THE MINES MAGAZINE

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ROLL CALL
76th Anniversary

CELEBRATING COMMENCEMENT 1950

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- 76th ANNUAL COMMENCEMENT
- MID-CENTURY SURVEY
- ALUMNI BANQUET
- EDUCATIONAL PROGRAM IN THE MINERAL INDUSTRY
- A.A.P.G. CHICAGO CONVENTION
- NEWS ATOMIC ENERGY COMMISSION

JUNE ✦ 1950

VOLUME XL NUMBER 6

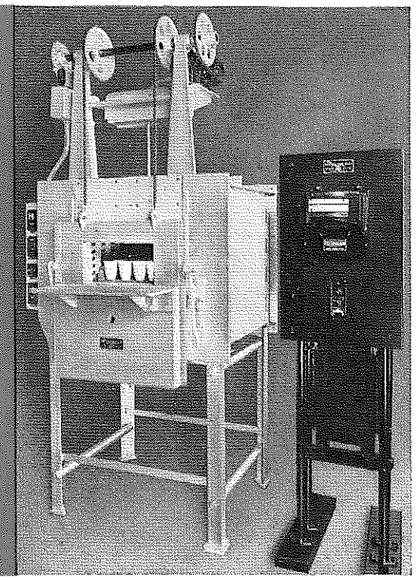
PRICE $1.00

COMMENCEMENT NUMBER

DFC

ACCURATE DEPENDABLE

ELECTRIC ASSAY FURNACES



SPECIFY DFC Electric Assay Furnaces for accurate, uniform assays and for the greatest return on your money.

Rugged open hearth type furnace. Fast heating, nickel-chrome "U" shaped heating elements are supported in specially designed refractory blocks . . . insure maximum heat reflection. Furnace lining is backed with high and low temperature insulating brick. Entire unit is encased in welded steel jacket.

DFC Electric Assay Furnaces are economical to operate and comfortable to work around. Wide doors provide easy access to crucibles. Reliable controls insure absolute and constant control of temperatures and control of atmospheric conditions for cupeling.

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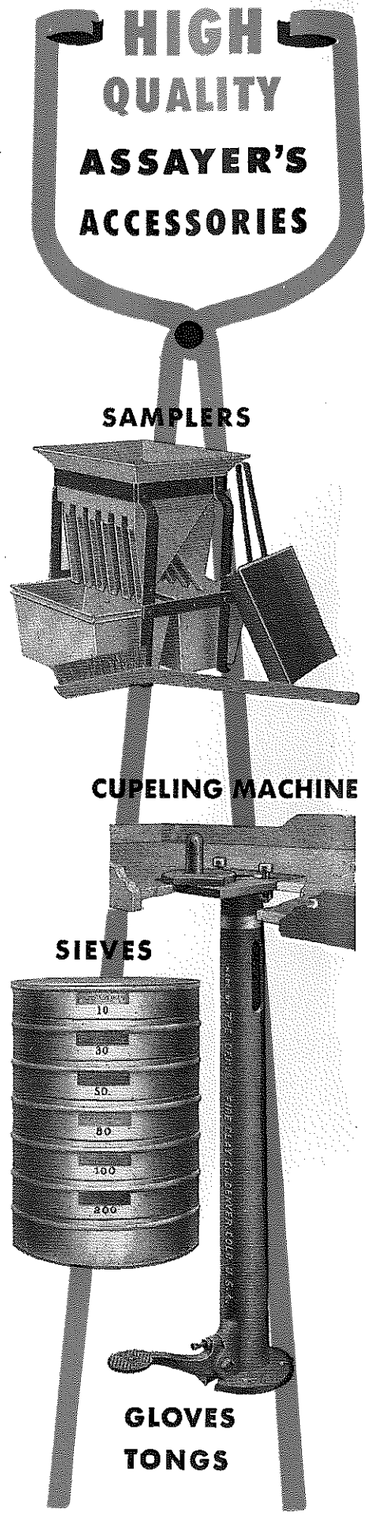

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a network of engineering organization serving the mining industry in every corner of the globe . . .

Throughout the mining areas of the world, Dorr equipment and engineering are available through Associated Companies and Representatives, with facilities for local manufacture.
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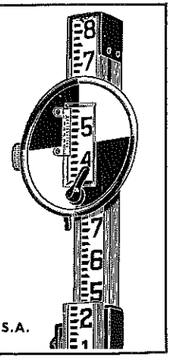

PERSONAL NOTES

Charles F. Allen, '34, has returned to the States from Johannesburg, South Africa, where he was serving as Technical Representative for the South African Cyanamide Company and, at present, is being addressed 239 West Broad Street, Stamford, Conn.

James A. Appleton, '37, Sales Engineer, Goodman Manufacturing Company, has been transferred to the main office of the company, 4850 South Halsted Street, Chicago 9, Ills., where he receives mail.

George O. Argall, Jr., '35, newly appointed Editor of Mining World and World Mining, 121 Second Street, San Francisco 5, California, was a Denver visitor the middle of last month.

Frank P. Bicknell, Ex-'12, who is retired and is residing a few miles out of Denver, is addressed Route 2, Box 324, Arvada, Colorado.

Robert J. Black, '49, Graduate Student at George Washington University, has a change of address to 1737 Massachusetts Ave., N. W., Washington 6, D. C.

Donald H. Blair, Ex-'50, is receiving mail at 330 Fortlee Road, Apt. B-3, Leonia, N. J.

C. A. Blaurock, '16, Manufacturer of Dental Golds, has moved his offices from the Mack Building to 722 Exchange Building, Denver 2, Colorado.

A. F. Boyd, '26, of Bishop, California, was visiting in Boulder, Colorado, and Denver the latter part of April.

John A. Brandon, '49, Metallurgist for American Smelting & Refining Company, has been transferred from Magdalena to Deming, New Mexico, with street address 402 So. Silver.

Lt. Col. F. Erich Bruhn, '22, since his arrival in California from Fort Monroe, Virginia, has obtained an apartment where he is now at home, 156 School Street, Apt. D, Daly City 25, Calif.

D. L. Cedarblade, '44, has been promoted to the position of Field Engineer by Gulf Oil Corporation and transferred from Dallas to their Houston office. His new address is in care of the company, Box 2140, Houston, Texas.

Rex E. Cheek, '43, Field Engineer for Stanolind Oil & Gas Company, is addressed Box 586, Ulysses, Kansas.

Harry W. Chinn, '30, is Process Coordinator for Phillips Petroleum Company, receiving mail thru Box 2568, Philrich Branch, Borger, Texas.

John P. Cogan, '49, has completed his work for his Master's degree and has accepted a position with Shell Oil Company. For the present, mail is being addressed at his home, in Buena Vista, Colorado.

C. Lorimer Colburn, '07, Consulting Engineer with office 617 Cooper Building, Denver, has moved his residence to 1444 Bellaire Street, Denver 7.

C. O. Clark, '49, who is associated with International Cementers, Inc. and addressed Rt. No. 1, Box 213, Cody, Wyoming, called at the Alumni office recently when in Denver.

Sherman Comstock, '43, upon completing work on his Master's degree, accepted a position with the Atomic Energy Commission. His present address is Box 270, Grand Junction, Colorado.

John G. Cowan, '49, Roustabout Engineer for Trigood Oil Company, has a change of address to Box 381, Worland, Wyoming.

(Continued on page 14)

The Mines Magazine published monthly by the Colorado School of Mines Alumni Association, Inc. Entered as second-class matter, at post office at Denver, Colorado under act of Congress, March 3, 1879. U. S. Subscription rate $4.00 yearly, foreign rates $5.00, single copy $.50.

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Capital National Bank Building
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George R. Brown, '22
Brown & Root, Inc.
Engineering Construction
Houston Austin Corpus Christi

Walter E. Burlingame, '01
Assayer—Engineer—Chemist
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Denver

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President
San Joaquin Drilling Company, Inc.
417 S. Hill St. Los Angeles, Calif.

Will H. Coghill, '03
No Consultations
145 W. Lincoln Ave. Delaware, Ohio

Ralph D. Curtis, '26
Production Manager
C. H. Murphy & Co.
1st Nat'l Bank Bldg. El Dorado, Ark.

E. E. Dawson, '38
Manager, Foreign Operations
Brown Drilling Company
Long Beach California

Earlougher Engineering
Petroleum Consultants — Core Analysis
319 E. Fourth St. Tulsa 3, Okla.
R. C. Earlougher, '36, Registered Engineer

Albert C. Harding, '37
General Manager
Black Hills Bentonite, Inc.
Moorcroft Wyoming

Thomas S. Harrison, '08
Consulting Oil Geologist
1104 First National Bank Bldg.
Denver, Colorado

Letters . . .

LITTLE DAUGHTER MUCH TO HIS LIKING

From WILLIAM E. ELLWANGER, '43, *3326 So. 3130 East, Salt Lake City, Utah*

"I found my sugar in Salt Lake City." Her name is Sheryl Lin, and my wife gave birth to her on March 19, 1950, in this capital of the Beehive State. The doctor predicted she would be a tiny mite, but she came forth at 8 pounds 3 ounces of solid sugar.

We have all kinds there are now, and our son, Rick, is rapidly growing into a future "Miner."

It's swell to get the monthly magazine, for I always enjoy reading the "Personals" and interesting articles therein.

My travels for Crucible Steel Company take me into Montana, Idaho and Nevada, besides a complete coverage of Utah, and it's nice to say hello to old friends from *Mines* and meet new ones.

REPORT ON INTERESTING TRIP

From CAPTAIN ROLAND E. MORRISON, '41, *441st CIC, Det, GHQ, FEC APO 500, c/o Postmaster, San Francisco, Calif.*

Regret to have been late with my dues but have been on the move since the first of February.

Mrs. Morrison, son Pat, and I sailed from the Port of New York the 7th of February, aboard the USAT George W. Goethals for Bremerhaven. The trip was made while I was on leave between assignments.

After reaching Bremerhaven we proceeded by train to Paris where we spent a week visiting friends and seeing the sights. From Paris we visited Mrs. Morrison's family home near Bordeaux and then continued on to Porte Vendue, on the Spanish border, where we embarked for Algiers. After several days with friends and relatives there we proceeded to Casablanca by train. Mrs. Morrison and Pat settled down in a beach resort there and I flew back to the United States.

Upon arrival in the States, I proceeded to Camp Stoneman, California, where I spent a month awaiting shipment to Japan. My flight from the States was enjoyable and was worth the long wait at Camp Stoneman.

I am getting settled in my assignment here and expect my family to join me in July. They will have a long trip since the Army requires them to return to the States before leaving for Japan.

At the moment I am stationed in Tokyo. Understand that Lou Bremkamp, '38, is down at Yokohama and hope to see him before too long.

Please note my correct address.

Best of luck to all of you at the Association office.

FORMS PARTNERSHIP IN SALES & ENGINEERING SERVICE

From CLARENCE G. HEMBERGER, '43, *Hardy, Hember & Co., 1554 Howard Street, Chicago 26, Illinois*

I enclose herewith my check for 1950 alumni dues. I regret that this is late but have been very busy and overlooked the payment.

As of January 1st of this year I entered a partnership with a Chicago man and we are presently acting as Sales Representatives handling industrial equipment and production items. Our organization operates under the name of Hardy, Hember & Co. (Note that the last three letters of my name have been dropped. Needless to say this prevents numerous mis-pronunciations.)

At present we are handling a complete line of crushing, pulverizing, and screening equipment, specialized packaging and assembling equipment, moulded rubber items, and gears. Our operations have been slowly increasing and we hope to be well established by the end of this year.

Best regards to everyone.

ENJOYED CHECKING UP ON CLASS OF '49

From ALBERT H. FLEITMAN, '49, *241 Clinton Street, Hammond, Indiana*

Enclosed is my check for 1950 dues.

I have received my copy of Year Book of Mines Men and it was a pleasure to thumb through it and note how the class of "49" ended up.

Now, as always, I am eagerly awaiting the next issue of *Mines Magazine.*

GREETINGS FROM CHILE

From L. J. PARKINSON, '23, *Anglo Chilean Nitrate Corporation, Casilla 808, Antofagasta, Chile, S. A.*

Thank you for your friendly reminder that my subscription to *Mines Magazine* runs out next month. I enclose check which should pay me up to June 1952.

I was in the U. S. last year for some time but spent most of the period in a hospital in Boston and, much to my regret, was not able to get as far west as Denver. However, I shall hope to call on you next time I am in those parts.

Am wishing you and the magazine every success.

NOW RESIDING IN DENVER

From ALLEN R. MARTIN, '42, *2536 Birch Street, Denver 7, Colo.*

Please change my mailing address in your files from Bureau of Reclamation, Grand Lake, Colorado, to that given above.

For the past three years I have been on the construction of Granby Dam, the Westslope holding reservoir of the Colorado-Big Thompson Project, for the Bureau of Reclamation. I have now been transferred to the Chief Engineer's office of the Bureau in Denver, hence the change of address.

(Continued on page 16)

"When YOU do the blasting— you appreciate Du Pont 'MS' Caps"

"You see more and more mine operators turning to Du Pont 'MS' (Millisecond) Delay Electric Blasting Caps. The way they look at it . . . these caps lower the cost of explosives per ton of ore mined . . . in both outside and underground work.

"And when you do the blasting yourself, you appreciate working with 'MS' Caps. For one thing, you feel safer. These caps pull the rounds clean . . . leave no dynamite in the muck, and the chances are that you can reduce your explosive load appreciably. What's more, blasting with 'MS' Delays greatly cuts down concussion and vibration. They are easier to work with, too. Priming is simplified because 'MS' Caps are all the same length. And there's no mistaking the clearly marked delay periods on each cap . . . even if there is poor light at the working face.

"One thing more. When you're using Du Pont 'MS' Delay Electric Blasting Caps, you know there's going to be a lot less secondary blasting. We've seen these caps give well-broken ore time after time . . . even from badly fractured veins.

"We work with them . . . we know."

Ask any Du Pont Explosives representative for complete information about "MS" (Millisecond) Delay Electric Blasting Caps. He'll be glad to help you. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., 444 17th Street, Denver 2, Colorado.

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BLASTING SUPPLIES AND ACCESSORIES

Du Pont "MS" Delay Electric Blasting Caps

HAVE THESE IMPORTANT SAFETY FEATURES:

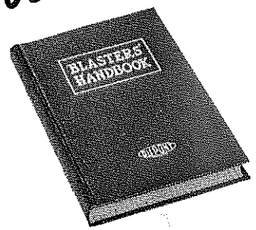
1. Nylon insulated wires. Brightly colored for easy identification in hooking up. Clean to handle.

2. Rubber plug closures are double-crimped into shells, highly water-resistant.

3. Aluminum foil shielded shunts. Bared ends short-circuited for entire length and shielded from accidental contact with electric currents.

