on this problem is ably explained in a paper entitled "Production of Low-Temperature Coke by the Disco Process" and presented at the New York meeting of the A.I.M.E. in February 1940. Carl E. Leshner of '08 is the author of this Technical Publication which describes the final success of the process

in a commercial way, and the manufacture and sale of the by-products of tar and its derivatives, and the economics involved.

Drugs and Pharmaceuticals also claim their share in research as evidenced by one of the class of '13, who has spent a number of years in research along these lines.

We have mentioned in a brief manner the accomplishments of Mines grads in research and invention, which have come to our attention. Numerous others have devoted much time and endeavor to research in various branches outside the mineral industries, and have been outstanding in their chosen field of endeavor and a credit to their Alma Mater.

Today the improved facilities at the Colorado School of Mines for investigation and experimentation in new processes are the means of giving to the scientific and industrial world young graduates who have been instilled with the spirit of progress and an inherent desire for adventure along untrodden paths.

It is to these young men we confidently look in the future for even greater developments in research and invention.

Murals—

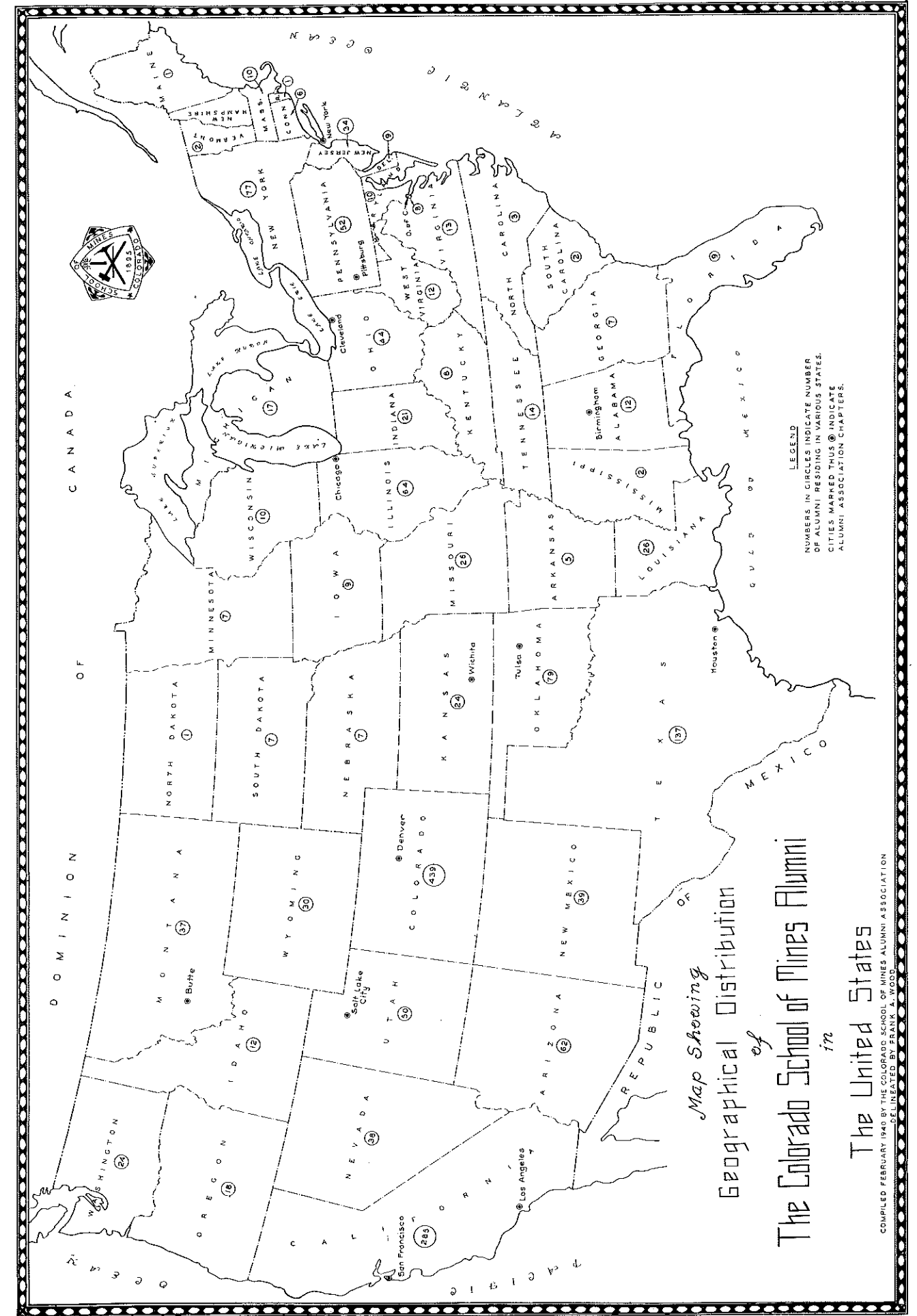
(Continued from page 170)

operated in attempting to have the murals donated to the School. However, after several weeks of effort it



was learned that the murals could not be donated under the laws of California but must be sold for a sum which amounted to \$1,500.00. The Alumni and Board of Trustees and President again became active but found that no School of Mines funds

(Continued on page 202)

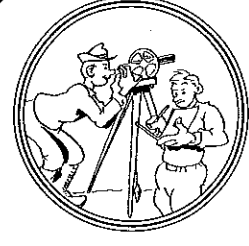
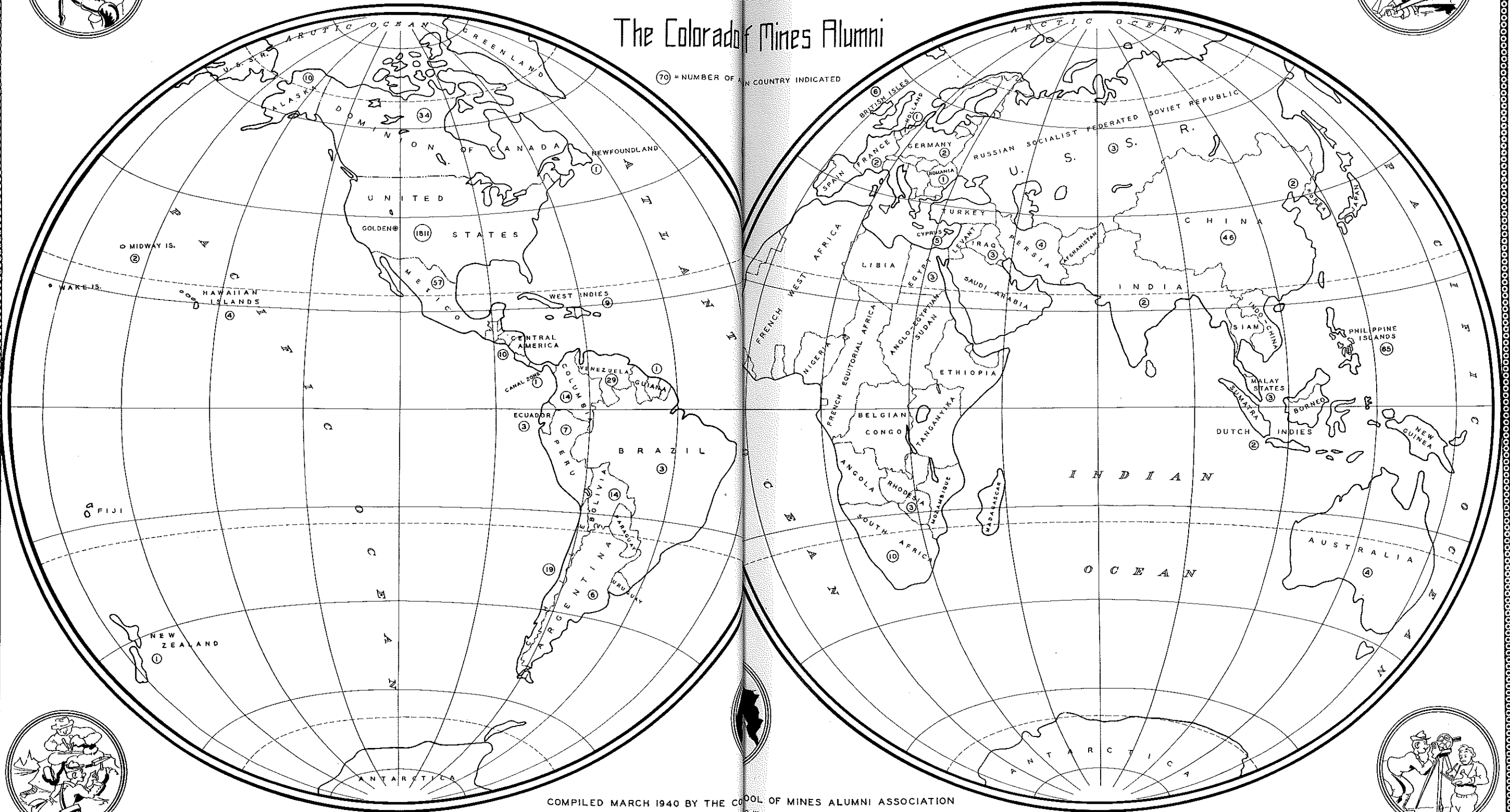
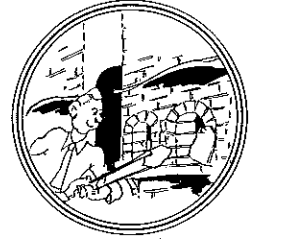
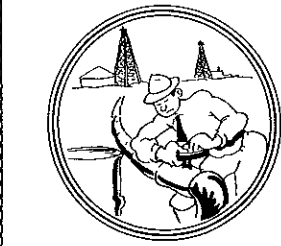


COLORADO MINES CRATES COVER THE GLOBE

Mining
World Geographical Distribution

The Colorado Mines Alumni

(70) = NUMBER OF ALUMNI IN COUNTRY INDICATED



DELINEATED BY FRANK A. WOOD

COMPILED MARCH 1940 BY THE COLORADO SCHOOL OF MINES ALUMNI ASSOCIATION
 EDWARD J. BROOK, PRES. • ERANK C. BOWMAN, SEC. Y.
 CHARLES O. PARKER • M. EDWARD C. CARSTARPHEN • DIRECTORS

ART WORK BY KENNETH SCHNEIDER

CONTRIBUTING TO THE MINING INDUSTRY

By
HUGH M. CONNORS, '22
Mining Engineer
Denver, Colo.

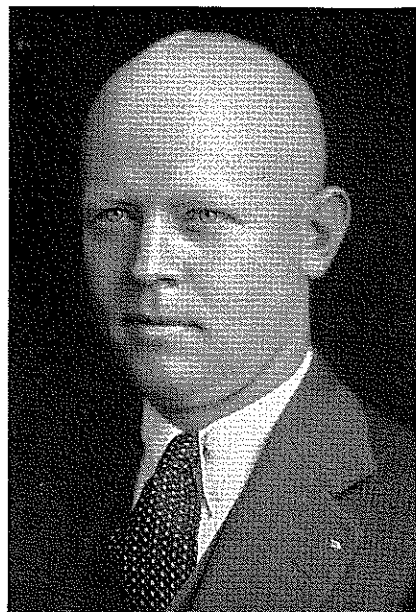
Civilization and mining have gone hand in hand ever since the beginning of time. Without the mineral industries, mankind would still be plowing the ground with a sharp stick, reaping his grain with a cradle, threshing it with a wooden flail, wearing a breech clout and living in a skin tepee. And, should any skeptic try to tell you that mining is a declining industry, remind him that in the last forty years, more metal of all kinds has been produced in the world than was produced from the dawn of history to 1900.

The recent rapid advance of the mining industry has been principally due to the education and its application by the mining engineer. It might be well to look into the qualifications of this individual who is responsible for so many of the things we enjoy today. As he must be able to "pitch his tent" in any of the far distant places around the world where minerals are found, he may have to establish and build his own community which might make him virtually dictator over many lives necessary to the successful carrying out of his program. Besides his duties in connection with his mining operations he is shouldered with the responsibility of the community he has built. In such case he would have to direct the civic affairs of the community, involving problems in housing, sanitation, water supply, transportation, education, recreation, hospital, religion, human relations and many others.

To withstand all this responsibility he must have a rugged constitution, be able to think, plan and perform accurately and carefully. He must have a general understanding of mechanical, electrical, metallurgical, civil, and geological engineering. He must be endowed with a vivid imagination which enables him to visualize the character and extent of ore deposits ahead of his exploration and development work to locate such deposits with the smallest expenditure of time and money.

Besides these qualifications he must be possessed with a keen insight into the human nature of many nationalities to successfully handle the labor problems that he will be continually confronted with. The man who said, "I am only human, you are super human" must have been referring to a mining engineer.

The Colorado School of Mines has been training Mining Engineers since 1879, but at that there are only a handful compared with the graduates of some of our larger universities. Notwithstanding this fact, the distribution and influence of "Mines Men" is



HUGH M. CONNORS

world wide. They are found from one end of the Americas to the other, from Australia through the Malay States, Dutch Indies, Philippines, India, China, Russia, European countries and on through Africa to South Africa.

In all parts of the United States, Canada, Mexico and Central America we find "Mines Men" directing important operations in Copper Mining, Lead Mining, Zinc Mining, Iron Mining, Coal Mining, Gold Mining, Silver Mining, Molybdenum Mining, and many minor metals besides many

of the non-metals. In the major companies, such as Anaconda, Golden Cycle, Tennessee Coal & Iron, St. Joseph Lead, Lake Shore Mines, Highland Mary, Bunker Hill & Sullivan, United States Vanadium, San Luis Mining, Mex., Kelowa Exploration, Canada, Woodward Iron Co., Climax Molybdenum, Idaho Maryland, Empire Zinc, New Jersey Zinc, Mazapil Copper, Mex., North Butte, National Zinc, Hudson Bay Mining & Smelting Co., A. S. & R. Co., Combined Metal Reduction, Pittsburgh Coal, Phelps Dodge Corp., Miami Copper, Union Pacific Coal, New York & Honduras, and many others we find that much of their success is attributed to "Mines Men".

In South American Countries of any mining importance where major companies are operating, you will find "Mines" well represented and "Mines Men" responsible for much of the success of those companies.

The success of gold mining in the Philippines from its first inception is largely due to "Mines Men" who are found in responsible positions with all of the major producers. Two Local Sections of "Mines" Alumni are well established on the Islands and probably have the largest representation of any American colleges.

In China you will find "Mines Men" directing many mining operations and in Russia they played an important role in the "5-year plan" until it became dangerous to remain in that country longer. On the island of Cyprus, we find the operations of the Cyprus Mines Corporation under the direction of "Mines Men" who have been responsible for its success from the start. In South Africa we find "Mines Men" with such major operations as South West Africa Co., Debeers Consolidated, International Engineering Corp., Worcester Gold Mine, Golden Valley Mine, Rhokana Corp., and many others.

And so it goes, due to their proven abilities for successful operation of mines under most difficult conditions, in not only the Americas but in all parts of the world, "Mines Men" have gained an enviable reputation.

IMPORTANCE OF THE GEOLOGICAL AND GEOPHYSICAL ENGINEER

By
W. A. WALDSCHMIDT
Associate Professor of Geology
Colorado School of Mines

Exploration and discovery of the world's vast and hidden mineral resources are no longer undertakings for amateurs, but tasks for men trained in the fundamentals of geology and geophysics.

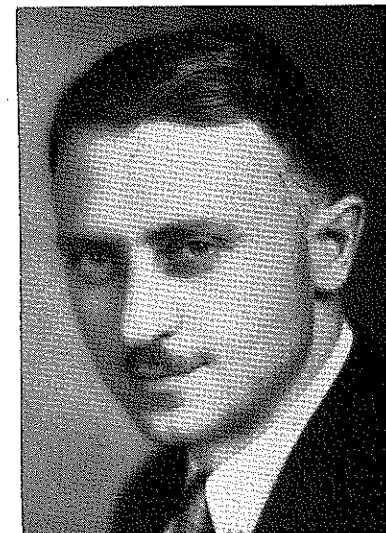
Previously to the last generation, discoveries of mineral deposits—metallic, non-metallic, and fuel—were made in great part by men with little scientific training. Yet, these men, endowed with perseverance and a lust for adventure, combined their smattering of knowledge with common sense or instinct, and found by digging, or by sheer luck, many of the world's great mineral deposits.

The compilation of facts relative to mineral deposits thus discovered formed a basis upon which others could guide their exploration activities more efficiently. Year after year, this accumulation of facts, published and unpublished, led to the propounding of theories about the origin and accumulation of oil and gas, theories of the origin of mineral deposits, theories of coal formation, and theories of earth structure. These theories, as well as numerous related facts and postulations, are today embodied in the broad subject of geology—a subject vital to the mineral industries. But geology has become such a complex subject that it must now be divided and subdivided into numerous branches such as mineralogy, petroleum geology, mining geology, paleontology, micropaleontology, petrography, optical mineralogy, mineralography, and others. Thus, while the student of a generation ago covered the subject of geology as a whole, the student of today must not only study the broad phases, but must choose a branch in which to specialize.

The application to exploration activities of geological knowledge gained by study is also becoming more complex. During the early days of petroleum production no systematic method of exploration was in practice, but after the establishment of proof that oil and gas accumulated in anticlinal structures, discovery of oil fields grew by leaps and bounds. In

many regions anticlinal structures were easily recognized, mapped, and subsequently drilled. Some of these structures were located by geologists, but others were located by men untrained in geology.

Since the most apparent structures have been located and drilled, the task of locating additional anticlinal structures and other types of traps is becoming more and more difficult—let us say, the easy geological mapping has been completed, and the difficult mapping now confronts us. Surface



W. A. WALDSCHMIDT

surveying now has to be supplemented by core drilling; microscopic studies of cores and cuttings, including the identification of micro-fossils; geophysical surveying; and by studies of regional geology and paleogeography.

Similarly, the application of geology and geophysics to the exploration for ore minerals is becoming more intricate. The early-day prospector followed the crowd and depended on luck, the experience of others, and on his "Grub Stake". The present-day prospector, who should be a geologist, must rely on surface mapping; studies of trends; application of theories of ore deposition; geophysical surveys, and core drilling—but he too must have a "Grub Stake".

In the development of a new or an old mine much detailed geological work must also be undertaken. Petrographic examinations of the gangue rocks and examinations of polished

sections of the ores must be made in order to determine the mineral relationships and grain sizes which may have a direct bearing upon the milling of the ore. Such work must, or should be done previous to milling, and should be carried on during the process of milling in order to maintain better control.

Naturally, the work of the geologist in mining may overlap the work of the mining engineer, or the metallurgist. In many cases the work of the geologist may be done by the mining engineer, or the work of the mining engineer by the geologist. Likewise, some of the work of the metallurgist may require a knowledge of some phase of geology. Because of the overlaps of mining, metallurgical, geological, and petroleum engineering, it is necessary for a young man to receive basic training in all of these subjects, but to specialize in one.

Such training is given to MINES men. A geological engineer is trained in the fundamentals of geology, and is allowed to devote extra time to specializing in some phase of this subject. In addition, he is trained in the fundamentals of other engineering subjects. Thus, he leaves the school not only with a basic training in his selected profession, but also with a broad training that permits him to branch into other phases of the mineral industries aside from exploration.

Some may say that MINES men who receive the degree of Geological Engineer, which also embodies training in geophysics, are, when they graduate, merely amateurs in their field of endeavor. But, it should be remembered that they are trained amateurs, well grounded in the fundamental principles of engineering, and that with this equipment and additional experience they will soon reach the rank of professionals. This contention is supported by the number of MINES graduates who are holding responsible positions in the geological and geophysical professions throughout the United States and foreign countries. Many of these men have graduated only recently, but with the training received at MINES they have been able to achieve success in their chosen field in a comparatively short period of time.

"MINES MEN" IN METALLURGY

By
DONALD DYRENFORTH, '12
Assistant Manager, Metallurgical
Division, Dorr Co., Denver, Colo.

Metallurgy includes the separation of the minerals from the gangue, the reduction and refining of the metals from the minerals and the preparation of the metals for the manufacturer and the arts. The future metallurgist obtains his fundamentals at "Mines" that enables him to take the products from the mines and transform them into useful alloys or metals. By reason of his physical and chemical knowledge he is able to devise processes by which he changes the products of nature to those of man.

Who are these men of magic who transform the works of nature? These "Mines Men" in metallurgy? They are the men who go on! And rightfully one has good reason to wonder at the character of men performing such achievements. There are some men who can obey orders; and there are some men who can get things done. It is well to be obedient; it is better to be resourceful. The resourceful man keeps trying: where the other man quits, he begins. His motto, "where there is a will there is a way", and his determination to win lures him ever onward to greater accomplishments. Of such are "Mines Men" in metallurgy.

Glance through the Alumni Directory and you will find there is a treat in store for you. Probably you have not sensed it; neither did I, but nevertheless it is there. Impressively, the chemistry of solutions as a metallurgical pursuit is far and away the leader in attracting men from "Mines". Cyaniding, leaching, flotation, smelting, steel, alloys, refining, plastics; these are all glamorous sirens which call out to resourceful men.

The urge for gold and silver is universal. The way was opened with the discovery and application of the dissolving power of weak cyanide solutions. Disseminated and low grade material could be economically worked where previously only rich concentrations were sought. Look at your map of the world: America, from the Arctic to the Argentine; the Philippines;

Australia; the East Indies; Africa; each is noted for its production of the precious metals in the cyanide process and each has its quota of metallurgical men from Mines.

So also can you spot these men in the steel centers of the United States. There are not many in steel elsewhere and for two reasons: Steel is a national commodity and its heavy tonnage home is in these United States.

Not so much so non-ferrous smelting and leaching. Like cyanide they are more international in their aspects and metallurgical men of Mines have gone far afield in answer to the call for energetic and resourceful souls.



DONALD DYRENFORTH

In the smelting of lead, copper and zinc ores you will find that much in the advancement of processes and methods originated from the minds and labor of Mines Men, some of whom have practically devoted their lives to the invention of more efficient methods and equipment which has returned incalculable profits to the metallurgical industry. The article on "Research and Invention" found in this issue will give the reader more detailed information.

Allied with steel are the alloys and here perhaps is the field in solutions where downright ingenuity and dogged persistence have produced some outstanding workers. We know of the need for molybdenum, of manganese,

chromium and tin; aluminum, zinc and beryllium; tungsten, and magnesium. Many years ago this need was sensed by metallurgically trained men of Mines and here and there in the Directory you can spot names that are synonymous with these alloying materials and their development.

Somewhat newer are the plastics and fewer the names that are found. But plastics, in infancy now, partly paralleling the alloys, will converge with them and draw on the men who respond to the lure of that game.

Plentiful, too, are names in the field of ore dressing and here again the aspect is more international than local. The majority tonnage of metals is, by all odds, a product of the art of the ore dresser who, from the sorting of run-of-mine to the dewatering of micron size floated particle, imposes his will on the process and begets economic success. The ore dressers field is the world and he is a part of the responsibility for economic success whether he be operator, sales engineer, equipment manufacturer, or executive.

When you've gone through the listing of names and found the metallurgical men, you are interested in knowing their ages and the year of the class they are in. It isn't surprising to see in checking by classes and years there are many young men who are prominently identified in all of the metallurgical trends. This holds true of the teachers, with whom can be classed the development and research men and inventors. It has been said that teaching is the most honorable occupation in which anyone can engage; the most self-respecting business on earth; the teachers' influence, the most far reaching of all. In a somewhat different way, but nonetheless far reaching and profound, the men in development and research and with practical vision leave their impression. Their's is the work of forging the tools for the workers the teachers turn out. All are there in the Directory from the earliest groups up to now.

Of all rules that govern the activities of the metallurgists—the Metallurgical Men of Mines—three are sure rules for success. The first is: Go on. The second is: Go on. The third is: Go on.

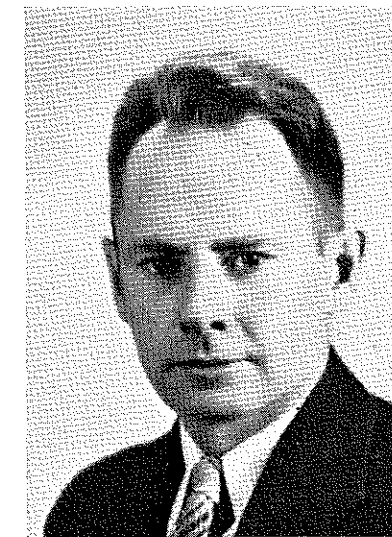
THE ENGINEER IN THE OIL INDUSTRY

By
CLARK F. BARB, '25
Professor of Petroleum Engineering
Colorado School of Mines

The question is constantly being asked, "What does the engineer do in the oil industry?" or it may be reworded to ask what the oil companies expect of their engineers? The answer to the question isn't easy. Usually there is a counter question. What kind of an engineer is referred to? By way of comment it may be said that the oil industry employs mechanical engineers, production engineers, civil engineers, chemical engineers, valuation engineers, gas engineers, refinery engineers, mining engineers, metallurgical engineers, geophysical engineers, geological engineers, lubrication engineers, sales engineers, electrical engineers, and just plain engineers.

The reason for the employment of men trained in such a wide field of engineering and science is simply because the oil industry is large and covers a wide range of activities. Obviously, no one man could cover this entire field with any degree of success. Each branch of engineering or science requires a specialist with a basic training which is common to all.

There will be no attempt to outline the exact duties of each class of men mentioned above. In most of the cases the type of service is obvious. The electrical engineer for example has a very specialized field and it is out of place for a man with only a few general courses in electricity to attempt the design, construction and operation of a high voltage power plant. (Or at least such is the opinion of this author.) However, the oil industry often has need for



CLARK F. BARB

heavy duty electrical equipment and employs electrical engineers to handle it. It would probably be as difficult for the electrical engineer to design a multi loop gas line or to calculate the reserves and present value of a partially drilled oil field.

The chemical engineer, specially trained in physics, chemistry and thermodynamics could design a cracking plant or figure the thermal reaction of a polymerization process but he might have trouble in predicting the rate of edge water encroachment by Darcy's law and some proration formula.

A geologist, or more properly, geological engineer has a very definite place in the industry in locating probable or likely places to drill. He figures this from his concept of the laws of oil and gas migration and accumulation. His knowledge is also called upon in figuring probable rates of fluid movement through the under-

ground reservoirs. He is immediately in the realm of production and should know his laws of flow through porous media. The oil content of a reservoir might be ever so many millions of barrels but if the sand is so tight that commercial production cannot be attained, the field is worthless. (Some of the Berea fields of Ohio are good examples of this.) But this same geologist might be at a loss in explaining the theory of lubrication to a customer or in formulating an alloy for deep well sucker rods.

In the Petroleum Department at this institution the men are given some specialized training in either petroleum production or in refining, according to the particular desire of the individual. They have the basic work, common to all options, of mathematics, physics, English, chemistry and related sciences. Of these, in the opinion of the author, physics is paramount. Without an understanding, and this means more than just the memorizing of formulae, of physics a man is stopped.

In order to use his physics he must know his mathematics. In order to explain his ideas he must be able to use his English. And so the basic foundation is built. This idea of "fundamentals" has been discussed, written about, talked about, argued about until the very expression has become trite. However, it's still fundamental.

Upon this basic training is given some general work in the petroleum industry. The idea is to give the man, production or refining, a bird's eye view of the industry. Make him at least cognizant of the relationship and interlocking functions of the Exploration, Development, Production, Transportation, Refining and Marketing branches of the industry. Make him realize that thruout the entire organizational structure there is an economic blood stream that keeps the organization alive.

Certain other work is intended to indicate to him the industrial applications of his physics and chemistry in the design and operation of a refinery. His laws of fluid flow and mechanics are utilized in figuring pipe lines and potential productions. Special stress is constantly laid upon fluid flow. That might be called the theme song of the oil industry. It is actuated by pumps, moves thru pipes and is controlled by valves.

There is no claim that the men are finished engineers after four years. There has been merely an attempt to indicate to them the value of courses that two years earlier they were chiefly interested in for the sake of the credit in the Registrars office.

(Continued on page 223)

NON-METALLIC INDUSTRIES

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

The non-metallic industries offer a very large field for the technical graduate. This is evidenced by the number of Mines men who have entered these industries with a resulting benefit to themselves and the particular branches of the industry with which they have become associated. We find that Mines men are holding positions of responsibility in management, superintendence, sales, and research in many non-metallic operations throughout the world.

The cement industry has profited to a great extent through the activity of Mines men. Important cement industries in the United States and foreign countries have become successful and large commercial enterprises through the direction of men who obtained their fundamentals at Mines.

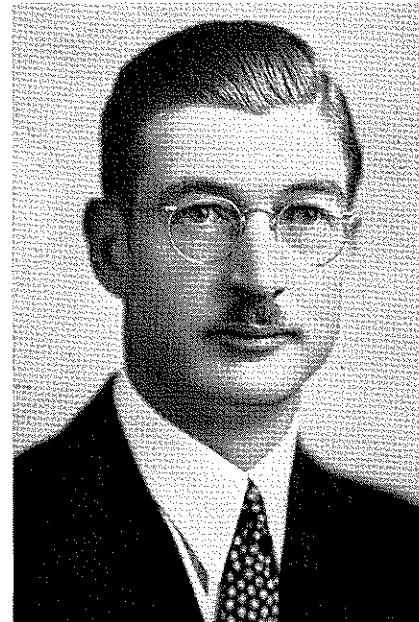
Potash is another non-metallic industry which is utilizing Mines men in all phases of production. The success of The Potash Company of America at Carlsbad, New Mexico, is largely responsible to Mines men working on its staff in positions ranging from manager to surveyors. This very forward-looking company realizes the value of technical training in all phases of its mining and milling operations.

The production of kyanite for high-grade refractories is a field which was sadly neglected until a Mines man saw the possibilities of this material. He now occupies the position of Vice-President and General Manager of the Celo Mines, Inc., Burnsville, North Carolina. In addition to the production of kyanite, by-products in the form of mica and garnets represent a considerable income for this company. Part of the kyanite is burned to mullite, a very desirable refractory for many uses where severe service is to be met.

Phosphate rock production also utilizes its share of Mines men, working in the Florida and Tennessee phosphate fields in positions of responsibility. Since the production of phosphate directly affects the price of ham and eggs, wheat, corn, cotton,

tobacco, etc., we are all greatly indebted to these Mines men, because they make it possible for us all to eat much more heartily and at a lower cost.

Limestone is a mineral which we all realize, has such a diversified number of uses that it would require a good sized library to enumerate them. A few of the more common uses of limestone are: as one of the major raw materials in the manufacture of cement, iron and steel industry, smelter flux, chemical industry, agri-



KENNETH HICKOK

culture, sugar refining, water purification, glass making and many others. In all of these we will find Mines men occupying positions of responsibility and influence.

Gypsum is another one of the non-metallic products in which Mines men are showing the value of technical training. Gypsum wall board, plaster, and insulating blocks have found wide-spread use in the building industry in the last few years, and, as a consequence, the value of a technical education is being realized more and more by the producers of gypsum and gypsum products. Mines men in the cement industry are creating a use for gypsum in the form of a retarder for the set of cement.

Kaolin and feldspar materials which are widely used in the ceramic industry, are also benefiting from

Mines graduates who hold responsible positions in companies producing these materials. Kaolin is used quite widely in pottery, porcelain and china ware, and feldspar is widely used in the glazing of this material to make it more delightful to the eye as well as resistant to chemical action and abrasion.