"MS" Caps are supplied in 14 clearly marked delay periods ranging from 25 to 500 milliseconds.

JUST OUT!



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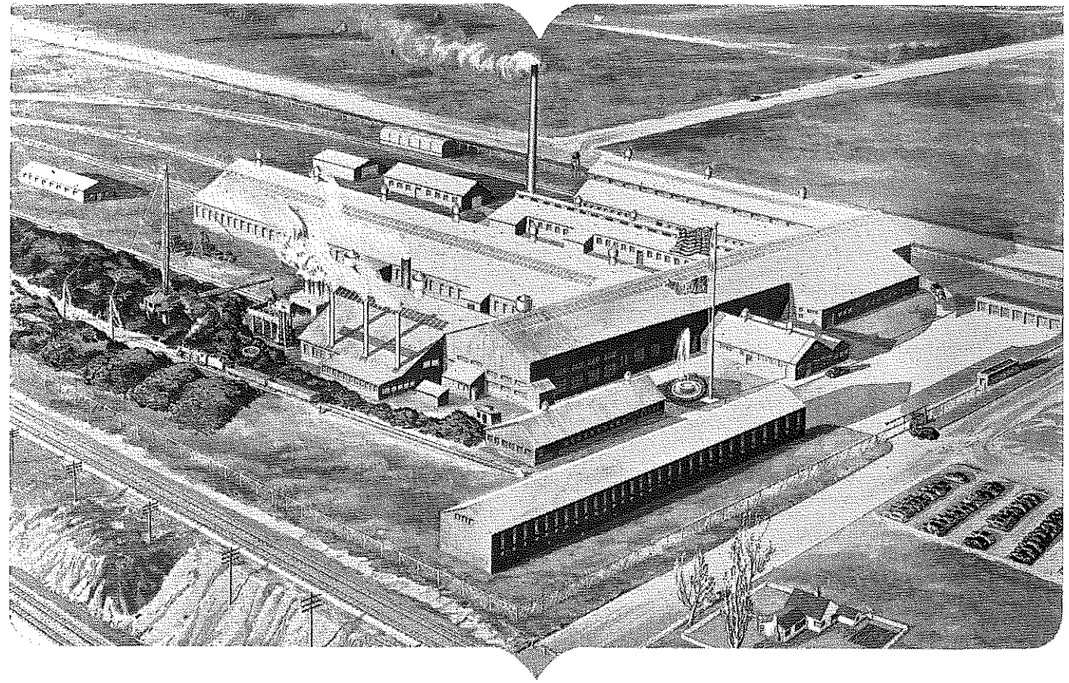
. . . THROUGH CHEMISTRY



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- DESIGNING
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Manufacturing is but one phase of our COMPLETE SERVICE, which also includes engineering and field construction "know how" reflecting 65 years experience.

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These contributors to "Mines" Placement Service assure its success and continuous expansion. It makes it possible for "Mines" Men to improve their employment by automatically presenting their qualifications to the employer best suited to make use of their services. Your contribution now may insure your future advancement or that of some other "Mines" Man who has the ability but not the contacts with the better job. Every "Mines" Man takes a pride in watching this list grow.

M. T. Honke, Jr., '48
George Baekeland, '22
Max Schott, Hon., '40
J. L. Fusselman, '42
H. V. Stewart, '49
G. F. Kaufmann, '21
N. J. Christie, '35
H. D. Graham, '48
V. G. Gabriel, '31; '33
Wilfred Fullerton, '12
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T. N. Allen, '41
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Robert McMillan, '41
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M. W. Miller, '49
T. A. Hoy, '49
J. R. Newby, '49
J. P. Bonardi, '21
C. A. Weintz, '27
F. D. Kay, '21
J. C. Andersen, Jr., '45
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R. E. Buell, '41
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R. L. Scott, '42
P. W. Crawford, '22
M. L. Gilbreath, '33
R. F. Dewey, '43
J. A. Kavenaugh, '38
J. G. Johnstone, '48
Wm. C. Lieffers, '48
F. E. Woodard, '42
Wm. H. Bashor, Jr., '49
T. H. Allan, '18
T. F. Adams, '29
C. V. Woodard, '44
Otto Herres, '11
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Herbert Schlundt, '43
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R. D. Eakin, '48
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James Colasanti, '35
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Finley Major, '47
W. J. McQuinn, '46
R. E. Cheek, '43
G. H. Shefelbine, '35
W. H. Nikola, '41
S. E. Zelenkov, '36
G. H. Fentress, '49
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W. L. Falconer, '41
G. P. Mahood, '24
J. A. Bowler, '39
W. C. Kendall, Ex-'47
J. C. Smith, Ex-'35
E. L. Durbin, '36
W. D. Caton, '35
W. A. Conley, '19
H. H. Christy, '22
F. E. Lewis, '01
E. C. Royer, '40
E. A. Berg, '41
G. A. Smith, '34
H. L. Jacques, '08
S. C. Sandusky, '48
J. W. R. Crawford, III, '48
O. P. Dolph, '25
A. M. Keenan, '35
W. H. Breeding, '39
N. S. Whitmore, '29
R. G. Hill, '39
L. E. Wilson, '27
L. P. Corbin, Jr., '40
W. J. Rupnik, '29
F. C. Aldrich, '48
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R. P. Olsen, '49
E. M. Watts, Ex-'26
L. O. Storm, '40
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Victor Bychok, '42
C. F. Fogarty, '42
M. M. Aycardo, Jr., '41

(Continued on page 56)

TECHNICAL MEN WANTED

Those interested in any of the positions listed may make application through "Mines" Capability Exchange, 734 Cooper Building, Denver 2, Colorado.

(841) INSURANCE SALESMEN. An old established life insurance company offers excellent opportunities for inexperienced and experienced salesmen. The type of men wanted should be capable of earning several thousand dollars per year.

(1148) JUNIOR MINING ENGINEER. An eastern manufacturer of iron products has a position open for young mining engineer in connection with their iron mines. Applicant should have some mining experience and ability to supervise men. Salary will depend upon experience and ability of applicant.

(1153) PHYSICISTS AND RESEARCH ENGINEER. A research organization established in the middlewest has positions open for physicists, and electrical engineers with good background in physics, electronics and electrical research. Applicants should have Master's or Doctor's degrees. Salary open.

(1154) MINING OR METALLURGICAL ENGINEER. A well established company operating in foreign countries has a position open for an engineer who has ore-buying experience and a good knowledge of the Spanish language. Salary open.

(1155) MINING AND METALLURGICAL ENGINEER. A company operating non-metallic mines in the south has a position open for graduate engineer to work in open pit mining and carry on research work for the flotation of non-metallics. However, several months training will be required before taking on an executive position. Salary open.

(1171) MILL FOREMAN. A South American mining company has a position open for a graduate metallurgist as Mill Foreman. Applicant must have had experience in the operation of flotation and concentration equipment. Must have a good working knowledge of Spanish and be able to successfully handle South American employees. Must report single status for six months. Salary open with liberal vacation allowance and free living quarters. Bonus to the right man.

(1172) RESEARCH CHEMICAL ENGINEERS. A South American mining company has a position open for Research Chemical or Metallurgical Engineers under 30 years of age. Must be familiar with analytical procedures in the determination of all elements, including rare metals. Salary open.

(1176) METALLURGIST. An aircraft manufacturer has position open for metallurgical graduate with education and experience covering metallurgical testing of ferrous and non-ferrous metals as well as physical processing, heat-treatment, welding practices and ability to coordinate these practices with the application of metals for manufacturing. Salary open.

(1178) JUNIOR METALLURGIST. A mining company in South America has position open for Junior Metallurgist with some experience in ore-dressing and laboratory work. Knowledge of Spanish is desirable. Starting salary, $3000 per year plus living quarters. Transportation by air, free. Yearly bonus of 1 month. 3-year contract.

(1186) JUNIOR MINING ENGINEER. Well known mining company operating in Central America has position open for Junior Mining Engineer who is qualified to make underground and surface surveys and maps. Good opportunity to advance into production. Salary open.

(1188) DRAFTSMAN & DESIGNING ENGINEER. Well known consulting engineering organization located in the middle-west has a position open for designing engineer who has had extensive experience with the cement industry. Should have had from 5 to 10 years experience of which 3 to 4 years have been drafting and designing. Probable salary, $400 to $500 per month.

(1194) MINING ENGINEER. A well known company operating a gold mine in Central America has position open for mine manager. Applicant must have had several years experience in operation of mines in Latin America. Salary depends upon qualifications and experience of applicant.

(1197) RESEARCH METALLURGIST. A well known research organization is setting up a new department covering research in connection with projects for pyro- and hydro-metallurgy. Applicant must be able to direct research and be well grounded in physical chemistry and especially thermodynamics. Should have few years experience in concentration of ores. Salary will depend upon the experience and ability of applicant.

(1199) PETROLEUM ENGINEER. A company operating in a southern state has position open for Petroleum Engineer 30 to 40 years of age with experience in natural gas transmisison and distribution. Will be necessary to travel approximately 50% of the time. Salary open.

(1200) MINING ENGINEER. Federal position open for Mining Engineer and Technologist who has had experience in coal mine operations, steel plants and gas manufacturing plants. Foreign employment. Probable salary $7600 per month plus travel and living expenses.

(1203) MINING GEOLOGIST. Position open in Mexico for Mining Geologist. Must have at least five years experience. Length of present engagement, six months. May be extended longer. Starting salary, $450 per month, U. S. Cy., plus travel expenses.

(1208) MINING ENGINEER. Position open for Mining Engineer in connection with Greek mining. Applicant must have broad experience in operation, examination and report work in connection with non-ferrous metals. Probable salary, about $9000 per year plus living allowance.

(1209) MINING ENGINEER. Company operating in South America has position open for assistant to Mining Superintendent. Man must have had a few years mining experience, be able to stand high altitudes and report single status. Three year contract. Probable salary, $400 to $500 per month.

(1215) MINE FOREMAN. A South American mining company has position open for Mine Foreman who has had several years experience in metal mining and is a college graduate. Must have working knowledge of Spanish and be either single or willing to go single status for at least six months. Three year contract. Starting salary, $4200 per year plus a bonus of one month salary for each year. Four weeks vacation. Free living quarters.

(1216) MILL SUPERINTENDENT. A well known mining company in South America has position open for Mill Superintendent with several years experience in milling operation. Latin American background is essential. Three year contract with housing provided. Approximate starting salary, $5000 per year.

(1219) DRAFTING AND DESIGNING ENGINEER. An engineering company has a position open for Mine Plant Designing Engineer. Applicant must be familiar with mining operations and have had several years experience in drafting and designing. Salary, $350 to $500 per month, depending upon experience and ability.

(1225) ENGINEER AND PHYSICIST. A shipyard has position open for an Engineer and

(Continued on page 14)

TECHNICAL MEN WANTED

(Continued from page 12)

Physicist with experience in the control of sound and vibration. Must be able to develop new techniques for reducing and controlling these elements. Probable starting salary, $5400 per annum.

(1227) SAFETY AND VENTILATION ENGINEER. A permanent well established company has position open with its foreign operations for a Safety and Ventilation Engineer with experience in large underground mines, technical background. Three year contract. Generous vacations. Housing and utilities furnished. Travel expenses paid. Must be in good physical condition. Salary liberal, depending upon experience.

(1228) METALLURGIST. Foreign company has position open for a young Metallurgist with some actual experience in ore beneficiation. Natural aptitude for research important. Salary open.

(1229) METALLURGICAL SUPERINTENDENT. A mining company operating a sulphuric acid plant in connection with copper leeching plant where pyrite roasting is used has position open for a Superintendent of sulphuric acid plant. Should have broad chemical knowledge. Good academic background and practical experience. Three year contract with liberal salary. Housing furnished, traveling expenses paid. Vacation allowed. Applicant must be in good physical condition.

(1230) MINING GEOLOGIST. A well established company with foreign operations has position open for Mining Geologist with broad experience in connection with ore deposits and geological field work. Salary open, depending upon experience and ability.

(1232) GEOPHYSICIST. A geophysical company with headquarters in New York City, has position open for a young geophysical engineer familiar with seismic operations in connection with mining work. Must be willing to travel extensively, both domestic and foreign. Salary open, depending upon experience and ability.

(1233) MINING GEOLOGIST. A mining company has position open for Chief Geologist with good academic background and experience in mine examination work and mine reports. Salary will depend upon experience and ability of applicant.

(1236) REFINERY ENGINEER. A refinery construction company has position open for a Refinery Engineer with several years experience in actual operation, who is capable of developing specifications and requisitions for instrument equipment from working sheets and process data for petroleum refinery units. Salary depending upon experience and ability of applicant.

(1238) REFINERY ENGINEER. A company constructing refineries and refinery equipment has position open for a Refinery Engineer with at least four years experience in actual operation. Must be capable of supervising and inspecting instrument installations during construction, and able to check calibration and adjust control functions. Must be able to assist operators during starting up period. Headquarters in New York but work will be both foreign and domestic. Salary open.

PERSONAL NOTES

(Continued from page 4)

P. W. Crawford, '22, Construction Engineer, Frontier Refining Company, is at present in McPherson, Kansas, with address 215 West 1st Street.

Peter C. Cresto, Ex-'50, was a Denver visitor the early part of May. He is Top Boss and Engineer for Canon Royal Coal Company, residing at 1708-11th Avenue, Greeley, Colorado.

(Continued on page 16)

We Congratulate . . .