The sand and gravel industry, while lacking the romance of gold mining, none the less accounts for many of the nicer things of civilization. It is widely used in concrete aggregate, railroad ballast, road surfacing, filter beds, etc. This industry is also benefiting from the technical training of Mines men. These men are not only valuable from the production standpoint directly, but also from the manufacturing of equipment suitable for handling this type of material.

In a key position with the major company producing natural asphalt for its many uses, we find a Mines man directing and influencing the trend of this industry. It is obvious that his technical training at Mines furnished him with a foundation that enabled him to successfully cope with many unknowns.

Rutile, a compound of titanium, offers another field which is being explored successfully by a Mines man. While this particular non-metallic does not have as great nor as diversified a use as many others, none the less, its use as a flux on welding rods and in paint pigments has assured it of a place in the industrial sun.

In this short sketch about the influence of Mines men in the non-metallic industries, it is only possible to touch upon the high spots; however, the spots touched should convey to the reader's mind the importance of Mines men in this most diversified branch of the mineral industries.

The ever widening scope of Mines men in the non-metallic industry has proven beyond a shadow of a doubt that technical training is a valuable asset to this industry and largely responsible for its rapid expansion. We may expect, as time goes on, more and more Mines men will find this field of endeavor to possess interest and value, not only to themselves, but to an increasing number of the public at large.

INFLUENCE IN EDUCATIONAL FIELDS

By
GEORGE W. THOMAS
Ch.E., '26, M.S., '29
Golden, Colo.

The word "Mines" has become the symbol of a great educational institution, with a world wide reputation. No matter where you go, to the stranger even, "Mines" means Colorado School of Mines. As an illustration, two men in a middle west city were heard discussing mining schools, one was very firm in his statement, "There is just one mining school in the world worth consideration and that is 'Mines' at Golden, Colorado." He had never seen the school but knew it from reputation. To his mind it was the "one and only one," although we know there are other good mining schools but I will leave the discussion of their merits to others, I will try to stick to my own topic.

Naturally a stranger thinks of "Mines" as a large institution with many graduates in order that it should become so well known all over the world and is surprised to find a comparatively small group. Therefore to make up for the lacking in numbers, "Mines Men" must be outstanding in performance. The high entrance requirements at "Mines" insures that candidates must be properly equipped. This in turn insures an excellent foundation upon which to properly build with the fundamentals so necessary for the successful engineer.

"Mines" has always been progressive in its methods of selecting and imparting to its students the important essentials. A sane, straight forward attitude is always maintained toward new and pertinent material which conforms with modern theory and practice. It clings to the highest standards of education. With a broad knowledge of the fundamentals and their application so necessary to meet the many requirements of the mineral industries, the "Mines" graduate is especially well fitted to impart his knowledge to others. He has had a severe training which makes him a supporter of high standards, naturally producing the strong incentive for accomplishment so necessary to reach his ideals. His influence is only measured by the number to whom he imparts his knowledge and this in turn depends upon the wide distribution of "Mines Men" in the teaching profession.

One gets a good idea of the tremendous influence played by "Mines" in education by glancing over the vast territory embraced by Alumni in educational work. Among the foreign institutions represented are Otago University, Dunedin, New Zealand; Mapua Technical Institute, Manila, Philippine Islands, and the Temporary University of Shensi Province, Shensi, China.

Not including eleven of the Alumni who are keeping the home fires burning at "Mines," we have an extremely wide distribution among the institu-



GEORGE W. THOMAS

tions of this country. We are represented by two of our Alumni in each of the following; The University of Arizona, University of Texas, and Montana School of Mines. One representative is found in each of the following: Missouri School of Mines, University of Vermont, University of Pittsburg, University of Kansas, New Mexico School of Mines, University of Colorado, San Jose Technical School, The Command and General Staff School at Fort Leavenworth, Ohio Wesleyan University, University of Oregon, Pennsylvania State College, Purdue University, University of California at Los Angeles, South Dakota School of Mines, and The Massachusetts Institute of Technology. Besides these, "Mines Men" will be found in educational work in connection with many high schools in several different states as well as many institutions of

higher learning other than those mentioned.

In making mention of some of the outstanding leaders in the educational work who are "standard bearers" for "Mines," the writer feels that he can do no better than to quote certain of their experiences and remarks. For lack of space the following all too few references can be chosen from the wealth of material available.

To Francis A. Thomson, '04, President of the Montana School of Mines we are indebted for the following: "Students of mining engineering should guard themselves against becoming narrow, dingy-spirited specialists. While necessarily devoting themselves whole-heartedly to their highly technical studies, they should endeavor to take an intelligent interest in public affairs and in the world at large so that they may graduate as potential professional men and not as future artisans in the technology of the mineral industry. Roughneck qualities and a hard-boiled appearance and manner have no value to a future mining engineer." Also an excerpt from an address delivered at the Annual Meeting of Colorado Mining Association, Denver, Colorado, January 26, 1940 paid a fine tribute to his Alma Mater, he said, "I am happy to have this opportunity to acknowledge the very great debt which I owe personally to the State of Colorado and its great School of Mines for giving me my early undergraduate education in the profession of mining engineering."

Sound advice by William R. Chedsey, '08, Director of the Missouri School of Mines and Metallurgy is as follows: "The soundest advice to students of engineering that I know of is after training themselves as thoroughly as possible and getting out into practical life, to associate with engineers, but more important associate with everybody else possible, take a part in politics, join the Chamber of Commerce, run for office on the school board or anything else, and keep everlastingly at it provided it does not interfere with your professional duties."

Adolph S. Walter, '15, Dean of Mining and Metallurgy at the New Mexico School of Mines pays tribute to his Alma Mater in the following quotation: "My contacts with Dr. Chauvenet, Dr. Butler, Dr. Chedsey, Dr. Patton and Dr. Sherwood assisted

(Continued on page 223)

Three Co-Eds AT "MINES"

By
FREDERICK C. STEINHAUER, '99
Denver, Colo.



FREDERICK C. STEINHAUER

"Mines" in the early days had always been considered a man's institution. No thought had ever been given to co-education. Why should there be, for no woman would ever have the audacity to tread upon a domain so outstandingly that of the male sex. Strange things happen sometimes and so one of the "seven wonders" appeared one day as a member of the class of 1898, a very robust young woman from Cleveland, Ohio. At first the tendency was to discourage her but the boys soon found she was "there to stay," so she was finally initiated as "one of the gang" and did her share of the "heavy work."

As a student she was a wonder and the records show a 99 in Calculus to her credit. Florence H. Caldwell was one of the few to obtain the degree of Civil Engineering at "Mines."

Before coming to Golden she graduated from the Ohio Wesleyan University and Cleveland School of Art.

She was married to Frank H. Jones, also of the class of 1898, April 10th, 1901, at Cleveland, Ohio. In a recent letter to the author, Mr. Jones stated:

"There is little to write about her engineering experience . . . I prefer to remember how much help she was to me in assisting to solve many knotty problems in my work. Her personal characteristics were admirable: loyalty to friends, kindness and sympathy to any one in distress of mind or body, an unwavering courage. She kept me encouraged thru many rough places."

Until Mrs. Jones death April 22, 1937, at Clarkdale, Arizona, she and Mr. Jones devoted their lives in serv-

ing the Mineral Industries. Mr. Jones now resides in Houston, Texas.

The experience of Florence Caldwell must have attracted another one of the fair sex, for with the class of 1903, the second co-ed, Grace McDermut (now Mrs. Grace Mulligan) received the first degree of Mining Engineering conferred by "Mines" upon a woman. According to the Denver Post, in an article April 11th, 1934, which in part is quoted, "While Grace McDermut was in school near Denver, her aunt acquired a claim in the Razzle Dazzle lode in Colorado. Her aunt and her parents decided it would be a good plan for Grace to study mining engineering so that she could look after the mine. . . . She was pleased when it was decided that she should enter the Colorado School of Mines. . . . a few weeks before she received her degree in Mining Engineering, the Razzle Dazzle gold mine passed out of the McDermut family, 'and there I was,' she explained, 'with a fancy degree on

my hands and no place to make use of it.' There were no jobs open for women mining engineers. Even government officials were inclined to regard women engineers in the same light as the professors at the Colorado Mines regarded a woman student at a predominately male school. However, the year following her graduation she received an appointment at the National Bureau of Standards, being the first woman appointed on the Scientific staff, and the first to receive a permanent appointment there, the department stating "It was something of an experiment."

The Bureau which had but recently moved to its present site, had about one hundred employees and three buildings. The Physical building in which most of the laboratories were located, was not quite complete as yet. It was a formative period, very interesting, and the work varied a good deal, according to the needs of the occasion. There was much experimental work, defining of specifications, designing and building of apparatus and equipment. At first Mrs. Mulligan did draughting, for the most part. Later, she had opportunity to carry on experimental investigations as well as routine testing and special work. For several years she was connected with the Electrical division, but most of her experience has been in the division of Weights and Measures, chiefly in the Volumetric and Density section, where she has been for a good many years, and to some extent in the Mass section.

The work of the Volumetric laboratory deals with the calibration of volumetric standards and the testing of precision volumetric apparatus such as is used by chemists, physicians, and technicians. In the Density laboratory, hydrometers are tested,



MRS. FLORENCE CALDWELL JONES

densities and the thermal expansion of liquids are determined. Routine apparatus must conform to the specifications of the Bureau and special apparatus must be of suitable design in order to be accepted for test. If the apparatus qualifies, it is tested, and if found to conform to the specifications in all respects, receives the seal of the Bureau.

Reports are made on special types of instruments, but they do not receive the official seal. A great deal of work is done for the Federal Government, and State institutions may have tests made free of charge. A nominal fee is charged for work done for the general public. Frequently requests come for information from the general public; manufacturers and others come to the Bureau to discuss technical matters.

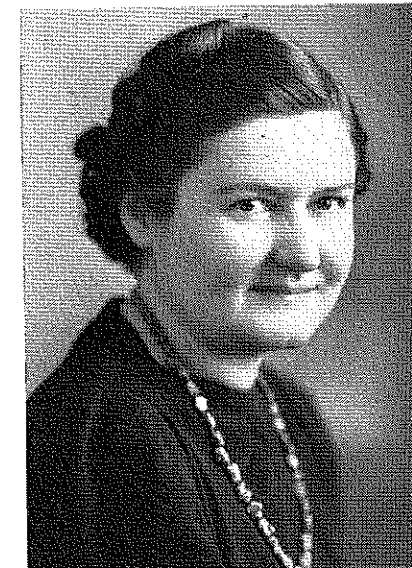
Mrs. Mulligan supervises the testing of the glass volumetric apparatus and acts as alternate for section chiefs.



MRS. GRACE McDERMUT MULLIGAN

Thousands of pieces of apparatus are tested each year and as the work is of high precision, the staff must be carefully trained and the equipment be of the best. A good deal of specialized testing is done. She assists with the determinations made at the Bureau on the density and expansion of alcohol-water solutions, and has done quite a bit of work compiling and tabulating density data of various kinds. Some of these appear in the international Critical Tables, some are in Bureau and other publications. Occasionally the work is done upon the request of a private party where there is sufficient need to warrant it.

"The Bureau received a great impetus during the war," Mrs. Mulligan wrote, "because of the vital import-



NINETTA DAVIS

ance of its work in many ways, and it has continued to expand. There are twelve large buildings and a number of minor ones. At first, it seemed rather like a college campus, and you walked up the steps with the Chief, or clung to a strap in the street car, beside the Director. But not any more! The personnel numbers about nine hundred now, and the Great, drive cars—as do plenty of others."

A long period lapsed and then our third co-ed, Ninetta Davis, had the degree of Mining Engineer conferred upon her in 1920. Her recent letter does not go into the interesting detail as that of Mrs. Mulligan, but, nevertheless, indicates a varied experience in geology and petroleum and she too is in the government service.

Her first job was with the Midwest Refining Company, at Casper, Wyoming, where she spent four years as assistant to the petroleum engineer; then a year as office geologist for the Union Oil Company of California at

Fort Collins, Colorado; then several years in private business.

She has been with the Geological Survey, Conservation Branch, in Denver since January 1, 1934—first working on office geology of dam sites, and soon studying subsurface geology of oil fields in the western states to further the conservation of oil and gas on public lands.

While very little has been heard from our "Three Co-eds" during all these years, it cannot be overlooked that they have done their part towards holding up the traditions of "Mines"—leadership in the Mineral Industries.

Mineral Economist—

(Continued from page 174)

affiliations, financial resources, and methods of settlement.

9. Buyers, with information respecting their employers, principals, and affiliations when such data are available.

10. Manufacturers, with information regarding the nature and relative importance of their operations and products, and their customary requirements.

11. Industrial contacts, classified with respect to requirements, products, technical importance, and specific relation to the probability of developing new uses.

12. Governmental contacts. Departments or agencies directly interested in minerals or mineral products, and names of specific individuals having authority to conduct negotiations or sign contracts.

13. Confidential contacts.

14. Index of uses for each mineral or product, classified according to industries and products manufactured.

15. Index of industries, and the list of minerals used in each.

16. Classification of military or strategic uses.

The general subject of mineral economy offers a fascinating life work in a wide field of activity and service, and one that is likely to be of increasing importance.

Any Colorado Mines graduate has the basic theoretical training necessary for such work, and if on top of this he has had ten to twenty years of active professional experience in the field, his qualifications should be considered adequate for an appointment in this special profession. The longer and more diversified his experience, the better. Arbitrary limitations as to age should have no consideration in an occupation of this kind, where the chief qualifications are technical knowledge, experience, judgment, and discretion.

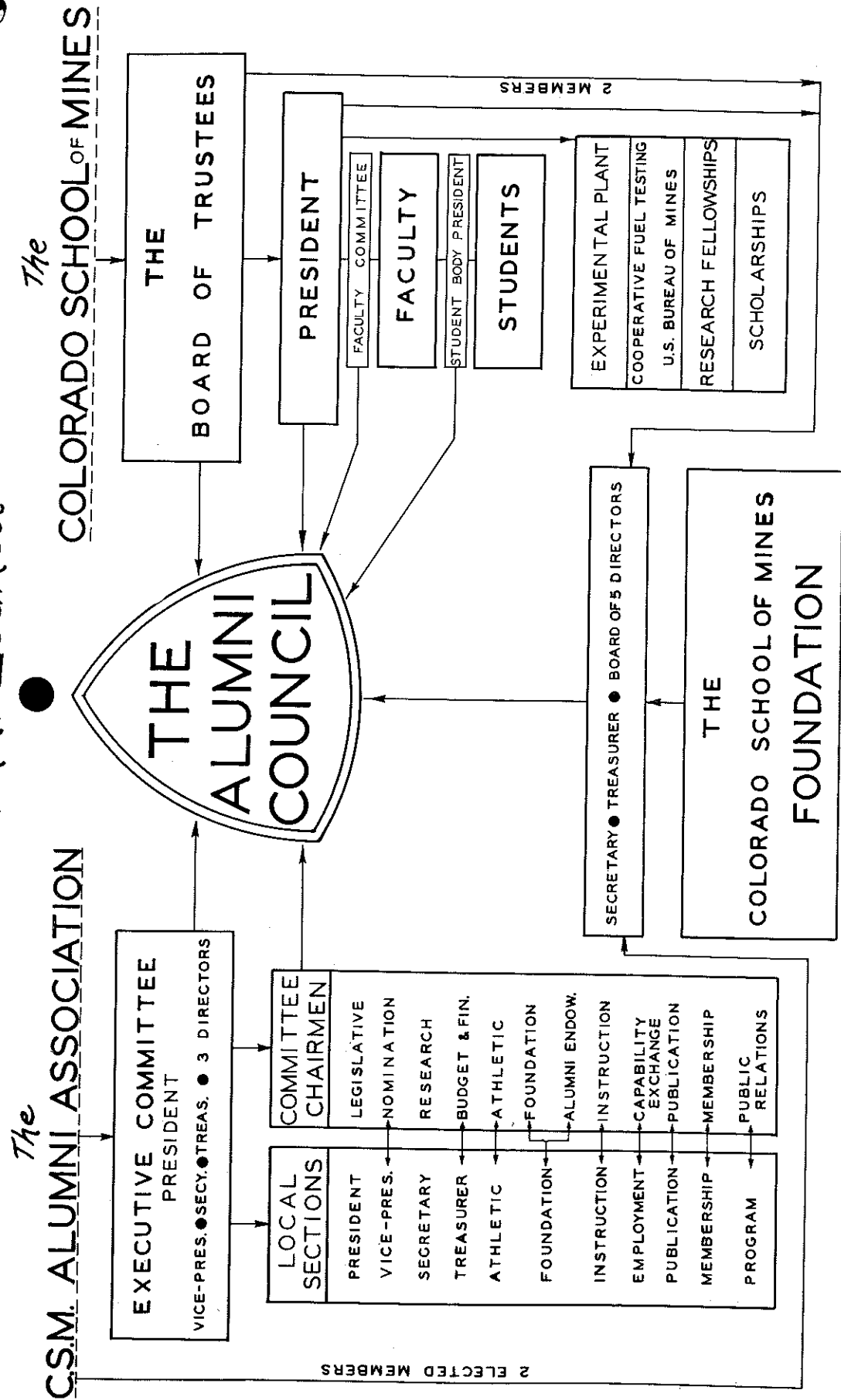
1940 Alumni Banquet

THURSDAY MAY 23, 1940
AT 6:30 P.M.

"Mines Men," members of Colorado School of Mines Alumni Association and honored guests will assemble at the University Club, Denver, Colorado to enjoy a great celebration and festive occasion. This will be the greatest Alumni Banquet ever given by "Mines" so remember the time and the place and be there!

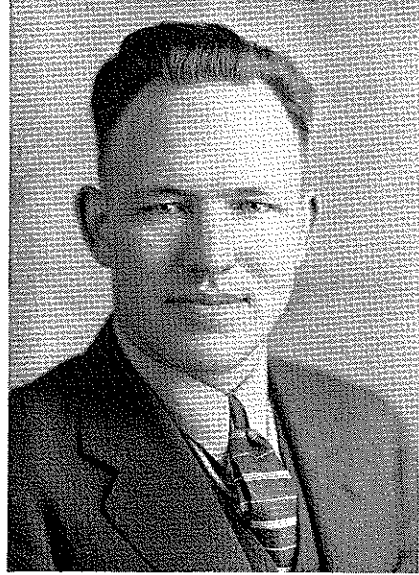
Order your tickets now.
734 Cooper Bldg. Denver, Colo.

The Colorado School of Mines Alumni Council



ALUMNI COUNCIL OF THE COLORADO SCHOOL OF MINES

By
RUSSELL H. VOLK, '26
Chairman, Membership Committee



RUSSELL H. VOLK

The Alumni Council can best be explained that it is a super governing body for the school and its Alumni. It covers the entire field of the Colorado School of Mines. Its membership is composed of the members of the Board of Trustees, President, Dean and representatives from the Faculty of the School; the President of the Student Body of the School; the officers, members of the Executive Committee and Chairmen of the Standing Committees of the Alumni Association. The deliberation and discussion of this body affords an opportunity for representatives of those four vitally interested parties, the Trustees, the Faculty, the Student Body and the Alumni, to exchange ideas, viewpoints and opinions in order to determine policies. The Trustees represent the viewpoint of the State and its citizens; the Faculty presents ideas tinged with the intellectual, cultural and ideological background of the academician; Student Body representatives contribute the enthusiasm of youth with all the hopes of the future and the contribution of the Alumni must necessarily be based upon the practical viewpoint of those engaged in professional and business careers. Yet from all these diverse ideas thrown into the round-table discussions there emerges policies and programs acceptable to all and capable of being transformed into an expres-

sion of service. This is truly a remarkable body.

The Council was organized for the purpose of co-ordinating all the work, functions and activities of the school and Alumni, so that complete cooperation and efficiency could be obtained in the administration of the programs and the setting forth of the policies of the school and its Alumni. Its primary objective was the creation of a practical working body to build the CSM foundation for the adequately endowing of the school.

The general nature of the work of the Alumni Council necessitates that it be held in confidence and for that reason it is only possible to report on its activities from a general stand-

point. It should be sufficient to say that a systematic investigation is being carried out by the Council of all foundations, groups or individuals who are directly or indirectly interested in the mineral industries for the express purpose of interesting them in the needs of the Colorado School of Mines.

The first meeting of the Council was held March 27th, 1936 and for the first year the Council met once in every three months. However, the work of the Council during the first year was found to be of such great value it was decided to hold the Council meetings regularly once every month, except during the summer months, so for the past three years to the present time the Council has been meeting regularly once a month.

It has been stated the startling success of the school during the past three years dates from the time of the inception of the Alumni Council. That is probably stating it too strongly, but there is not any question the Council has been a definite and powerful force in the rapid growth of the school during the past four years. The remarkable success of Mines athletic teams during the past year had its birth in the intelligent planning and well directed program adopted by the Council over three years ago.

When your newly elected President, Mr. E. J. Brook, of Los Angeles, California, visited Denver at homecoming in October 1939 he attended a meeting of the Alumni Council. His comment on this group is worthy of including in this article and I quote from Mr. Brook.

"I know of no single group which created a more favorable impression on my recent visit in Denver at homecoming than did the Alumni Council. Since its formation, various members had written me enthusiastic reports concerning the work of this organization which aroused not only my interest but curiosity as well. It was subsequently my pleasure to attend one of your meetings as a guest. This meeting not only confirmed the reasons for all of the enthusiastic comments which had previously reached me, but was a revelation and a source of inspiration to me as well. Upon less emotional and more objective reflection, the realization of the tremendous potential power for service possessed by this group was almost overwhelming in its portent."

Once every month at the Argonaut Hotel in Denver the representatives of every department of the School and its Alumni meet for the express purpose of building our great mineral engineering school of the future.

THE COLORADO SCHOOL OF MINES FOUNDATION

By

JAMES BOYD, M.Sc., '32,
Assistant Professor of Geology
Colorado School of Mines

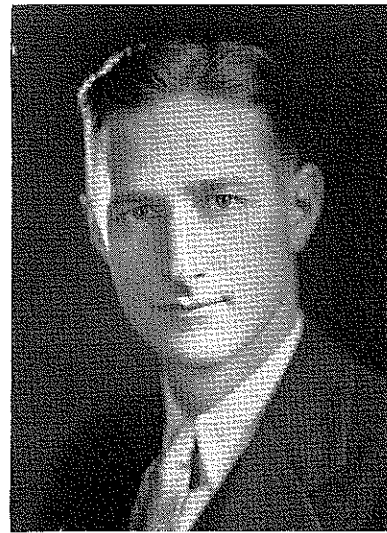
One of the most vital functions of the Alumni Association of the Colorado School of Mines is the promotion and furtherance of its FOUNDATION. Much material has been published in Mines Magazine from time to time regarding the details of its organization. It began to function even before its complete establishment by the Colorado School of Mines Alumni Association May 17th, 1928.

It was incorporated under the laws of the State of Colorado which are particularly liberal for Foundations which provide for educational or charitable functions. Such Foundations are free from taxation under the laws of Colorado. The Alumni Ways and Means Committee who were entrusted with the organization of the Foundation were extremely fortunate to be able to profit by the experiences and advice of those associated with the work of many similar organizations.

All of those who have studied the incorporation and organization of the C. S. M. Foundation are impressed with its unique and practical plan. Its constitution provides that the Board of Directors shall consist of the President of the School, two directors elected by the Board of Trustees and two elected by the Alumni Association. This Board is separate and distinct from the School of Mines but thoroughly familiar with the needs of the School and how best to administer any funds provided to relieve those needs.

The invested capital is handled by a trustee (a bank or trust company) thoroughly versed in financial matters and best qualified to conserve the principal and secure the largest earnings consistent with safety of the money intrusted to it. Through the FOUNDATION, funds may be provided to help students obtain an education at the School of Mines, to endow and maintain professorships, to provide much needed buildings and to insure their maintenance and operation, and for other purposes which the donor may specify.

Here is how it works—Suppose that John Jones decides to establish a fund of \$25,000 to help students obtain an education at the School of Mines. The money and securities donated for the purpose are turned over to a Trustee selected by the Board of Directors of the Foundation. In the selection of this Trustee



JAMES BOYD

Mr. Jones will of course be consulted and his desires respected. As soon as definite earnings are established by this gift, the Board of Directors will announce that funds are now available for the John Jones Scholarships and will set out how students may qualify for such scholarships.

This will all be done according to a plan formulated by Mr. Jones at the time of making his gift and approved by the Board of Directors at the time of accepting the gift. Under such a plan Mr. Jones will go on educating young men for the mineral professions and in this way build a monument to his high ideals which will continue to function long after he has passed out of the picture.

Likewise funds can be administered by the Foundation, for research, for fellowships, for professorships and prizes for unusual attainments. Wealthy people like to donate buildings to prominent colleges because such buildings are perpetual and visible monuments to their memory.

With a new building must be pro-

vided funds for equipment, maintenance and the added faculty personnel needed for the expansion that such a new building entails. Hence it is just as important to provide more funds for the expansion of the faculty to enable it to continue the high standards of education which have given "Mines" the rank of leadership that it has always held in its particular field.

To establish fellowships whereby competent men may do advanced work in cooperation with the research department of the School, on pertinent problems now confronting the mineral industries, there is always an opportunity to use funds to great advantage when provided.

Of course buildings are always needed and the Colorado School of Mines is now in desperate need of a Hall of Chemistry, a Petroleum Building, a Library and Auditorium and several other structures made necessary by the crowded condition of the School.

However buildings do not make a college great, they are only the tools needed to help reach an ideal. It is the knowledge and teaching ability of the faculty that gives the college its status in the educational world. State supported institutions are usually rather lax in recognizing unusual ability in its faculties directly responsible for the reputations of its schools. Salaries are usually fixed at an average level, so in a college like the School of Mines where genius developed in the faculty is in demand by industry it is important to establish endowed chairs which pay a higher salary than ordinary. Such salaries give the professor added means to pursue his learning and at the same time encourages other members of the faculty to strive for greater attainment and success. It provides the extra incentive so necessary to highest accomplishment.

What could be a greater honor than to have one of the principal chairs at the School of Mines named for one's self? Let it be the John Jones Chair of Mining Engineering or the Henry Abbott Chair of Metallurgical Engineering or the Charles Smith Chair of Petroleum Engineering or any one of several others. The Colorado

(Continued on page 223)

A HELPING HAND TO THE WORTHY "MINES" STUDENTS

By

JAMES W. DUDGEON, '13
Chairman, Athletic Committee

Mines Alumni have continually in mind, ways and means for the betterment of the student body at Mines to the end that the mineral industries will be furnished with young men who are better equipped mentally and physically to cope with the severe conditions which these industries impose upon them.

The Alumni have given much thought and study to the conditions facing these young men and to the qualities that they should have to insure greater success when they are thrown on their own resources. These older men have found through their many years of experience in combating the problems presented to the Engineer of the Mineral Industries, that two characteristics are extremely essential—"horse sense and guts". It has been found that these qualities are usually more highly developed in the young lad who has had to combat many difficulties and hardships and assume responsibilities from his boyhood days. The boy with the combination of a mental and a physical development is the best equipped to combat in after life the severe conditions imposed by the mineral industries. These young men have not all been blessed with the necessary income that is required to enable them to attend Mines and continue both mental and physical development.

About four years ago a group of Mines Alumni working under the sponsorship of the Alumni Athletic Committee launched a plan designed to assist worthy young students in a financial way and in this manner to assist them in completing their engi-



JAMES W. DUDGEON

neering courses and become graduates of the greatest Mining School in the world.

The plan evolved was that of creating a fund to be known as the "Alumni Loan Fund". This fund was to be raised thru voluntary subscriptions made by all Mines Alumni and loyal supporters of Mines.

The plan for the "Alumni Loan Fund" was discussed at length with all interested persons, officers of the Alumni Association, and with the faculty and students at Golden. It was conceded by all to be a step forward in the enhancing of the friendly and cooperative spirit existing between the Alumni, School of Mines administrative heads, faculty and student body at Golden. It was enthusiastically received by all Mines men and alumni. They at once discerned the benefits which would accrue to the Colorado School of Mines and Mines

graduates through the raising of the standing and morale of the student body at Mines and consequently that of the Mines graduate. When it was deemed certain that the plan for the loan fund was sound, a letter soliciting voluntary contributions was prepared and mailed to every alumnus and ex-Mines man on the association mailing list. The results of the initial drive were most gratifying.

During the second year of operation of the fund the results were even better and thruout last year the Alumni Loan Fund proved its worth beyond all shadow of doubt.

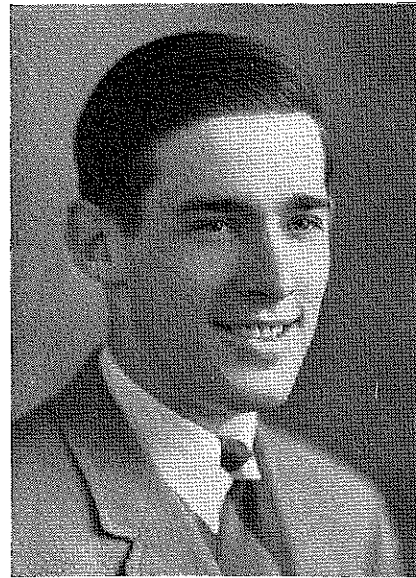
During the year 1939 loans to students in amounts ranging from \$25.00 to \$150.00 enabled fourteen men to remain in school and complete their academic work, which they could not have done without this assistance.

It will not be amiss to explain the method by which a worthy student may obtain a loan from the fund. If he is an entering student his entrance requirements must meet the academic standards prescribed by the school. An investigation relative to his need for financial assistance is then conducted. If in need of assistance, he must then be recommended by the C. S. M. Athletic Director as a suitable person to receive a loan. His application for a loan is then presented to the Executive Committee of the Alumni Association for approval. If approved by this committee the loan is made. As security for the loan a promissory note embodying the terms for repayment of the loan must be properly executed by the applicant at the time he obtains the loan.

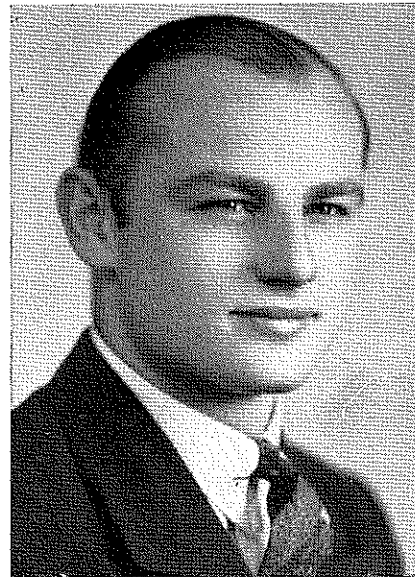
The Alumni Loan Fund has been in operation about two and one-half years. Only two recipients of loans have graduated during this period. The plan is still in its infancy and experience figures to determine the rate at which the fund will be made self-perpetuating thru repayment of loans are not available. We are, however, confident that the loan fund will gradually become self-perpetuating. In the meantime, however, it is going to be necessary to solicit additional funds with which to carry on the good work.

We of the alumni association desire to express our appreciation and gratitude to the many contributors, who by their contributions have enabled us to carry on the program of extending financial assistance to those in need of such help, who are now obtaining an Engineering degree at the Colorado School of Mines. Everyone must continue to do his part toward perpetuating the Alumni Loan Fund and thus enable us to continue a task so well begun.