. . . 1950 Graduates

CLASS 1895
ROBERT S. STOCKTON
415 East 29th Avenue, Spokane 10, Washington

CLASS 1899
WILLIAM D. WALTMAN
325 South Plymouth Boulevard, Los Angeles 5, California

CLASS 1900
JAMES H. STEELE
420 West Ralston Road, Arvada, Colorado

CLASS 1901
FRANK C. BOWMAN
734 Cooper Bldg., Denver 2, Colorado

CLASS 1906
NEWTON PILGER
2900 Hauser Boulevard, Los Angeles 16, California

CLASS 1907
ALBERT G. WOLF
c/o Texas Gulf Sulphur Company
1009-2nd National Bank Building, Houston 2, Texas

CLASS 1908
B. W. KNOWLES
1524 Mesa Avenue, Colorado Springs, Colorado

CLASS 1909
A. HARTWELL BRADFORD
802 Richfield Building, 555 South Flower Street, Los Angeles 17, California

CLASS 1910
G. S. McKAY
Apartado No. 13, Chihuahua, Mexico

CLASS 1913
FRANK B. HARRIS
159 First Avenue, Salt Lake City 3, Utah
IRWIN R. SOLOMON
Federated Metals Division, American Smelting & Refining Company
P. O. Box 471, Whiting, Indiana

CLASS 1914
N. M. MacNEILL
615 Custer Street, Brush, Colorado
F. C. McNICHOLAS
603 Midland Savings Building, Denver, Colorado

CLASS 1916
CARL BLAUROCK
722 Exchange Building, Denver, Colorado

CLASS 1918
THOMAS H. ALLAN
921 Union National Bank Building, Wichita 2, Kansas

CLASS 1922
PAUL W. CRAWFORD
215 West First Avenue, McPherson, Kansas
NEIL E. JOHANSON
Colorado Plant Department, M. S. T. & T. Company, Denver, Colorado
FRED W. KIRBY
2324 Coventry Road, Columbus, Ohio

CLASS 1923
FLOYD M. BELLEAU
955 Tuxedo Ave., Webster Groves 19, Mo.
EDWARD J. BROOK
3637 Manderly Place, Fort Worth, Texas
RONALD F. CRAWFORD
2509 Park Lane Court South, Birmingham 9, Alabama

CLASS 1925
CARL F. BEILHARZ
The Pure Oil Company, Houston, Texas
JOHN L. HUTTON
635 Ferguson Building, Cleveland 14, Ohio
MYRON C. KIESS
The Pure Oil Company, P. O. Box 239, Houston 1, Texas

(Continued on page 60)

LETTERS

(Continued from page 6)

GREETINGS TO THE CLASS OF 1900

From DANIEL HARRINGTON, '00, *1400 So. Barton Street, Arlington, Va.*

While I would much like to participate in the Golden Anniversary of the Class of 1900 in Denver on May 25th, it is not feasible; but it is feasible to accept your invitation to send a message to those who are present. Apparently, about one-third of the graduates of 1900 are now in the land of the living and I am the only one residing east of the Mississippi River.

I note that five of these old timers must be millionaires as they reside in California, where those who make their pile usually migrate to live in luxury and ease. Four still live in Colorado so they, possibly, have been like me and failed to accumulate the desired pile. One lives in Utah, one in Washington, and one in Kansas, and they may or may not have become plutocrats.

It is rather significant that more than half of the surviving members of the Class of 1900 were members of the championship football team of 1898; and, of course, this doesn't include me though I was a decidedly enthusiastic and loyal camp-follower.

All in all the Class of 1900 has done a pretty good job and I salute the survivors, and hope all of them have a long and healthy and happy future.

Thanks so much for giving me this opportunity to greet the Alumni, including the old timers of 1900.

IN CANADA AND CANNOT ATTEND REUNION

From AUGUST F. BECK, '25, *1949 Albert Street, Regina, Saskatchewan, Alberta, Canada*

I have just received a letter from Mr. Bowman, dated May 5, advising me of the

(Continued on page 58)

PERSONAL NOTES

(Continued from page 14)

W. G. Cutler, '48, Petroleum Engineer for The California Company, has been transferred from Hamilton, Colorado, to New Orleans, where he is addressed 251 Hollywood Drive, New Orleans 20, La.

Willis K. Daggett, '35, Manager, Weltex Jet Services, has moved to Fort Worth, Texas, with mailing address, 3909 Hemphill Street.

J. T. Darde, '39, is employed by Stanolind Oil & Gas Company in their Producing department. His present address is Box 351, Alvin, Texas.

Lt. Col. Frank DeGiacomo, '32, is addressed A. F. Board No. 2, Fort Knox, Kentucky.

Wayne Denning, '26, Geologist-Geophysicist for United Geophysical Company, has been transferred from Pasadena, California, to Tulsa, Oklahoma, where he is addressed 422 No. Main Street.

Frederick F. Dueser, '49, is Engineer for the Republic Natural Gas Company, in whose care he is addressed, M. & W. Tower Building, Dallas, Texas.

Reeve M. Duhme, '40, Geologist with the U. S. Engineers Corps, has a change of address to R.F.D. No. 1, Box 84, Mill Valley, California.

Donald W. Dunn, '41, Quarry Superintendent for U. S. Gypsum Company, has been moved from East Tawas, Michigan, to Oakfield, N. Y., his mailing address being 87 No. Main Street.

Virgle L. Easterwood, '49, is now being addressed Box 967, Borger, Texas, where he is serving as Geophysical Trainee for Phillips Petroleum Company.

Marvin H. Estes, '49, District Engineer for Frigidaire Sales Corporation, has moved his residence from Denver to Golden, 515-14th Street.

George H. Fentress, '49, resigned his position with Phillips Petroleum Company to accept one as Geologist for Lion Oil Company. He is addressed in care of the company, P. O. Drawer 3911, West Jackson, Miss.

Mario Fernandez, '39, is Mine Superintendent for Minas de Iguala, S. A. His address is in care of the company, Apartado 130, H. del Parral, Chih., Mexico.

John F. Finn, '42, has been transferred by Stanolind Oil & Gas Company from Rangely, Colorado to Elk Basin, Wyoming. His position with them is Field Engineer.

Robert H. Freeman, '48, has a change of address from Kimberly to Kopperston, West Virginia. He is Transitman for Eastern Gas & Fuel Association.

David H. Fulton, '48, Stope Engineer for Phelps Dodge Corporation, is now in Lowell, Arizona, with P. O. Box No. 3824.

P. H. Garrison, '39, Seismograph Field Supervisor, Stanolind Oil & Gas Company, is now located in Fort Worth, Texas, with address Box 1410.

George L. Garwood, '39, Associate Engineer for Phillips Petroleum Company, is addressed Drawer 1232, Odessa, Texas.

Charles E. Golson, '34, who recently returned from Chile where he was associated with the International Machinery Company, has accepted position of Sales Engineer with the Colorado Fuel & Iron Corporation. He and his family are now at home at 1745 West 51st Ave., Denver 11, Colorado.

(Continued on page 35)

The Mines Magazine

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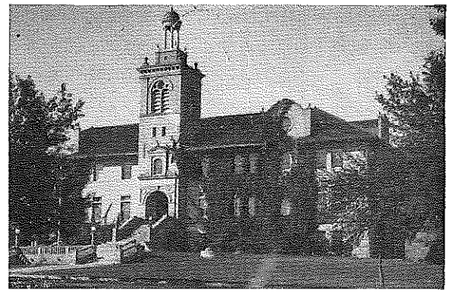

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COLORADO SCHOOL OF MINES HOLDS ITS 76th ANNUAL COMMENCEMENT

Friday, May 26, 1950

The Steinhauer Fieldhouse provided an excellent auditorium for the Commencement exercises during which silver diplomas were presented to the largest graduating class in the history of "Mines." The inauguration of Dr. John W. Vanderwilt, who officially became President, and the graduation ceremonies were witnessed by an audience of approximately 750.

The invocation was given by the Reverend Lance A. Mantle, of the First Presbyterian Church of Golden, Colorado. Mr. Lester C. Thomas, President of the Board of Trustees gave a short welcoming address and presented the charge and investiture of the new President, followed with the acceptance of office by Dr. John W. Vanderwilt. In his acceptance address, Dr. Vanderwilt expressed his great confidence in the future of the Colorado School of Mines and stated that every effort would be made to maintain and advance the high standing of the Colorado School of Mines. He further emphasized the necessity of cooperation from all concerned in the building of a greater "Mines" in the future.

▼ 1950 Seniors on their last lap.

In his introduction of the speaker, Dr. Vanderwilt said in part, "The speaker today has done more than his share of providing metals for industry. While he graduated from Yale University in 1913, majoring in electrical engineering in Sheffield Scientific School, he gradually became associated with the minerals industry. During the First World War, he joined the United States Naval Reserve as engineer officer in Aviation with the rank of Lieutenant. After the war was over he became interested in radium and served as President of the Radium Company of Colorado from 1921 to 1925. In 1925 he organized the United States Vanadium Company and, as its president, developed the vanadium deposits near Rifle, Colorado. In 1927, the Union Carbide and Carbon Company purchased the United States Vanadium Company and he became associated with the Lehman Corporation of New York. When the Second World War was declared, he resigned from the Lehman Corporation to join the War Production Board in Washington, with which organization he advanced to Chief of Staff. After the war he became a general partner of Lehman Brothers, from which firm he resigned in 1949 to become President of the Climax Molybdenum Company and his interests are again turned to mining and the production of uranium in Colorado and it is my sincerest pleasure to present to you, our speaker of the day, Mr. Arthur Hugh Bunker." (The full text of Mr. Bunker's address will be found in this issue of Mines Magazine.)

In extending his congratulations to the Class of 1950, President Vanderwilt stated that these two hundred ninety-seven men included two hundred sixty-seven to be awarded Engineering Degrees in Mining, Metallurgy, Geology, Petroleum Production, Petroleum Refining and Geophysics and twenty-nine Master of Engineering Degrees and one Dr. of Science Degree. The graduating class represents thirty-nine states and ten foreign countries; two hundred thirty-four of these are World War Veterans, a large portion of which are married and have families totaling one hundred and eight children.

The Degrees were awarded by President John W. Vanderwilt and Professor Clark B. Carpenter, Chairman of the Graduate Division.

In presenting commissions to Corps of Engineers, U. S. Army, to graduates of the Reserve Officers' Training Corps, Colonel Wendell W. Fertig made the following remarks:

"The Colorado School of Mines, in the period between 1919 and 1941 furnished 9.7% of all Engineering Officers. At the present, the R.O.T.C. Unit at 'Mines' is the largest single Engineering R.O.T.C. Unit in the United States. This Unit will send more Cadets to the 1950 summer camp

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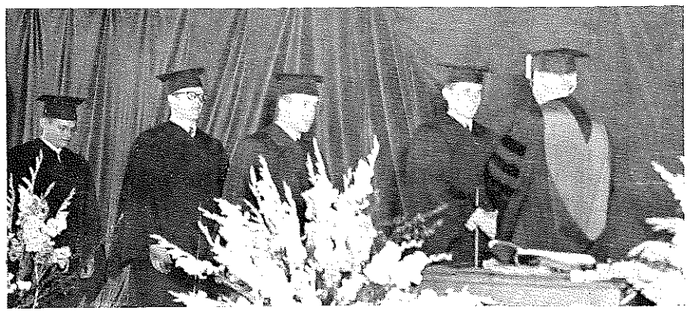


▼ Dr. Vanderwilt presents Silver Diplomas.

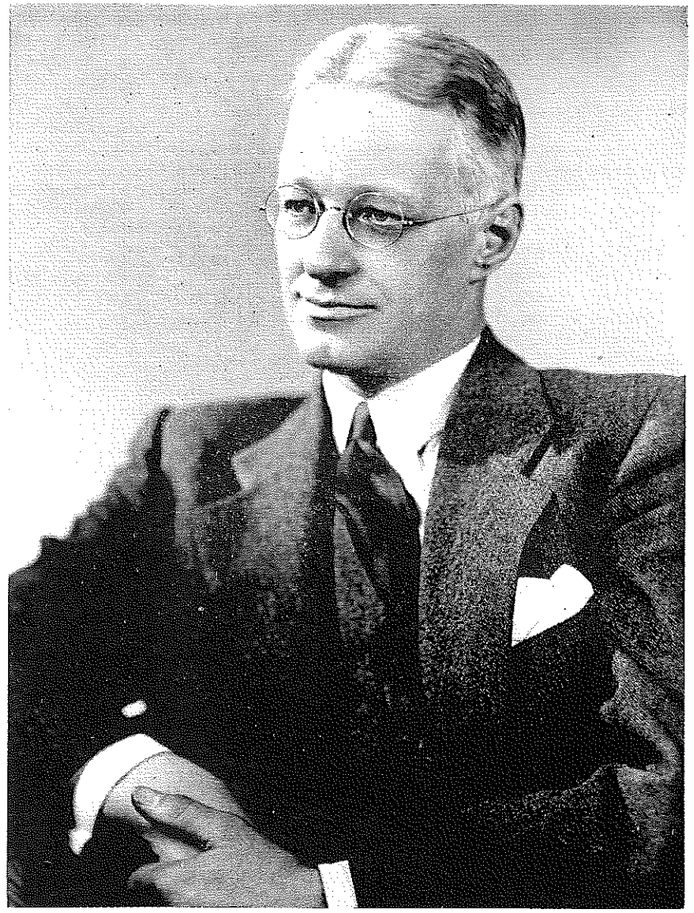
A Mid-Century Survey For The Engineer†

Commencement Address, Colorado School of Mines Golden, Colorado May 26, 1950

By

ARTHUR H. BUNKER

President, Climax Molybdenum Company



ARTHUR H. BUNKER

It is an honor indeed to be asked to speak before a school which for so many years has justly enjoyed the reputation of being the senior educational institution in the fields of mining, geology, and related sciences.

It is especially pleasing to me because my earliest experiences in mining were here in this state. More than 25 years ago I came to Colorado to engage in the production of radium from ores in the Colorado Plateau. This was a particularly fascinating experience because it presented new problems both in process and use. All through this period I knew and used the facilities of your school to solve many of these riddles. So my friendship here is an old one. When I became President of the Climax Molybdenum Company, I was particularly delighted to find we were doing much of our process research here. It was a pleasant renewal of an old friendship.

Life Expectancy Advances

But I came here to talk about *you* and your future. I think it is only fitting that I should approach your problem as an engineer. The first task I assigned myself was to see how long this particular piece of machinery, that is, *you members of the graduating class,* could expect to remain in good operating condition. The life expectancy tables tell me that most of you should live through this century and some considerably beyond.

How did this come about, when 50 years ago you could only have looked forward to another 30 years after graduation? It is because we have behind us 50 years of productive discovery in the field of medicine which gave us vitamins, hormones, sulfa drugs, penicillins, blood plasmas, X-rays, and an extraordinary improvement in surgery.

Research did not stop at the material level, but penetrated the mind and emotions and discovered man's "Unconscious." This may well be man's greatest discovery in an age when he needs more knowledge of his machine — that is, his behavior, his compulsions, his difficulties with himself and his neighbors, his frustrations, and his tendency to war. In the Constitution of The United Nations Education, Scientific and Cultural Organization there appears, "Since wars begin in the minds of men, it is in the minds of men that the defenses of peace must be constructed."

The past half century has, then, provided this machine of yours with better quality of materials, lower rates of depreciation, wear and tear, and a better understanding of yourself and your neighbor. Yours is a very unusual piece of machinery, compared to what came off the assembly line 50 years ago. But added to this rare chassis your engineering training has given you four years in the discipline of penetrating below the surface exteriors to find and examine much of the fundamental composition of things. *If there is one thing certain, it is that this age is going to need men with ability to penetrate below the surface in all walks of life.*

The Next 50 Years

What should these next 50 years be like? It seemed to me that one part

† Presented before the Graduating Class of the Colorado School of Mines, Golden, Colorado, on May 26, 1950.

of the answer could be found in a rough measurement of the accomplishments, the forces, and the rate of change of the first 50 years of this century. These forces and movements are a controlling factor which will shape the period ahead. I have considered two broad fields: one, the great material gains; and the other, the sweeping changes on the social and political fronts.

On the material front 50 years ago, we lacked telephones, automobiles, aeroplanes, electric lights, internal combustion engines, motion pictures, radios, television, radar; we had no electric eye, typewriters, adding machines, or calculating machines. I am sure you cannot imagine living out your life without these things. They are the backbone of most of your daily activities.

In the entire year of 1900, 4000 cars were produced. Today we can produce that many in any afternoon —and do.

In 1900 there was electric generating capacity for 2,000 k.w.; in 1949 it was 30,000 times as great.

In 1900 production of petroleum amounted to 63 million barrels; last year production was 30,000 times as great.

Today we have 35 million telephones; 35 million cars; unbelievable millions of electric refrigerators, washing machines, radios, and innumerable work aids, all unknown at the turn of the century.

It seems impossible to believe that this is a review of only the active life span of a generation. It sounds like a review of centuries. But this has all occurred in the same number of years that you should be privileged to live and give an account of yourselves. This tremendous pace of material growth is an augury of the future. It is a measure of the force and movement of our times.

Freedom and Research Driving Power

How did this all come about? Are the forces which caused this growth still going on? Are they at their point of maximum power?

At the beginning of the century we had discovered many of our rich raw materials; we were just emerging from our agricultural economy. There was a substantial body of knowledge available from the European industrial countries, and there were a number of important discoveries ready for development. *And we were a vigorous people, filled with the pioneering spirit. We had established a government under which we were free—free to move and act and venture.*

Let us see what happens to one discovery in these settings—the internal combustion engine. This engine gave us the first compact, mobile, light weight source of great power. First it was applied to the automobile. But the construction of an automobile did not consist merely of building an internal combustion engine. It called for the development of innumerable other industries: for example, petroleum, steel, rubber, tens of thousands of filling stations, garages, sales offices. It created vast employment on numerous fronts.

Before the automobile, the petroleum industry was a small business supplying kerosene for light and lubrication for general purposes. It competed, often unsuccessfully, with whale oil and the tallow candle. *The development of this industry called upon many sciences, such as geology, physics, and chemistry; it required research on every front,* from the discovery of raw materials to marketing; it demanded new materials of every kind; it made possible the development of the aviation industry. But this development in turn required the parallel development of lighter and stronger metals, still better gasolines, and improved lubricants. When these were achieved, old products, methods, and plants became obsolete overnight.

For a moment let us look at the development of the electric motor and generator. This developed an enormous demand on all sources of power —coal, petroleum, water. It created our great public utilities, our distribution systems, our transmission lines; it expanded our railroads; it paved the way for all other electrical devices, whether for home or factory.

New Discoveries Multiply Opportunities

Every new discovery had almost myriad applications. Look at such an unlikely place as the farm. A revolution took place. Chemistry analyzed our souls and developed our fertilizers. The tractor replaced the horse; the farm implement industry became great. The gasoline engine became the source of power for every device used—from plowing and planting to cultivating, harvesting, and to moving our products to market. This in turn released millions of people from production of food for work in our industrial plants. And despite releasing them, we were able not only to support the needs of our great and growing population but to provide generous quantities of food for export.

So we see that one industry begot others. *New industries were born, only to double and redouble in size at each new stage of development. An invention would develop beyond the wildest dreams of its inventor, finding application in unexpected field after field.*

My experience in the West demonstrated how interwoven were the various unrelated sciences. When we started to extract radium, the demand was slight; but as soon as it was known to be available, the medical profession, through extensive research, found out how to use this powerful and dangerous element. So the demand multiplied geometrically. And again a development in the ferroalloy field created a demand for our by-product vanadium which we had been throwing away.

Free Society Provides Dynamic Factor

But it is, I believe, our free society which provides the dynamic factor that continually improves our standard of living. It is because we are freer here than in any other country in the world that we can start new enterprises and take great risks in the hope we may reap large rewards. This freedom provides that impetus and the ways and means which bring together our technologies, our raw materials, and our labor to produce new developments and new industries.

But in this last half century we have had the added impetus of two great world wars. In spite of all the destruction and evils that flow from war, it is the greatest stimulus to concentrate and hasten developments on the material front that man can have. In war, all men are brought together in a common cause through the common danger of being confronted, killed, or overwhelmed by the enemy.

War creates vast and novel problems. It creates upheavals in the working force in the factory and on the farm, as it has to take most of the young vigorous men for the armed services. And while it reduces the available supply of the current labor, it makes enormously increased demands on over-all output, on improved methods of producing goods with less labor, and on invention and creation of new devices and weapons of war superior to the enemy's.

Some ordinary peace time supplies are shut off. Others become drastically short. Demand becomes astronomical and time is of the essence. New tools must be perfected, substitutes developed, production increased.

Can you possibly imagine an aviation industry growing from a few thousand transport and private planes to a hundred thousand complicated war planes a year, ship building increasing from two million tons to twenty million, an aluminum industry growth of 700%, magnesium of 10,000%—and all in a few years, and during the same period when a seven-ocean Navy was being constructed and all the general armament of war manufactured as well? This is a measure of the stimulus of war.

Research and Development Makes Rapid Strides

To meet these quotas and solve these problems peace time rules are broken, all barriers are down. Scientists are brought together and assigned given problems. One inspiring example was The Office of Scientific Research and Development, headed by that able man, Vannevar Bush, gathering together 30,000 scientists and engineers who were charged, among other objectives, with the development of war weapons. Whether it was hunting down the submarine, perfecting radar, developing the proximity fuse, producing the atomic bomb, the problem was assigned and solved. It meant the free interchange of all scientific knowledge, centralization of authority, organization to the highest degree, and intense devotion to the cause.

On the industrial front, the War Production Board was established to apportion materials and provide facilities for production. It did this with its own 25,000 men and with 700 Industry Advisory Committees, drawn from every section of our industry and charged with interchanging all known knowledge of production methods and technique.

For development of new processes, the National Academy of Sciences was placed in charge. They in turn drew in the Universities where they assigned research programs and provided interchange of knowledge.

And because, as a nation, we had already learned mass production, organization, and research, and had developed a capacity for the immediate incorporation of new methods, we achieved unbelievable success at breathtaking speed — outperforming the enemy in every industrial and scientific field.

The result of all of this is that we compressed, into a few years, developments which might have taken generations to achieve in times of peace. We learned the true strength of our industrial machine. It is historically true that the development of new technologies in war provides stimulus for an expanded economy for a generation. It takes that long to adopt the new knowledge and methods into a peace time economy.

Engineer's Place in Industrial Economy

What part did the engineer play in this turbulent and fast moving 50 years of industrial history, both in periods of peace and war? What is his probable place in our industrial economy in the next 50 years? At the turn of the century, when the population of this country was 75 million, or one-half its present size, there were only 27,000 engineers. There are graduating this Spring some 47,000 engineers, or nearly twice as many in one year as existed throughout the United States 50 years ago. Altogether there are 350,000 engineers occupied in this country, or some 12 times as many as we had at the turn of the century. Fifty years ago one engineer for every 70 industrial workers; and it is estimated that by the end of the century, one will be needed for every 40 workers. *There can be no question of the increasing reliance upon the trained engineer in a society that will be even more industrial and complex.*

What does all this scientific and material development mean? Standing alone it would mean that all of you could have all the material prizes that you want. All of the necessary knowledge and experience exist for a forward thrust. If there were no other considerations that might impede the natural projection of these forces, I think it is reasonably calculable what you might see in your life span. There are enough sound reference points to permit some forecasting.

Next 50 Year Forecast

In the first half century alone we increased our consumption of goods on a per capita basis 2½ times over. Year after year factory output per man hour—owing to increased plant investment and improved technologies —increased 2% a year and is now increasing at more than this rate. This increase took place while the work week underwent a gradual reduction of nearly 1/3, from 60 hours a week to 40 hours.

It is reasonable to assume that in your lifetime this same rate of increase in production per man hour could take place for 50 years with productivity increasing by 2% a year or more, so at the end of the century consumption could have increased again by 100% above today's rate. And while all this takes place there should be another reduction in the work week, possibly from 40 to 30 hours, so that your leisure time would be enormously increased.

Estimates tend to agree that the population should reach 200 million; that the automobile population will be astronomical—probably 85 million; that the entire traffic and road system of the country must be rebuilt; that there will be 2 cars per family on the average; that there must be decentralization of production, and great suburban development.

In the field of raw materials, our great industrial development and two world wars have worked sadly to deplete them. *It is estimated that in the next 50 years alone we will need 2½ times as much raw material as this country has produced in its whole industrial history covering the last 150 years.* Where will these come from? Certainly it is not reasonable to expect that they will come from discoveries of new deposits. They must come, of course, in part from foreign countries and many of you must go there to search for them. But they must also come from marginal reserves, from substitute materials. It will keep you engineers busy in search and development for the balance of your life to see that such a need as this is met. It will tax your ingenuity to the utmost.

We are spending $500 million a year on research. Where will it take us? Surely no one knows precisely. But at the turn of the century man did not believe that in a few years he could look under the ground, through the water, hundreds of miles beyond his range of vision through the air; nor did he even imagine he could send forth guided missiles unaccompanied by human direction; nor did he have any concept, when the discoveries behind these developments were made, what industries would be built to use them. Even if there were no new discoveries, the natural expectancy would be that we would double our work unit output in the next 50 years.

We only yesterday laid bare our new concept of matter. We have every reason to believe that, in the re-exploration of physics and chemistry and allied sciences in terms of our newly-won knowledge, developments in new fields lie before us that will dwarf all previous achievements.

Great Sweeping Social Changes

But can man remain free to accomplish these things? Can the engineer remain purely the engineer? Let us look at the great sweeping social changes that have occurred, and see if they carry portent for the shape of the future. You will see that such changes have been as radical and sweeping as they have been on the industrial front.

First, let us look at the lot of the workman. At the turn of the century there were in fact no labor unions. True, there had been guilds for certain centuries, having limited influence in highly skilled crafts. Even fifteen years ago only 10% of our factory workers were union members. Today 65% of the workers in our factories and 80% of the workers in our mines are represented in unions. They proceed to negotiate their wages

through collective bargaining.

Fifty years ago man expected to work an average of 58 hours a week in mines, mills and factories. Today the average is 40 hours, and for a greater number of hours he is compensated with higher rates of pay. There are free vacations, national holidays, pensions, welfare insurance, and compensation for accident and death. There has been a major revolution in the improvement of working conditions, in the development of safety devices, in the reduction of occupational hazard, in health and well being of the worker.

On the other hand, we have developed mass production and offer the worker less satisfaction in his occupation than when he was an individual artisan and craftsman.

In the early thirties we had a depression, creating untold misery and unemployment. It occurred when you were very young, but I am sure your parents will never forget it. It raised the question of whether any credit system can survive which does not permit a man to work who wants to work and to create goods which he needs. In our dilemma we resorted to plowing under of crops, to slaughtering livestock, in an effort to change the price level and create prosperity. We destroyed the very goods our people needed. This seemed a special form of madness.

We have seen states yield their accustomed powers to the national government. We have seen the central government rapidly approaching paternalism in an effort to increase the security of its people. This has quickly cost the people in other countries many of their basic freedoms. Even England has adopted a program of nationalization of property and socialized medicine. They have, in fact, legislated a standard of living without determining first whether or not it can be maintained. We will eventually find out whether this can fail to lead to bankruptcy.

We have created new methods of taxation. In the main, this has been necessary to provide revenue for new undertakings. *But far too many taxes result from yielding to the demand of pressure groups without first examining their effects; and some have been used to maintain tenure of office.* We are using taxation as a means of redistribution of wealth. We have adopted high income tax rates, and death duties, with minor allowances for loss. This creates new concepts of property rights by diminishing the incentive to take normal investment risks, and greatly reducing the privilege to retain gains. Our central government has assumed some of the taxing power of the states.

We have seen our Constitution interpreted anew. The Constitution must be flexible and must reflect the will of the people. But we must always be alert to re-examine whether those interpretations and these judgments are in accord with that will and that wish.

We have seen the inevitable growth of big corporations to provide our needs through mass production. We have enacted the Sherman and Clayton Acts to prevent monopoly and ensure free competition. *Many are now suggesting that bigness in itself is evil, even where vigorous and free competition exists. These are not measures to be considered lightly lest we lose our strength and freedom.*

And we have a special group of post war problems. After World War II, unfortunately, we did not find peace. We found we were at war. A cold war. It is a subversive war, a fifth column war, an enduring war. It is not killing one's enemy as in a fighting war, but *enslaving people at an unprecedented rate; and today the totalitarian state is inflicted on one-third of all the population of the world.* We are learning about this new type war. We are beginning to think as a nation about this war. We know we must meet the conditions of this war.

General Marshall said the other day: "The current threat to our existence as a free nation comes from the international conspiracy of communism and its use by the rulers of Soviet Russia as an instrument to destroy the freedom of other peoples and subject them to Soviet Control. *Communism as it is practiced by the Soviet rulers is inimical to freedom and democracy not only because it is aggressive toward other nations but also because it seeks to destroy the integrity of the human individual.* By the ruthless use of propaganda, subversion, coercion and force, Soviet Communism has now extended its control over most of the Eurasian continent and one-third of the population of the earth."

We found new and greater problems. We found our friendly neighbors exhausted. We found them with impaired sinews of production, with very little hope and great despair. So to meet all of these problems, we have taken strenuous and expensive measures.

We have established a $15 billion defense budget to keep ourselves strong, in the hope that this strength may avoid another world war. We believe this is not enough. So we have a Western European Defense Pact whereby this nation must provide most of the materials and articles of defense for Western Europe. We have the Marshall Plan whereby we furnish billions of dollars in supplies a year to aid friendly nations to help themselves rout their misery and despair, the consequence of their war exhaustion. And the cost of all of this must be added to maintenance of our people in their way of life.

These are but the outlines of some of the dominant problems that have great force and movement on the social and political front. Within the terms of their solution will be determined the political and material climate under which you will live, and work, and create, and have—or *not* have—your freedom. Surely it is clear that simply to be set for dynamic progress on the material front is not enough. The political and social framework must be sound. In a war, material progress is not impeded by social differences. We pull together. We work for a common cause.

But our history has been that in peace time too many of us are indifferent to our social problems—too uninformed, too satisfied that all this is the responsibility of someone else. We have been too confined to our own pursuits. It may well be, however, that without this absorbing attention to our material problems we could not have had our industrial growth.