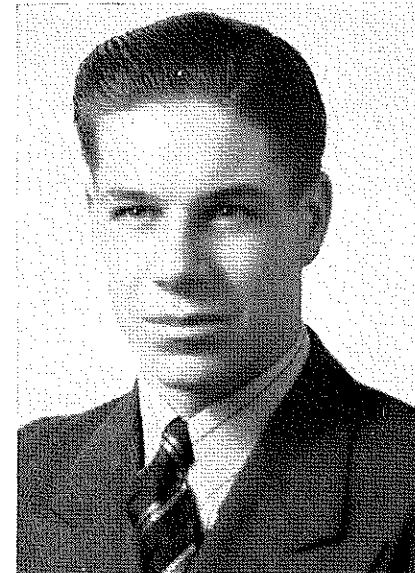
ENGINEERS IN OUR SCHOLAR



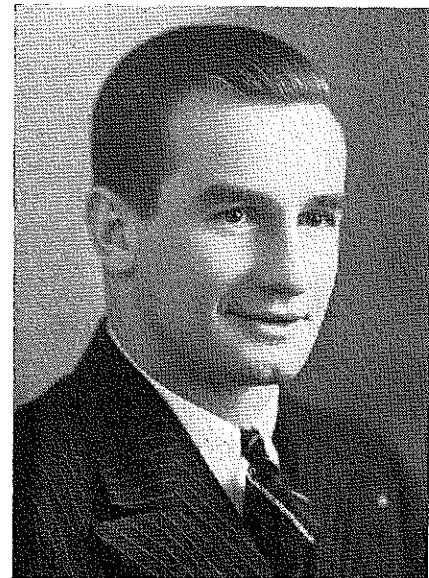
HARRY W. HALLMAN



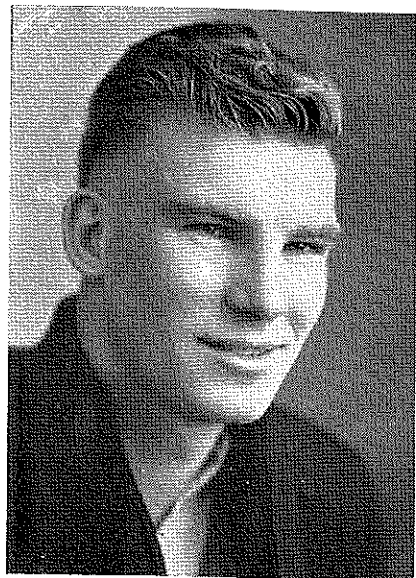
NICK SHIFTAR



HAROLD ROGERS



ART WOODS



ROBERT C. PRUESS

HARRY W. HALLMAN, of Norristown, Pennsylvania, is the pride and joy of Coach Esslinger, freshman Coach. He joined the ranks of the varsity squad for the first time during this spring practice that is the topic of sports talk around the School of Mines. John Mason agrees that he is good so fans will probably get used to hearing about Harry Hallman next year. He has been practicing with the backfield, showing that he can handle a ball in excellent fashion.

◇ M ◇

ART WOODS, of Western Springs, Illinois, is a natural born entertainer. His humor is the spark of the football team. At wingback position, Art shows a lot of fire. He gained some good experience this year and expects to be his best this coming season. He is a junior student of mining engineering.

◇ M ◇

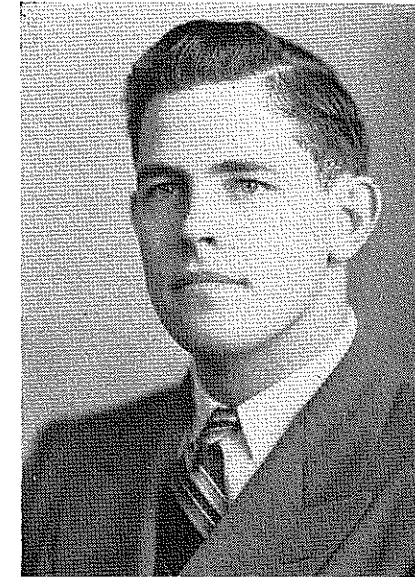
ROBERT C. PRUESS, of Grants Pass, Oregon, is a junior student of mining engineering. He played tackle on the Mines football team. Next season will be the last one for Pruess and a lot of action is expected from him.

NICK SHIFTAR, of La Crosse, Wisconsin, is a senior student of geology. He played guard for the Miners and did it very capably. Nick's spirit and enthusiasm will be sadly missed this next season and his position will be a hard one to fill. There is no better example of what sportsmanship means at Mines than Nick Shiftar.

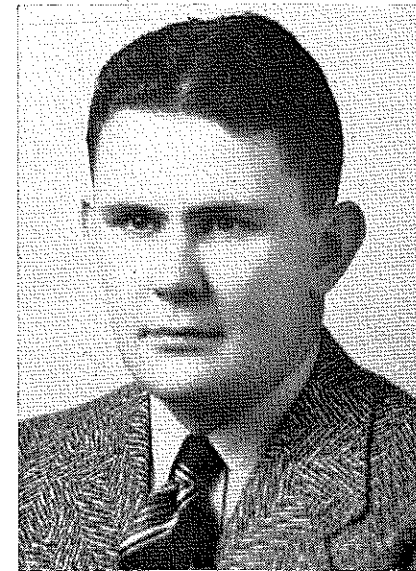
◇ M ◇

HAROLD ROGERS, of Jonesboro, Arkansas, is a sophomore student of petroleum production at the Colorado School of Mines. He plays at wingback position on the football team. As a pass receiver, Rogers is spectacular; often catching them in one hand or with the tips of his fingers. This year he hopes to replace Madden on the team. Rogers made as enviable a record in basketball as he did football. He finished the season by being named all-conference. At football, basketball, track, and any other competitive sport Rogers is an all-around man. He can be counted on to make a good showing for the Miners during the rest of his time here.

THE MAKING SHIP MEN



RICHARD MOE

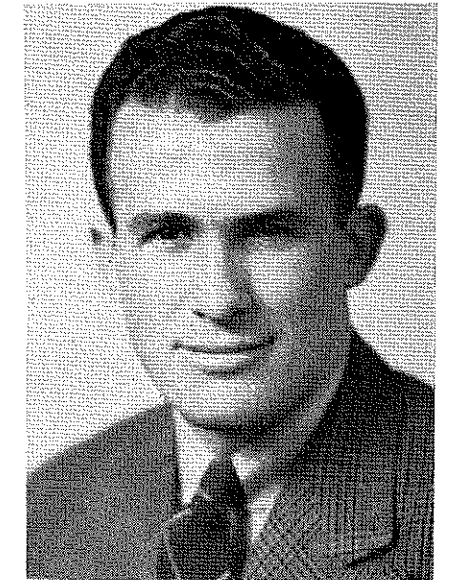


ROBERT H. SHANLEY

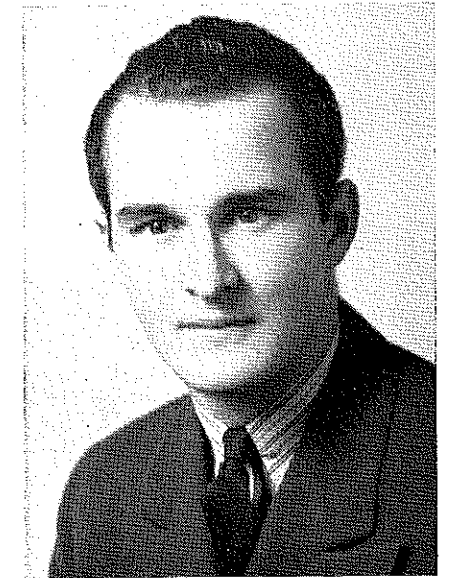
RICHARD MOE, another Los Angeles man, is a big and powerful member of the Mines football team. As a tackle there is none better; always on the job getting his man. If John Mason were asked what he needed most to make him completely happy, he would probably say, more tackles like Moe. Richard is a sophomore student of mining geology. Among his other accomplishments, he can handle a piano in a very musical fashion.

◇ M ◇

ROBERT H. SHANLEY is a sophomore student from Long Beach, California. His father, John R. Shanley, Jr., '15, is president of the Shanley Oil and Gas Company in Long Beach. Robert has gained weight since the 1939 season and Coach Mason expects him to make a good showing in the backfield of the 1940 football team.



LOUIS DE GOES



CLAY L. CREAGER

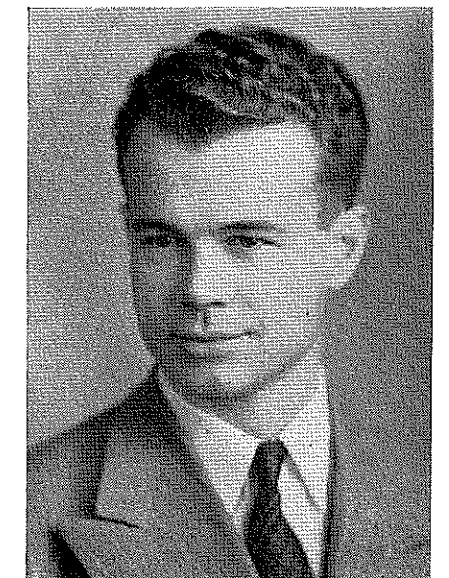
LOUIS DE GOES, of Los Angeles, California, is a junior student of geology at the Colorado School of Mines. He played end on the 1939 championship football team. His perfect blocking was responsible for many of the scores the Miners made. Louis is also an ace basketball player. He suffered an injury, however, early in the season and was forced to drop basketball until next year.

◇ M ◇

CLAY L. CREAGER hails from Cincinnati, Ohio. He is a junior student of petroleum production at the Colorado School of Mines. Clay plays at end on the football team, and expects the 1940 season to be his outstanding year. He is also a member of the basketball squad. He belongs to the Alpha Tau Omega fraternity and has been prominent in many campus activities of the school.

◇ M ◇

HARRY D. CAMPBELL hails from Pasadena J. C. Several injuries and an illness kept Campbell from proving his full worth. He played at tailback position and displayed a fine bit of passing. The Campbell and Rogers combination were favorites with the fans. A lot is expected from this team in the 1940 season. Campbell is a sophomore student of petroleum engineering, and is maintaining a high scholastic standing.



HARRY D. CAMPBELL

PHYSICAL TRAINING AND THE ENGINEER

By
JOHN H. MASON, Director
Physical Education and Athletics

At the foot of Lookout Mountain lies a school that for years has trained the best engineers in their profession. It is the desire of the Colorado School of Mines not only to train men mentally for the profession, but to give them the physical and social training necessary to successful living.

The department of physical education has a great interest in all of this training. The department feels that it has the responsibility of encouraging physical and social activities on a par with the mental training.

The program of required physical education, intra-mural games and competitive athletics not only aids in the development of the body and the social graces but also improves the intellect; the latter, of course, all important not only in the education of the engineer but of all students in general. The opportunity afforded young men to express themselves in different physical activities such as inter-collegiate competition, is bound to be an impetus for other students toward activities such as intra-murals or selected activities provided in the gymnasium, field house or playing fields.

Today, the Colorado School of Mines has an athletic plant that is fast developing into a splendid unit. With the new field house, opportunity is given for such activities as, track, baseball, wrestling and minor sports such as badminton, volleyball and similar activities. During inclement weather this past spring a number of these sports were carried on at the same time with very little confusion and in no way did any sport interfere with the other. This is bound to increase interest in physical fitness throughout the school.

With the enlargement of Brooks Field to the west, it has been possible to construct one of the best tracks in the country. The last load of cinders for the track has been spread and with the mixing of clay for binding purposes, the school is ready to be the host for the Conference Track and Field Meet on May 24th and 25th. Incidentally, this is the first time in the history of the school that this has been possible.

Four concrete tennis courts have just been completed. These lie southwest of the field house and when landscaped the natural rock which has been used for rip-rapping on the south and west sides, will be one of the beauty spots of the campus. This will add another opportunity for students to take part in some activity that they enjoy doing. When a student is able to exercise for his own enjoyment, he gains double the benefit from physical exercise.

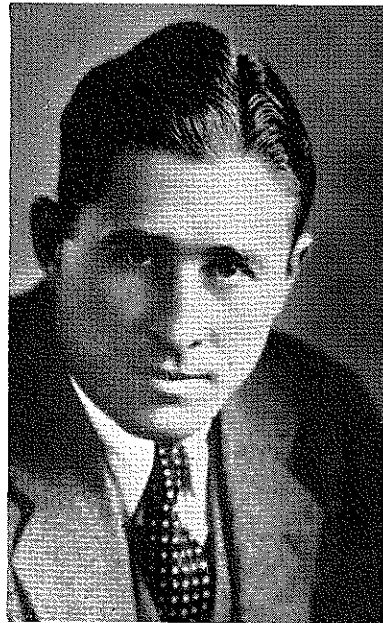
The baseball field has been constantly improved until at the present

time it is in the best condition since its construction. Plans have been formulated to sod the thirty acre tract and to rip-rap the south and west sides with natural rock constructed into seats. This field will be available not only for baseball, but also for intra-mural softball and touch-football and a much needed practice space for varsity and freshman football.

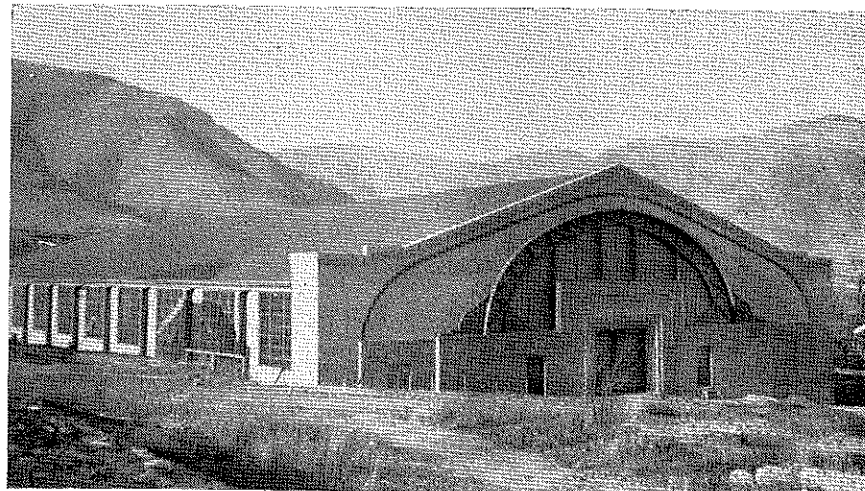
It takes time and patience for the completion of such splendid facilities, but with the cooperation of all concerned it will not be long until the school can have one of the best athletic plants in the country.

At the present time the School of Mines is represented on the athletic field with teams of football, baseball, basketball, track, wrestling, swimming, golf, tennis, ice hockey, fencing and soccer. There is not another school in the region that gives its students the opportunity to participate in such a large variety of sports. The intra-mural program includes such activities as touchfootball, basketball, volleyball, wrestling, boxing, swimming, tennis, track, softball, horse shoes and any other sport that the student body wishes to introduce.

These activities provide an opportunity for men of all dispositions and temperament to meet and find physical activity which is so necessary for the development of the intellect and body. Of what good is mankind without both? This department will continue to improve the methods in its phase of training of the Engineer—and CHAMPIONS!



JOHN H. MASON



▼ New Field House.

"MINES" EMPLOYMENT SERVICE

By
ALLAN E. CRAIG, '14
Chairman, Capability Exchange

Wanted! MEN FOR JOBS

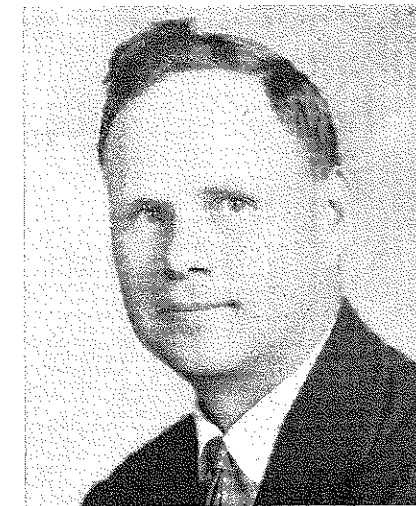
Wanted! JOBS FOR MEN

It is the function of that branch of the Alumni Association known as the Capability Exchange to correlate these two items and to bring suitable men in contact with suitable positions. The services, therefore, are two-fold in that the interest of the employer is served as well as the interest of the alumni member. In this work of correlation, however, we are very often seriously handicapped in that we do not have complete up-to-date experience records of all the School of Mines graduates. At all times we have certain small lists of men who are unemployed, most of whom are in more or less desperate need of quick service. This class is apt to take on greater importance than it truly merits for the reason that if the Exchange were functioning at a high efficiency, it should be possible to place a good man in a better position even though he might be at the time employed. By improving the situation of this one man a place would be open for a second man who might also be supplied from our ranks if we had a more detailed knowledge of the ability and qualifications of our members.

In work of this kind we must necessarily rely on the honesty and sincerity of the applicant on the one hand, and on the judgment and integrity of the employer on the other hand. In order to secure greatest satisfaction for all concerned, there is nevertheless a certain amount of responsibility which falls on the Capability Exchange on account of the fact that our recommendations are given careful consideration and are rated as being authentic. To meet this responsibility, we attempt to interview each applicant either by mail or by personal contact and, in this way to learn as much as possible of his character and ability. Complete office records are indispensable for this purpose.

On the other hand, we have a certain responsibility to the applicant and we must know something of the character of the employer in order to safeguard the interests of our members.

We have calls for men in foreign countries as well as at home. Here is a young graduate in Nicaragua bitterly complaining that conditions are not as he had expected. He wants to change. This particular man wasn't



ALLAN E. CRAIG

placed through our efforts, but perhaps if we had been consulted we might have found out enough of conditions to discourage him from taking the job. At our suggestion another man has made application for a job which proved to be merely a request for a young graduate to work at practically no wages in making examinations and reports apparently for purely promotional objects.

We have real legitimate inquiries for assayers, surveyors, miners, superintendents, and occasionally managers. It seems to be only occasionally that we are able to match the right men with the right jobs.

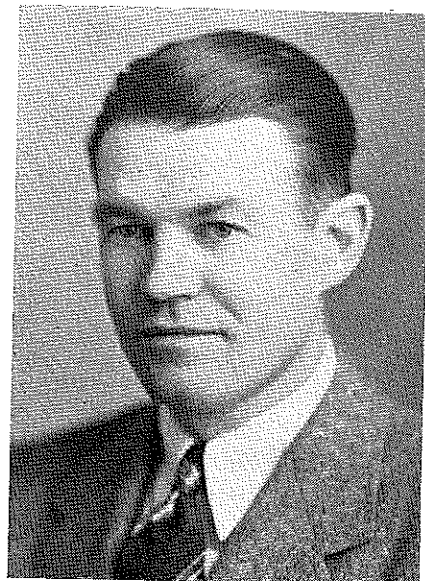
There seems to be a growing demand for executives and engineers in industrial fields not necessarily directly connected with mine interests, for which our men with their broad fundamental training are well fitted. Openings are sometimes available with manufacturing concerns in either production or sales departments, which should eventually lead to executive positions with broader responsibilities.

It is the ambition of the Capability Exchange to broaden its activities in such a way that all of these outlets for our members can be drawn upon as the need may arise. We emphasize again, then, the importance of keeping complete experience records on file at the Alumni office.

The activity of the Capability Exchange centers around the office in Denver. However, committee members are placed at distant points from Denver for the purpose of supplying information to members in their districts, and also for the purpose of securing data on available positions for transmission to the Denver office. In addition to active committee members, we are counting on every man who is gainfully employed to keep a sharp lookout and to keep us informed as to opportunities in his own vicinity which may interest some of his fellow members. More can be accomplished by personal contact than by form letters or circulars, or even an article in the Mines Magazine. It is impossible for the committee members themselves to reach all possible sources, and we urge you therefore to bear this work in mind individually and to give us the benefit of your thoughts and efforts to build up the service of the Capability Exchange. This appeal is made to all members separately, and to the various local sections collectively.

TRAINING AT "MINES" ESSENTIAL IN SALES

By
CEDRIC E. McWHORTER, '24
District Manager, Goodman Mfg. Co.
Denver, Colo.



CEDRIC E. McWHORTER

A glance thru the Alumni Directory will give indication of the surprisingly large number of "Mines Men" that have followed the business of supplying to the mineral industries the tools with which they work. In speaking of tools I mean to include equipment and supplies such as hoists, rock drills, compressors, locomotives, tramways, shoveling machines, conveyors, powder and dynamite, chemicals, and just a host of other items up to complete mining, milling, preparation plants, smelters and even manufacturing plants. Mechanization of the mineral industries has become an important part of it and surely the most potent means of reducing production costs.

The technical education received at the Colorado School of Mines is such that a great number of engineers has either chosen this mechanization profession or have been drawn into it by the very nature of their training. Far-thinking manufacturers interview the graduating class at *Mines* each year for the purpose of picking out a number of prospective technicians and sales engineers. These interviews are invariably done by personal contact, not by letter, reflecting the care and prudence exercised by these industries in selecting men who are particularly well suited for their specialty. Many manufacturers have made the remark: "I don't know what it is but there is a certain intangible something found in the man from 'Mines' that has proven to be very essential, a quality not found in men from other colleges".

It is an established fact that men from *Mines* are more generously scattered thru the mining equipment industry than men from any other one institution and I believe I know why. First of all, a man who enrolls at *Mines* almost invariably reaches this decision only after a lot of hard, straight thinking, with a full realization of the energy and personal discipline required to complete his 4 hard years of study. He is, therefore, already a man of purpose and equipped to make a logical decision. Success in any business demands a good generous portion of purpose and logic, better known as clear judgment, "horse sense" or what have you. I have heard it said by my people, as well as by other manufacturers, that a cross section thru the graduating class at *Mines* invariably shows a clean cut, energetic man who knows what he wants to do

with his life and why. We, as well as others, believe that they are above the average in these necessary requisites.

The well worn term, "Machinery Salesman" or "Drummer" is most surely a misnomer. A successful mining executive cannot be "sold" anything. He will "buy" it if it will make money for his company but he is too shrewd to be talked into anything that he does not need. High pressure selling simply won't do. We manufacturers call our field men, "Sales Engineers" and we know that our best men are those who are actually considered "consultants by their clients. We train them intensively in the application of whatever it is that we build as well as "what makes it tick." It isn't so important to know how a set of gears and a motor are assembled in a machine, but it is vitally important to know what kind of a job this machine will do when applied to a particular problem. This is why we want and use mining engineers. They know after a little experience how to analyze a mining man's problem as related to their own particular product.

Little need be said about the actual technical training received at *Mines*. We all know it is excellent and full of good sound fundamentals. Of more importance is that when we manufacturers get these new men we find them already capable of applying these fundamentals to our specialized problems. The old saying, "Make a start, the rest is easy" applies here. It is important that the "Mines Man" has secured the fundamentals of engineering and knows how to apply them—the important start.

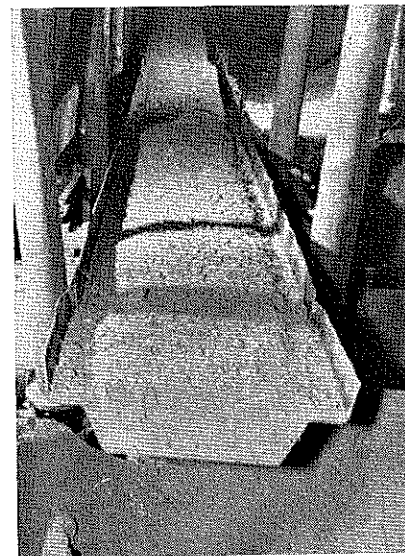
I like to think that these sales engineers and technicians are performing a real service to the mineral industries and I feel that they are. While they do not actually produce the minerals, they keep pace with the needs of the industry for more efficient methods and are constantly developing and introducing better and safer tools. They have hundreds of thousands of dollars in annual research expenditures back of them and they are intelligently applying the results of this research to the many problems of production. Because of his start the "Mines Man" fits into the setting which the manufacturer has prepared at great expense and effort. The two, through combined efforts, produce a service to the mineral industries which has resulted in the rapid progress in civilization today. Thus "Mines Men" in sales and distribution supply the "tools" so necessary for industrial progress.

MINES MEN IN Manufacturing

Shaker Conveyors for Metal Mines

The Goodman Manufacturing Company, 4834 South Halsted Street, Chicago, after nine years of intensive development and improvement of this system of mechanized loading, has a line of shaker drives which is being used very successfully in both iron ore and copper mines.

The shaker conveyor may be used solely as a medium of transportation in mines which use a scraper loader for digging and loading, or, as is the case in coal mines, it may become a digging, loading and transporting medium combined by



▼ Goodman Shaking Conveyor.

the addition of a duckbill. The duckbill is a self-loading head which is made only by Goodman Manufacturing Company but is suitable for use with any make of shaker conveyor.

IN ORE MINES . . . The scraper loader has proved to be a reliable digging unit, but, under conditions where soft bottoms or long distance are involved it is much more effective and profitable to load with scrapers and discharge onto a shaker conveyor, for two reasons: (1) As the scraper drags for only short distances, its productivity is increased; (2) The shaker conveyor, having been designed especially for the carrying of heavy loads, transports the ore continuously as fast as it is loaded.

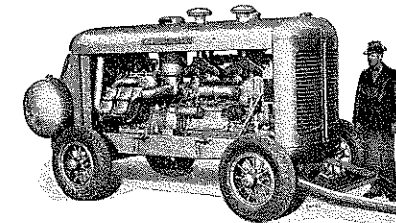
The narrow width of the troughing permits very close timbering. The shaker trough line may be easily and quickly moved to a new location, ground movements. The capacity of a shaker conveyor is far in excess of most haulage systems or systems in which the scraper does both the digging and the hauling.

Goodman engineers who specialize in this type of equipment are available to make a survey of your requirements and offer their recommendations without any obligation on your part.

"Mines Men" associated with Goodman Manufacturing Company in the manufacture and distribution of equipment for the mineral industries are Cedric E. McWhorter, '24; Morris F. Cunningham, '24; Orville O. Shott, '37.

New Portable Compressor

A new portable compressor delivering 500 cu. ft. per minute (actual) at 100 lbs. pressure has just been announced by Ingersoll-Rand Company. Known as the K-500, this machine is now the largest in their line of two-stage, air-cooled units, and weighs only 10,600 lbs.



▼ Ingersoll-Rand K-500 Portable Compressor powered with a gasoline engine.

Features of this new portable compressor include: choice of either an oil engine or a new-type 6 cylinder gasoline engine which does not require high-grade motor gasoline, replaceable cylinder liners for engines, and a patented automatic fuel saver which changes the engine speed according to the use of compressed air.

The manufacturer offers this new unit with either wheel- or skid-mounting.

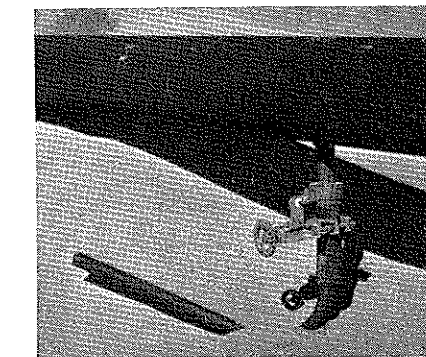
More detailed information, including charts showing the savings made possible by this new portable compressor with automatic fuel saver, is contained in Form 2641. Copies are available from Ingersoll-Rand Company, 11 Broadway, New York City, or any of their branch offices.

Ingersoll-Rand is proud of the list of "Mines Men" shown below who are with them in manufacture and sales of their many products used in the mineral industries:

H. M. Fiske, '21; W. M. Gebo, '23; T. E. Giggey, '34; P. Hiatt, Ex-'11; F. W. Horn, '36; H. D. Hoskins, '37; K. P. Hurley, '22; W. G. Lofgren, '28; M. L. McCormack, '26; R. L. Olund, '37; B. Rossette, '15; F. H. Storms, '24; R. W. Wells, '29; P. Gillespie, '29; J. H. Leary, '38; G. B. Whitaker, '38; W. H. Sparr, Jr., '39; W. C. Rogers, '38; N. Ham, Ex-'23; R. Crawford, '23.

Tails Distribution

The Mine and Smelter Supply Company announces a new type of valve for the distribution of tailings.



After many years of practical experience in the construction of large tailing ponds Mr. G. G. Grigsby, '14, through

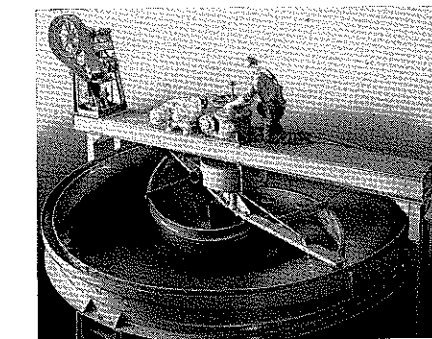
the means of the Grigsby Spigots, has developed a system by which most of the back-breaking, shoveling-up and disagreeable wetting of the operator is eliminated. Materials are placed exactly where required. Retaining dams constructed even in freezing weather at minimum expense and with good control at all times.

Essentially the method consists of placing the coarser tailings (usually table sands) on the back of the dam with the flotation slimes forming a graded "pad" with the coarser materials on the face of the dam. This is easily accomplished with two pipe lines, where the table sands are placed by the outer line and the flotation slimes by the inner. A single line may be used by proper alternate pumping and use of the Grigsby Spigots and Gooseneck for placing the materials where wanted.

Manifolding of pumps and distribution of flow to the various lines are controlled effectively with Grigsby Rubber-lined Pinch Valves.

Denver Hydro-Classifer

Fine sizing and desliming problems, in both cyanide and flotation, will find their solution in the Denver Spiral Rake Hydro-Classifer. This is an ideal unit for further treatment of the overflow from other types of classifiers especially the rake type, or in closed circuit with a re-grind mill treating jig or flotation concentrates where it is essential to reduce the material to sizes —200 mesh to 10 microns.



▼ Denver Equipment Company, 1400 Seventeenth Street, Denver, Colorado, announces their Hydro-Classifier.

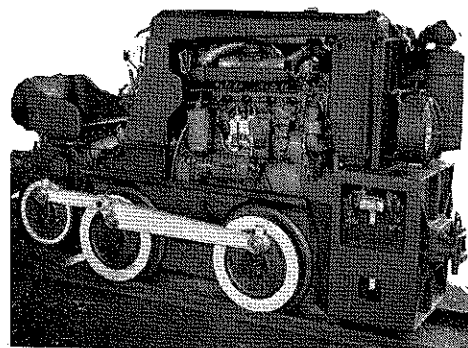
When the Hydro-Classifier is used for desliming purposes, all particles below any predetermined size are removed with efficiency. This flexible unit is built in sizes from 8' in diameter of 25 tons per day capacity to 30' in diameter of 750 tons per day capacity. Even larger sizes will be engineered for higher tonnage plants.

As shown in the illustration, this Hydro-Classifier utilizes spiral rakes and the Denver Integral-Lift Worm Gear Reducer. The Denver Adjustable Stroke Diaphragm Pump permits positive control of the underflow. This complete unit is the answer to many problems.

Colorado School of Mines Men in Deco Organization: A. C. Daman, '15; F. E. Briber, '16; Fred A. Brinker, '21; H. W. Kaanta, '15; E. J. Garbella, '30; Glenn Horlbeck, '36; Thos. G. Smith, '99; Wm. H. Evans, '38; Douglas Newton, '43.

Diesel Mine Locomotive

Diesel Locomotives for underground work have been used in Europe for a number of years, but it remained for The Ruth Company of Denver, Colorado to build and introduce them into this country. Their first installation was in the Philippines where they have proven to be a great success.