But now we have come of age. We have developed as a nation the greatest power ever known on earth; and with this power, as with any power, comes responsibility—the responsibility to understand it and to see that it is used correctly.

Frankly, I do not think these problems of ours are frightening or incapable of solution—unless we slumber and are unaware.

As engineers you know well that the first step in the solution of any problem is carefully to define it. And you know that very frequently this definition carries most of the answer.

I firmly believe that on the social front the careful definition of the problem carries most of the answer. But it will be the obligation of all to define these problems. I firmly believe that the Government will remain the servant of the people, if the people are alert.

It will not do for you as individuals or as citizens to be only even the best of engineers. It is my hope that you will inform yourselves about these issues, that you will weigh them, and that you will make your voices heard. And that in so doing you will live full lives as men as well as engineers.

(Continued on page 53)

▼ Left to right—Alex B. Carver, '25; Dean M. I. Signer; Ted P. Stockmar, '43; George A. Parks, '06; L. C. Thomas, '12; Ben Parker, '24; James Colasanti, '35; Russell H. Volk, '26; Clark F. Barb, '25; Frank C. Bowman, '01; James H. Steele, '00; Louis R. Ball, '00; Clarence C. Malstrom, '00.

"MINES" ALUMNI BANQUET

May 25, 1950

It took more than a snowstorm in May to cool the enthusiasm of a group of "Miners" who had planned for months on the big "get-together" at their Annual Alumni Banquet. Despite the fact that the Speaker of the Evening, Mr. G. T. Harley, General Manager of the International Minerals and Chemical Corporation, Carlsbad, New Mexico, was "grounded" at Pueblo, on account of the storm, the banquet was held on schedule at six o'clock, May 25, in the Daniels and Fisher Dining Rooms, Denver.

The large group of "Miners" and their friends soon filled the "Men's Club Room" almost beyond capacity. The group represented classes from 1898 to 1950 inclusive. It was the first time since graduation that many of those present had the opportunity of meeting with such a representative group of "Miners." The good old "Mines Spirit" ran high and Joe Ruth was kept mighty busy passing out refreshments. The time was all too short to allow for the relating of the many fortunes made and lost since leaving "Mines."

It was a jubilant crowd that sat down to a fine roast-beef dinner in the main dining room. Alumni Association president, James Colasanti, introduced Miss Donna Morrison, Accordionist and Vocalist, who led the "Miners" in the singing of the National Anthem, and later entertained those at individual tables with their favorite songs and music. While waiting for dessert, all joined in singing the "Mining Engineer," the song first composed and sung by "Mines" men in the '70's.

▼ James Colasanti welcomes new graduates.

When all were finished with the sumptuous dinner, James Colasanti welcomed members of the Class of 1950 and congratulated them for having such a fine representation at this gathering. He said, "Past records show that 'Mines' men who have gone out and assumed responsibility have reached a point where they can look back upon their work with pride."

Walter S. Forbes, Class President, responded, saying that "there are two hundred sixty-eight of the finest in the Class of 1950 and that all of those present this evening are having a great time."

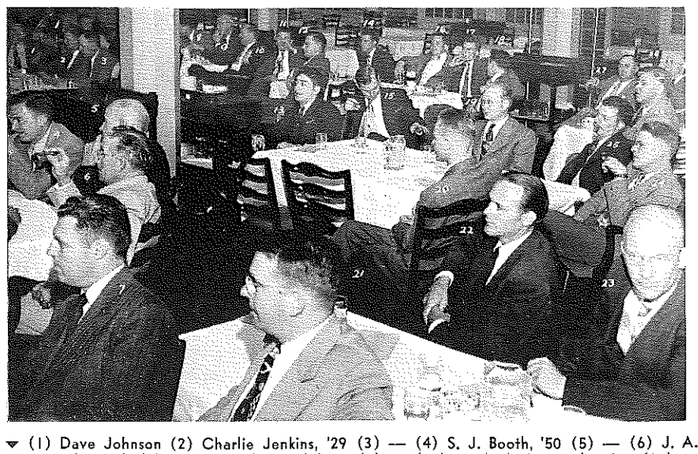
President Colasanti next congratulated the Silver Anniversary Class of

▼ (1) — (2) — (3) H. M. Holkestad, '24 (4) — (5) — (6) G. C. Weaver, '26 (7) — (8) — (9) A. B. Mosgrove, '35 (10) — (11) — (12) — (13) — (14) C. L. Barker, '31 (15) — (16) — (17) Jack W. Hyer, '42 (18) A. W. Lankenau, '48 (19) Clarence C. Malmstrom, '00 (20) Russell H. Volk, '26 (21) — (22) — (23) — (24) Ray Summer (25) Allan E. Craig, '14 (26) V. L. Mattson, '26 (27) Oscar Reynold, Ex-'04 (Above 23) Donald J. Drinkwater, '42 (28) — (29) —(30) — (31) —(32) Oscar H. Johnson (33) — (34) A. A. Holland. Insert lower right hand corner, Joe Ruth questions "Lindy" Barker's money.

▼ Frank C. Bowman and James Colasanti discuss the program.

▼ (1) — (2) — (3) —(4) —(5) —(6) — (7) Jack Weyler, '50 (8) — (9) — (10) — (11) S. J. Booth, '50 (12) R. L. Marsh, '50 (13) Tom Allan, '50 (14) Bill Hostetter, '50 (15) Jack Petrocco, '50 (16) E. W. Milligan (17) I. A. Mercier (Guest) (18) Pat Mercier, '50 (19) — (20) R. H. Muench, '50 (21) Malcolm Collier, '22 (22) Mert Signer, '50 (23) — (24) — (25) — (26) James G. Cox, '38 (27) H. L. Muench, '40 (28) G. C. Weaver, '26 (29) Walter J. Morris (30) Winfred Clark, '98 (31) Evans W. Ferris, '38 (32) R. E. Powers (33) — (34) V. L. Mattson, '26 (35) —.

▼ All eyes on Donna Morrison and Oscar Johnson.



▼ (1) Dave Johnson (2) Charlie Jenkins, '29 (3) — (4) S. J. Booth, '50 (5) — (6) J. A. Mercier (Guest) (7) B. M. Bench, '30 (8) — (9) — (10) — (11) Jim Taylor, '50 (12) — (13) Daniel Pavone, '48 (14) Donald F. Wall, '50 (15) — (16) Frank Murphy, '50 (17) Stu Collester, '50 (18) Richard H. Fulton, '50 (19) — (20) — (21) — (22) Kenneth Fenwick, '36 (23) Hildreth Frost, '39 (24) — (25) — (26) Harry McNeill, '24 (27) G. C. Weaver, '26 (28) V. L. Mattson, '26.

1925, pointing out that of the seventy-eight graduated, seventy-one are still among the living. Those who have passed on are Charles D. Bennett, Alia T. Ehrlick, Homar L. Johnson, Franklin O. Krieger, Emil J. Nylund, Frederick L. Teale and Henry W. Waterfield.

As spokesman of the Class, Professor Clark F. Barb read letters and telegrams from members who could not be present. He said that contributions for the Silver Offering had come from the Philippines, China, Newfoundland and other foreign countries as well as from many states in this country. He concluded by presenting to Gurnett Steinhauer, Treasurer, the Silver Offering of $78.00 for the C. S. M. Foundation.

Following Steinhauer's speech accepting the gift, President Colasanti introduced Russell H. Volk, Toastmaster of the evening. After telling one of the "wild and wooly" stories from his inexhaustible supply, he introduced Dean Merton I. Signer, Lester Thomas, President of the Board of Trustees, Ted P. Stockmar and Dr. Ben H. Parker, member of the Board of Trustees.

He then introduced President John W. Vanderwilt and called upon him for a few remarks. President Vanderwilt quoted from a friend who had remarked, "Knowing the School of Mines and its graduates, I didn't believe it possible to have a Harvard man as president." President Vanderwilt remarked that he had found the Spirit of "Mines" men quite different from that of other colleges, he thought much more unusual than "Mines" Alumni realize and that he was looking forward to the fine cooperation of the Alumni Association. He had found

▼ Dr. Vanderwilt tells a "funny one."

that "Mines" had the backing of many friends throughout the United States and foreign countries.

Toastmaster Volk called upon Dr. Parker for a few remarks, who in replying, said that it was a pleasure to see so many of the Class of 1950, present. He urged them to continue active in the Alumni Association and help to keep it at the top.

The following old-time friends of "Mines" were then introduced to the group by Toastmaster Volk: Oscar Johnson, Mine & Smelter Supply Company; Ray Summer, DuPont Powder Company; Gerould A. Sabin, Colorado Fuel & Iron Company; Walter J. Morris, National Fuse & Powder Company; A. A. Holland, Ingersoll-Rand Company; Edward W. Milligan, Kistler Stationery Company; Homer H. Davis, John A. Roebling's Sons Company; Robert S. Palmer, Executive Director of the Colorado Mining Association.

When called upon by the Toastmaster, Mr. Palmer said, "I am sure the mining industry will join me in congratulating 'Mines' men and wishing you well."

(At this point, Claude L. Barker should have introduced the invited Speaker of the Evening, Mr. G. T. Harley. His prepared address is printed in this issue).

When introducing George A. Parks, '06, former Governor of Alaska, Toastmaster Volk asked for a few remarks. Mr. Parks said there had been many changes since he graduated from "Mines," one of which was in travel time. He could now leave Alaska at 12:30 noon one day and be in Denver at 2:30 P. M. the next day, where it used to take weeks. He said he recalled a piece of advice given to him when he went out on his first job, "you do not have to reform the whole world, all you have to do is your own little job," and that still holds good.

Dave Johnson, Athletic Business Manager, was introduced and Fritz Brennecke, Director of Athletics. Fritz called attention to the Alumni Athletic Association (AAA) which, for an annual subscription of $5.00, furnishes each member with the Ore-Digger for one year, a book of tickets good for admittance to all home games during the school year and a chance to participate in a revolving fund to help purchase text books for needy students. He said that a large part of the improvement in athletics at "Mines" could be credited to the efforts of "Mines" alumni.

A telegram expressing congratulations and good wishes was read from Donald Dyrenforth by Toastmaster Volk who also stated that Eddie Brook had planned on being present but illness in his family had prevented it.

▼ "Rut" Volk prepares for a "wild one."

Frank C. Bowman, who needed no introduction, was called upon for a few words. He called attention to the active work of the Alumni Association and especially that of the Placement Service, directed by an eight man committee, which had become well known by many branches of industry throughout this country and also foreign countries. In the past few years it has helped many employers to secure competent technical men and found employment for "Mines" men who needed a job or desired a change of employment. This activity of the Association is continually expanding. For the past two years, much time has been directed to the placement of new graduates.

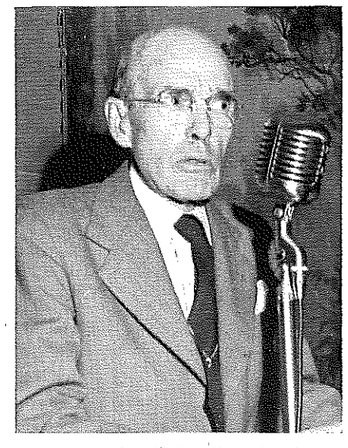
Toastmaster Volk now paid honor to the Class of 1900, the (50 Year) Golden Anniversary Class. In speaking of this group, Mr. Volk referred to the fifteen graduates of the original class of twenty-eight who were no longer living, Wilber (Hank) E. Adams, George A. Benwell, Jr., Harry F. Bruce, Thomas B. Crowe, Frank M. Drescher, Donald S. Giddings, Edward (Jeb) B. Jones, Fred Jones, Victor (Vic) E. Kerr, John M. Pendery, Edwin H. Platt, John Prout, Lloyd Robey, Arthur H. Rudd and Claude H. Smith.

James H. Steele, of Arvada, Colorado, one of the three men present from the above-mentioned class, was introduced and he presented Mr. Louis R. Ball from Laguna Beach, California and Mr. Clarence C. Malmstrom from Palo Alto, California.

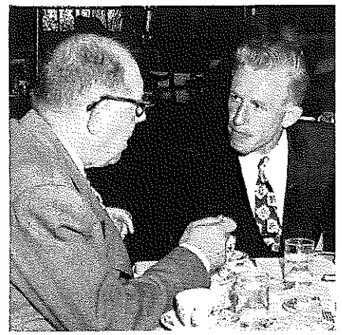
To the Old Timers present, the introduction of Steele and Ball brought back memories of those early days of football at "Mines" when these men were members of the Championship team of 1898. Others, thinking back only a few years to the Second World War, recalled how Malmstrom, Engineer for Marsman & Company of Manila, had suffered internment at the hands of the Japs, when the latter took over control of the Philippines.

Steele related many amusing experiences at "Mines" and his dry wit brought much laughter from the crowd. When he concluded his remarks, Louis Ball told one of his funny stories which brought more laughter.

Toastmaster Volk now announced that the final and great event of the evening was the drawing of the prizes and turned the meeting over to Ed White, Chairman of the Public Relations Committee, who conducted the drawing, assisted by Al. A. Holland.



▼ James Steele tells how they played football back in the days of '98.



▼ Jack Weyler receives fatherly advice.

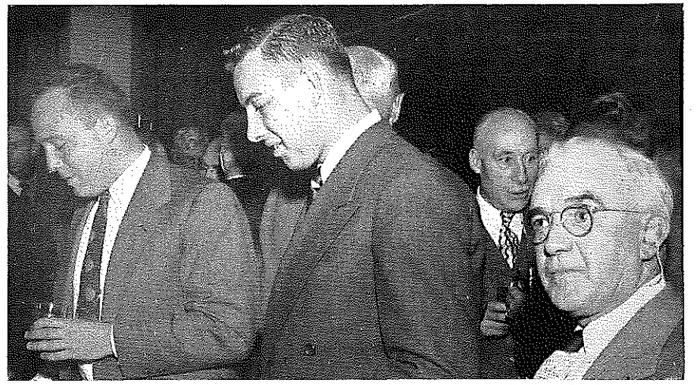
▼ Second group — (1) D. L. Reese, '50 (2) John N. Adamson, '21 (3) Arthur G. Wood, '41 (4) J. W. Hyer, Jr., '42 (5) — (6) Neil E. Johanson, '22 (7) Col. Fertig, Ex-'24 (8) A. L. Pierce, '22 (9) — (10) Leo Bradley, '50 (11) A. George Setter, '32 (12) Gurnett Steinhauer, Fac. (13) Ben Arkin, '27 (14) Jas. W. Flood (15) C. L. Barker, '31 (16) W. P. Morris, '30 (17) Carl I. Dismant, '31 (18) Robert S. Palmer (19) George G. Volk, '35 (20) R. A. Baxter, '23 (21) I. L. Vaughan, '40 (22) E. L. Durbin, '36.

Third group—(1) — (2) — (3) — (4) — (5) — (6) — (7) — (8) — (9) — (10) — (11) Oscar Reynolds, Ex-'04 (12) A. F. Corbetta, '48 (13) Dave Frazier, '50 (14) B. M. Bench, '30 (15) Victor G. Bench, Guest (16) — (17) Hildreth Frost, '39 (18) — (19) Herbert Heckt, '36 (20) Charles F. "Red" Oram, '13 (21) Irvin T. Vaughn, '40 (22) Earl Durbin, '36 (23) Albert Keenan, '35 (24) — (25) Art Haig, '36 (26) Vince Miller, '35 (27) Mert Signer, '50 (28) Ed White, '36 (29) — (30) — (31) — (32) — (33) A. A. Holland (34) Will H. Coghill, '03 (35) —.

Fourth group—(1) — (2) — (3) — (4) — (5) — (6) — (7) — (8) A. A. Holland (9) Norm Nordby, '49 (10) — (11) Joe P. Ruth, Ex-'21 (12) A. F. Corbetta, '48 (13) — (14) Walt Loftgren, '28 (15) Dave Frazier, '50 (16) A. H. Bradford, '09 (17) F. L. Weigand, '39 (18) Dave C. Johnston, Fac. (19) — (20) Dave McMurrin, '50 (21) John Abendschan, '50 (22) — (23) Herbert Heckt, '36 (24) Art Haig, '25 (25) William B. Patrick, '09 (26) Victor G. Bench, Guest (27) Charles H. Jenkins, '29 (28) — (29) — (30) F. T. Quiett, '50 (31) — (32) — (33) Jim Taylor, '50 (34) B. M. Bench, '30 (35) Vince Miller, '35 (36) C. Lorimer Colburn, '07 (37) Hildreth Frost, '39 (38) — (39) —.

Louis R. Ball, the lucky man present from the Class of 1900, was awarded the fine electric clock presented by the Hendrie & Bolthoff Company, of which Henry V. Waterman is President, and Robert W. Hannington, General Manager. James M. Flood, member of the firm, was present as our guest. Established since 1861, the firm deals in machinery, tools and supplies for mines, mills, contractors and automobile users.

Clark Barb was the lucky man from the Class of 1925, and received an order on Frank Strawn Book Store, Golden, for $20 worth of technical books of his own selection, presented by Gardner-Denver Company. This



▼ Mert Signer and Pat Mercier mixing with the good old "Mines Spirit."

company is the manufacturer of mining equipment, including compressors, drills, car loaders, hoists, pumps, slushers and other equipment. Ben C. Essig, '15, is Vice-President.

Winfred N. Clark, '98, the oldest graduate present, was the winner of a combination thermometer and barometer presented by the Dorr Company of Stamford, Connecticut, manufacturers of Hydro-Metallurgical equipment, Sewage equipment and Sugar Processing equipment. J. V. N. Dorr is Chairman of the Board and Elmer R. Ramsey, '12, is President.

Daniel M. Cooper, the lucky Senior present, was the winner of an engineering loose leaf notebook presented by W. H. Kistler Stationery Company, dealers in engineering and office equipment and supplies. As one of the oldest printing and publishing firms in the West, they publish Mines Magazine. Erle O. Kistler is President. Edward W. Milligan, member of the firm, was our guest.

George A. Parks, '06, from Alaska, was the lucky man from the longest distance and winner of a tool-kit presented by Mine and Smelter Supply Company, manufacturers of Marcy Mills, Wilfley Tables and Flotation machines, and dealers in mine, smelter, and mill equipment and supplies. Albert E. Seep is President and J. D. Nicholson, General Manager. Oscar H. Johnson, Chairman of the Board, honored us with his presence.

R. E. Hudson, '50, one of the lucky men present, received a pocket slide rule presented by Colorado Iron Works Company, established in 1860 and manufacturers of mining, milling and smelting machinery and equipment. Edward C. Bitzer, '29, is General Manager.

Ben Arkin, '27, one of the lucky men present, was winner of a Barometer and Thermometer desk set presented by the Denver Fire Clay Company, who are one of the oldest manufacturers of fire clay goods and manufacturers of and dealers in assaying and laboratory supplies and equipment. J. Claire Evans is President. This firm is the oldest advertiser in Mines Magazine and "Mines" publications since 1892.

All good things must end and "Mines" Alumni Banquet is no exception. Many thanks for a grand and glorious time to the Entertainment Committee and J. S. Lupton, Manager of Daniels and Fisher dining rooms.

Those attending the banquet were the following:

Daniel Pavone, '48; Frank J. Piro, '50; N. H. Nordby, '49; A. F. Corbetta, '48; Dave Frazer, '50; Wendell Scott, '50; Robert S. Padboy, '50; Oscar Reynolds, Ex-'04; Red Oram, '13; N. M. MacNeill, '14; Tyler Brinker, '50; Dennis E. Gregg, '50; Harvey Mathews, '13; A. B. Mosgrove, '35; Don Drinkwater, '42; John V. Finnegan, '42; Allan E. Craig, '14; Geo. Atwood, Guest; Eugene German, Guest; A. W. Lankenau, '48; James G. Cox, '38; H. L. Muench, '40; R. H. Muench, '50; W. L. Hartz, '39.

R. E. Powers, Guest; V. L. Mattson, '26; G. C. Weaver, '26; Harry L. McNeill, '24; Malcolm E. Collier, '22; Hugh A. Wallis, '28; William H. King, '28; Chas. H. Jenkins, '29; Dave C. Johnston, Fac.; Walt Lofgren, '28; F. L. Weigand, '39; E. E. Howard, '50; M. G. Zangara, '48; Richard H. Fulton, '50; Stewart M. Collester, '50; Frank J. Murphy, '50; Donald F. Wall, '50; James M. Taylor, '50; Alan L. Stedman, '48; Carl I. Dismant, '31; W. P. Morris, '30; Robt. Palmer, Guest; Lindy Barker, '31; Earl L. Durbin, '36; Irvin J. Vaughan, '40; Alex. B. Carver, '25; M. I. Signer, Fac.; Ted P. Stockmar, '43; Geo. A. Parks, '06.

L. C. Thomas, '12; Ben H. Parker, '24; John W. Vanderwilt, Fac.; Jim Colasanti, '35; Russell H. Volk, '26; Clark F. Barb, '25; J. H. Steele, '00; Louis R. Ball, '00; C. C. Malmstrom, '00; Tom A. Allan, '50; Frank N. Bosco, '35; '41; Thos. H. Allan, '18; Carl Blaurock, '16; Dart Wantland, '36; Jerry Sabin, Guest; Andrew Wolikowski, '50; Donald Berry, '50; Fritz Brennecke, Fac.; Carl K. Amano, '50; Warren S. Dronen, '50; George L. Miller, '50; Wm. V. Burger, Fac.; Gurnett Steinhauer, Fac.; Tenney C. DeSollar, '04; Ray H. Summer, Guest.

Warren Prosser, Ex-'07; C. Lorimer Colburn, '07; W. B. Patrick, '09; A. H. Bradford, '09; Alfred A. Holland, Guest; G. S. McKay, '10; H. M. Holkestad, '24; Oscar Johnson, Guest; Jack Dressel, '50; Fred Cazin, '50; Daniel W. Butner, Jr., '50; Melvin Carlson, '50; Daniel M. Cooper, '50; Melih Genca, '50; Pat Mercier, '50; Ira A. Mercier, Guest; M. I. Signer, Jr., '50; H. E. Weyler, Guest; S. J. Booth, Guest; Evans W. Ferris, '38; Charles S. Burriss, Ex-'40; Frank Geib, '40; Lewis D. Anderson, '39; Lee Scott, '42; J. Russell Chambers, '40; Kenneth R. Fenwick, '36; Stephen Joseph Booth, Jr., '50; John R. Weyler, '50; Hildreth Frost, Jr., '39; Bernard M. Bench, '30; Victor G. Bench, Guest; Herbert W. Heckt, '36; A. Haig, '36.

Vincent Miller, '35; Frank C. Bowman, '01; W. Bremkamp, '49; Edwin F. White, '36; F. T. Quiett, '50; Edward W. Ely, '50; D. H. McMurrin, '50; H. A. Anderson, Jr., '50; Foster E. Endacott, '50; John J. Abendschan, '50; Glenn J. Poulter, '50; D. L. Reese, '50; Norman Korn, '50; J. N. Adamson, '21; A. G. Wood, '41; J. W. Hyer, '42; A. B. Manning, '40; Ralph J. Weaver, Sr., Guest; Albert Marsh, Guest; W. N. Clark, '98; E. W. Milligan, Guest; Robert L. Marsh, '50; W. J. Morris, Guest; R. A. Baxter, '23; George D. Volk, '35.

Jas. M. Flood, Guest; A. George Setter, '32; Neil E. Johanson, '22; A. L. Pierce, '22; Joe Shoaf, '50; Benj. Arkin, '27; Gus Berninghausen, '50; Walter S. Forbes, '50; Robert E. Hudson, '50; John E. Hudson, '50; Leo N. Bradley, '49; Bruce B. LaFollette, '22; Bob Torpey, '49; John Bernstein, '47; Glenn Sides, '50; Norm Johnson, '50; J. O. Ball, C. U. '20; J. P. Ruth, Ex-'21; A. M. Keenan, '35; Homer A. Davis, Guest.

"MINES" COMMENCEMENT

(Continued from page 20)

than any other engineering school in the United States.

"The composition of the present cadet corps represents a cross-section of all services. Enrolled at the present time are veterans whose previous service has been in the Air Force, all branches of the Army, the Navy, the Marine Corps, the Coast Guard and the Merchant Marines. For the first time since the war, the group being commissioned at this time includes a small number of non-veterans. This group is the largest post-war group to be commissioned and is the last group in which the veterans will predominate.

"There were 63 who completed the R.O.T.C. work and eligible for commission. Of the 63, 34 are receiving their commissions as 2nd Lieutenants, Corps of Engineers, U. S. Army. 29 will receive their commissions later after they have either completed their work for graduation or completed their required work at the summer camp. Of the 63 Cadets who have successfully completed the advanced course, R.O.T.C., 18 were designated as Distinguished Military graduates and of these, 8 have been tendered regular Army appointments. If accepted, the Cadet will go on active duty as 2nd Lieutenant, Corps of Engineers, U. S. Army, June 1950."

Medals for Distinguished Achievement in the field of the mineral engineering were presented by Lester C. Thomas, President of the Board of Trustees, to George A. Parks, 1906, former governor of Alaska, Consulting Engineer and United States Cadastral Engineer for Alaska, now retired, and Francis A. Thomson, 1904, President of Montana School of Mines and Director of State Bureau of Mines and Geology. (Illness prevented Dr. Thomson from being present.)

In recognition of long service, President Vanderwilt presented Arthur W. Buell and William B. Cramer with plaques.

Arthur W. Buell graduated from the Colorado School of Mines as a Mining Engineer in 1908 and received his Master's Degree in 1923. After graduation he followed mining until 1921 when he returned to the Colorado School of Mines for his Master's Degree. From 1924 to 1936 he was with the Stanolind Oil and Gas Company. From 1936 until 1940, he followed Consulting practice in mining and petroleum. In 1940, he became instructor in the Petroleum Engineering Department at the Colorado School of Mines which position

(Continued on page 33)

PROGRAM OF EDUCATION IN THE MINERAL INDUSTRY*

By
G. T. HARLEY[1]

G. T. HARLEY

This evening I wish to discuss with all of you, but especially with the young men here gathered who are so soon to take up their responsibilities in the mining industry, the problem of undergraduate technical training and of your post graduate education in the years that lie ahead. In dealing with my subject, I speak from the point of view of one who has had many years experience in developing young men in our industry, and it has been my good fortune and a source of great satisfaction to me to have seen many of these young men advanced rapidly into positions of importance and responsibility in their chosen fields.

Technologists and Engineers Defined

Before we move in on our subject I would like to describe for you the two great groupings of technically trained men in our industry which can best be designated as technologists and engineers. *A technologist is a man who is interested in the scientific side of his profession, or in some special activity within it.* He is one who aspires to be a chemist, a geologist or a metallurgist. He may prefer to do research, or he may lean toward accounting practices and general office work. Those who elect to advance in such special fields will have steady employment, job security, ample opportunity for promotion and a steadily increasing income. The degree of personal risk in such jobs is minimized, and because of this, peak earnings will be moderate to high depending on the size of company you are associated with, and the degree to which you yourself develop your personal talents. *The engineer, on the other hand is a person with a special temperament and different likings.* He is willing to assume the risks and headaches that are so much a part of production. He will start his career as a mucker or a mill operator's helper, and he will come up slowly thru the operating departments, eventually to reach the grade of foreman or superintendent, and finally to become manager, consulting engineer or officer of his company. He will enjoy his relations with his employees and with labor leaders, he will design improvements in plant and practice, and it will be his job *to sell* these improvements to his officers and stockholders. In his progress he has become a mining engineer and he has developed sound judgment and executive ability in mining, financial, and labor matters. He assumes a risk when he makes his recommendations, or when he attempts to guide his company thru difficult labor and economic crises, and a costly mistake on his part may well be grounds for discharge, after which he can start up the ladder of advancement again, with some other company. For these risks which he is willing to assume, he receives high pay and an expanding reputation among his fellow engineers and financial associates.

Degrees Awarded Four-Year Graduates

Let us return now to the main theme of this discourse and let us consider briefly the degrees that are awarded to four-year graduates of our technical schools. We find that these young men may be starting their careers in mining, after having studied essentially the same courses, with the degree Bachelor of Science: Bachelor of Science in Mining Engineering: or from at least one school, the four-year Degree Mining Engineering. I think this condition should be corrected and made uniform and I would like to recommend

* An address prepared to be given before the Annual Banquet of the Colorado School of Mines Alumni Association, May 25, 1950. A heavy storm forced the grounding of the plane at Pueblo, Colorado, carrying G. T. Harley and prevented him from delivering the address.

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that the four-year degree awarded by the technical school should be the Bachelor of Science Degree with proper designation as:

Bachelor of Science in Mining Engineering
Bachelor of Science in Geologic Engineering, or
Bachelor of Science in Metallurgical Engineering.

As to the content of these courses they *should necessarily be strong in the basic subjects—mathematics, physics, chemistry and geology*. We would do well to examine and improve the courses offered in written and spoken English, economics, government, and ethics in order to create a firm foundation for future advancement. Our four-year courses *should be strengthened by the introduction of material on human relations, labor history, labor laws, and industrial relations.* At recent forums for labor, management and agriculture, I have advocated orientation courses covering these subjects as far down in the secondary schools as students are able to comprehend them in order to give the young man who does not go to college a general picture of our national economy as opposed to the one sided views propounded by labor groups, or management thinking exclusively. I am advised by educators that this sort of training can probably be started in the upper grades of the primary schools. How much more important it is to have our graduate engineers well grounded in these subjects.