In design of the locomotive for underground service it was necessary to completely divorce it from the common source of trouble found in the industrial locomotive. Chain drives were eliminated and side rods used which make it possible to put uniform torque through all four wheels without chatter. The wheels are amply sprung, enabling them to follow rough and crooked mine track. The best of alloys are used in all parts. Timken bearings are used for journals and other principal bearings. To get maximum adhesion from every pound of weight, steel tires are shrunk on cast iron centers. Automotive type brakes are used. These are only a few of the important features which have contributed to the successful operation of the Ruth Locomotive.

Besides the Diesel Mine Locomotive, The Ruth Company manufactures Ruth Rod Mills, Ruth Flotation Machines and Ruth Laboratory Machines. Full details and specifications will be furnished on any of this equipment. Joseph P. Ruth, Ex-'21 is President of The Ruth Company.

Led-Plate Thread and Gasket Paste

This product, made by the Armite Laboratories of Los Angeles, (H. C. Armington, '07) as the name implies, is a pipe thread dope containing metallic lead. It is made in two grades, the No. 250 to hold water, steam, alkalis and acids and the No. 251 to hold oils, gases and hydrocarbons.

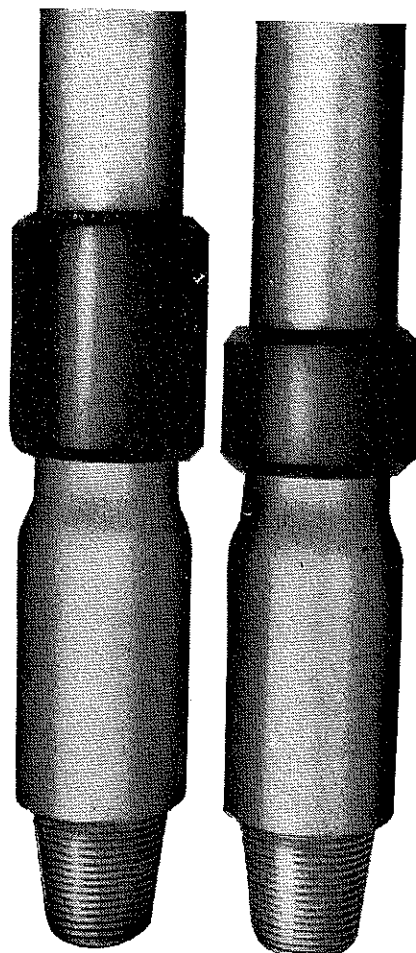
The use of Led-Plate provides a Compound that has "body" to fill the tiny voids and in extreme temperatures will not volatilize, carbonize or alloy with the contacting surfaces. It is unaffected by gases or liquids in the line. It will not disappear as do aluminum zinc and antimony; nor carbonize and "char" like organic Compounds.

Led-Plate is excellent for all tight fits, for gaskets, threads and machine press fits. It is a natural lubricant even after the vehicle has been driven off.

Led-Plate remains in suspension in the container and is always uniform. It will not deteriorate with age or use and is unaffected by extremes of heat or cold. It prevents galling and destructive seizure and is easily applied and can be spread on thin or thick. It is most economical.

Patterson-Ballagh Casing Protector

The principal item of manufacture of the Patterson-Ballagh Corporation of Los Angeles, California, is the rubber casing protector marketed under the name of the "Patterson-Ballagh Casing Protector." This protector was introduced to the oil well drilling industry 13 years ago by Patterson-Ballagh, and has now become a standard item of use in almost all rotary wells in the world, that are being drilled to any depth, over 4000 feet. It is offered in some one hundred different sizes, to fit all sizes of drill pipe and all diameters and weights of casing. The function of the casing protector is to furnish a wearing ring on the drill pipe to take the wear against the inside of the casing, and stop the tool joints from contacting the inside walls of the well. They are made in larger and longer sizes, to stabilize the drill pipe, and prevent whip, and increase drilling speed.



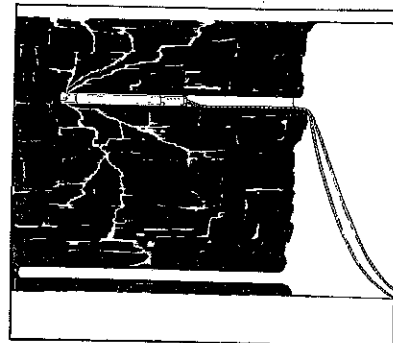
Patterson-Ballagh Casing Protectors are made in the rubber factory of the corporation, where the complete cycle of manufacture takes place, from the crude rubber imported directly for that purpose to the finished article. They also manufacture the other items that comprise their line, being the Wire Line Guide, the Swivel Bumper, the Pipe Wiper, the Mud Gun, the Wire Line Wiper, and the Sucker Rod Wiper. In the field of plastics they manufacture a Tubing Protector, and a Sucker Rod Protector.

A Branch is maintained in Houston, and an office is maintained in New York. Branch stocks and service men are stationed in the principal oil drilling centers of the country, in Canada, and in South America. D. G. Miller, '09, is President; J. C. Ballagh, '10, is Secretary-Treasurer; H. C. Armington, '07, is Chief Engineer.

The Non-Explosive Mining Method

CARDOX is a non-explosive method of dislodging coal at the working face, which employs the gentle heaving action of expanding carbon dioxide to bring down the coal. It operates without smoke, flame, or noxious fumes. CARDOX has been approved as permissible for use under gassy and dusty conditions by the U. S. Bureau of Mines.

The CARDOX cartridge consists of a hollow tube forged of chrome-molybdenum



▼ Cardox Method of Dislodging Coal.

steel, capable of withstanding internal pressures up to 40,000 pounds per square inch. Into one end of the cartridge is threaded the charging cap, and into the other end is threaded the discharge cap. After a heater has been inserted, liquid carbon dioxide is pumped through a valve in the charging cap. There are two electric terminals in this cap for connecting the shot firing cables to an electric squib in the heater.

The discharge cap is equipped with angle ports through which the expanding carbon dioxide is released at discharge. These ports are so constructed that they hold the cartridge to the back of the drill hole. A soft steel shearing disc seals the carbon dioxide in the cartridge until the predetermined discharge pressure is reached.

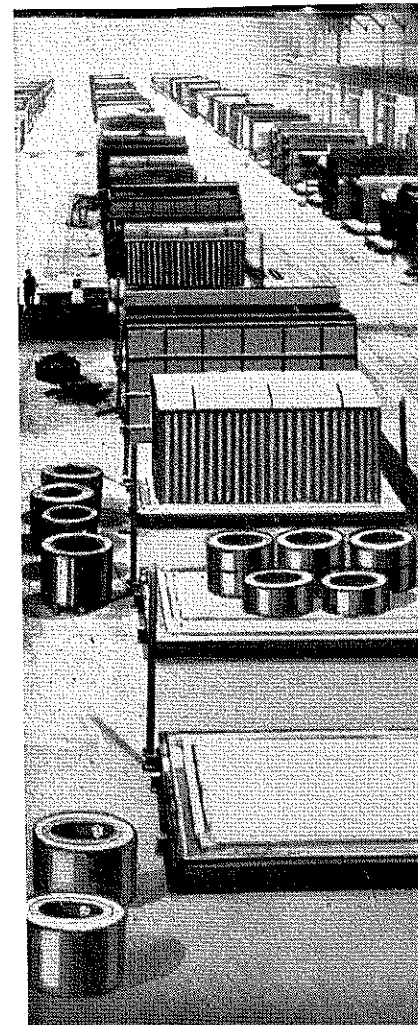
When current is applied to the terminals in the charging cap, the electric squib sets off the chemicals in the heater, and sufficient heat is generated to instantly gasify the carbon dioxide, increasing the pressure within the cartridge. As the gases in the cartridge reach the predetermined discharge pressure, the shearing disc gives way, and the gas is released through the ports.

After the CARDOX cartridge has been discharged, it is returned to the charging plant and used over and over again. There are over 150 mines throughout the United States, Canada and England using this method of dislodging coal. John H. Bell, '30, is Vice President of Cardox Corporation, 307 North Michigan Avenue, Chicago, Ill.

Radiant Tube Annealing Covers

The Lee Wilson Sales Corporation, Cleveland, Ohio, manufactures portable annealing covers that may be placed over cut length sheets or coiled sheets after they have been reduced by hot or cold rolling in charges of from 60 to 100 tons. The unique part of this equipment is the use of radiant tubes for firing gas and thus giving a furnace equipment which has advantages of electric furnaces, plus the advantage of using gas, which, under prevailing rates may cut the cost per ton for material heat treated about 1/2.

These radiant tubes burn gas in such a manner that combustion continues throughout the length of the tube with an even temperature along the tube. A spark plug



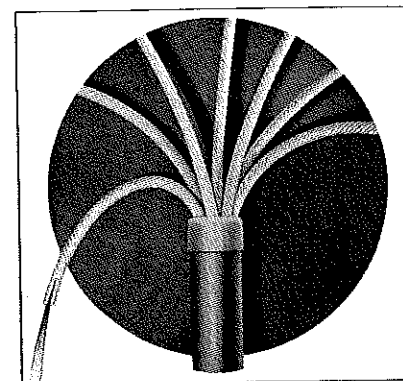
igniter located at the exhaust end of the tube adds to the ease with which the furnace may be lighted up after a shutdown.

New equipment manufactured by this corporation is an electrostatic precipitator for the cleaning of fuel gas.

Employed by this company is Mr. C. H. Carpenter, '09, Chief Engineer. Mr. Carpenter has spent some eight years in mining and metallurgy, eighteen years with the Westinghouse Electric and Mfg. Co., starting with the alloys and scrap house reclaiming, followed by several years in the research laboratory and general engineering department.

Master Safety Fuse Lighter

The National Fuse & Powder Company, Denver, Colo. announces the "Master Fuse Lighter" for lighting six fuses with one master fuse. The lighter consists of



the paper portion of a twelve gauge shot gun shell, the inner surface of the wad being coated with a powder mixture and the open end being provided with an elastic rubber cap. Fuses from the round are cut square when trimmed and forced thru the rubber cap which holds them firmly against the bottom. A master fuse for lighting is placed in the shell in the same manner.

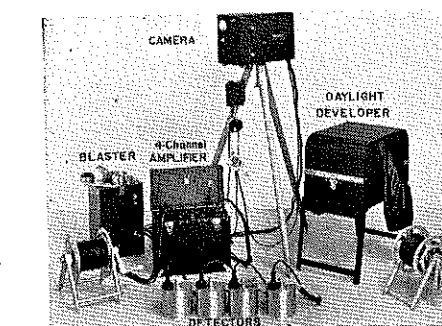
This lighter is most advantageously used in places from which it is difficult to retreat, such as raises, stopes and workings reached by ladders. Where there is water dripping, Master Lighters protect the ends of the fuses until they are spit.

Short primers may be used with some saving in fuse by using Master Fuse Lighters since the proper period to reach safety is obtained by a master fuse of sufficient length.

The National Fuse & Powder Company employs H. M. Cronin, '13 as Factory Superintendent and R. F. Barney, '35 as Field Representative.

Heiland Research Corporation, Denver, Colorado

Engaged in geophysical research, development and manufacture of geophysical equipment, and geophysical consulting service. Activities have been chiefly along the lines of seismic and electrical prospecting. The company has perfected a new type of oscillograph recorder with electromagnetic damping which combines high sensitivity, high overload capacity, and good photographic reproduction with remarkable field worthiness. Seismic equipments range from truck mounted 12 and 6 element recorders to small and portable 6 and 4 element outfits. A recent development is a portable 4 channel equipment for foundation, highway, etc., exploration which requires no storage batteries and is daylight operating (see cut).

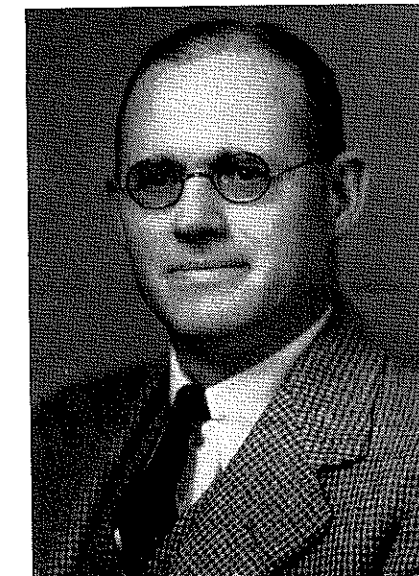


▼ Heiland Geophysical Equipment.

Electrical exploration equipment includes the resistance gradiometer suitable for the detection of quartz veins, faults, etc., and an electromagnetic outfit for ore exploration which measures the in-phase and quadrature components of electromagnetic fields. Recently, a sensitive gravity meter, suitable for truck or tripod mounting and for direct or remote reading, has been developed. Heiland Research has manufactured, sold geophysical equipment in the U. S., Canada, South America, South Africa, Europe, Japan, and the Philippine Islands. Geophysical consulting work has been done in the U. S. and Canada. Among the personnel of the company are the following: Dr. C. A. Heiland, President; J. C. Hollister, '33, Vice-president; L. I. Freeman, Vice-president in charge of field operations; and J. E. Hawkins, '38.

W. L. Maxson, '23 Receives Promotion with Allis-Chalmers

Mr. Walter L. Maxson has been appointed Sales Manager and Chief Engineer of the Mining Machinery Division of Allis-Chalmers Manufacturing Company, according to an announcement just made by Mr. Herman Schifflin, manager of the company's Crushing, Cement and Mining Machinery Department.



For many years a Sales Engineer of the Mining Division, Mr. Maxson will now have charge of all sales activities of his division, both in the home office and in the field. As Chief Engineer, he will be in charge of all engineering in this division.

Mr. Maxson is a graduate of Cornell University in mining and of the Colorado School of Mines in metallurgy. Prior to becoming associated with Allis-Chalmers Mining Division in 1927, he had a wide experience for many years with numerous mining companies. Mr. Maxson had also been a Consulting Engineer for various mining and metallurgical interests, and at one time was Professor of Metallurgy at the Colorado School of Mines. He is a member of the American Institute of Mining and Metallurgical Engineers and has to his credit a variety of articles and patents on metallurgical subjects.

Other "Mines Men" employed by the Allis-Chalmers Manufacturing Company are: F. C. Bond, '22; R. M. Schade, '21; C. L. Morris, '36; R. D. Moody, '36; B. H. Irwin, '37; J. A. Fagnant, '37; W. R. Parks, '38.

Ross Amalgamation Centrifuges

The Ross Siphon is devised to force finely ground ores or minus ten mesh screened finesands, etc. thru a deep well of Ross Chemically Treated Mercury, wherein, gold in both coarse and minute particles is partly amalgamated.

The Ross Siphon is operated with two Ross Centrifuges following as PILOTS. These are in reality CONTINUOUS PANNING MACHINES and contain only a small quantity of Ross Activated Mercury to act as a collector and amalgamator of any floured mercury pulled over from the Siphon. The proper densities for correct siphon action are also indicated in these machines.

The Ross Amalgamation Centrifuges
(Continued on page 228)

CATALOGS AND TRADE PUBLICATIONS

(859) **MODERN TURBINES.** Bulletin GEA-2868 by General Electric Co., Schenectady, N. Y. Eight pages covering Facts & Fancies regarding modern turbines. Illustrated with sketches, drawings and cuts.

(860) **V-BELT DRIVES.** March 1940 Industrial News by Gates Rubber Co., Denver, Colo. Shows V-belt installations as applied to compressor plants, pumping plants and elevators.

(861) **FLOTATION MACHINES.** Bulletin No. 82 by Morse Bros. Machinery Co., Denver, Colo. Description of single and multiple "Weinig" cells, with illustrations, drawings and tables of dimensions and capacities.

(862) **CONTRACTORS' EQUIPMENT.** Catalog No. 600 by Chicago Pneumatic Tool Co., New York, N. Y. 56 pages of illustrations, specifications and descriptions covering all types of compressors, rock drills, tampers, vibrators, riveters, pumps, etc., and accessories. Denver office, Stearns-Roger Mfg. Co.

(863) **ALUMINUM CABLE STEEL REINFORCED.** For Rural Lines by Aluminum Company of America, Pittsburgh, Pa. Part One—Descriptions and illustrations of several rural installations. Part Two—Descriptions and illustrations of how aluminum is obtained and refined. Other uses of Aluminum. Denver office, U. S. National Bank Building.

(864) **MANGANESE STEEL.** The Amsco Bulletin, January 1940, by American Manganese Steel Division, Chicago Heights, Ill. 16 pages of illustrations and descriptions of manganese steel castings for earth and rock moving equipment.

(865) **DIESEL TRACTORS.** 1939 Annual Report of Caterpillar Tractor Co., Peoria, Ill. 24 pages of charts and tables showing sales, profits, dividends and balance sheets, also illustrations of various tractors and diesel powered machines.

(866) **MOLYBDENUM DIE STEEL.** The Moly matrix, February 1940. Climax Molybdenum Co., 500 Fifth Ave., New York, N. Y. Manufacture and characteristics of dies made of five percent chromium and one percent molybdenum steel with tables of hardness and distortion.

(867) **ROCK BITS.** Pamphlet on Timken Rock Bits, distributed by the Mine and Smelter Supply Co., Denver, Colo. Construction details of the various Timken Bits and shank design with illustrations of operations using these bits and price list.

(868) **STORING COAL AND RAW MATERIALS.** Sauerman News, Jan.-Feb. 1940, by Sauerman Bros., Inc., Chicago, Ill. Storing and moving various materials on the surface and underground using scraper and cableway machines with illustrations and sketches.

(869) **MINE CAR LOADERS.** Bulletin GD-9, Third Edition by Gardner-Denver Co., Quincy, Ill. Complete description of construction and specifications of Gardner-Denver mucking machines with illustrations of assembly and sketches of car service methods.

(870) **SHORTWALL COAL CUTTERS.** Bulletin M-368 by Goodman Manufacturing Co., Chicago, Ill. Illustrations of various types of short wall cutters with construction details, dimension tables, control details and specifications with sketches showing operation methods.

(871) **THRUSTOR OPERATED VALVES.** Bulletin CR9507-L by General Electric Co., Schenectady, N. Y. Description of single-seat and double-seat thrustor operated valves with table of dimensions for various pipe sizes and classifications as to purpose.

(872) **CONVEYORS.** Bulletin 109 by Robins Conveying Belt Co., New York, N. Y. Illustrations of conveyor equipment such as belt conveyors, bucket elevators, vibrex screens, feeders and skip hoists.

(873) **BALANCING MACHINES.** Form 1079 by Gisholt Machine Co., Madison, Wisconsin. Descriptions and illustrations of a line of static and dynamic balancing machines for locating and measuring unbalance in rotating parts such as crankshafts, armatures, pump-impellers and propellers. Tells the story of unbalance and forces exerted unbalance.

FOR YOUR CONVENIENCE

Send your publications to Mines Magazine, 734 Cooper Building, Denver, for review in these columns. Readers will please mention Mines Magazine when requesting publications from the manufacturer. Readers may order publications from this office by giving index number.

(874) **STORAGE BATTERY TRAMMER.** Catalog No. 500 by Mancha Storage Battery Locomotive Co., Chicago, Ill. Operating data about Mancha's little trammer with tables of specifications, performance and draw bar pull. Illustrations of construction details and actual installations.

(875) **THE WORKING OF NICKEL ALLOY STEELS.** Reprint from American Machinist, October 18, 1939, by The International Nickel Co., Inc., New York, N. Y. How to drill, thread, mill and grind nickel alloy steels including kinds of nickel alloy steels and tables of heat treatment and weldability.

(876) **MICRO-PROJECTORS.** Catalog E-20 by Bausch & Lomb Optical Co., Rochester, N. Y. The advantages and time saving of using micro-projection. How any standard laboratory microscope may be made into a micro-projector and the various types of projectors with specifications.

(877) **PORTABLE COMPRESSORS.** Supplement "C" to Bulletin 758 by Chicago Pneumatic Tool Co., New York, N. Y. Illustrations and descriptions of two-stage air-cooled portable compressors mounted on steel wheels, pneumatic wheels and skids.

(878) **GAS ENGINES.** Bulletin No. 229 by The National Supply Co., Pittsburgh, Pa. Complete description of the Superior Type CT gas engine that has twin two-cycle horizontal cylinders convertible to gas or oil for heavy duty work.

(879) **MODERN STEAM TURBINE DRIVES.** Turbines by Westinghouse Electric & Manufacturing Co., Philadelphia, Pa. Complete information on type C single and double stage steam turbines from five to fifteen horse power with illustrations and drawings of the models and accessories.

(880) **POWER TRANSMISSION.** Link-Belt News, March 1940, by Link-Belt Co., Chicago, Ill. This issue contains articles about a ten mile conveyor belt, a snow machine and other illustrated articles covering shovels, draglines, dryers and overhead conveyors.

(881) **HIGH SPEED SYNCHRONOUS MOTORS.** Bulletin GEA-246F by General Electric Co., Schenectady, N. Y. Completely illustrated description of two and three phase "7500 Series" motors and accessories.

(882) **AUTOMOBILE FACTS.** March 1940 bulletin by the Automobile Manufacturers Association, Detroit, Mich. History and economic aspects of the automobile and how automobile pioneering has aided other manufacturers.

(883) **V-BELT DRIVES.** Catalog No. 151 by Allis-Chalmers Mfg. Co., Milwaukee, Wis. A

Notes on Valuation OF Oil and Gas Properties By Corpus Christi Geologists' Study Group

These notes are mimeographed, letter size, paper covers, comprising 58 pages of problems and their application to oil property valuation. Various methods of attacking problems are discussed and compared. Only a limited supply to be distributed at actual cost. Price \$1.00 postpaid.

THE MINES MAGAZINE
724 Cooper Building Denver, Colo.

text book on V-Belts with tables on selection, sheave dimensions, horsepower ratings and service factors which supersedes all previous data.

(884) **MODERN ROCK DRILLS.** Catalog 4301 by Ingersoll-Rand, 11 Broadway, N. Y. contains 88 pages illustrating all forms of rock drills for every purpose, together with tools and accessories used in connection. Eight pages are devoted to tables of data and information of an engineering nature. This book will be a valuable addition to every mining man's library.

(885) **LATHE TOOLS.** Catalog Form 1059B by the Gisholt Machine Co., Madison, Wis. A 40 page booklet covering standard tools for ram type turret lathes, each tool is illustrated so correct selections may be made.

(886) **TURN KEY MILLS.** Bulletin by Western-Knapp Engineering Co., San Francisco, Calif. Descriptions and illustrations of complete cyanide, flotation and crushing plant installations with sketches and blue prints. Western Machinery Co., 1655 Blake St., Denver distributors.

(887) **CYANIDE MACHINERY.** Bulletin C-40 by Morse Bros. Machinery Co., Denver, Colo. Descriptions and illustrations of machinery needed in cyanide treatment from crude ore to bullion with a typical continuous counter-current decantation cyanide flow sheet.

(888) **CENTRIFUGAL PUMPS.** Bulletin 5972 by Fairbanks, Morse & Co., Chicago, Ill. Illustrated descriptions of construction details for two-stage, split-case centrifugal pumps with table of dimensions.

(889) **TWO DECADES OF MANUFACTURING.** Bulletin GED-833 by the General Electric Co., Schenectady, N. Y. A pamphlet to the stockholders describing aims and activities of the company the past two decades with illustrations of many of the products that have been manufactured.

(890) **MACKENZIE RIVER, CANADA.** Deco Trail, April 1940, by the Denver Equipment Co., Denver, Colo. An account of the history, life and activities along the Mackenzie river, Canada, plus mining news and milling equipment. Also engineering note book supplement containing flow sheet and description of mill operation at the Lamartine Mine, Idaho Springs, Colo.

(891) **OIL WELL DRILLING TOOLS.** Oil Well Specialties pamphlet by Patterson-Ballogh Corp., 1900 East 65th St., Los Angeles, Calif. A seventeen page booklet with illustrations describing drilling tools and accessories with particular attention being given to rubber protectors and stabilizers.

(892) **NON-EXPLOSIVE MINING METHOD.** Bulletin on Caedox by the Cardox Corp., 307 N. Michigan Ave., Chicago, Ill. A sixteen page booklet telling the story of cardox, how it works, how to use it and illustrations of its use in coal mines.

(893) **THREAD AND GASKET PASTE.** "Lead-Plate" pamphlet by Armit Laboratories, Los Angeles, Calif. Description of a metallic lead paste for use with threaded joints and gaskets and where it is applicable.

(894) **ANNEALING COVERS.** "Radiant Tube Annealing Covers" as reprinted from the Iron & Steel Engineer, May 1939, by C. H. Carpenter, Sales Mgr., Lee Wilson Engineering Co., Cleveland, Ohio. A paper telling of the development of radiant tube annealing covers explaining how gas burns uniformly throughout the tube thus giving the same effect as electric heaters.

(895) **PARCEL CHECKING SERVICE.** Pamphlet titled "The Key That Solved The Problem" by the American Locker Company, Inc. 113 Lincoln St., Boston, Mass. A description of parcel checking service with illustrations of the parcel lockers.

(896) **PORTABLE GASOLINE COMPRESSORS.** Bulletin H-850-852 by Worthington Pump and Machinery Corp., Harrison, N. J. Descriptions and illustrations of two and four wheel two-stage portable gasoline powered compressors with table of specifications.

(897) **500 CUBIC FOOT PORTABLE COMPRESSOR.** Form 2641 by Ingersoll-Rand, 11 Broadway, New York, Denver Office, 1637 Blake Street, illustrates the many advantages and economy incorporated in this new portable compressor, two stage air cooled, gasoline or oil engine driven.

(898) **OIL WELL SURVEYS,** their necessity and application is well set forth in the March-April number of "Tomorrow's Tools Today" by Lane-Wells Company. 12 pages of illustrations and important information are given in this issue, send at once for your free copy.

Alumni Business

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FRANK C. BOWMAN, '01
Vice-President
FRANK J. NAGEL, '03
GEORGE W. THOMAS, '26
Treasurer
FRED C. CARSTARPHEN, '05
Denver, Colo.
M. EDWARD CHAPMAN, '27
Tulsa, Okla.
CHARLES O. PARKER, '23
Denver, Colo.

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Publications
JAMES W. DUDGEON, '13
Athletic
ALLAN E. CRAIG, '14
Capability Exchange
KEPPEL BRIERLY, '34
Instruction
RUSSELL H. VOLK, '26
Membership
T. C. DOOLITTLE, HON. '27
Budget and Finance
C. LORIMER COLBURN, '07
Alumni Foundation
A. GEORGE SETTER, '32
Legislation
DONALD DYRENFORTH, '12
Public Relations
KENNETH E. HICKOK, '26
Nomination
W. A. WALDSCHMIDT, Faculty
Junior Membership

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Chairman
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CHARLES W. HENDERSON, HON. '30
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CLAUDE L. BARKER, '31
RUSSELL H. VOLK, '26
ARTHUR W. BUELL, '08
W. A. WALDSCHMIDT, Faculty

MEETINGS

Executive Committee Meetings
3rd Monday of each month, Alumni Office,
7:00 P.M.
Alumni Council Meetings
4th Thursday of each month, Argonaut
Hotel, 6:30 P.M.
Publication Committee Meetings
2nd Tuesday of each month, Alumni
Office, 7:00 P.M.
Magazine Staff Meetings, Alumni Office
on call.

NEW ASSOCIATION MEMBERS MARCH, 1940

Alumni
P. W. BILLWILLER, '39
Britannia Beach, British Columbia
JOHN J. CORY, '05 - - - Denver, Colo.
E. W. COWPERTHWAITTE, '13
Chingola, No. Rhodesia, So. Africa
RALPH C. DEWOOBY, '33 - - Odessa, Tex.
A. Z. DIMITROFF, '39 - - - Jerome, Ariz.
JAMES R. DORRANCE, '15
Bakersfield, Calif.
CARVER B. ELLIS, '33 - - - Denver, Colo.
CHARLES R. EMLER, '25
Valley Station, Ky.
WALLACE LEE, '04 - - - Lawrence, Kans.
H. WENDELL MATHEWS, '28
Midland, Texas
B. G. MESSER, '36 - - - Miami, Ariz.
WM. E. MITCHELL, '35 - - - Houston, Tex.
WM. B. PATRICK, '09 - - - Denver, Colo.
JACK D. POWERS, '39 - - - Greenville, Calif.
KENNETH W. POWERS, '25 - - - Denver, Colo.
BAILEY E. PRICE, '23 - - - Norwalk, Conn.
JOHN H. REHM, '37 - - - Boston, Mass.
WM. C. RUMP, '33 - - - Houma, La.
JOS. W. VOTA, '32 - - - Silverton, Colo.
EARL M. WOLTERS, '30 - - - Denver, Colo.
WM. C. ZULCH, '14
San Bernardino, Calif.

Associate

FRANK R. BLOOM, Ex-'34
Ann Arbor, Mich.
EDWARD HELLIER, Ex-'28 - - - Louisville, Ky.
JOHN L. HOGGATT, Ex-'33
Lead, So. Dakota
JAMES W. MCKENNA, Ex-'38
Boulder, Colo.
CHAS. J. VAUGHT, Ex-'41 - - - Harvey, La.
C. M. (NICK) WATTS, Ex-'26
Edgewater, Colo.
J. L. WOODRESS, Ex-'04 - - - St. Louis, Mo.

REPORTS

Executive Committee Meeting

The regular meeting was held March 19th, 1940 from 7:00 to 10:00 P.M. at the Alumni Association Office. Members of the Executive Committee present were Frank C. Bowman, Vice President, Frank J. Nagel, Secretary, George W. Thomas, Treasurer and those absent were Edward J. Brook, President, Fred C. Carstarphen, M. Edward Chapman, and Charles O. Parker. Committee Chairmen present were C. Lorimer Colburn, Allen E. Craig, R. H. Volk, James W. Duden, Bruce B. La Follette, and Hugh M. Connors; those absent were T. C. Doolittle, Kenneth Kickok, Keppel Brierly, A. George Setter and Donald Dyrenforth.

TREASURER'S REPORT. Treasurer Thomas reported that actual receipts were ahead of the same period last year but not up to where they should be in proportion to our heavier budget requirements. A study is being made to effect all possible economies and still meet the heavy demand that necessarily must be met to carry out the progressive program planned.

ALUMNI ENDOWMENT FUND. Chairman Colburn discussed the policy of the consolidation of the Life Membership Fund with that of the C. S. M. Foundation. A lengthy discussion followed and in the

absence of sufficient data and exact knowledge, definite action was postponed for consideration at subsequent meetings.

CAPABILITY EXCHANGE. Chairman Craig reported that he was having difficulty finding men to fit some positions. In some cases it has been necessary to go outside of our own organization to supply them. No doubt "Mines Men" are available, however they do not keep in touch with the Alumni Office and avail themselves of the services offered. There were seven calls for men in February and seven in March. Many of the undergraduates will need summer employment so let me know of any employers who can use these young men for the summer months.

MEMBERSHIP COMMITTEE. Chairman Volk reports great progress. The work of the committee during the past two years has materially increased the interest and membership in the Association and resulted in the establishment of new Local Sections at Bay Cities (Oakland and San Francisco, California), at Cleveland, Ohio and at Wichita, Kansas.

Charters for two new Local Sections have already been granted this year, which are located at Phoenix, Arizona, known as the Arizona Local Section, and at Seattle, Washington, known as the Pacific Northwest Section. Both of these sections will be installed shortly, watch the Local Section page of the magazine.

The Membership Committee will appreciate the cooperation of every "Mines Man" in carrying out its important work. We are especially interested in getting the names and addresses of Ex-Mines men to complete our records. Send them in.

PUBLICATION COMMITTEE MEETING. Chairman La Follette reports that his committee have their hands full. President, E. J. Brook, in his message to the Alumni Association for March, said that the "lack of eternal strength" is revealed by an examination of reports of the association activities for 1939. His statement, shocking to many an alumnus, is based on the fact that about one-third of our graduates are not members of the association.

This situation was discussed at the Publication Committee at its February meeting and it was decided to publish a Special Alumni Issue celebrating the Thirtieth Anniversary of Mines Magazine in a grand effort to awaken members and non-members alike to the proud realization that they compose a body of men that is unexcelled throughout the world in the development of the mineral industries. The April Number will be the results of these plans.

It should convince every reader of the inherent strength of the Association. The magazine is the natural medium through which that strength can be realized and put to use. The Publication Committee is directing its efforts toward providing a diversity of good articles throughout the year as well as a coverage of all matters of alumni interest. Many changes will be noted in the style of the magazine. These were worked out by the editor and his staff and through the cooperation of "Mines Men" and friends who have supplied many constructive suggestions.

The Seventh Annual Petroleum Number is planned for June. Last year this was a very outstanding number and promises to be just as good this year. "Mines Men" will contribute most of the material for this issue which is being rounded up by Arthur W. ("Pop") Buell. He will appreciate your cooperation.

PUBLIC RELATIONS. Chairman Dyrenforth, while not present, reported that while the members of his committee were infrequently in Denver as a group, nevertheless they were alive to the requirement and are planning an outline of activity that should be well under way beginning with the Annual Banquet in May.

The wide field in which we can function to advantage in Public Relations covers a number of important possibilities of which I will give only a few. Social activities of the Association are primary and closely allied is Publicity in the Press and other publications. The value of the School of Mines to the State and to the nation brings thought of Chamber of Commerce and Mining Groups and these will be surveyed in the cause.

Public Relations presupposes individuals. We Alumni are a group of individuals that must continually increase in number. Needless to say our trend is to work closely with the Committee on Membership and with every other group, committee or otherwise.

RESEARCH AND INVESTIGATIONS. Chairman Connors discussed the anticipated work of this committee and results are promised. There is a great deal of statistical information needed in regard to our Alumni as individuals and as a group, that can be used to advantage by the Association and its committees in pushing plans for greater service.

ATHLETIC COMMITTEE. Chairman Dudgeon stated that the "Mines" Basketball team had tied with Colorado College for second place, which is a very good showing after the many years of defeat. The response for contributions to the Alumni Loan Fund met with a good response, however further funds will have to be provided if the worthy work of the past several years is to be kept going.

INSTRUCTION, LEGISLATIVE AND NOMINATION Committees have made no reports up to this time.

Alumni Council Meeting

The regular monthly meeting of the Alumni Council was held at the Argonaut Hotel, Thursday evening, March 28th, 1940. Those who attended the meeting were Dr. M. F. Coolbaugh, Edward C. Hanley, and Frederick C. Steinhauer of the Board of Trustees; Dean Jesse Morgan, W. C. Cramer, J. Harlan Johnson, W. A. Waldschmidt, Coach John Mason, George W. Thomas, Kenneth Hickok, of the Faculty; George Yeager, President of the Student Body; and Frank C. Bowman, A. E. Perkins, James W. Dudgeon, Russell H. Volk, Dent Lay, C. Lorimer Colburn, Hugh M. Connors, Allen E. Craig, of the Alumni.

Athletic affairs were discussed by Coach Mason and James Dudgeon and followed by a general discussion participated in by all present. Plans for the Alumni Endowment were explained by Chairman Colburn. Other activities of the Alumni Association were given consideration. Dean Morgan gave a statistical report on the under-graduates of the school and the relative standing of the scholarship students to the average of the student

body. Dr. Coolbaugh told of the method adopted in granting of scholarships at "Mines" and his observation of the effect on the student body. He also discussed important research that had been carried out at the School of Mines Experimental Plant.

Murals—

(Continued from page 176)

could be spent for such a purpose. Mr. Edward C. Hanley of the Board of Trustees interested Mr. and Mrs. Barney Lee Whatley of Denver who very generously purchased them for the school.

The Donors

Mr. and Mrs. Barney Whatley have made numerous benefactions to educational institutions. They have a natural interest in mining. Mr. Whatley, a native of Alabama, came to Colorado in 1911. An expert in mining law, he conducted private practice in Breckenridge until 1919. He was also district attorney for the Fifth Judicial District during that time. In 1919, he moved to Denver where he has since continued the practice of mining law and maintained an active interest in mining operations. In 1920, he married Gertrude Thielen, daughter of a Leadville mining engineer and a native of Colorado. Thus, these mining murals were presented by a mining family to the Mining School.

The C. S. M. Setting

The murals were delivered to the Geology Building on February 23, 1940. They were mounted on temporary frames for Engineer's Day (March 15) and the formal dedication of the Geology Building and wings. At that time they were displayed in the north half of the main museum room. It is planned, however, that they will be placed along the

central portions of the east and west walls of the room for permanent display. All in all, they will make a notable addition to the Museum and the alumni can be proud to know that these famous murals are now at the Colorado School of Mines through the generosity of Mr. and Mrs. Barney Whatley and as a result of the interest and efforts of Frank Hayward, President, Bay Cities Section of the C. S. M. alumni and of the Board of Trustees, especially Messrs. Barnett and Hanley.

Mining Engineer—

(Continued from page 172)

and for 35 years they have been progressing at an ever increasing tempo, until they stand in the forefront of those who apply the latest discoveries of science to the solution of their problems.

Costs in metal mining must be reduced and this means increased mechanization of our mines, and the adoption of geological methods, now known and to be discovered to the finding of ore bodies. The metallurgists must prepare to handle ores of ever decreasing value, until the extraction of gold from sea water becomes a practical problem, and not a vision. Our present faculties in our mining schools are facing severe and justified competition from the great influx of foreign pedagogues of great competence, that have fled from persecution in the homeland.

This upward surge in the number of students of mineral technology, may indicate a revival in mining, and accompanying enterprises that is not yet discernible. Such a revival can come when industry thrives, unemployment is checked, business is profitable, and money is at hand for the further development of marginal mining projects and the solution of baffling problems. We need political tranquility in a world of wars, can we attain it in a life time?

This is the challenge of our times to youth. Although the present and past generations may not have met it successfully, the opinion of the world is that our doubts are traitors, that we fail of success because we fear to attempt, and that our great hope lies in the accomplishments of our engineers. An engineer is a master of the arts and sciences, of ethics and economics, a man so cultured that he is at home in the citadels of kings, or in the tents of savage hunters, and is competent to construct and administer so that the welfare of humanity may be safely entrusted to him.

FROM THE Local Sections

BAGUIO



W. T. Graham, Ex-'26, President; C. W. Berry, '36, Secretary, Box 249, Baguio, P. I. Dinner meeting, first Wednesday each month, Pines Hotel, Baguio.

You are a long way off and all the more reason why "Mines Men" in other parts of the world want to know more about you. Why not send some stories of what you are doing? Ed.

BIRMINGHAM



Tenney C. DeSollar, '04, President; W. C. Chase, Ex-'05, Vice-President; Hubert E. Risser, '37, Secretary, Flat Creek Alabama. Meetings upon call of secretary.

Although in the past it has not been possible for this section to arrange a definite schedule for its meetings, we all look forward to sometime in the future when it will be practical to do so.

The members of this section although badly scattered have given wonderful cooperation to the staff of Mines Magazine. Ed.

BAY CITIES



Frank Hayward, '32, President; William J. Rupnik, '29, Secretary-Treasurer, 714 Hillgirt Circle, Oakland, Calif. Four meetings per year, 2nd Monday, March, June, September and December.

Bay Cities Section are holding their next meeting at the Engineers Club in San Francisco, Thursday, April 18, 1940—6:30 P. M.

Speaker for the evening will be Ben Allen, Secretary to Herbert Hoover, and former A. P. correspondent. His subject—"War Censorship and Propaganda."

ALUMNI MEETINGS

Many a graduate has possibly asked this question: "How can I benefit

myself by attending the Alumni meetings?" This question should be given due consideration because those who ask it should first ask themselves: "How did I benefit myself by attending the Colorado School of Mines?" It is an easy thing for one to say: "Well, I got my degree, and had a tough time getting it, so goodbye *Mines*." However, a little thought will soon convince one that a college degree is in reality but a secondary standard, the value of which is ultimately based upon the success of the Alumnus. An alumni organization is vital for the success of the School and the individual. The School is largely guided by the demands and suggestions of its Alumni. By becoming active in your local alumni chapter you are boosting *Mines*, and a *boost for Mines is a boost for you!*

More than ever before in the history of *Mines* is it urgent that the Alumni organize themselves, as far as possible. You can bet your neck, that Colorado U., Stanford, Cal., M. I. T., etc. aren't going to boost *Mines* first! It's up to *Mines Alumni* to boost *Mines!* So let's "*perk up*" fellows, and attend the local Alumni meetings. *Boost Mines, and Boost yourself!*

THERE IS NO SUN

There are men who toil where there is no sun,
In the earth's deep bowels, where every ton,
Wrested by skill and sweat, and brought,
From the rock-locked vault which God hath wrought,
These men of metal have torn asunder,
By muscle, steel, and man-made thunder.

They are men of courage, underground,
Who serve a master called "The Round"
with driving will, that needs no rest,
Their homage pay with oath and jest
At roaring drill in oil-drenched mist,
With moil or pick in hard clenched fist.

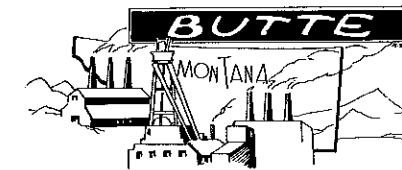
Oh, the men who toil where there is no sun
See the world move on with each shift done,
As metals gleam and molds are poured;
These miners take for their reward
The glory strong and proud men find
In service given to mankind.

And, thus it was—in former years;
The world now bows its head in tears,
As metals which helped civilize
Return to earth—from guns and skies,
Are measured now by tragedy,—
"So many tons—and lives—at sea".

For now, where racing war clouds run,
The world stands still; there is no sun.

—A. C. Harding, '37, El Portal, Calif.

Thanks for the wonderful efforts Bay Cities members made to obtain advertising for this number of the magazine. We feel that you have paved the way and your interest is bound to bring results in the future. Ed.



E. S. McGlone, President; H. M. Strock, '22, Secretary, 1309 Platinum St., Butte, Mont. Meetings upon call of Secretary.

"Mines" Magazine wants to express their appreciation for the great cooperation in furnishing information for this number, but why stop with this? You have many capable men in your section and those in other parts of the world would like to hear from you as a group. How about sending in the results of an early meeting? Ed.

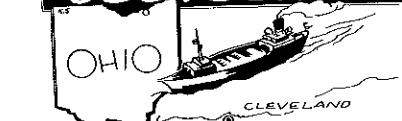
CHICAGO



A. L. Lynne, '06, President; M. E. Frank, '06, Secretary, 4537 Drexel Blvd., Chicago. Meetings upon call of secretary.

Good reports come from Chicago visitors. We know that the men in this section are past masters when it comes to entertaining guests from "Mines", however why not tell us more about these events? Our readers are all interested. Ed.

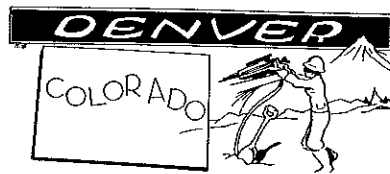
CLEVELAND



K. D. True, '35, President; R. J. Maloit, '37, Secretary-Treasurer, 9701 Lamont Ave., Cleveland, Ohio. Four meetings during year, 4th Friday, March, June, September and December.

The members of this section are always interested in the "Mines" Alumni Association and the activities at "Mines" although we have not had much success in functioning as a group. Individual members are always ready to do their part but as an organization we still have much to accomplish. Any suggestions as to methods used successfully by other chapters in obtaining attendance and creating interest for meetings will be appreciated.

The Magazine Staff appreciates the efforts of members of this section in co-operating to make this number a big success. Ed.



Dent L. Lay, '35, President; R. J. McGlone, '27, Vice-President; A. L. Mueller, '35, Secretary, 430 E. 11th Ave., Denver, Colo. Luncheon meeting, third Friday each month.

Due to the fact that Engineers Day was held at Golden on March 15, Colorado Section postponed their meeting to the following Friday, March 22, which was held at the Oxford Hotel.

President Lay announced that in the future very little business would be conducted during the regular luncheons so as to give all possible time to the principal speaker. It was announced that the committees appointed last meeting had begun to function very satisfactorily.

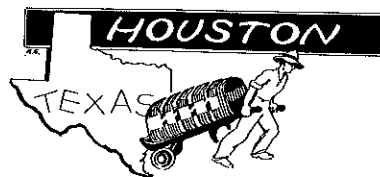
The meeting was turned over to Mr. Bruce LaFollette who in turn introduced the principal speaker, Dr. H. H. Nininger, world renowned authority on meteorites. Dr. Nininger delivered a very interesting talk on his various experiences. One of which was recently made by airplane into northern Colorado with Warren Prosser, Ex-'07, in search of a meteorite which fell in that vicinity last year.

Colorado Section was indeed fortunate in obtaining Dr. Nininger for it is understood that he is in great demand all over the United States to deliver his ideas on Meteorites. He has been studying this new field for fifteen years.

The following members were present:

R. J. McGlone, '27; W. B. Patrick, '09; Harvey Mathews, '13; Hugh M. Connors, '22; S. H. Sherman, '04; Frank J. Nagel, '03; Warren Prosser, Ex-'07; Earl L. Durbin, '36; Herman Lutz, '36; R. F. Barney, '35; R. Spalding, '33; Ralph G. Ehret, '33;

Ralph E. Johnson, '33; P. Hammond, '42; J. R. Morgan, Dean; H. W. Kaanta, '15; Joseph P. Ruth, Ex-'21; Frank Bowman, '01; Bruce LaFollette, '22; W. P. Arthur, '95; D. L. Lay, '35.

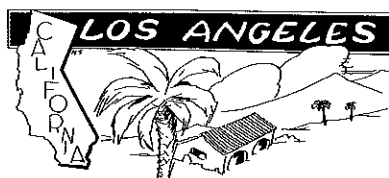


Clark W. Moore, '32, President; R. J. Schilthuis, '30, Secretary, 1410 Gustav, Houston, Texas. Dinner meeting, second Friday of month. 6:00 P. M., Lamar Hotel, Houston, Texas.

The Houston Chapter held its regular monthly meeting at 6:00 P. M., Friday, March 8th in the Cafeteria of the Lamar Hotel. The following attended:

T. H. Andrews, '17; W. E. Mitchell, '35; C. W. Moore, '32; Ralph J. Schilthuis, '30; C. H. Stewart, '25; A. G. Wolf, '07.

We had as visitor A. S. Bunte, '26 of Wichita, Kansas who was here on a short business trip. At the close of the meeting, the group also ran into R. L. McLaren, '32, in the hotel lobby, who is with the Arkansas-Louisiana Gas Co. located in Shreveport.



R. S. Brummett, 26, President; William Dugan, Ex-'12, Secretary, 315 West 9th St., Los Angeles, Calif. Four meetings during the year, 2nd Monday of month, January, April, July and October.

Southern California Section turned out Monday, April 8, to participate in one of the most enjoyable meetings ever staged by this group. It was held in the luxurious setting of the famous Los Angeles Athletic Club—an innovation that proved popular with the members.

After an excellent dinner guests of the section, including Gene Volpi,

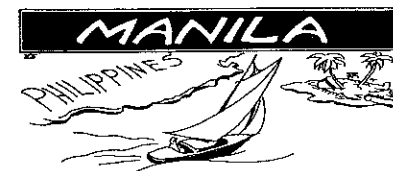
Don Eden, Ken Nickerson, Ralph Blair and Ted Gerber, prospective students, were introduced. Bows were taken and short speeches given by some of our famed "old timers." Terry Du Rell '95, J. E. Warnecke, '98, Colonel L. R. Ball, '00, former Prof. Test, and Mines' great all-time full-back, the one and only George Nordenholt, '07. This gave the evening of fine fellowship a good start and it progressed to a regular old times Mines "session" as the evening advanced. Our new prexy "Bob" Brummett then discussed his program and outlined his policies for the year, which should result in proving the slogan "Southern California leads the Alumni Parade." Following the President's pep talk "Smilin' Frankie" Brown gave a discussion on chapter finance to disclose the new "painless process" policy adopted by our new administration.

Then for two hours, which passed like so many minutes, guest speaker, Frank Pearson, showed over three thousand feet of film and accompanied them with a narrative of a six months' big game hunting expedition into deepest Africa. Speaker Pearson completely "debunked" the audience from popular impressions of the danger of this sport depicted by certain awe inspiring animal films of the movies. The habits of the animal life and native customs and life were interestingly told and shown. Program Chairman Bill Boyle really "pulled one out of the bag" in presenting this feature. The meeting adjourned after ten o'clock.

Those who signed the roster were: C. Terry Du Rell, '95; J. E. Warnecke, '98; L. R. Ball, '00; A. C. Watts, '02; D. G. Miller, '09; W. D. Abel, '06; H. C. Armington, '07; H. C. Eddy, '09; W. R. Kilgore, Ex-'08; J. P. Pinger, Ex-'10; G. D. Nordenholt, '07; E. C. Austin, Ex-'11; J. E. Dick, '12; Bill Dugan, '12; E. J. Brook, '23; R. S. Brummett, '26; C. D. Heaton, '12; W. C. Wattles, '03; C. B. Neiswender, '13; C. B. Morrison, '11; R. F. White, '18; Walter J. Eaton, '13; Henry E. King, '03; J. H. Easthagen, '28; R. M. Fullaway, '16; C. F. Oram, '13; R. A.

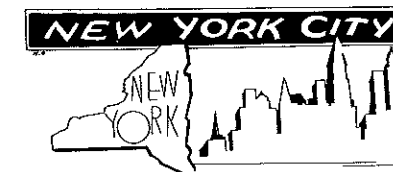
Leahy, '13; N. J. Mueller, '22; A. E. Hambly, '23; A. M. Turner, '20; C. T. Baroch, '23; H. M. Fiske, '21; Gower Waters, '09; C. W. Teets, '15; Wayne A. Harrod, '17; M. W. Wilkinson, '17; E. W. Westervelt, '13; J. N. Teets, '17; J. R. Shanley, '15; E. E. Dawson, '38; Bill Beggs, '37; Randy West, '37; J. J. Rupnik, '33; R. G. Couch, '36; Norman Christie, '33; K. A. Robertson, '37; George N. Adams, '36; Jack Ballagh, '10; W. W. Cline, '30; E. F. Bladholm, '29; H. R. Hammond, '17; C. N. Whitaker, '14; F. A. Brown, '21; Bill Boyle, '12; C. D. Test, ex. fac.; Guests: Ken Nickerson, Gene Volpi, Don Eden, Ted Gerber, Ralph Blair, Lincoln Clark, Jr., R. F. Sopris, '26, Lester Crabbe, Frank Pearson.

As usual we have to take our hats off to this section for getting action. We expected them to lead in the parade, however they ran New York a close second. They lead in number of advertisements but New York jumped the gun on space. Ed.



A. F. Duggleby, '15, President; Ralph Keeler, '31, Secretary, Box 297, Manila. Dinner meeting, first Friday each month.

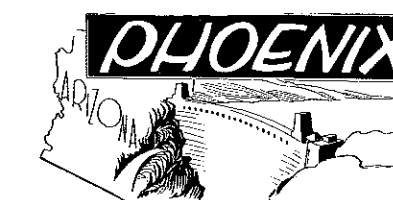
From accounts that reach us occasionally, we know that you are active but why keep it all to yourselves, we at home would like to read accounts of the big doings there just the same as you like to read about what the big events are here. How about a report on the next meeting? Ed.



C. L. French, '13, President; Ben W. Geddes, '37, Secretary, 1112 University Terrace, Linden, N. J. Meetings upon call of secretary.

At a luncheon March 12th, 1940, we discussed advertising for the Special Alumni Number and plans were laid to approach several prospective advertisers.

A large amount of the advertising in this issue can be credited directly and indirectly to this section, they carry off the honors for this number. Ed.



Two meetings in year, second Saturday in April and October. T. E. Giggey, '34, President; A. F. Hallett, '09; Percy Jones, Jr., '08, Vice-Presidents; E. M. J. Alenius, '23, Secretary-Treasurer, Box 2751, Phoenix, Ariz.

On the evening of April 13, 1940, twenty-two former students of the Colorado School of Mines, gathered for dinner at the Adams Hotel in Phoenix. On this occasion they were formally presented with a Charter from the Colorado School of Mines Alumni Association by E. J. Brook, of Los Angeles, President of the Alumni Association. Mr. Brook was assisted by R. S. Brummett, President of the Southern California Section. The new group was designated as the Arizona Section, the membership to consist largely of those former students of the school residing in Arizona.

The spirited Miners from Golden were given a rousing address by President Brook regarding the aims of the Association and the wide range of activities of the other sections. Twenty inspired charter members of the new section are determined to assist the organization in its work and to exceed the high level of accomplishment of the other sections. A telegram was read from Harry M. Lavender, '16, wishing for the success of the new organization.

At the first business session, the following officers were elected to serve the new section:

President, T. E. Giggey, '34.
Vice-Presidents, A. F. Hallett, '09; Percy Jones, Jr., '08.
Secretary-Treasurer, E. M. J. Alenius, '23.

Meetings of the section will be held the second Saturday in April and October. Consideration was given to holding these meetings in various parts of the state. The following appointments were made for the several committees:

Membership: E. M. J. Alenius, Ch., Bennie G. Messer, Jack Pardee, M. E. Volin, Carl Schmidt.

Program: Robt. W. Crabtree, Ch., Chas. A. Davis, K. B. Hutchinson.

Employment: A. F. Hallett, Ch., N. W. Logue, J. F. Frost, Geo. D. Middleton.

Athletic: M. E. Volin, Ch., Geo. F. Jenkin, E. J. Eisenach, Jack Pardee, L. D. Anderson.

Student Help: Harry M. Lavender, Ch., P. S. Geshell, E. H. Crabtree.

Foundation: H. W. Aldrich, Ch., H. D. Phelps, C. A. Rockwood.

Instruction: Chas. A. Davis, Ch., H. N. Tufts, W. F. Distler.

Publication: Percy Jones, Jr., Ch., Wm. W. Simon.

Those present subscribed 100% by paying their dues to the new section. This, according to President Brook, was an unprecedented occurrence and augers well for our future prospects. Both President Eddie Brook and Bob Brummett contributed to make the collection percentage 100%, which places them high on the record of generous supporters to the Alumni Association.

After the business of the evening was dispensed with, speeches were made by the newly elected officers. In addition Mr. N. W. Logue of the Class of '97, the oldest alumnus present, gave a very interesting talk on the traditional Mines spirit at the time he attended Golden. The movies of the Championship Mines Football team of 1939 were also shown which created considerable discussion on the prospects for this year.

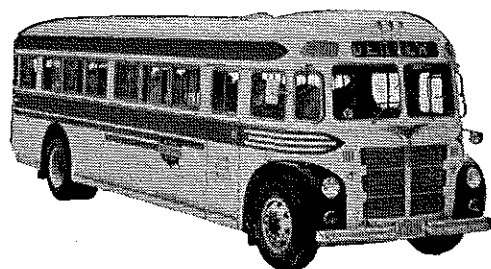
The Charter Members present included:

N. W. Logue, '97; Percy Jones, Jr., '08; A. F. Hallett, '09; Harlow D. Phelps, '10; Wm. W. Simon, '15; E. M. J. Alenius, '23; J. F. Frost, '25; Chas. F. Davis, '27; Geo. D. Middleton, '31; R. W. Crabtree, '31; T. E. Giggey, '34; C. B. Schmidt, '34; B. G. Messer, '36; Jack Pardee, '36; Geo. F. Jenkin, '38; J. M. Tufts, Ex-'38; H. N. Tufts, '39; K. B. Hutchinson, '39; W. F. Distler, '39; L. D. Anderson, '39.

"Mines" Magazine extends cordial greetings and best wishes to the new section and its members. We know our readers will look forward to many interesting accounts of your future meetings. Articles and news items are always acceptable. Ed.

(Continued on page 231)

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Headquarters for Mines Men

MINES TODAY

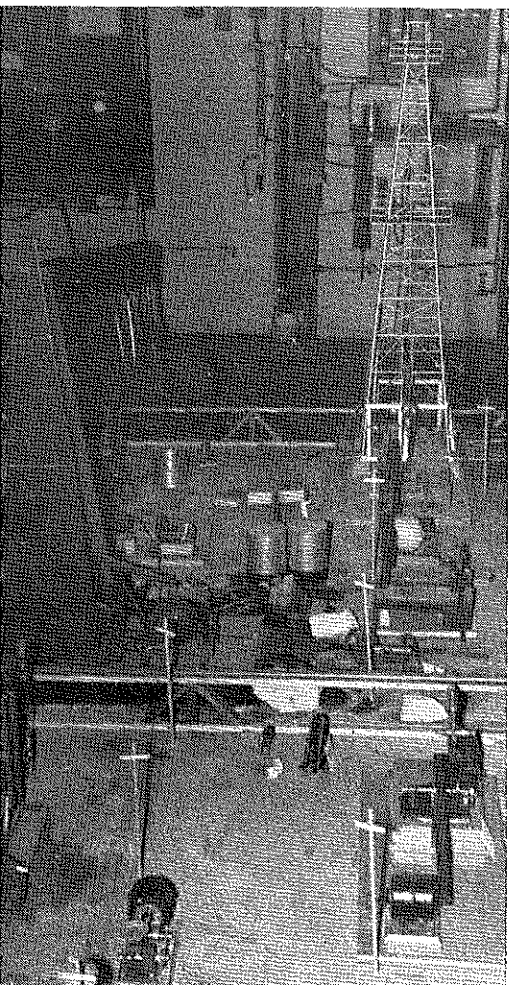
ENGINEERS DAY AT MINES

By TED GOUDVIS

The most interesting and successful Engineers' Day in the history of the Colorado School of Mines was last March 15th, 1940. Over four hundred visitors, both men in the engineering profession and interested guests of the school, visited the campus, the great majority remaining for the entire day's program.

Registration of all guests began in Guggenheim Hall at 9:00 A. M. At 9:30 A. M. technical sessions started in the graduating departments of mining, metallurgy, geology, petroleum and geophysics, where papers were presented by many outstanding authorities from the field.

▼ Petroleum Department Exhibit.



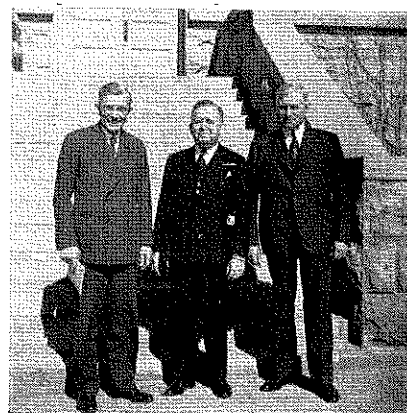
In the two mining sessions at which Prof. J. Burns Read and Dr. James Underhill presided, A. H. Bebee spoke on "Construction and Work of the Carlton Drainage Tunnel"; Donald Dyrenforth presented a paper on "The All-American Canal Desilting Plant"; E. W. Jones spoke on "Mining Operations at Climax"; H. N. Lary spoke on "Problems in Valuation"; R. H. Summer spoke on "New Trends in Explosives"; J. A. Bowsher gave a paper on "Engineers—A Comparison" and S. S. Tor presented a paper on "Aspects of Mining in Turkey".

The metallurgy session, headed by Dr. Clark B. Carpenter heard four papers. L. C. Atchison spoke on "Photo-Elastic Stress Analysis"; Franklin Coolbaugh gave a talk on "Problems of Concentrating Climax Ore"; C. C. Drake spoke on "Recent Developments in Chilled Iron Wheel Manufacture" and H. W. Linhardt spoke on "Western Blast Furnace Operation".

Geologists heard three outstanding papers. A. E. Brainerd spoke on the "Recent Developments in the Lance Creek Field"; C. E. Dobbin spoke on "Minerals of the World" and J. W. Vanderwilt told of the "Geological Importance of Molybdenum". Dr. F. M. Van Tuyl acted as chairman of the session.

Clark F. Barb presided at the petroleum session where three papers were given. Paul Torrey spoke on "Slime Hole Drilling"; Herbert Treichler and Herbert Thornton presented a paper on "Drilling Muds" and Frank Fisher spoke on the "Removal of Peroxides and Ethers".

In the geophysics session, Dart Wantland presided. Dr. E. L. DeGolyer spoke on the "History of Geophysics in the United States"; Dr. Carl A. Heiland discussed "Soil Analysis" and J. E. Hawkins spoke on the "Application of Geophysics in Engineering". All sessions were well attended, many of which were filled to



▼ Left to right: President M. F. Coolbaugh, Dr. E. L. DeGolyer, Dr. John T. Barnett.

capacity with over sixty or seventy interested students and visitors.

Also during the morning, high school seniors from over thirty high schools in Colorado took a competitive examination to win one of five scholarships that were awarded during the afternoon's activities. The quiz was based on chemistry, mathematics, physics, English and a general question. Scholarships were awarded on the basis of the best grades and the number of students in the graduating class of the high school.

Following the technical sessions and the high school competition, groups of visitors and students were conducted about all the buildings of the campus. The mining building displayed its new complete and modern dust-control equipment, and exhibits depicting the study of photo-elastic stresses and showed its display of historical pumping, mining and ventilation equipment.

In the petroleum exhibit was seen porosity and permeability testing equipment, octane rating, vapor pressure and specific gravity testing apparatus and a model standard tool and operating field, which was in actual operation.

In the metallurgical department visitors were shown how the study of polished sections are made; models of plants and equipment and the operation of heat treating furnaces, hardness testing machines and other laboratory equipment. In addition,

the pilot mill of the experimental plant was in operation.



▼ President Coolbaugh un-veils plaque in Berthoud Hall.

The Electrical Engineering Department gave a magic show, demonstrated its varied electrical equipment, and showed the school power plant. Mechanical Engineering Exhibit included a blue-printing machine which made souvenirs for visitors, and showed cut-away models of motors and machines and mechanical devices.

The Mechanics Department in the basement of the chemistry building showed a working model of the Ralston Creek Dam Spillway, apparatus for measuring friction loss, research work in metallurgical pulp transportation, a turbidimeter and a vacuum vapor turbine.

The school exhibits were probably the most interesting ever shown. A great amount of time for several months previous to Engineers' Day was spent by a large committee of students and a number of professors in preparing these departmental exhibits for this occasion.

A highlight of the program of the day was the noon activity in the new field house. Here during the noon hours, over five hundred people had lunch and examined the twenty-odd industrial exhibits. The six social fraternities on the campus cooperated in serving lunch to the large group of people.

The field house proved to be an ideal place for the exhibition of industrial equipment. The following firms exhibited, many of whom brought heavy operating machinery to Golden:

Gardner-Denver Company—Automatic mucker operated from a portable compressor.

C. S. Card Iron Works Company—In conjunction with above exhibit, furnished track and ore car.

Denver Fire Clay Company—New electric assay furnace in actual operation with large display of products.

The Dorr Company—Many fine and beautifully constructed operating models of ore-dressing equipment.

Western Machinery Company—

Rock drills of all types and sizes operated from a portable compressor, and other compressed air machinery.

National Fuse and Powder Company—New types of fuse, caps and dynamite.