Fundamental Training in Basic Sciences Important to Industry

You may now well ask what becomes of the engineering subjects that are a part of the normal engineering curricula. My answer is that with the proper balance there is still room for the pursuit of a major and a minor in the field of engineering. I taught for six years at one of our schools of mines in this country and during this time I had occasion to write many letters inquiring what it is that industry requires of its young graduates. In an overwhelming majority of replies it was stated, in essence, *"Give us men with fundamental training in the basic sciences, with ability to think, speak and write clearly, with training in basic engineering subjects—surveying, hydraulics, dynamics, heat and electricity*. We will then train these young men in our own organization in the specialized requirements of our work."

When young graduates enter industry it is more or less problematical just where they may start. They may enter as technologists—chemists, geologists, metallurgists. They may enter the engineering department to gain experience in surveying, construction, sampling and valuation, or to observe the problems of operation. They may enter directly into one of the production departments to advance as operators and eventually progress into the field of superintendence and management. We in industry place these young men where we need them at the moment, but we give them the privilege of transferring to the department of their choice or into their special field of interest as the opportunity arises.

Award Professional Degree

Not many young engineers after entering industry will have the inclination to return to school for further work in residence, but I think that their progress in the industry should be recognized by the award of the suitable professional degree such as

Mining Engineer
Metallurgical Engineer, or
Geological Engineer

and these degrees should be rated in all respects the equivalent of the Masters Degree. The Professional Degree should be awarded after

1. A suitable number of years' experience in the industry
2. A suitable number of years (2-3) in responsible charge of work
3. A minimum of required reading for course credit
4. A thesis which shows marked ability in some special branch of the industry
5. An oral examination which will show a general knowledge of the industry.

During these years of experience the schools can be helpful to the young man by providing him with lists of significant and required reading material, news letters covering developments in the industry, new discoveries in the art, and other pertinent material. Such helpful lists and letters will serve to stimulate the young man and keep him alive to his opportunity for advancement. It is a phase of activity in which our schools have heretofore shown little interest as far as I can determine, but *it seems to me that the opportunity for guided self-advancement of the progressive young engineer in industry and the award of the professional degree in recognition of this period of training is something that our technical schools should seriously consider* in the very near future as an integral part of their programs.

Where Advanced Degree Needed

In certain phases of the mineral industry the need for advanced academic degrees is recognized. The student who contemplates a career in teaching or research or who proposes to specialize in geology, geophysics or metallurgy is probably well advised to continue his formal education and to secure at least the Masters Degree. In teaching and research the Doctors Degree is probably an essential requirement but whether the degree should be attained by continuous attendance at the school or after some years of practical training is a matter for consideration. I, personally, think a few years of practical experience gained between the awarding of degrees is very desirable and an essentially broadening experience.

Ideas For Long-Term Programing

It may now be in order for me to present some ideas for your consideration and for possible long-term programing on the part of those who are responsible for the curricula of our technical schools and in this connection the needs of one other group of engineers may now be considered. I refer to those who have attained the undergraduate degree and perhaps the Master's or the professional degree and have had several years of experience in the industry and who have come to an understanding that they need further training preparatory to advancement in a particular phase of the industry. Those who look with favor on a career in management may want to take additional work in business administration, industrial economics and human relations. Those who prefer industrial relations work will want training in labor history, labor law, personnel relations, human relations and applied psychology. Advanced work in geology, metallurgy of the metals, mineral dressing, chemical engineering and so forth, may be indicated for certain technologists who find themselves intrigued with these special fields. But should these men be required to attend school in residence for one or more years to attain such goals? I think not. There is no substitute for practical experience and I think that credit should be given for the years so spent and the quality of the work performed while in the industry. I think our schools should give considerable thought to this problem to make it possible for the candidate to secure the Masters Degree with designation or even the Doctors Degree based on

1. Years of experience in the industry
2. Years of responsible administration
3. Contributions to the literature of the industry
4. Credit for a restricted number of short courses while in attendance at seminars, summer school sessions or for short periods during the regular school year.
5. A comprehensive oral examination showing knowledge of the industry
6. A thesis showing adequate knowledge of a special branch of the industry

In connection with point 4 just mentioned—

Harvard University and Carnegie Institute of Technology have made a start on administrative training by conducting 13 weeks courses which I believe are without degree recognition. Our technical schools could do as much in other fields by conducting intensive 2, 4, or 6 weeks courses, with degree credit for graduate students.

It is ten years now since I have had any relations with our schools of mines except in my capacity as a member of the board of regents of one of them, but I have observed many young graduates and I have been interested in watching their progress and considering their problems, perplexities and inadequacies.

Conclusions

My conclusions are based on these observations:

1. Our engineering courses should be broadened to *include sound courses in written and spoken English,* the social sciences and the humanities.
2. We need to include sound *Fundamental training in mathematics, physics, chemistry and geology*. These are the indispensable tools of the engineer and he must be thoroughly grounded in them.
3. Certain basic engineering courses in *surveying, assaying, hydraulics, dynamics, heat and electrical engineering, metallurgy, mining, design, and civil and mechanical engineering* should be included to the equivalent of a major and a minor in the four-year course.
4. There will be *no place* in such a well-rounded four-year course *for too great specialization* in any one field of engineering. The young engineer must acquire this knowledge as he gains experience in the industry.
5. Advanced training in residence for the Masters Degree and the Doctors Degree is indicated when a career in teaching or research is the goal, but in most instances it is well to acquire experience in the field in the interim periods.
   A. To make sure that the career chosen is the right one
   and
   B. In order to approach the period of advanced study with discernment acquired by practical experience
6. Our schools can cooperate and encourage the young engineer to obtain his professional degree more wholeheartedly and intelligently than they have in the past to the great benefit of the recipient and to the advantage of the school.
7. We do not advocate the return of a young engineer who has had several years of experience to the usual type of graduate course offered at most schools which require a full year of residence. Rather we believe that residence credit should be given for experience gained and only such courses required as will advance him in his special field. Every effort should be made to make these courses short and intensive and they can well be offered at times most convenient to the student.

During the past six years over half of my time as manager of a large mining operation has been occupied with problems of human and industrial relations when, by inclination, I would much rather be occupied with the operating and technical problems involved. *But in my opinion no problem is greater or more urgent than that of establishing sound cooperative relations between workers and management.* The young engineer cannot afford to lose sight of this fact and he must make every effort to become expert in the problems of human relations and in the technique of conducting his industrial relations program on the basis of mutual understanding. It is for this reason that *I place the greatest stress on the self-advancement of the young engineer by practical application to the job in the actual presence of these industrial problems.* Of necessity then, graduate training in the class rooms of our schools must be accorded second rank in the overall training of our young engineers, except under special conditions as I have tried to note above.

No longer are the technologist and the engineer to be thought of only in terms of test tube, slide rule and transit. *Labor relations, finance and tax situations, and politics are important factors influencing this changing world and our mining graduates must studiously prepare themselves to cope with these problems.* It is my belief that if our mining schools can cooperate with industry to make such advanced training programs possible at times convenient for the graduate student, we will find that many of our mining companies will welcome such programs and will provide the opportunity for the young engineer to acquire further training in the specialized fields of the industry.

"MINES" COMMENCEMENT

(Continued from page 30)

he has held until his retirement at the present time.

William B. Cramer graduated from the Sheffield Scientific School of Yale University in 1902. He was instructor in that school from 1902 to 1905 and from 1905 to 1913, he was employed by copper companies in Arizona in chemical departments. In 1913, he became associated with Phelps-Dodge Corporation of Douglas, Arizona, first as Assistant Consulting Engineer and later as Consulting Engineer until 1930. From 1930 to 1935 he followed a Consulting practice and in 1935 became Associate Professor of Metallurgy at the Colorado School of Mines which position he has held until his retirement at the present time.

Dean M. I. Signer presented the awards for scholastic attainment to the following:

Martin S. French of West Springfield, Massachusetts, outstanding among the graduates, won the Harry J. Wolf gold medal and the William D. Waltman award. The Wolf gold medal for high scholastic attainments was established by Harry J. Wolf, a graduate of "Mines" in 1903. The William D. Waltman award to the Senior "whose conduct and scholarship have been most nearly perfect and has most nearly approached the recognized characteristics of an American gentleman" was established by Mr. William D. Waltman, who graduated from "Mines" in 1899. This award amounted to $207.08.

Ross M. McDonald of Breckenridge, Colorado, was awarded the Brunton Transit, established by the late D. W. Brunton for meritorious work in mining engineering.

Glenn W. King of Thermopolis, Wyoming, won the Thomas S. Harrison award of $25.00, established by Mr. Harrison, of the Class of 1908, for meritorious work in petroleum engineering.

John D. McIver of Fort Collins, Colorado, won the prize of $100.00, for meritorious work in metallurgical engineering awarded by Mrs. Harold Otis Bosworth as a memorial to the late Harold Otis Bosworth.

Carl F. Yuenger, Jr., of 546 S. Emerson, Denver, Colorado, won the prize of $25.00 awarded by Mr. Harrison L. Hays, of the Class of 1931, to the Senior in petroleum refining engineering "who has demonstrated by scholarship, personality and integrity of character the potentialities for a successful industrial career."

The Honorary Degree of Doctor of Engineering was conferred upon Mr. Bunker by President Vanderwilt.

The Benediction, pronounced by Reverend Lance A. Mantle, brought to a close the graduation of a record class at the Colorado School of Mines.

"MINES" MEN WELL REPRESENTED AT CONVENTION OF AAPG-SEPM AND SEG

CHICAGO APRIL 24-27, 1950.

The Convention which was attended by approximately 3000 petroleum engineers, geologists, geophysicists and scientists from all parts of America was very well represented by *Colorado School of Mines* graduates.

The program included a large number of valuable and interesting subjects and naturally, to cover these in the allotted time, meant that there were many conflicts with meetings and although all were extremely busy, the *"Mines"* men managed to arrange an Alumni luncheon which was attended by approximately 100 graduates.

Short talks were given by several of those present and among others who took part were Professor Warren D. Mateer, of the Department of Geology who stressed the need of assisting this year's graduates in securing employment. Mr. Thomas S. Harrison, '08, Consulting Petroleum Geologist and member of the Board of Trustees of "Mines," discussed the future building plans for the *Colorado School of Mines*. Robert McMillan, '41, Vice-President of Geophoto Services, told about the athletic activities and stressed the importance of "Mines" graduates encouraging young men with outstanding ability as students and athletes to plan on attending the *Colorado School of Mines* to obtain an engineering education.

As usual, the "Mines" Spirit prevailed throughout the luncheon and all were delighted with the opportunity to renew old acquaintances and make new ones. Many favorable comments were heard in regard to the work of the Colorado School of Mines Alumni Association.

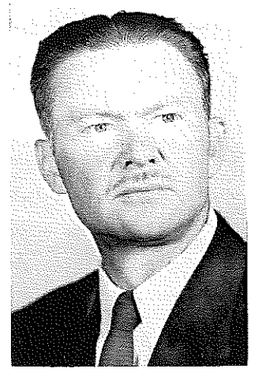
Those who attended the luncheon are shown on the accompanying group photograph and were as follows.

(1) R. E. Spratt, '26; (2) Thomas S. Harrison, '08; (3) Ben F. Rummerfield, '40; (4) Carl W. Nelson, '40; (5) T. A. Manhart, '30; (6) C. Richard Wagner, '39; (7) Robert McMillan, '41; (8) A. J. Hintze, '31; (9) John H. Wilson, '23; (10) D. L. Rankin, '23; (11) C. L. Barker, '31; (12) V. A. Peterson, '30; (13) W. D. Mateer, Faculty; (14) J. Harlan Johnson, '23, Faculty; (15) George E. Wagoner, '28; (16) Cary P. Butcher, '24; (Next to 16) J. J. Torpey, '41; (17) G. F. Kaufmann (Buck), '21; (18) B. O. Winkler, '33; (19) Dart Wantland, '36; (20) John J. Rupnik, '33; (21) Roderick J. Forsyth, '29; (22) Foster E. Endacott, '50; (23) Morton E. Frank, '06; (24) Horace Goodell, '42; (25) J. F. Mann, '43; (26) Vincent Miller, '35; (27) Wayne F. Bohanan, '50; (28) J. L. Morris, '38; (29) Ralph H. Jones, '50; (30) Ernest J. Malovich, '50; (31) Wm. W. Wells, '33; (32) George Carr, '25; (33) P. G. Sharp, '33; (34) K. R. Marble, '42; (35) W. D. Nooran, Ex-'40; (36) A. Haig, '36; (37) David M. Evans, '36; (38) W. T. Schneider, '36; (39) W. E. Pugh, '30; (40) J. E. Hawkins, '38; (41) R. C. Holmer, '38; (42) J. K. Ziegler, '41; (43) W. L. Falconer, '41; (Between 43 and 48) M. R. Budd, '24; (44) Max W. Ball, '06; (45) K. F. Robertson, '37; (46) Guy E. Miller, '19; (47) Unidentified; (48) E. L. Caster, '25; (49) Art Austin, '32; (50) Win Payne, '38; (Behind 50) J. E. Lee, Jr., '37; (51) L. H. Johnson, '37; (52) C. B. Cox, '36; (53) A. N. McDowell, '40; (54) Emory V. Dedman, '50; (55) Jim Patch, '50; (56) H. C. Woldenberg, '38; (57) L. S. Melzer, '39; (58) Brian B. Hill, '50; (59) R. C. Siegfried, '50; (60) Carl Beilharz, '25; (61) Henry Rogatz, '26; (62) George Pasquella, '24; (63) Joshua L. Soske, '29; (64) W. H. Throop, '50; (65) John Petrocco, '50; (66) Howard W. Leaf, '50; (Between 66 and 67) Ray F. Keller, '41; (67) William N. Hostetter, '50; (68) Max Silverman, '49; (69) See 74; (70) Albert W. Musgrave, '47; (71) Robert J. Lamm, '50; (72) Clyde W. Kerns, '50; (73) James M. Murphy, '50; (74) John C. Hollister, '32; (75) H. E. Stommel, '41; (76) R. E. Watson, '43; (77) Wayne H. Denning, '26; (78) F. W. Mann, '43; (79) J. L. Ballard, '25; (80) Unidentified; (81) E. L. Campbell, '43; (82) M. E. Chapman, '27; (83) Ronald K. DeFord, '21; (84) S. A. Packard, '23; (85) Edw. Morrison, '50; (86) George H. Fentress, '49; (87) Myron C. Kiess, '25; (Unidentified) Donald M. Davis, '25; Ralph S. Powell, '21; and Lynn W. Storm, '02.