Morse Brothers Machinery Company—Many types of milling and ore-dressing equipment, the smaller units of which were in operation.

Heiland Research Corporation—A seismic recording truck and a portable rotary drilling rig.

Allen Bearings Company—A display of various types and qualities of bearings.

General Electric Company—A control device in connection with a cut-away motor.

Climax Molybdenum Company—Molybdenum samples of ore to molybdenum steel.

The National Supply Company—Oil well equipment, rock bits, fishing tools, deep hole tubing, etc.

Urquhart Service—An operating display of Ajax screens, carbon dioxide fire extinguisher and other operating and model equipment.

Colorado Iron Works—Models of Akins classifiers and thickeners.

Mine and Smelter Supply Company—The display and operation of a density controller.

The Golden Fire Brick Company—A complete and large display of all types of refractories and building bricks.

These industrial exhibits in the field house found another valuable use for the new building, and also gives to the Colorado School of Mines one of the best locations in the country with the best facilities of display for the showing of these industrial exhibits.

After the inspection of industrial exhibits, a general assembly gathered in Guggenheim Hall at 2:15 p. m. Here Dr. M. F. Coolbaugh opened the assembly with a short welcome message, and introduced various speakers concerned with Engineers' Day. Following a few short talks, the dedication of the new geology-geophysics building, Berthoud Hall commenced. Dr. E. L. DeGolyer, speaker of the day, gave the dedicatory address in a survey of the geological and geophysical developments of the United States. Following this talk, the assembly heard several other speakers connected with the dedication of the new building, and prominent guests of the day were introduced.

At the assembly awards were made to the winners in the American Institute of Mining and Metallurgical Engineers' technical paper contest sponsored by the Colorado Section by Mr. Frank E. Briber. One hundred ten dollars was given in prizes to stu-



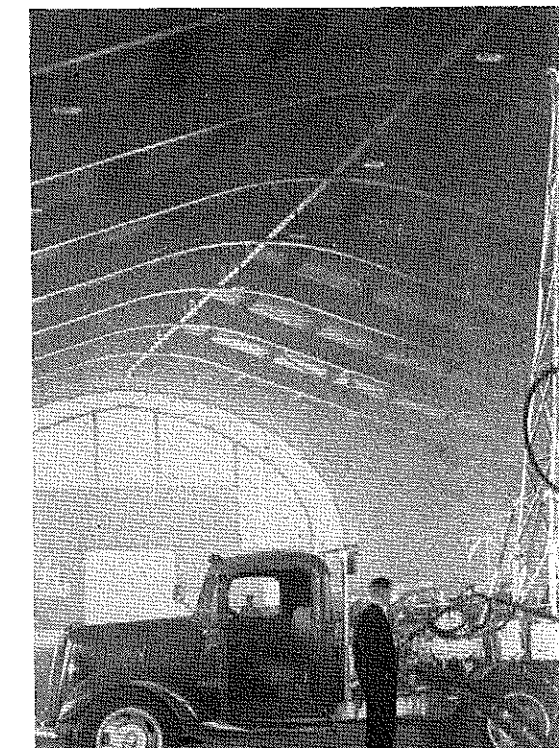
▼ Dean Morgan and winning High School students.

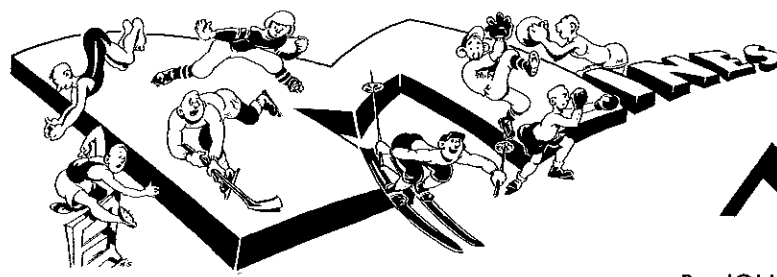
dents in this local contest. Also, the five scholarship awards were made by Dean Morgan to the winning students from the morning's competition. Sigma Gamma Epsilon honorary fraternity presented a slide rule to the outstanding freshman during the school year.

Following the dedication exercises in Guggenheim Hall, the group proceeded to Berthoud Hall where a brief and simple ceremony dedicating the new building was witnessed, after which the building was opened to all visitors for the first public display of the entire structure.

Engineers' Day this year was placed entirely in the hands of a committee of twenty-four students. Its success depended upon the great amount of cooperation received from the school, the students and the engineering profession.

▼ Portable Drilling Rig Heiland Research Corporation.





Sports MARCH

By JOHN A. BAILEY

Nineteen forty is destined to go down in the school's history as one of the greatest years in sports ever recorded at Mines. The past year has seen the rejuvenation of Mines football as one of the greatest elevens ever to represent the school, finishes its season undefeated and untied. It will be remembered as the year that Lloyd Madden made football history by being the first Mines gridiron luminary ever to be selected for a berth on an All-American team, and it will be remembered as the year in which the basketball team made a complete reversal of form by breaking a three season string of defeats by finishing its season in a second place tie for the conference championship.

In the fall Coach John Mason, beginning his third year as coach, commented on the team's chances for the season at its first practice session with the statement that, "We will be better than last year," but adding, with the pessimism that seems to be traditional with gridiron mentors, that he felt that other conference teams figured to be much better. He was right in both predictions. The team went through its eight game schedule without a loss in the face of strong opposition by such teams as the Greeley Teachers.

But it was far from any such thing as a foregone conclusion that Mines would win the Conference Championship in an undefeated season. Even with fifty promising prospects, Coach Mason still had the job of finding somebody to fill Harley McDonald's shoes. After the first game when the team beat Aggies with Lloyd Madden snatching the fat from the fire to grab a pass and run for the winning touchdown in the closing minutes, Mason found his running back.

With a strong pair of tackles in Moe and Katzenstein, Mason was able to build a strong running attack with Madden as the nucleus. It was this running attack that beat Nebraska State Teachers, 32-0, in the second game of the season. In that game Madden, made 18 points to bring up his total in two games to five touchdowns giving him a running start toward his standing as the top scorer in the nation for the season.

In the backfield with Madden, Jack Torpey, Joe Berta, Harry Tanaka, Randy Taylor, and Harry Campbell formed a secondary that was hard to stop. Torpey, playing his last year, took the brunt of attack in his job as blocking back, and it was his effective blocking together with that of Lou DeGoes, sophomore end and a deadly downfield blocker that paved the way for many of Madden's runs. Berta, a Rock Springs, Wyoming product, counted heavily in the kicking and passing assignments.

The team gathered confidence as it rolled through its schedule. Montana State took it on the chin, 20-7, in a game with Madden and Berta getting headlines; then the team turned out the following Saturday to wallop C. C., 50-7, for a homecoming alumni. Moe, Katzenstein, and Torpey made names on that day both on defense and offense.

After the team beat Western State by the lop-sided score of 71-7 for its sixth straight victory of the season, talk of a post-season bowl game started



▼ Fred Nagel Intercollegiate Ski Champion 1938.

in the region. Mines was then the only team in this part of the country still undefeated and untied. Several organizations made approaches on the possibility of a post-season game with the winner of the C. U.-D. U. game and of a possible game with a Southwest team.

Kearney and Regis fell on successive Saturdays and Mines completed what was probably the most amazing football season in the school's history, its first undefeated season in twenty-one years.

Nineteen forty saw the completion of the careers of some great players. There was Herb Thornton, deemed by his coach "the smartest center in the conference," and there was Rex Flynn, 200 pound varsity end for three years. There were Dave Gieskieng, Nick Shiftar, Gardner Blythe, and George Yeager, who fought all season in competition with one another for the guard positions. Bill McGlothlin and Joe Richleski will be remembered as players who played on the Rocky Mountain Conference Championship team of 1939-40.

Skiing

This year Fred Nagel ends his career at Mines as one of the most outstanding skiers the school has had in years. He has won skiing championships every year since he entered school four years ago. The intercollegiate skiing championships won in two of his years here and its record as runner-up for two years has been due largely to his performances.

As an entering frosh in 1936, he took the intercollegiate championship in the slalom; in his sophomore year, he was high point man in the championship meet winning first in both the Downhill and in the Slalom, and he was second in jumping. Mines won the championship both years. Nagel won the slalom and finished third in the downhill race in his junior year, and this year he has been outstanding as high point man in all meets but one, and in that one he had a first place tie. Mines was runner-up to a fine Boulder team during the past two years.

Nagel, a mining senior, is the present captain of the ski team, presi-

dent of the Ski Club, and is president of the Intercollegiate Ski Union. The Ski Union is a federation of all ski clubs in the region.

With four men aside from Nagel graduating, it is difficult to tell how good the team will be next winter. The team this year lost meets because there were no jumpers on the team to win first places, and if a jumper can be discovered the team may get back in the running even with their loss in such men as Nagel, Herb Treichler, Walt Heinrichs, and Jorn Dowling, who have garnered a good many second and third places during the year.

Robert Hopper, a sophomore transfer from D. U. has done well in this winter's meets and should be capable of getting a good many points next winter. Clarence Levoe and Dick Burrows, two freshman skiers, will return to the team, and Angus Robertson, a Canadian student, should be back for the meets. Dr. Phelps, ski coach has a question mark team that won't be rated until the snows begin to fall again.

Spring Football

Fifty football hopefuls finished three weeks of spring practice recently with several intersquad scrimmages and a large amount of drilling on fundamentals. The linemen worked hard on blocking and tackling, while the backs polished in running, kicking, blocking, and passing.

From these fifty men, Coach Mason hopes to pick a first string that can build a record to compare with last year's championship team, and with thirteen seniors to replace, he's going to have his hands full. He has fourteen lettermen returning next fall. Among these men are eight backs with at least one year of experience. These men are: Art Wood, Joe Berta, Randy Taylor, Clint Edwards, Hal Rogers, Harry Bane, Harry Campbell, and Harold Eakin, who will return to the team next fall. Among the linemen who have earned letters and who will be trying for starting assignments next fall will be

▼ 1940 TRACK TEAM

Front Row, left to right: Allen Berg, Bill Hammond, Harry Tanaka, Kenny Hueckel, Alex Jamieson, Woody Todd.

Middle Row, left to right: Tabor DePolo, Stan Stocker, Glen Hutchinson, Lloyd Madden, Dick Shaw, Lester Spencer, Nobby Tashiro.

Back Row, left to right: Jack Roberts, Joe Berta, Bob Hartman, W. E. Hensela, Jack Roeschlaub, Robert Patterson, Bob Moore, Coach Esslinger.



Clay Creager, an end; and 175 pound intramural boxing champion; Lou DeGoes, first string end last fall; Glen Hutchinson, 180 pound center; John Gargan, guard; Bob Pruess, and Dick Moe, tackles.

From the reserves of last year; Franz Lupton, William Schiele, Robert Rehgger, John Seeman, Al Moore, Robert Wisener, George Kiersch, Noburo Tashiro, Jack Roeschlaub, Robert Shanley, James Hankett, Phil Hammond, and Stanley Shaffer will be trying for starting assignments.

Mason expects to find in Joe Berta, Harry Campbell, and Carter DeLaitre material for a good kicking and passing attack. He has declared that he wouldn't trade any of these tailbacks for any others in the conference. In this squad of fifty men, the biggest spring practice squad on record, are Elkins at blocking back and Shanley and Roeschlaub, wingbacks. The prospect of playing a game with Fresno State in California next fall is keeping enthusiasm and a strong competitive spirit among team members.

A crop of frosh players are getting ready to turn sophomore with a bang next fall. Several graduates from Golden High School are showing promise, according to Coach Mason. Among them are Speies, Kerr, Shallenberger, Spain, and Olmstead.

▼ 1940 BASEBALL TEAM

In Front: Bill Parisi, Art Wood.

Seated, left to right: Jerome Zohn, Randy Taylor, Ed DeLega, Kurt Mohler, MacDonnell, John English, Bob Hancock, Coach Signer.

Standing, left to right: Angus Robertson, Dale Strohminger, Bob Wilson, Rex Flynn, Dan Dunn, Elmore Pelouber, Charles Grimes, Joel Moss, Bob McPhee, Bill Roberts, Charles Fogarty, Dean Thompson, Charles Steifken, R. L. Scott, "Shorty" Heglund.



Ted Stockmar another large size edition in tackles is looking well in the practices. Hallman and Bodine backs are showing up exceptionally well, Mason stated. Van Saun, Tempus, Gallaher, Keating, Ruggs, Seerly, Morrison, McKinnis, are expected to give plenty of support in the fall gridiron sessions.

After looking over his fifty hopefuls Coach Mason stated: "I feel that with all these boys—with three weeks of practice ironing out weak spots—that next year's squad should round up as a dangerous contender for repeating the championship. Every team in the conference will be pointing for us next fall."

Baseball

Faced with the task of replacing Ian McNab, star hurler of the 1939 season, Coach Signer is attempting to rebuild his weakened pitching staff. To date, the two men, who appear to be capable of taking over the job are lanky Joe Moss, also an experienced pitcher of last year's team, and Bill Roberts, promising Junior transfer student. With almost all of the rest of the squad back, Coach Signer's worry is chiefly that of finding a competent pitching force.

With two practice games with Denver teams, played early in the season the baseball team met a strong Boulder squad two Saturdays ago and were blanked by 4-0 score. A return game scheduled to be played on the following Saturday was rained out. In the game at Boulder, Bill Roberts, making his first appearance in a Mine's uniform pitched a fine game in allowing the Buffs but nine hits, scattering five of them and allowing but three in one inning. He issued no passes and sent four down by the strike-out route. Moss played his usual steady game. The Orediggers' weak spot in the game was their poor showing at the plate. In the field their strength was equivalent to that of Colorado University. The school was only able to garner three singles to Boulder's nine, ten Blasters swinging at nothing

more than vagrant breezes in the entire game. It is hoped that with increased emphasis in future practice sessions on hitting practice the team's percentage can be raised before the season progresses much further. Randy Taylor, Rex Flynn, and Shorty Heggglund, were the only Miners to hit safely.

Randy Taylor was the leading hitter in the conference last year with a seven game average of .560. He is expected to add power at bat again this year. The Orediggers have games scheduled with Denver University, Greeley Teachers, Colorado College and Regis College.

Track

Paced by Lloyd Madden, the Mines' tracksters gave a fine performance, recently, in Colorado University's annual indoor invitational track and field meet.

Madden gave an exhibition of his celebrated speed in the 50-yard dash, when he ran that distance in 5.5 seconds to tie the existing meet record. Trailing in second and third positions were Learned and Puett, of C. U.

In the low hurdles, which he has not run until this year, Loping Lloyd came in third. This event was won by Cope of C. U., who lowered his old record of 5.9 to 5.6. Learned was second.

Coach Esslinger was pleased with the showing the squad made. "I took only twelve men to Boulder," he said, "and all of them got into the finals. We should do pretty well in conference competition this year."

Miners placing in the finals were: Madden, first in the 50-yard dash and third in the low hurdles; Berta, tie for second in the pole vault; and DePolo, third in the 880.

Woody Todd, leading 440 runner in the conference, qualified in the preliminaries with a faster time than won in the finals, but was unable to place in the top three for the event. Todd's

preliminary time was 53.0 while the winner's time in the finals was 53.3.

Track meet results:

50-yard dash: Madden, Mines; Learned, C. U.; Puett, C. U. Time: 5.5 (tied old record).

880-yard: Bristol, C. U.; Veach, C. U.; DePolo, Mines. Time: 1:58.8 (new record).

Low hurdle: Cope, C. U.; Learned, C. U.; Madden, Mines. Time: 5.6 (new record).

Pole vault: Barnes, C. U.; Berta, Mines, and Hoggatt, D. U. tied for second. Height 13 feet (new record).

Nineteen forty produced a basketball team which was remarkable not so much because it was able to finish a twelve game schedule in a second-place tie with Colorado College, but because of the complete surprise its record was to everyone but the second-guessers, who, of course, knew it all the time. To the rest of us, the team appeared to be nothing more than a green bunch of sophomores and one lone senior veteran who were considered capable of little more than one or two scattered wins during the season—just enough to keep the school from adding one more year to its discouraging total of four victoryless seasons.

Even after the season had started, the teams' possibilities were scarcely hinted at by three straight defeats in a two game series with Colorado College and a defeat by Greeley. It is unfortunate that the school had C. C. on its schedule for the first two conference games. Perhaps, if the team had been able to schedule these games with the Colorado Springs quintet later in the season, outcomes might have been more favorable. At any rate, the contests would have provided more inspiration for the sports writers' use of the superlative.

In its early weeks of practice the team had yet to develop one man to sparkle above the rest of the players—

a situation often developing on basketball teams, where one man stars. Curiously enough when individual players did begin to stand out later in the season, it was not one man that took the limelight as a scoring threat, but three. It was diminutive "Shorty" Heggglund, the squad's lone senior, tall Lee Talbott, and sophomore Hal Rogers, that vied closely with one another for scoring honors. All three of these men were among the top four scorers in the conference, and Hal Rogers came out at the end of the season with 147 points to beat out Talbott and Heggglund in that department and to win scoring honors in the conference. Bousman and Comstock, a junior and a sophomore, held starting spots for most of the season on this team which probably never did reach its peak performance in more than one or two games.

After dropping its first three games in succession, the team skipped thru its remaining nine games with only one defeat, but it was not enough to win a championship. Montana State with only four games in conference play won the crown by winning three out of the four games. Despite the fact that Montana played only four games (Mines did not play Montana), the team can not be underrated and Montana would probably still have won the championship with all the conference teams on her schedule.

The sweetest victory of the year was not one won in a conference game, but it was the 36-32 win over Denver University of the Big Seven in the National A.A.U. tourney that gave Mines' fans their greatest thrill.

Coach Neighbors, who deserves a great deal of credit for doing a fine job with good material in his initial year as coach, believes with the loss only of one man, "Shorty" Heggglund, that next year should see the school with a more experienced team and consequently a better one.

MINES All Americans

Two seniors at the Colorado School of Mines are rated as outstanding athletes of the Rocky Mountain Region. Lloyd Madden and Marvin Katzenstein, although two distinct types, have football as their common interest. Both men have been drafted to play professional football but will continue their work in the field of engineering.

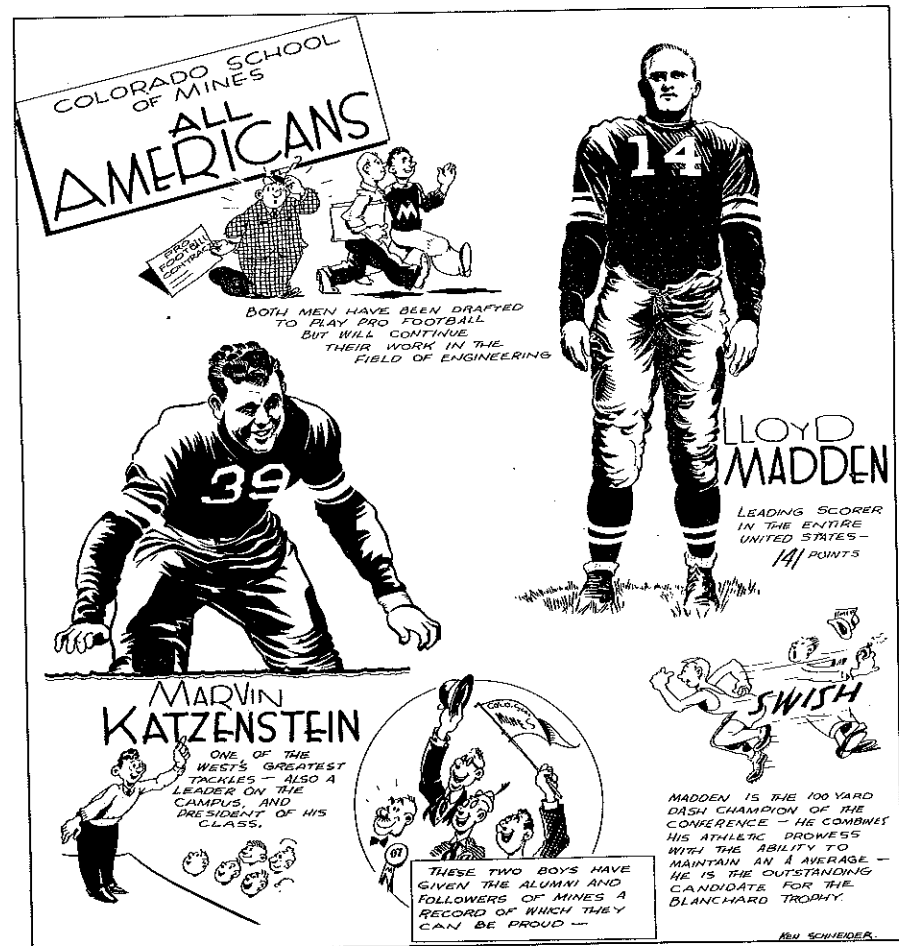
Lloyd Madden, who is only twenty-one, entered the Colorado School of Mines in February, 1937. He came from Manhattan, Kansas with four years of high school football and track experience. In his first year at Mines, Madden earned his letter at wing back position. Although fast his football playing still showed the lack of experience.

In the spring of 1938 Madden proved himself a valuable track man for Mines by becoming the outstanding sprint man in the Rocky Mountain Conference and winning first place in the 100-yard dash of the Colorado relays.

When the football season started in 1938 a much improved Madden was noticed. At the close of the season he led the Rocky Mountain Conference with 30 points. It was during this season that Coach Mason began the development of the weak-side attack that was instrumental in making Mines the champions of 1939.

Another track season in 1939 added still more to his speed and brought additional honor to Mines. This year Madden was conference champion in the 100-yard dash and placed second in the 220. In the indoor meet at Boulder he won the 50-yard dash; beating Crosby, the Big Seven Conference champion.

Madden plunged into the 1939 football season with even more than his usual enthusiasm. He seemed determined to outdo himself for Mines in his last year of academic sports. Each game saw him piling up the scores. Fans came to see Madden lead the team in his spectacular runs. The team gave him one hundred percent cooperation and he received perfect blocking. When the final game was played, Mines had the outstanding back in the U. S. leading the scoring with 141 points. For his remarkable work, Madden was awarded the Williams trophy as the most valuable player and was placed on the first little All-American team.



On the campus Madden is as quiet and unassuming as ever. The honors that he has won have been for the school and not his own personal glory. The same enthusiasm that he puts into sports goes into his class work. He maintains an "A" average and is a candidate for Tau Beta Pi. He is also a member of Sigma Gamma Epsilon, professional engineering fraternity for juniors and seniors with high scholastic standing.

The offer of the Chicago Cardinals to play professional football will be declined because Madden plans to come back to Mines next fall and complete his work for a degree in petroleum engineering.

Before the year is over, Madden hopes to add one more trophy to his list for Mines. He is one of the leading candidates for the Blanchard trophy which is awarded to the outstanding athlete of Colorado each May.

Marvin Katzenstein came to Mines from Council Bluffs, Iowa one year before Madden. He was married the next year and now has a son. According to "Daddie Kats", Marvin Jr. will be the star of the 1960 Mines football team.

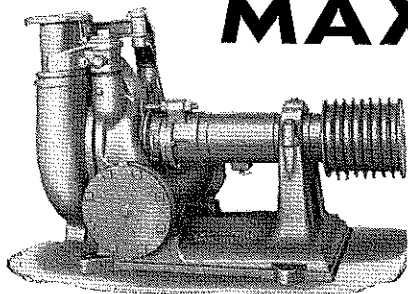
Katzenstein has been a stalwart tackle for the three years he has

played at Mines. In 1938 he was named all-conference tackle. Again in 1939 this honor was awarded him. This time, however, it was the unanimous choice of both sport writers and coaches. He was placed on the second little All-American team and was considered one of the best tackles in this region.

Katzenstein's spirit and determination was, in all probability, the backbone of the team's defensive record. Coach Mason considers him one of the best linemen that has ever reported at the Colorado School of Mines. Although he did not participate in any other sport, Katzenstein was an outstanding man in the intramurals for the four years he has been in school.

On the campus, Katzenstein is a leader. President of his senior class, he was recently appointed Cadet Colonel of the Mines R.O.T.C. unit. He is a member of the Alpha Tau Omega fraternity, the Scabbard and Blade, and A.I.M.E.

In all probability, Katzenstein too will refuse the offer to play professional football for the Pittsburgh Pirates. He will complete his work in May and receive a degree in mining engineering. Already he is investigating the prospective positions that he will soon be able to accept.



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W. C. Douglass, '11
 Mining Engineer
 Hedley British Columbia

Thomas S. Harrison, '08
 Consulting Oil Geologist
 1104 First National Bank Bldg.
 Denver, Colorado

Harlow D. Phelps, '10
 Mining Engineer
 U. S. Mineral Surveyor
 Prescott Arizona

PERSONAL NOTES

Bradford Bailey, '37, has moved his residence to 43 Bellwood Place, Elizabeth, N. J. He is in the Process Laboratory of the Standard Oil Development Company.

J. C. Ballagh, '10, Patterson-Ballagh Corporation, Los Angeles, and *I. B. Williams, '11*, Williams Oil Flow Process, Inc., Tulsa, Okla., have been successful in the manufacture and sales of devices for the petroleum industry.

E. V. Bauserman, '25, Valuation Engineer for the U. S. Bureau of Internal Revenue, has been transferred from Washington, D. C., to Dallas, Texas. His street address is 3812 Lemmon Avenue.

Kenneth Bowie, '30, is back in the States after some time spent in Havana, Cuba. He is now being addressed in care of the Exploitation Department, Shell Oil Company, Shell Building, Houston, Texas.

Charles W. Bowman, '36, Sales Engineer for General Electric Company, has been transferred to Los Angeles, Calif., his address being in care of the company.

Lewis H. Boyd, '36, Party Chief for Gravity Service Company, has a change of address to Box 710, Kascinsko, Miss., which will probably be all right for the next two or three months.

L. J. Brewer, '39, recently accepted a position with the Combined Metals Reduction Company and is being addressed at Pioche, Nevada.

C. C. Brook, '23, is Engineer for the Log Cabin Mines Co., at Leevining, California. *Wm. A. Perkins, '27*, recently joined him there as his assistant.

Prentice F. Brown, '20, who for several years has been Manager of Texas Division, Honolulu Oil Corporation, was recently elected as a Vice-President. He first became associated with this company as Geologist in the Rocky Mountain district and when they decided to enter Texas, he was placed in charge and given a complete staff of office assistants. Credit for a large part of the success of the Honolulu company is given by oil men to the personnel of the Texas organization, signalized in the promotion of the head of this unit.

John W. Bucher, '02, Engineer for the Colorado Iron Works Co., resides at 1080 Sherman Street, Denver, Apt. No. 205.

Luther J. Buck, '20, has received another promotion from the American Smelting & Refining Company. His new position is that of Manager of the Federal Plant at Alton, Illinois.

John J. Cadot, '13, as Vice-President and Works Manager of Hardinge Company and *H. W. Hardinge, Hon. '17*, Chairman of the Board, are responsible to a great degree for the manufacture of the Hardinge Ball Mills.

M. Edward Chapman, '27, Vice-President of The Chemical Process Company, Inc., has developed a method of introducing an emulsion breaker in kerosene ahead of the acid when acidizing wells.

G. W. Clarke, '23, first became associated with the Dixie Oil Company and then went out on his own, later joining a small independent firm. When the Stanolind Oil and Gas Company was organized in 1931 they secured his services and made him manager of the Land Department, the position he now holds.

(Continued on page 214)

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 1640 Blake St. Denver, Colorado

Wm. D. Waltman, '99
 Franco-Wyoming Oil Company
 601 Edison Bldg., Los Angeles

Elmer R. Wilfley, '14
 Wilfley Centrifugal Pumps
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Mining—Ore Dressing
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Concepcion del Oro, Zac., Mexico

Charles L. Brown, '08
Butterfly Consolidated Mines
Ophir Colorado

Harold H. Christy, '22
Colorado Fuel & Iron Corporation
Pueblo Colorado

The Wilkinson Company
Manufacturing Metallurgists
Mearle W. Wilkinson, '13
John N. Teets, '15
Chas. W. Teets, Ex-'17
Santa Monica
California

T. W. Callahan, '14
San Antonio
Texas

Robert S. Cockle, '33
Mining Engineer
Standard Silver Lead Mining Co.
Wilborn Montana

W. F. Koch, '11
Manager
Hercules Powder Company, Inc.
910 Kearns Bldg. Salt Lake City, Utah

Lester S. Grant, '99
Manager
McElroy Ranch Company
Crane Texas

R. L. Stark, '31
Crucible Steel Co. of America
Crusca Drill Steel Resistal Stainless Steels
2635 Walnut St. Denver, Colo.

Arthur E. Falvey, '34
Resident Engineer
Colorado & Utah Coal Company
Mt. Harris Colorado

PERSONAL NOTES

(Continued from page 212)

Merle A. Cook, '33, is doing mill construction work for E. L. Sweeney at Carlsbad, New Mexico.

S. D. Cunningham, Jr., '21, is Manager, Crane Company, Salt Lake City, Utah.

Ralph Curtis, '26, is in the Engineering Department of the Barnsdall Oil Company at Tulsa. Immediately after his graduation from *Mines* he connected with the Gulf Oil Company where he remained several years. When the Barnsdall were in need of a Proration expert they found Curtis and he has since been associated with them serving as Proration Engineer.

Willis K. Daggett, '35, who is employed by the Shell Oil Company is at present being addressed in care of the Geology Department, Wichita Falls, Texas.

K. F. Dallmus, '27, Geologist for the Standard Oil Company of Venezuela, has been transferred to Caracas, Venezuela with Apartado number 1329.

George A. Davidson, '31, Assistant Engineer for the Soil Conservation Service, is located at Custer, So. Dakota, Box 92.

Paul Davis, '39, has joined the staff of the Creede Mills, Inc., at Creede, Colorado.

C. W. DeLong, '39, is employed by the Traylor Engineering & Manufacturing Co. and resides at 204 So. Madison Street, Allentown, Penna.

Tenney C. DeSollar, '04, Superintendent of Ore Mines, Woodward Iron Company, is in a Birmingham, Alabama, hospital, with a broken pelvis. He just escaped being killed in an accident underground the middle of last month. He was caught between the side wall and the trip.

E. J. Dickinson, Ex-'18, Valuation Engineer for the Stanolind Oil & Gas Company at Tulsa, got his start with the Dixie Oil Company in 1929 working as scout in the Wichita Falls district.

Leonard Doolittle, '29, District Representative for Gates Rubber Company, resides at 2916 Yale Street, Dallas, Texas.

F. A. Downes, '13, joined the staff of The Dorr Company, Inc. in 1919. Two years later he was assigned to the Development department where he has since been continuously. For the past fifteen years he has managed all research and development work done by his company.

George V. Dunn, '20, spent the first five years of his career with Shell Oil Company doing geological work in Oklahoma, Kansas, Wyoming, Utah and Montana. He then became associated with the White Eagle Oil and Refining Company where he rose to the position of Chief Geologist from which he resigned in 1929 to enter private business. He makes his headquarters in Tulsa.

Donald Dyrenforth, '12, has recently been elected to membership in the Chemical, Metallurgical and Mining Society of South Africa.

L. E. Elkins, '34, joined the staff of the Stanolind Oil and Gas Company at Winkler, Texas, upon his graduation, where he served for two years as Roustabout, Apprentice Engineer and Field Engineer, then was transferred to Tulsa in the Petroleum Engineering department.

(Continued on page 216)

Professional CARDS

Norman Whitmore, '26
Minerals Engineering Co.
Assayers—Engineers
417 South Hill St. Los Angeles

Tracy Bartholomew, '06
Consultant on
Utilization of Blast Furnace Slags
Mellon Institute Pittsburgh

Horace F. Lunt
Consulting Mining Engineer
507 Boston Bldg. Denver, Colo.

A. F. Hewitt, '05
Assistant State Highway Engineer
Denver

Robert S. Stockton, E.M., '95
Consulting Engineer
Irrigation and Land Development
Craigantler Ranch, Thompson Falls, Mont.

Roy B. Munroe, '29
Sales Director—South Sales Section
The Peoples Gas Light & Coke Co.
846 W. 63rd St. Chicago

Webster P. Cary, '10
Mining Engineer
233 E. Plaza St. Reno, Nevada

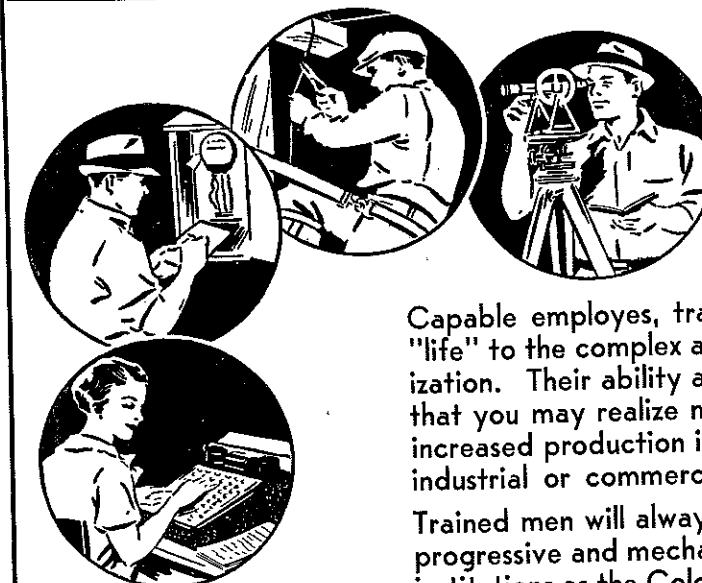
George Pasquella, '24
Consulting Geologist
503 Ramsey Tower Oklahoma City, Okla.

Harry J. Wolf, '03
Mining Engineer
501 Fifth Avenue New York, N. Y.

Harry M. Fiske, '21
Ingersoll-Rand Company
Manager Los Angeles Branch
Los Angeles, California

Robert L. Olund, '37
Ingersoll-Rand Company
Sales Engineer—Los Angeles Branch
Los Angeles, California

Ray Lee, '23
Lee Wholesale Grocery
Bellingham Washington

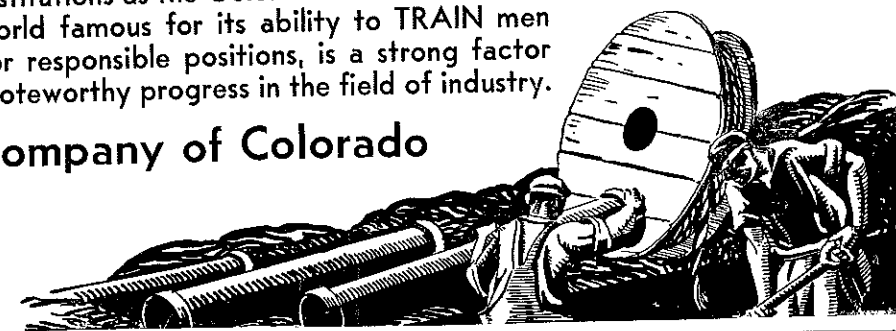


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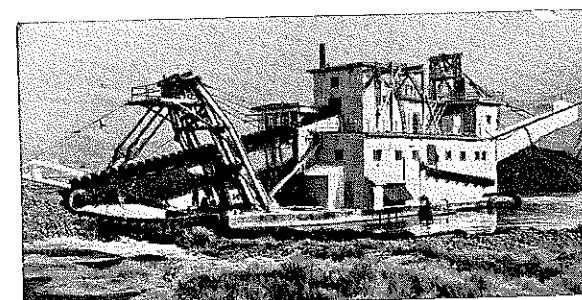
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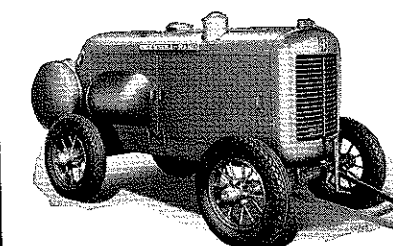
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Harry R. Grace, Ex-'34
Industrial Sales
The Sherwin-Williams Co.
1632 Arapahoe St. Denver, Colo.

Allen E. Hambly, '23
Patent Attorney
Byron Jackson Co.
Los Angeles Calif.

Knutsen and Terrill
A. O. Knutsen, Ex-'26 A. C. Terrill, '05
Mining Machinery Brokers
813 No. Los Angeles St., Anaheim, Calif.

Marshall D. Draper, '97
Engineer of Mines and Metallurgy
443 So. Peck Drive Beverly Hills, Calif.

Tenney C. DeSollar, '04
Mining Engineer
Bessemer Alabama

Walter G. Lofgren, '28
Ingersoll-Rand Company
Sales Engineer—Los Angeles Branch
Los Angeles, California

John H. Wilson, '23
Geologist and Geophysicist
Vice-Pres. Independent Exploration Co.
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J. C. Wilkerson, '31
Wilson Supply Company
Nixon Surface Control Gas Lift System
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Charles T. Baroch, '23
Metallurgical Engineer
Specializing in Process Research
8130 Evergreen Ave. South Gate, Calif.

Dan H. Griswold, '30
Assistant Agricultural Engineer
U. S. Soil Conservation Service
Price, Utah

H. E. Nyberg, '06
Mining Engineer
V. Carranza Num. 37, Depto. 4
Mexico, D. F., Mexico

PERSONAL NOTES

(Continued from page 214)

John R. Evans, '23, after several years spent in mining at Park City, Utah, joined the Midwest Refining Company at Denver in the Exploitation Department, spending considerable time in Denver, Wyoming, Montana and in Abilene, Texas. In 1931 Stanolind moved him to Tulsa in the Petroleum Engineering Department; in 1933 he was transferred to Casper as Division Engineer and in 1935 back to Tulsa as Chief Production Engineer.

Glen E. Fassler, '29, sailed recently for Peru, where he will be associated with the Andaray Gold Mines at Lima. His mail address there is Casilla 1825.

Ralph Finlay, '39, receives mail at Box 203, Telluride, Colorado, where he is employed by the Veta Mines, Inc.

Henry Forbes, '38, has been transferred from Wyoming to Texon, Texas, (Box 488) by the Continental Oil Company, where he is now doing work in their Pipe Line department.

Homer D. Ford, '05, has for many years been Manager of the gilsonite mines of the Barber Asphalt Corporation, in the Uintah Basin, Utah.

G. L. French, '13, as Engineer for Pfizer & Company, Inc., of Brooklyn, N. Y., is in charge of maintenance and new construction. His company manufactures drugs and pharmaceutical products.

Daniel C. Frobes, '24, President of Daniel C. Frobes Company, Salt Lake City, markets mining supplies and equipment.

Pedro Garcia, '36, is employed by the Masbate Consolidated Mining Co., Rio Guinobatan, Masbate, P. I.

P. H. Garrison, '39, is in Opelousas, La., doing seismograph work for the Stanolind Oil & Gas Company.

Wm. M. Gebo, '23, started working for the United Verde Copper Company at Jerome, Arizona, upon his graduation. After two years he went to Honduras, Central America, to look after a mahogany concession which he and his brother obtained. Tiring of this he joined Ingersoll-Rand in 1926, working at Phillipsburg, New Jersey, and Painted Post, New York. He was then sent to Dallas, Texas, for a short stay and then to Tulsa where he has since represented his company.

Karl F. Geib, '11, resigned his position as General Superintendent of the Molybdenum Gold Mining Company at Mammoth, Arizona, and is at present at his home, 2020 South Grant Street, Denver.

Marcus Geiger, '37, has completed his work in Trinidad, B. W. I. for the Seismograph Service Corporation and is now being addressed in care of the company, 709 Kennedy Building, Tulsa, Okla.

Jack Greenspoon, '26, who is doing petroleum development work for Hall-Baker Company of Wilmington, California, makes his home in Long Beach, 3740 Lewis Avenue.

Donald C. Gregg, '22, is Geologist for the Virac Mine in the Baguio district, Philippine Islands. They have recently uncovered a new ore body and find it necessary to build a mill. Gregg makes his home at the Pines Hotel, Baguio.

(Continued on page 218)

Professional CARDS

Ninetta Davis, '20
Geologist
U. S. Geological Survey
224 Custom House Denver, Colo.

W. Ross Wilson, '31
Special Field Representative, Giant Div.
Atlas Powder Company
Salt Lake City Utah

E. Dowden, '20
Consulting Mining Engineer
1198 Grant St. Denver, Colo.

Frank B. Harris, E.M., '13
Engineer of Mines
U. S. Smelting Refining & Mining Co.
Designer of Solasco Hook Spad and Tag.
See ad page 154 this issue.
1366 Glenmore St. Salt Lake City, Utah

Robert O. Howell, '39
Engineer
James R. Howell, General Contractor
1030 W. 6th Ave. Denver, Colo.

E. H. Frenzell, '21
Equipment Engineer
Grazing Service Dept. of Interior
Washington, D. C.

Will V. Norris, '21
Consulting Engineer
Specializing in Illumination and Acoustics
University of Oregon
Eugene Oregon

Geo. W. Mitchell, '23
Manager
Matachewan Consolidated Mines, Ltd.
Matachewan Ontario

T. C. Doolittle, Hon. '27
Colorado School of Mines
Golden Colorado

Joshua L. Soske, '29
Geologist and Geophysicist
Pres., Geophysical Engineering Corp.
199 S. Fair Oaks Ave. Pasadena, Calif.

P. J. McGuire, '15
Oliver United Filters, Inc.
San Francisco California

C. D. Frobes, '24
Edgar Clays
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McIntyre Georgia

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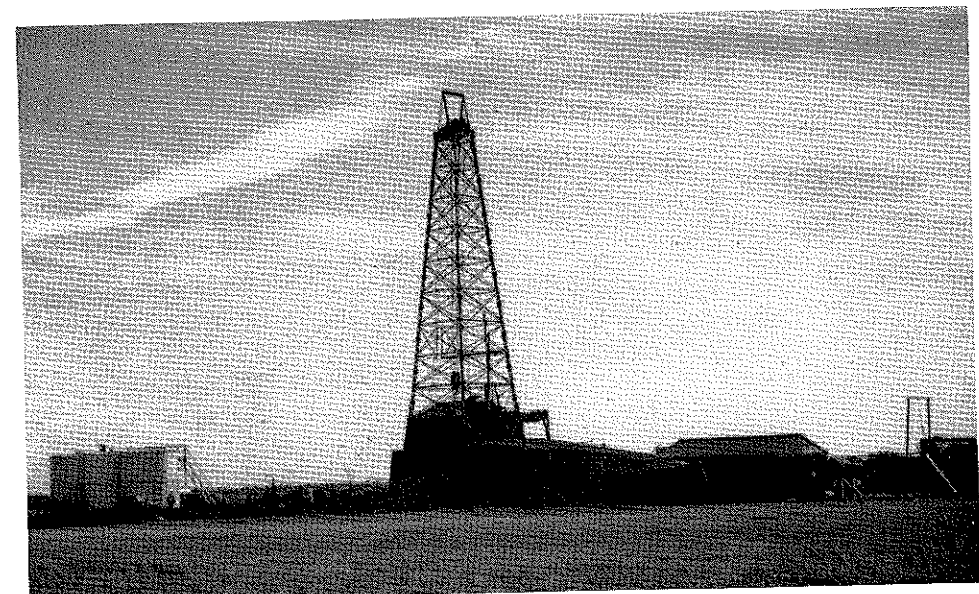
Harvey Mathews, '13
18 years with Stearns-Roger.
Sales Engineer in charge of
Mining Dept. Made a Director
of the Company in January, 1940.

Harry McNeill, '24
12 years with Stearns-Roger.
Sales Engineer covering
the Black Hills, Butte, and
Salt Lake City territory.

Chas. S. Beech, '26
4 years with Stearns-Roger.
Sales Engineer covering
Colorado, Nevada, and
California territory.

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F. S. McNicholas, '14
Mining Engineer
Climax Colorado

H. C. Armington, '07
Armit Laboratories
Thread and Gasket Compounds
Los Angeles California

Ralph J. Schilthuis, '30
Petroleum Engineer
Humble Oil & Refining Co.
Houston Texas

John William Bucher, '02
Mining and Metallurgical Engineer
Colorado Iron Works Co.
Denver Colorado

Bruce B. LaFollette, '22
Chief Assayer
U. S. Mint
Denver Colorado

Grace C. Mulligan, '03
Assistant Physicist
U. S. Bureau of Standards
Washington D. C.

Kenneth E. Hickok, '26
Golden
Colorado

Daniel C. Frobes, '24
Mine Ventilation
312 Dooly Bldg. Salt Lake City, Utah

Neil O. Johnson, '33
Technical Representative
E. I. duPont de Nemours & Company, Inc.
1030 Brown Marx Bldg. Birmingham, Ala.

Scott H. Sherman, '04
Mining Engineer
1132 Washington St. Denver, Colo.

Hubert E. Risser, '37
Engineer—Colta Mine
Alabama By-Products Corporation
Flat Creek Alabama

Earl D. Bristow, '37
Tennessee Coal Iron & R. R. Co.
Pratt City Alabama

PERSONAL NOTES

(Continued from page 216)

Sid Hanley, '34, dropped in the Alumni office recently on a trip to Denver. He keeps busy these days on a large cattle ranch near Roggen, Colorado.

Julius A. Heeren, '34, Petroleum Engineer for Stanolind Oil & Gas Company, resides at 3117 So. Detroit Street, Tulsa, Okla.

William T. Hohloff, '25, Chemist for The Carter Oil Company, is now in Alton, Illinois, P. O. Box No. 113.

H. M. Holkestad, '24, is District Manager for E. D. Bullard Company and resides at 322-10th Avenue, Salt Lake City, Utah.

Robert Howell, '39, has become associated with his father, James R. Howell, General Contractor. He receives mail at his home, 577 Gilpin Street, Denver.

F. S. Jacobson, '33, is Assistant Chief Metallurgist for the Great Lakes Steel Company, Detroit, Michigan.

G. R. Johnson, '34, accompanied by Mrs. Johnson, sailed from San Francisco on March 24 for the Philippine Islands where he will be associated with the Coco Grove, Inc., a Marsman operated company. This company operates two dredges in the Paracale district. His new address is c/o Coco Grove, Inc., Paracale, P. I.

F. H. Kellogg, '27, is now being addressed at his home, Guntersville, Alabama.

In Salt Lake City, Utah, *William F. Koch, '11*, is Manager and *Newin F. Whetzel, '34*, is Engineer for Hercules Powder Company. Wetzel recently has been in charge of the development and introduction of a sheathed permissible powder that is meeting with considerable success for blasting coal with safety during the shift.

J. H. Leary, '38, has been transferred by Ingersoll-Rand Company to Portland, Oregon, his address there being Box 4019.

Dana W. Leeke, '10, Mining Engineer for Oriental Consolidated Mining Company, Hokuchin, Chosen, is en route to the States on a vacation. Mail addressed to him in care of the Bank of America, Ontario, California, will reach him.

Paul Lewis, '29, who is associated with the Humble Oil & Refining Company, is at present located at Oakdale, La., Box 552.

Kurt O. Linn, Ex-'27, has returned to Denver and is employed by Strong & Linn (*H. K. Linn, '20*) Engineers. His address is Box 961, Route 3, Denver.

Edgar R. Locke, '28, Geophysicist for The Texas Company, is receiving mail thru Box 425, Hempstead, Texas.

A. H. Logan, '38, Junior Engineer for the Santa Fe Gold Mines, Inc., receives his mail at his home, 4555-7th Street, Riverside, California.

Fred MacLean, '38, Sales Engineer for Adolph Coors Company, resides at 1010 Downing Street, Denver.

Carl Madebach, '39, is employed by the Tungsten Metals Corporation at Shoshone, Nevada, as assistant in the mill which treats scheelite by tabling and flotation.

Robert Mann, '38, in the Photogrammetry section of the U. S. Bureau of Reclamation, has been transferred to Klondyke, Arizona, where he is being addressed thru General Delivery.

(Continued on page 220)

Professional CARDS

Frank E. Briber, '16
Secretary
Denver Equipment Co.
1400-17th St. Denver, Colo.

R. P. Jarvis, '97, E.M., Ph.D.
Geologist & Mining Engineer
El Oro, Estado de Mexico Mexico

Walter J. Eaton, '13
Consulting Engineer
San Juan Capistrano California

H. Kenny Burch, '33
Electrical Heating Engineer
Toledo Edison Company
Toledo Ohio

J. S. Bradford, '10
President
Chiksan Tool Company
Brea California

Robert P. Obrecht, '34
Research Staff, Great Western Division
The Dow Chemical Company
Industrial Road Pittsburg, Calif.

E. E. Linburg, '24
Manager, Gas Division
Metropolitan Edison Company
Easton Pennsylvania

Hal G. Knight, '08
Vice-President and General Manager
The Rubber City Sand & Gravel Co.
Akron Ohio

James L. Bruce, E.M., '01
Vice-President and General Manager
Cyprus Mines Corporation

H. G. Washburn, '04
Federal Mining & Smelting Co.
Wallace Idaho

S. L. Goodale, '04
Mining Engineer
Professor of Metallurgical Engineering
University of Pittsburgh Pittsburgh, Pa.

Carroll C. Taylor, Ex-'17
Newport Land Company
Ironwood Mines Corporation
Keweenaw Land Association, Ltd.
Ironwood Michigan

Thomas S. Carnahan, Ex-'04
Consulting Mining Engineer
928 Beverly Drive San Gabriel, Calif.

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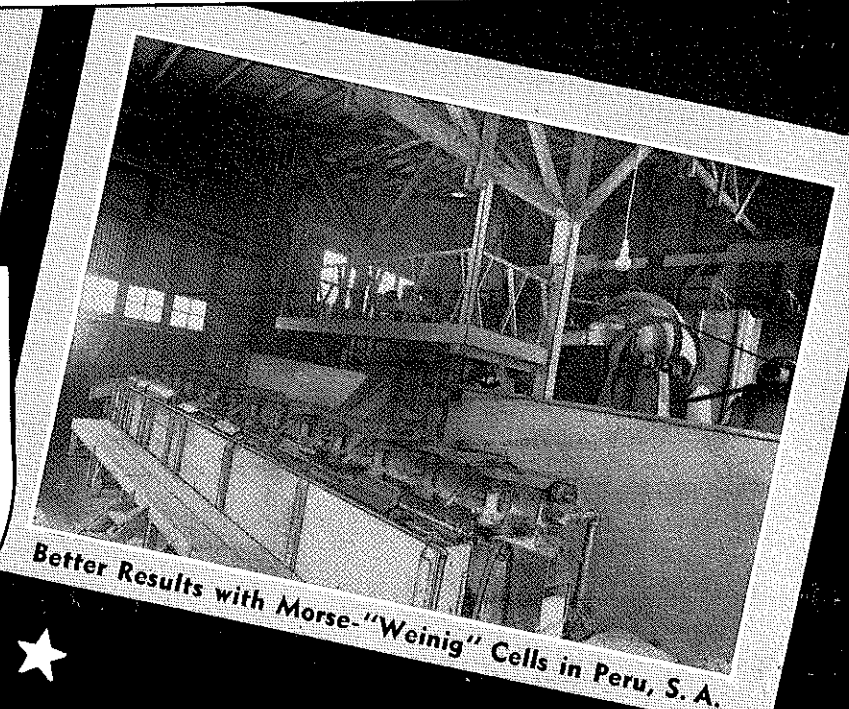
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Dale Nix, P.E., '26
Foreign Division
Standard Oil Co. of California
225 Bush St. San Francisco, Calif.

Howard J. Wallace, '04
Licensed Civil Engineer
1643 N. Sierra Bonita Ave.
Hollywood Calif.

H. C. Harris, '32
Foundry Metallurgist
Mack Mfg. Corp.
New Brunswick New Jersey

Fred W. Kirby, '22
National Electric Coil Co.
Columbus Ohio

Max W. Ball, '06
Consulting Petroleum Engineer
First Nat'l Bank Bldg. Edmonton Credit Bldg.
Denver, Colorado Edmonton, Alberta

L. P. Rooney, Ex-'21
General Petroleum Corp. of California
Los Angeles California

Will H. Coghill, '03
Principal Engineer
Nonmetals Div., U. S. Bureau of Mines
Supervising Engineer
Southern Experiment Station
Tuscaloosa Alabama

Hugh R. Van Wagenen, '06
Vice-President and Manager
Reliance Mining Company
Van Nuys Bldg. Los Angeles, Calif.

C. H. Carpenter, '09
Chief Engineer
Lee Wilson Sales Corporation
1368 Blount St. Cleveland, Ohio

Sidney S. Small, E.M., '17
Worthington Gamon Meter Co.
Worthington Pump & Machinery Corp.
Los Angeles California

A. L. Pierce, '22
Mine and Mill Superintendent
Ohio Mines Corporation
Gold Point Nevada

Daniel L. Beck, '12
Regional Manager
Dodge Bros. Corporation
1020 Lloyd Bldg. Seattle, Wash.

Chas. L. Harrington, '12
Mining Engineer
U. S. Mineral Surveyor
Idaho Springs Colorado

PERSONAL NOTES

(Continued from page 218)

Mines men with the Hercules Powder Company in Delaware include **Ted Marvin, '23**, Advertising Manager, and **M. R. Budd, '24**, Assistant Advertising Manager. **N. S. Greensfelder, '12**, who died some years ago, was Advertising Manager and started the Hercules publication, *The Explosives Engineer*.

Lloyd C. Mason, '38 and **Joseph L. Barber, '39**, have joined the staff of the Creede Mills, Inc., at Creede, Colorado.

Wm. A. McGilvray, '35, Engineer for the Gulf Research & Development Company, receives mail at 1109½ Beech Street, Duncan, Okla.

P. M. McHugh, '11, formerly Vice-President in charge of sales for the Dorr Company, is President of Petree and Dorr Engineers, Inc., 120 Wall Street, New York, N. Y.

Frank McKinless, '23, Sales Engineer for the Jackson Tube Company of Brooklyn, N. Y., spent several weeks in Denver last month.

Laurence Melzer, '39, is employed by the Stanolind Oil & Gas Company, doing gravity meter work, and is addressed at Box 1540, Midland, Texas.

Hugh Miller, '25, Chemical Engineer for the American Cyanamid & Chemical Corporation, resides at 953 "B" Street, Meadville, Penna.

Harold Mitchell, '36, is also at Hempstead, Texas, at the present time, where he is doing seismograph work for The Texas Company.

Wm. E. Mitchell, '36, is Sales Engineer for the Oil Well Supply Company and resides at 1923 Brun Avenue, Apt. 4, Houston, Texas.

C. O. Moss, '02, began his experience in the mining industry but twelve years ago the urge came upon him to get into the petroleum field. He started in the engineering department of the Deep Rock Oil Company, then served as Chief Engineer and is now Superintendent of their Gasoline and Gas department. He is located at Tulsa, Okla.

James Munro, '39, is being addressed at 100 No. Chickasaw, Bartlesville, Okla. He is in the seismograph department of Phillips Petroleum Company.

Dale Nix, '26, has had a varied experience as a Petroleum Engineer with the Marland Oil Company of Texas, The California Company, The Bahrein Petroleum Company of Bahrein Island, Persian Gulf, The California Texas Oil Company in New York City, and at present is Petroleum Engineer for the Foreign Division of the Standard Oil Company of California, located in their San Francisco office. During his 4 years as Assistant Manager of Bahrein Petroleum Company, he played a very important part in the development of the Bahrein oil industry.

Albert C. Norton, '07, Consulting Engineer for Calaveras Public Utility District and President of Norton Construction Company, moved his residence recently to 1954 Hopkins Street, Berkeley, Calif.

Russell B. Paul, '02, Resident Engineer, The New Jersey Zinc Company, is one of their key men and among the leading men in the zinc industry.

A. E. Perkins, '10, is widely known in the Western United States as Western Division Manager, Crucible Steel Company of America.

(Continued on page 222)

Professional CARDS

Dewey A. Dutton, '21
Consulting Engineer
Mining—Civil
Fairplay Colorado

Russell H. Volk, '26
Vice-President and General Manager
Plains Exploration Company
University Bldg. Denver, Colo.

Dent L. Lay, '35
Acetylene Service Company, Inc.
Acetylene Oxygen Carbide
1105 Zuni St. Denver, Colo.

Edward C. Hanley
Compliments
Colorado School of Mines
Golden Colorado

Jesse R. Morgan
Dean
Colorado School of Mines
Golden Colorado

James W. Dudgeon, '13
Manager, Limestone Department
Great Western Sugar Company
Denver Colorado

J. Harlan Johnson, M.Sc., '23
Golden Colorado

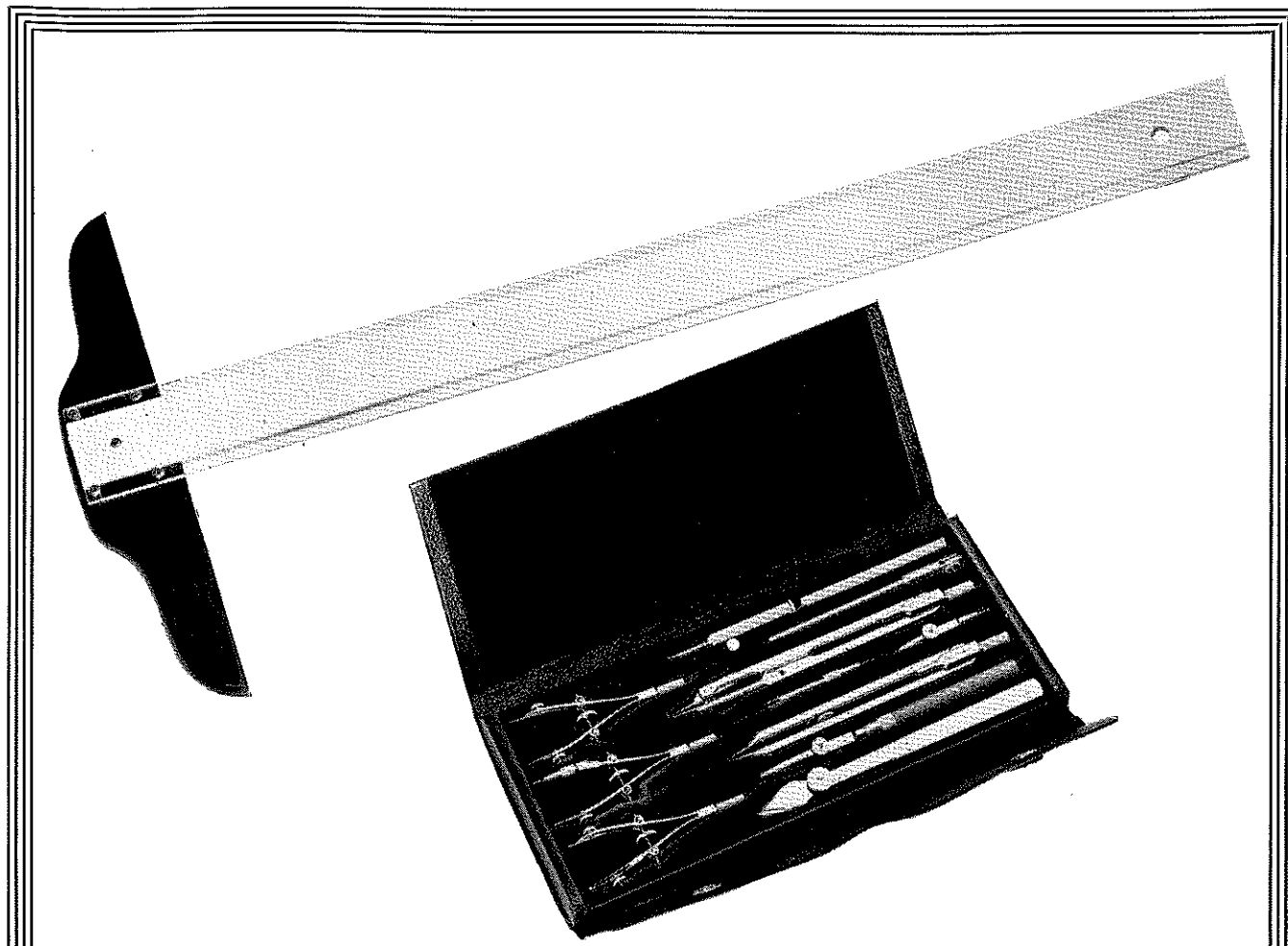
John H. Mason
Director, Physical Education & Athletics
Colorado School of Mines
Golden Colorado

George Yeager, '40
President, Student Council
Colorado School of Mines
Golden Colorado

George W. Thomas, '26
Registered Chemical Engineer
Golden Colorado

John H. Winchell, '17
Chartered Life Underwriter
Assistant Agency Manager
The Equitable Life Assurance Society of the United States
Security Building Denver, Colo.

Warren C. Prosser, Ex-'07
Consulting Mining Engineer
Federated Metals Division
American Smelting & Refining Company
Denver Colorado



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- Frank C. Bowman, '01**
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Denver Colorado
- Francis N. Bosco, '35**
Petroleum Engineer
Licensed Engineer, State of Colorado
2166 So. Washington St. Denver, Colo.
- T. F. Adams, '29**
Geologist
Box 1343 Denver, Colo.
- Edward P. Arthur, '95**
State Mine Commissioner
220 State Museum Bldg. Denver
- Robert F. Barney, '35**
Field Representative
National Fuse & Powder Co.
Denver Colorado
- Fred A. Brinker, '21**
Metallurgical Engineer
Denver Equipment Company
Denver Colorado
- Malcolm E. Collier, '22**
Attorney-at-Law
Collier & Collier
E. & C. Bldg. Denver, Colo.
- Ben C. Essig, '15**
Vice-President & General Manager
Gardner-Denver Company
Denver Colorado
- Neil E. Johanson, '22**
Colorado Plant
Mountain States Tel. & Tel. Co.
Denver Colorado
- Ralph E. Johnson, '33**
Assistant Manager
Sturgeon Electric Company
1534 Court Place Denver, Colo.
- H. W. Kaanta, '15**
Consulting Engineer
1429 Vine Street Denver, Colo.
- William B. Milliken, '93**
Consulting Mining Engineer
1680 Steel Street Denver, Colo.
- H. L. Minister, '16**
Representative, Rocky Mtn. Region
McGraw-Hill Publications
3880 Newton St. Denver, Colo.

PERSONAL NOTES

(Continued from page 220)

Earl Phillips, '31, Construction Engineer for Golden Cycle Corporation, has a new residence address, 2107 W. Kiowa Street, Colorado Springs, Colo.

Jack D. Powers, '39, accepted a position recently with the Cherokee Mine, Greenville, Plumas County, Calif.

Robert W. Price, '35, resigned his position as Assistant Mine Foreman of the New York & Honduras Rosario Mining Company in Honduras and has returned to the States. He is being addressed at present, 1126 Bryan Avenue, Salt Lake City, Utah.

George Reed, '35, is located temporarily at Yazoo City, Miss., where he is doing seismograph work for the Seismograph Service Corp. Post office address is Box 111.

E. A. Renfro, '30, had as his first job assisting in the laying of a gas line from Denver up into Wyoming. Later he joined the Empire Oil and Refining Company at Ponca City, Oklahoma, in the refinery. In 1934 he joined the Stanolind Oil & Gas Company and is still with them in their Natural Gasoline department. (As a sideline, Ed is an able architect and also quite a home movie enthusiast.)

George H. Roll, '19, has done a great deal of work in plastics and, for a time, it was his specialty. He is now President of Blade Master, Inc. of New York City, distributors of a safety blade sharpener which is a plastic product.

W. C. Rump, '33, is Petroleum Engineer for The Texas Company and makes his home at 905 High Street, Houma, Louisiana.

John C. Russell, '36, stopped over in Denver a few days last month en route to Alaska where he will take over the duties of Metallurgist, Mill Superintendent and General Manager of the Chichagoff Mining Company at Chichagoff. For the past year and a half he has been Chief Test Engineer for Morenci Branch of Phelps-Dodge Corporation doing metallurgical and equipment testing work at the Morenci test concentrator, developing flow sheets and equipment specifications for the new 40,000 ton concentrator.

Hal Sayre, '37, is now located at Townsend, Montana where he is doing engineering work for the Cooley Brothers Gravel Company.

Lewis B. Skinner, '95, has a change of address to 1705 Franklin Street, Denver. He is Consulting Chemical and Metallurgical Engineer.

Raymond Snyder, '37, called at the Alumni office the middle of March. He was in Denver a few days on a vacation from his duties with the Kingwood Oil Company, Effingham, Illinois.

Harry P. Taylor, '00, Consulting Engineer, is now being addressed at 1016 Center Avenue, Payette, Idaho.

Hugh Templeton, '36, Process Engineer for the Standard Oil Company of Louisiana, has a new residence address, 738 Canal Street, Baton Rouge, La.

W. A. J. M. van Waterschoot van der Gracht, Hon. D.Sc., '24, resigned his office the first of this year as Inspector General of the Mining Service of the Netherlands and is now at home at Huize Jachtduin, 36 Eeuwige Laan, Bergen, N. H. (Netherlands).

William A. Wasley, '09, Metallurgical Superintendent for The Fresnillo Company, Fresnillo, Zacatecas, resigned recently to accept the position of surface superintendent with the Mexican Candelaria Company, S. A., Contra Estaca, Sinaloa, Mexico.

Professional CARDS

- A. L. Mueller, '35**
Valuation Engineer
Public Utilities Commission
430 E. 11th Ave. Denver, Colo.
- Frank J. Nagel, '03**
Mining & Metallurgical Engineer
855 Humboldt St. Denver, Colo.
- Fred A. Nagel, '40**
Looking for a Mining Job
A.T.O. House Golden, Colo.
- William B. Patrick, '09**
Glenn B. Wilson Employment Specialist
307 Continental Oil Bldg. Denver, Colo.
- Arthur W. Buell, '08 and '23**
Consulting Mining & Petroleum Engineer
Golden Colorado
- Carrel B. Larson, '23**
Cie. Aramayo de Mines en Boliviá
Quechisla Bolivia

Greetings and Best Wishes

Robert S. Brummett '26

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San Gabriel, Calif.

Influence—

(Continued from page 185)

me materially in my teaching. Direct contact with students in small classes, the study of individual traits, the use of frank statements, and close cooperation are memories. My training at 'Mines' taught me what to avoid and what to use in teaching. The above and ten years practical experience after graduation coupled with associations formed in school, ability to support statements made, and successfully placing graduates in responsible positions are the main factors that have exerted an influence on students' training."

From G. Montague Butler, '02, Dean and Director, University of Arizona, we have the following excerpt: "... that I took with me from 'Mines' and have used in my teaching at other institutions is the method of teaching crystallography and mineralogy used by Professor Horace B. Patton at Golden. The best and most practical courses in the country are those taught in accordance with that method."

A very general criticism of earlier teaching methods comes from James H. Steele, '00, Assistant Principal Manual Training High School, Denver. (Continued on page 224)

Oil Industry—

(Continued from page 183)

There has been an attempt to make them think, rather than memorize. The reason is well illustrated by the old Texas classic of the young law student who memorized all of the statutes of his state. Then the Legislature met and repealed every thing he knew.

Assuming that the man has finished in either Refining, or Production there arises the question of what he will probably be called upon to do when he enters the industry. In answering this question we cover the field that the so called Petroleum Engineer must cover.

In refining he may go into the research laboratories and work upon (Continued on page 228)

Mines Foundation—

(Continued from page 190)

School of Mines can make use of these in its effort for continual advancement. The Faculty of any College is its "Main Spring", and that "Main Spring" needs to be of the best material obtainable.

There are many dire needs at the School of Mines such as those men-

tioned heretofore necessary to the working out of the numerous problems so vital to the mineral industries. Money is constantly needed to purchase new equipment, to replace obsolete equipment, and for additional facilities for maintenance at a decent level required by just the ordinary forced expansion. There are a host of functions almost too numerous to mention. Students need assistance, more so as the field of engineering expands and the constantly more exacting schedules prevent their working their way through school.

Plans for a concerted effort to interest and educate capital to the need of the Colorado School of Mines have been carefully laid and will be put in motion as soon as the time is most propitious. All of the Alumni should be constantly alert to the furtherance of the foundation. How can they do that? Principally by fostering everybody's interest in the School and emphasizing its importance to the advancement of the greatest of industries. Donations come from the most unexpected sources. If people are made aware of the great service the School is rendering the State, the Nation, and even the whole world, they may become interested in any single phase of its activities and they will if able con-

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The Colorado Society of Engineers, founded in 1916, with a present membership of over 1200, invites all MINES MEN to join with their fellow engineers of the Rocky Mountain Region. Besides maintaining a free employment service in all branches of engineering, C.S.E. assumes an active part in matters of public policy and the technical, educational and ethical advancement of engineers. The Society's monthly magazine keeps you in close touch with engineers and developments in Colorado.


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tribute to that service—perhaps directly during their life time—perhaps in their will. Every Alumnus should appoint himself as a good will missionary from "Mines". It is up to us to fight for our Alma Mater just as we used to on the athletic field.

This is the FOUNDATION; these are the needs; the ground work has been laid, not by one man, but by the fertile and experienced minds of many, often at real sacrifices to themselves. May every graduate enter into its spirit and perpetuate an Institution of which they are inordinately proud and which is the only one of its kind in the world, dedicated to producing Engineers for the Mineral Industries. "Mines" is part of the life of every "Mines Man", let us cooperate to make the most of that part.

Influence—
 (Continued from page 223)
 ver. He says, "In my day, and for long afterwards, it was the custom in the schools to toss pupils into the stream and if they swam out, all right, if not it was just too bad. To me the greatest single step forward in both high school and college administration is in the matter of counselors for incoming students."

"We are doing a very good job in the high schools, not only in regard to the possibilities in high school, but necessarily for college preparation. We give them a very good picture of what it is possible to do in college and university."

John J. Cory, '05, Assistant Superintendent in charge of Secondary Education and the Emily Griffith Opportunity School in Denver, has this to say: "From my experience at 'Mines' and the years following, I do not hesitate advising high school graduates, particularly those who seem a bit uncertain as to the type of education and vocation they shall choose, that they cannot make a mistake by taking an engineering course—and, naturally, to me that means 'Mines'—because regardless of what the future may hold for these students the breadth of application of the habits, attitudes, skills, and knowledges gained by such experience is invaluable."

In this sketch, one can only scratch the surface of a subject with such a large scope. Many have furnished material from which I have drawn and I regret there is not space to pay tribute to each one. If the reader is brought to a partial realization of the tremendous influence that the Colorado School of Mines is exerting as a leader in education throughout the civilized world, then the purpose of this article will have been accomplished.

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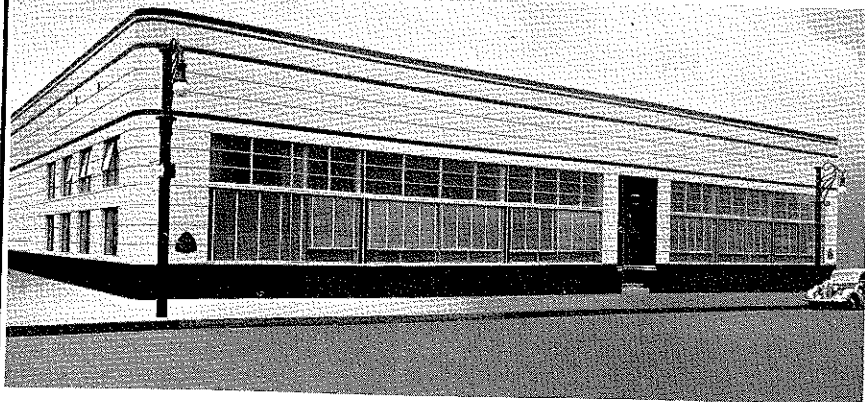
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WEDDINGS

Evans-Napier

Raymond Evans, Ex-'38 and Miss Arleen Napier were married at the home of the bride in Denver on February 24. They were attended by Miss Ann Napier, sister of the bride and Robert Evans, '36, brother of the groom.

Mr. Evans is employed by the Gardner-Denver Company. The couple are residing in Englewood, Colorado.

Koehler-Mohnike

Daniel W. Koehler, Ex-'41, and Miss Greta Mae Mohnike were married in the Methodist church of Youngstown, Ohio, the evening of March 5.

The bride, a cousin of Prof. and Mrs. Carpenter, is a graduate of the Golden high school and Barnes Commercial school in Denver. During the past year she was engaged in secretarial work for the Masonic Grand Lodge in Denver. Mr. Koehler was a member of the Sigma Alpha Epsilon fraternity while attending *Mines*. He is employed by an oil company in Ohio. The couple are now at home at 569 W. Chalmers Avenue, Youngstown, Ohio.

Wilson-Reed

Lewis A. Wilson and Miss Helen W. Reed were united in marriage on March 27 at the First Methodist Church of Cheyenne, Wyoming. They were attended by Mr. and Mrs. C. H. C. Braden.

The couple are at home at Central City where Mr. Wilson, of the class of '38, is Engineer for the Continental Mining Company.

BIRTHS

C. D. Frobes, '24, assistant general manager of Edgar Brothers Company of McIntyre, Georgia, was very proud to send order for professional card in this issue for his son, David Bruce, who, he stated, "will accept position in 21 years." The young man arrived at his parents home on March 4, 1940.

Jean McClure, tipping the scales at 7 lbs., 11 oz., arrived at the home of her parents, Mr. and Mrs. Parker M. Howell on March 12, 1940.

Her father, '38, recently accepted position of metallurgist with the Phosphate Recovery Corporation at Mulberry, Florida.

A 7½ pound daughter was born to Mr. and Mrs. Max Dessau on February 28, at the home of Mrs. Dessau's parents, Mr. and Mrs. I. A. Petrie, in Golden. Mr. Dessau, of the class of '26, is metallurgist for the Patino Mines & Enterprises Consolidated, Catavi, Llallagua, Bolivia.

Coach Doy Neighbors has not yet let loose of the broad smile he acquired on April 2nd when the stork presented him and Mrs. Neighbors with a young daughter whom they have named Rebecca Ann. He will be looking around in a few years for an assignment in a co-educational college where he can coach the girls in basketball and make his daughter efficient in this sport!

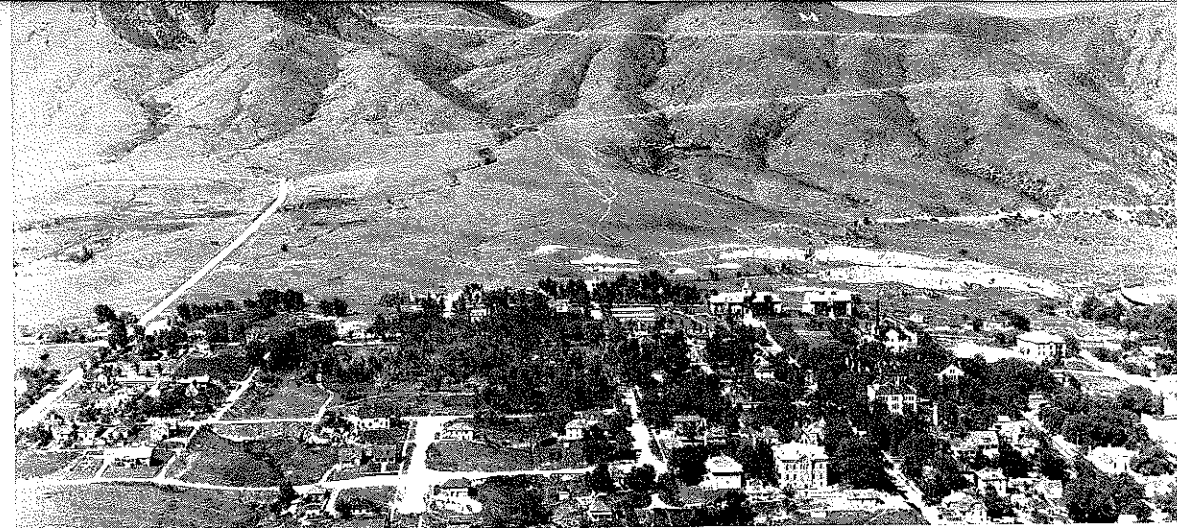
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Oil Industry —

(Continued from page 223)

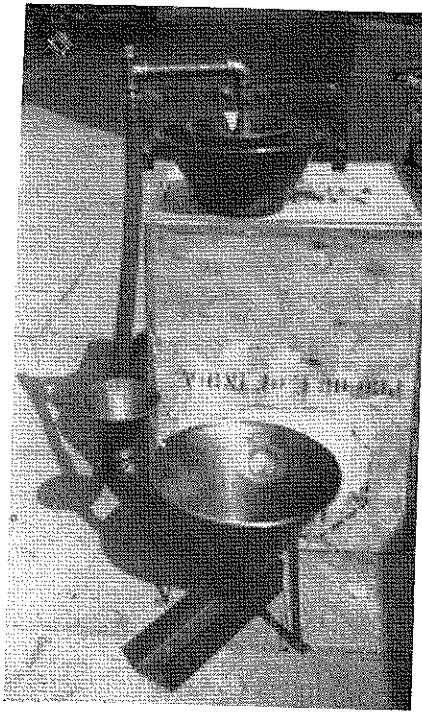
the development of new processes. Eventually, many of these men go into plants to supervise the operations of new installations. He may go directly into the processing and operations department where he acts as technical adviser in problems of equipment design, and maintenance or of processing. He may design new equipment or rebuild and alter equipment in use. In any case he should know something of the chemistry of oil and the reasons back of specifications on products. He must be able to handle some work in strength of materials and structure design. He should have an understanding of the economics of marketing and realize that runs to stills must be subordinate to stocks of gasoline. All of this affects the design and operation of processing equipment.

The production engineer may be called upon to dispose of waste salt water or to maintain pumping equipment. He may need to study problems in drilling muds or sucker rod failures. He may have a problem of heaving shale or floating derrick foundations. He may need to develop a proration formula or to calculate the most economical well spacing. He may have an emulsion problem or wax or corrosion troubles. He may need to study the effect of an expanding gas cap or encroaching edge water and correlate this with his geological information on the field. He must know enough of economics to make an estimation of reserves and calculate them to present value. He must realize that a weak gasoline market will be immediately reflected in runs to stills, reduced pipe line runs and cuts in production allowances. He must figure the cheapest and best method of drilling and producing. He must cut costs after they have been pared to the physical limit. He must know his laws of fluid flow, for oil, gas and water, and mixtures of these.

It is obvious that no one man could be a specialist in all of the above things but any oil engineer should have some knowledge of all and probably be a specialist in a few. After all, engineering is merely an application of principles which are given in school. Any engineer should realize that he will never find a case where there is a perfect application of a law or theory. Then he is a good engineer in so far as he can temper a law with judgment. He must know how much deviation from the law he can expect, and how much his calculations must be corrected.

In Manufacturing —

(Continued from page 199)



are more often used without Ross Siphons in PLACER OPERATIONS. They will operate on any dilution from 3½ to 1 on to several hundred to one. They require no attention when operating, will not sand up on any less than 5 to 1 of water, will operate on material minus ¼ mesh and will pan out without a weighable loss all the amalgam from riffle concentrates.

The Ross Process has proven highly successful for minute, coarse, coated and so called "rusty gold." All the units have extremely high capacities for the space (mill or dredge) required and are applicable to approximately 90% of all gold bearing material. The process is also inexpensive, in fact, cheaper to first cost and maintenance, than anything in the metallurgical field.

The equipment is manufactured by The Ross Process Company, 1890 Market Street, Denver, H. B. Ross, Ex-'07, President.

"The Key Is Your Check"

Hamilton W. Baker, Mines 1911, took over the American Locker Company in 1932, became President of the Company, and since then has established this parcel checking business throughout the United States.



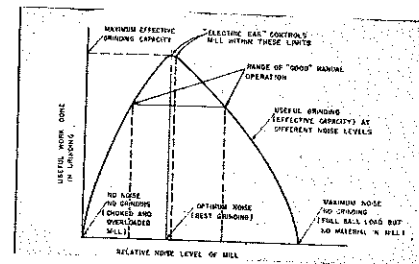
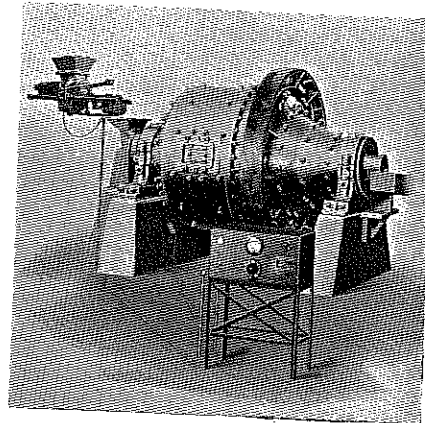
Ham Baker says, "When I became interested in the American Locker Company, I found that parcel room checking

on the railroads had been declining for years. This was due to several reasons such as inconvenient locations of these parcel rooms and slow service. So in building up the locker checking business, we have endeavored to overcome the inconvenience of the average checkroom by providing checking lockers at numerous locations in a station. These parcel lockers are greatly appreciated by the traveling public. This improved method of checking has grown rapidly and is now found on all the principal railroads, bus systems and subways. We have eleven district offices located from Maine to California".

"Electric Ear"

It is true that while the original Hardinge Ball Mill is the same in shape, improvements have been made both in construction and operation to such an extent that one would hardly recognize the present day performance with that of 25 years ago.

The most noteworthy recent improvement in grinding factors is the use of the "Electric Ear", which controls the operation of the mill by the sound, thus enabling the operator to attend to other duties and of more importance to the owner, he is able to cut his grinding costs appreciably by better control. (For description see March 1940 Mines Magazine, page 124).



Arrangement of mill, feeder and "Electric Ear". The microphone under the mill picks up the sound. The control cabinet, located at any convenient point, regulates the feeder to hold the mill at any desired noise level. The noise level is controlled by the adjustment of a dial on the control cabinet.

Hand in hand with the Conical Mill, other developments have been worked out in the way of drying with the Ruggles-Coles Dryer, thickening, filtering, classifying and feeding by weight, thus making a well rounded out line of equipment, which we manufacture in our own plant at York, Pennsylvania.

In the Hardinge organization are found H. W. Hardinge, Hon. '17, Chairman of the Board, J. J. Cadot, '15, Works Manager and Treasurer. Mr. Hardinge attended Mines from 1881 to 1883 and received his degree in 1917.

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Greetings . . .

We are pleased with this opportunity of again greeting our many friends among Mines Men who have done so much in the building of the Mineral Industries.

MERRICK SCALE MFG. CO.
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Letters

(Continued from page 154)

ever before of keeping "Mines" men, scattered throuout the world, in touch with their alma mater. In our business we consider this an important service because we know that in every corner of the globe "Mines" men are in positions of responsibility.

Shaw Advertising Agency, Denver, Colo.

◇ M ◇

GREETINGS FROM ALAMOSA

From HOWARD S. RINES, '29

Greetings from the Great San Luis Valley and the Great Sand Dunes National Monument which you are cordially invited to see during your vacation this summer.

I enclose herewith the slight consideration necessary to the operation of the Alumni Association. I am sorry to be late, but I hope that the old saying better late than never still holds.

Best regards to the Alumni Association for the year and may our magazine improve this year as it has during the last few. Fine work!

Box 416, Alamosa, Colo.

◇ M ◇

"GLAD HAND" FROM PERU

From W. T. MILLAR, '22

Yesterday I received the ballot from the office of our Alumni Association in Denver. Our Association is getting quite a lot of publicity and the magazine is "durn" good. It is gaining in recognition all the time, and actually I am proud to say that I am from Mines just because the magazine is considered such an authentic publication.

Carry on the good work.

In charge Engineering Department, Cerro de Pasco, Copper Corp., Peru, South America

◇ M ◇

LIKES MINES MAGAZINE

From NORMAN WHITMORE, '26

Let me congratulate the editorial staff of Mines Magazine upon the fine job you are doing. I subscribe to several professional engineering magazines in connection with my work. Articles which I consider of lasting interest are filed in my reference library. I find articles from Mines Magazine outnumber those of any other publication three to one.

I also thoroughly enjoy the personals, sports and campus news. Minerals Engineering Co., Los Angeles, California

◇ M ◇

A NEWS MAN'S VIEW POINT

From JACK HOW

Speaking as a news man, your authors are to be congratulated for the instructive material that they submit, and for their choice of timely and worthwhile subject matter. Your editorial staff does an A-1 job from the standpoint of makeup, and a well balanced selection of material.

It seems to me that even a layman, unschooled in the problems of a mining engineer, can always find something sufficiently comprehensive and well written to be of interest.

News Bureau, Caterpillar Tractor Co., Peoria, Ill.

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Local Sections —

(Continued from page 205)

PITTSBURGH



S. L. Goodale, '04, President; A. M. Keenan, '35, Secretary, Box 146, Pittsburgh, Pa. Meetings upon call of secretary.

A meeting of the Pennsylvania-Ohio Section of the Mines Alumni Association was held at the Fort Pitt Hotel, Pittsburgh, Saturday evening February 17.

The attendance was rather small possibly due to the severe 18-inch snow storm that engulfed Pittsburgh the day before the meeting was scheduled. Six members were present and although this was a compact group we had a swell evening.

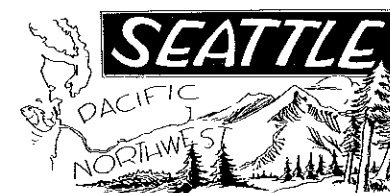
The dinner was followed by an informal meeting and plans to increase the future attendance were discussed but failed to reach a definite program. However, we are going to have small "get-togethers" from time to time and then arrange for a general meeting later on.

After the meeting we bowled a few games and discussed the various good times we had during our days at Mines. R. P. Kewley was the most recent graduate at the meeting and he gave us the lowdown on the latest happenings in Golden.

Present at the dinner and the meeting were:

S. L. Goodale, '04; Gordon Smith, '34; John M. Demmer, '36; R. P. Kewley, '39; Jack Whittaker, '38; and Albert M. Keenan, '35.

We expect to have another meeting early in April, and we hope that this section of the Alumni Association will give the other sections a run for attendance, in the near future.



The Pacific Northwest Section has been granted a charter and will soon hold its first meeting. This group is lead by Axel E. Anderson. "Andy" has always been one of the old "war horses" of the Alumni Association so we know this new group will "go places." Watch for the account of the first meeting. Ed.

SALT LAKE CITY



Otto Herres, '11, President; Kuno Doerr, Jr., '27, Secretary, 700 McCormick Bldg., Salt Lake City, Utah. Meetings upon call of secretary.

While we hear very little from this section as a group, still individually they are very active in promoting the best interests of "Mines" Alumni Association. The Magazine Staff appreciate the great interest that was taken in furnishing information and advertising for this issue. Letters printed indicate the effort made and the back cover shows real accomplishment. For the opportunities offered, this section gets the high percentage. Ed.

TULSA



John R. Evans, '23, President; D. H. Peaker, '32, Secy.-Treas., c/o The Carter Oil Co., Tulsa, Okla. Meetings upon call of secretary.

The Oklahoma Chapter of Mines Alumni Association held its regular meeting at the Hotel Tulsa, with dinner and get-together of all Mines men in the state of Oklahoma.

John R. Evans, the newly elected president, presided at the meeting and plans were made for future social and business gatherings. Definite steps were made toward entertaining the Seniors who will visit Tulsa on the annual inspection trip.

Chairman Earlougher of the publications committee has been active with his assistants preparing some very interesting articles for the Petroleum issue of Mines Magazine.

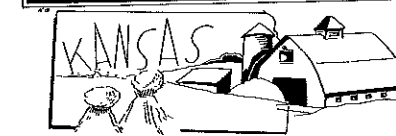
After the regular business meeting was disposed of, the meeting was turned over to Doug Hier who gave a very interesting talk on Java with the aid of color moving pictures. Short talks were given by several new members, who will be located in Tulsa, Bill Briscoe and H. A. Wallis being the new comers.

Those present were:

R. E. Westling, '37; Frank Lindeman, '33; R. C. Earlougher, '36; L. E. Elkins, '34; Geo. E. Wagoner, '28; C. D. Hier, '31; E. A. Renfro, '30; J. A. Heeren, '34; G. C. MacDonald, '28; M. E. Chapman, '27; Lee K. Worth, '17; C. O. Moss, '02; George V. Dunn, '20; P. L. Regan, '28; I. S. Salnikov, '25; H. A. Wallis, '28; Myron C. Kiess, '25; Louis E. Cotulla, '25; W. A. Van Hook, Jr., '35; John R. Evans, '23; Bill Briscoe, '30; Robert N. Hastings, '30; and Don H. Peaker, '32.

The meeting adjourned at 10:00 P. M.

WICHITA



Thomas H. Allan, '18, President; John T. Paddleford, '33, Secretary-Treasurer, 429 First National Bank Building, Wichita, Kansas. Meetings upon call of secretary.

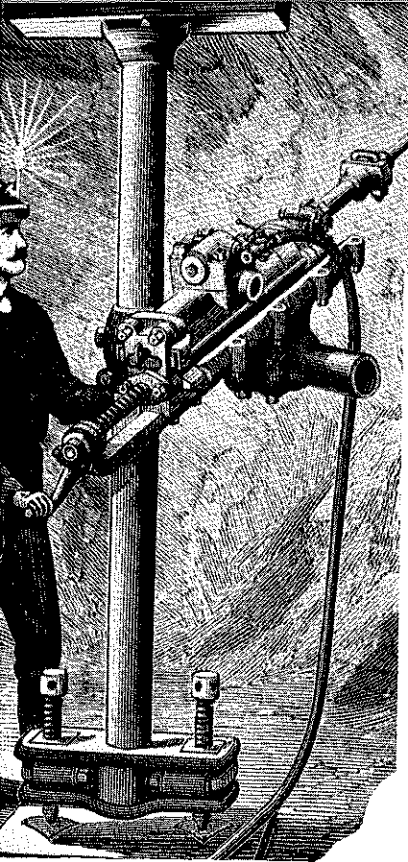
Meetings of the Kansas association during the past year have been occasional affairs due to the incessant activities of the members. All members including Tom Allan, Monty Smith, and yours truly, the secretary, have been very occupied with the field work of the Kansas oil activity. The Kansas chapter did have a very fine meeting at the showing of the Mines football pictures and a great deal of enthusiasm was shown by all of its members. Those attending this meeting at President Tom Allan's house were all favorably inclined toward giving the School of Mines their very wholehearted support in all of its endeavors. Inasmuch as the total membership of the Kansas chapter is involved in the geological, promotional, or production phase of the Kansas oil industry, any set time for meetings is impossible as all members are subject to call for field duty at any time. This, however, does not interfere with their candid wish for the success, betterment, and continued prosperity for their Alma Mater. The officers feel that meetings will be called at opportune times and no set date will be in order, due to the above conditions. We wish all members of the Alumni Association, however, will feel that they can call on any of the members of this chapter and receive the sincere cooperation to any of their problems at any time.

PRIZE WINNER February, 1940

Wm. E. Heinrichs, '13, is the winner this month of the free subscription to *Mines Magazine* for having listed the greatest number of errors in the February 1940 issue.

Mr. Heinrichs stopped in Denver for a few days last month en route to South Africa to take over duties of mine foreman for the Nchanga Consolidated Copper Mines, Ltd. at Chingola, Northern Rhodesia.

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SINCE Simon Ingersoll built his first rock drill in 1871, our engineers have continually worked towards one objective: the development of better machines that will do more drilling work for you. Although perhaps not fully appreciated, this policy has been of practical benefit not only to all industries that have rock to drill, but also to the world at large, for today's machines drill at least ten times faster and farther than their predecessors of 25 years ago.

If mining had to be done with the rock drills that were available in 1900, the cost of iron, copper, lead, zinc, and other base metals would be so high as to greatly restrict their use. Gold and silver mining would be confined to rich deposits. The working of marginal ore bodies would be unprofitable and little development work could be done.

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Probably no other machine must withstand as much abuse as a rock drill. Steel strikes steel 1800 hard blows a minute. In addition to this internal mechanical pounding, most drills are subjected to rough handling, to the constant abrasion of dust, and to the corrosive action of impure water.

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GELEX produces a minimum of noxious fumes thereby enabling miners to return quickly to working faces.

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DU PONT EXTRA offers the same attractive properties as **GELEX** except that it has less water resistance.

DU PONT EXTRA gives even lower blasting costs than **GELEX** because of its lower price and higher cartridge count.

Du Pont Blasting Caps, Electric Blasting Caps and Delay Electric Blasting Caps are most dependable. The standard for use in ore mining.

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"**NITRAMON**" S cannot be detonated by flame, friction, impact, "Cordeau" or "Primacord" detonating fuse, or by the strongest type of commercial blasting cap. Detonation of "**NITRAMON**" S requires the use of a special primer enclosed in a metal container designed to be attached to the other containers composing the charge.

To obtain the maximum efficiency, simplify field operations and economize on the costs of seismic prospecting, specify and use "**NITRAMON**" S.

DU PONT SSS ELECTRIC BLASTING CAPS

are especially manufactured for use in seismic prospecting. There is NO LAG from time of bridge wire break to detonation.

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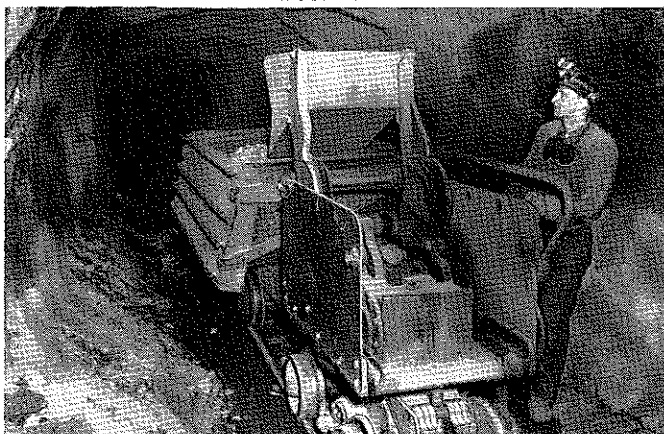


Illustration above shows Model 21 Eimco-Finlay Loader discharging into 81 cu. ft. Granby-type car. This car is 4'-7" high and 11'-5" long (overall) yet the Model 21 fills it in from 3 to 4 minutes. No replacement parts have yet been required, although the machine has been operated more than four months.

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