In addition to those listed as attending the Banquet, the following "Mines" men were seen at the Convention:

J. R. Dorrance, '22; L. D. Erwin, '40; O. D. Brooks, '30; M. A. Talbets; R. J. Downey, '44; Maurice Tripp, '39; P. A. Grant, '23; H. C. Skinner, '24; Max Euwer, '25; John H. Wilson, '23; E. R. Locke, '28.

The announcement of George E. Wagoner, '28, of Shreveport as the newly elected President of the Society of Exploration Geophysicists was made by the Society during the Convention. Wagoner assumes the high post for the year 1950-51, succeeding Andrew Gilmour of Tulsa. Wagoner



GEORGE E. WAGONER

is southern division manager of the Carter Oil Company. He graduated from the Colorado School of Mines in 1928. Wagoner served as secretary-treasurer of the International Society in 1945-46, and during the past year was vice-president. The presidency of the Society is one of the highest honors which a geophysicist may attain. Other officers elected were Sigmund Hammer, of Pittsburgh, vice-president and Francis F. Campbell, of Tulsa, secretary-treasurer.

PERSONAL NOTES

(Continued from page 16)

Alva W. Gorman, '41, resigned his position with Phillips Petroleum Company, to go to Alaska with the Independence Mine at Wasilla.

Harry D. Hall, '49, has moved from Bingham Canyon to Murray, Utah, with post office address Box 1. He is associated with the U. S. Smelting, Refining & Mining Company.

Martin O. Hegglund, '41, who was recently transferred to Oklahoma City by Stanolind Oil & Gas Company, now has post office address of Box 161-W, Warr Acres Branch, Oklahoma City, Okla.

James E. Heppert, '49, is employed as Geologist for Standard Oil Co. of California and is addressed in their care, Box 2605, Salt Lake City, Utah.

M. C. Irani, M. Met. '42, Vice-President, Booth-Irani Engineers, who went to India several months ago now has an office address there, Asian Building, Nicol Road, Ballard Estate, Bombay.

William B. Kays, Jr., '49, is associated with Stanolind Oil & Gas Company in their Producing department. His address is Rt. 1, Box 75, Vivian, Louisiana.

William H. King, '28, Mining Engineer with U. S. Bureau of Mines, has been transferred from Washington, D. C., to the Denver office. He is receiving mail at his home, 6620 East 17th Avenue, Denver 7.

Carrel B. Larson, '23, who for the past several years has been Minerals Attache to the U. S. Embassies in Peru, Chile, Colombia, Bolivia and Venezuela, has re-

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PROGRESS NEWS
U. S. ATOMIC ENERGY COMMISSION

URANIUM EXPLORATION IN THE UNITED STATES*

The impact of World War II, and the decision by Canada, Great Britain, and the United States to join in a program for the development of atomic weapons, created a sudden and immense demand for uranium minerals. Early in the raw materials program, it was evident that sufficient raw materials to fulfill wartime atomic weapon requirements could be secured from three sources: the rich pitchblende deposits of the Eldorado mine at Great Bear Lake; the Shinkolobwe mine in the Belgian Congo; and as a by-product of the vanadium industry of the Colorado Plateau in the United States. In the early part of the program, therefore, our joint efforts were directed toward obtaining immediate maximum production from these localities.

In addition, it was also obvious from the first that in this program, as in any mining enterprise, exploration activities directed toward the discovery and development of new sources of uranium ore were essential if production were to be maintained over an extended period of time. In order to satisfy obvious security requirements during the war, it was necessary to proceed with this exploration program, both in Canada and the United States, as secretly as possible. With the end of the war and the revelation that an atomic weapon had been developed, however, secrecy in exploration was no longer required. The important thing was to get on with a broadened exploration program.

EXPLORATION PROGRAM IN THE UNITED STATES

Stimulation of the active search for radioactive ores by prospectors and the mining industry is being carried out by the Commission through the establishment of:

1 A guaranteed price schedule for uranium-bearing carnotite or roscoelite-type of ores of the Colorado Plateau;
2 A guaranteed minimum price for high grade ores and refined products derived from such ores; and,
3 A bonus for the discovery and the production of the first 20 tons of uranium ore or mechanically produced concentrates assaying 20% or more U_3O_8 from new deposits.

In addition, we are attempting to stimulate public participation in our program by issuing responsible publicity, by distributing technical information, by giving assistance to the public through mineralogical and radiometric examinations of samples, and by offering geological advice to the public and to the mining industry.

We believe that the industry could make further contributions to our program if it would consider exploration for uranium ore as it considers search for gold, copper, lead, or any other metal—just good business. We believe that each company should take the following inexpensive steps to insure that no promising possibilities are ignored:

1 Familiarize exploration personnel with known occurrences of uranium;
2 Include a Geiger counter as an essential piece of equipment for prospectors and mine geologists;
3 Examine mine mineral collections, specimen cases of nearby museums, mine tailing piles, and ore and mine workings, for radioactivity;
4 Check sludges and cores from all drilling operations with a Geiger counter; and
5 Check all ores or concentrates that funnel through custom mills or smelters.

The carnotite ores of the Colorado Plateau represent our best immediate source of uranium, and consequently, this area has demanded a large share of our exploration attention. The objectives of our Plateau exploration program are:

1 To discover ore bodies in areas where it is presently unprofitable to risk private capital;
2 To obtain a better understanding of the ultimate uranium potentialities of the Colorado Plateau; and
3 To develop ore-finding criteria and techniques.

Another important phase of our exploration work is a nationwide reconnaissance program, in which both the staffs of the Commission and the Geological Survey are participating. This program involves the following:

1 Systematic examination and appraisal of the known mesothermal vein deposits, particularly those which contain metals commonly associated with primary uranium, such as lead, silver, and cobalt.
2 Systematic examination of sedimentary rocks as sources of uranium deposits;
3 Examination of occurrences, called to our attention by mining companies or the public, which appear to have some promise;
4 Development of engineering, geological and metallurgical research knowledge concerning large low-grade deposits which are not now economically attractive for industry;
5 Research into such fields as analytical methods, development of new mineralogic techniques, geochemistry, and application of geophysical and radiometric methods to ore findings; and
6 Development of new and improved instruments—airborne, carborne, and footborne—for the detection of radioactivity in field reconnaissance and in drill holes and mine workings; together with the improvement of laboratory instruments.

In developing our exploration program we have recognized that thorium, at some time in the distant future, may be an important source of fissionable material, and we have therefore undertaken a limited program of evaluation of thorium resources.

AREAS OF SPECIAL INTEREST

Uranium seems to be distributed much more widely than we had suspected; these areas are widely separated geographically and represent a variety of geological conditions. In addition to the Colorado Plateau, there are promising indications in the Colorado Front Range, in the Coeur d'Alene Mining District of Idaho, in the Upper Peninsula of Michigan, in Marysvale, Utah, and in various low-grade deposits in Tennessee, Kentucky, Florida, Wyoming, Montana, and Idaho.

Colorado Plateau. The Plateau is a physiographic province embracing about 130,000 square miles of eastern Utah, northwestern New Mexico, northeastern Arizona, and that portion of Colorado west of the Rocky Mountains. Uranium mineralization has been found as low in the stratigraphic column as the Permian Coconino sandstone and upwards through the Morrison sandstone of the Jurassic, but the most important producers have been the Triassic Shinarump and the Entrada and Morrison of Jurassic age.

The deposits of the Shinarump are represented by the copper-uranium ores of White Canyon, Utah, the asphaltic carnotites of Temple Mountain, Utah, and the carnotites of northwestern Arizona. Because of the remoteness of these deposits from populated areas, prospecting has not been as intensive in these localities as in the more accessible regions of the Colorado Plateau.

The ores of the Entrada sandstone are located near Rifle, Placerville, and Rico, Colorado, and are essentially vanadium deposits carrying about 1.5% V_2O_5 and generally less than 0.10% U_3O_8. The ore zones form undulating layers of great lateral extent but of variable thickness.

The Salt Wash member of the Morrison formation is by far the most important uranium producer of the Colorado Plateau. The Salt Wash extends over an area of more than 40,000 square miles of the Colorado Plateau; it is more than 500 feet thick in some places but averages nearer 250 feet. Hundreds of individual deposits of carnotite are scattered throughout the sandstone lenses of the Salt Wash. An ore body containing a few thousand tons of ore may be considered large, but one mine, consisting of several ore bodies of exceptional size, has yielded more than 150,000 tons of ore. The major ore bodies occur in a northeast trending belt extending from Blanding, Utah, through Uravan, Colorado, to Gateway, Colorado, distributed in groups or clusters along secondary trends not necessarily parallel to the main belt.

Most of the ore deposits are irregular, and many are roughly tabular, with their greatest dimensions essentially horizontal and parallel to the bedding of the enclosing sandstone. Although they generally conform to the bedding, they tend, in part, to cut at low angles across the stratification. The ore bodies are invariably associated with organic matter in the form of fossilized tree trunks, branches and leaves. The richest ores often consist of logs replaced by uranium and vanidium minerals.

All of the uranium deposits of the Salt Wash contain vanadium. The ore-forming constituents, which include such minerals as carnotite, calcio-carnotite, corvusite, and hewettite, are deposited around sand grains. The bulk of the ores mined contain about 1.5% to 2.0% V_2O_5 and 0.20% to 0.40% U_3O_8.

It is readily apparent that mineral deposits of the size, character, and irregular distribution of the carnotite ore bodies present unusual problems in exploration.

(Continued on page 51)

*Address by Phillip L. Merritt, U.S. AEC before the Annual General Meeting of the Canadian Institute of Mining and Metallurgy, Toronto, Ontario, April 18, 1950.

WITH THE *Manufacturers*

Equipment News

In these columns the latest in equipment of interest to our readers is reviewed. Many readers request additional information and prices. For their convenience each article isnumbered. Fill in the number on the coupon at the bottom of the page and mail your request to Mines Magazine, checking information requested.

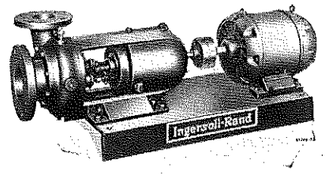
Cradle-Mounted Centrifugal Pumps (721)

This pump incorporates all of the well-known and job-proven features of the Ingersoll-Rand Motorpump. Some of these are deep water-cooled stuffing box, smothering gland, ring oil lubricated ball bearings, a heavy cradle shaft and bearing, sturdy channel steel baseplate and an all metal coupling.

The impeller is of the latest hydraulic design, mechanically and hydraulically balanced. An extra deep stuffing box accommodates 5 or more packing rings and due to the side-opening cradle it is easily accessible.

The pumps are built in 5 different sizes, single and two stage. Sizes range from ¾ inch to 5 inches discharge with capacities up to 1600 gpm and heads up to 250 feet. Normal horsepower range is from ¼ to 75.

The pumps may be driven by direct electric motor, electric motor and V-belt, turbine through reduction gears, direct turbine, V-belt gasoline engine or direct gasoline engine.



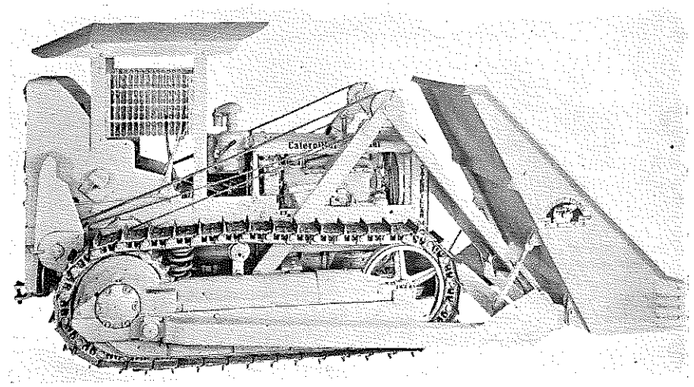
Due to the flexibility and ease of changing drivers the pumps are suitable for paper mills, breweries and distilleries, chemical plants, refineries, building and contracting and general manufacturing process.

For additional information contact Ingersoll-Rand Company, 11 Broadway, New York 4, N. Y. or any of its numerous branch offices.

Joy RBD-1 Hydraulic Roof-Bolting Drill (722)

The Joy Manufacturing Company, Henry W. Oliver Building, Pittsburgh 22, Pa., announces a new, all-hydraulic roof-bolting drill. The drill employs boom feed and is self-leveling and self-aligning while drilling. This machine, which Joy calls the RBD-1, is said to have an extremely high drilling-speed where rotary-type drills are applicable. (U. S. Bureau of Mines reports state that 60 to 65% of the roof overlying U. S. coal beds may be drilled by rotary-type machines.)

The RBD-1 is a self-propelled machine available in 26", 30", or 36" heights. Any model may be equipped for wet drilling or with vacuum dust remover, as desired. A great advantage of the RBD-1, it is claimed, is that the low height of the drilling mechanism permits bottoming the maximum possible hole with only one steel change. Since the machine is electrically powered, the necessity for compressed air at the face is eliminated.



Small Overshot Loader Added to Austin Line (723)

Recent addition to a line of Overshot Loaders for tractor mounting is the Austin Model 4-C, announced by John Austin, Inc., Denver, Colorado, manufacturer. The loader is readily attached to utility size tractors, including the Caterpillar D-4, Allis Chalmers HD-5, and International TD-9.

The loader has a rated capacity of one cubic yard and a 20-second loading cycle. It will handle bank-run material at a rate of 125 yards per hour on a 50-minute hour with no increase in fuel consumption over normal dozing operations. The overshot action, which eliminates swinging and blocking, is powered by a Caterpillar Model 24 cable control unit driving a single cable through a wrap-around series of sheaves. The result is even tension at both sides, maximum power at the start of the loading cycle, and maximum speed for the balance of the cycle.

The Austin Model 4-C loader is made in two heights, for surface operation and for underground mining, respectively. The standard machine for surface operation has an overall height of 15'-3" with bucket raised, and a dumping clearance of 8'. For underground mining it has an overall height of 12', bucket raised, and a dumping clearance of 6'. Both units have adequate clearance for highway transportation and low underpasses.

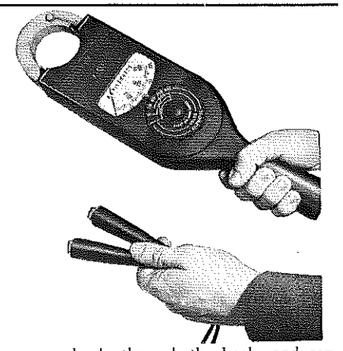
Other models in the line of Austin Overshot Loaders are: Model 6-C, 1½ cu. yd.; Model 7-C, 2½ cu. yd.; and Model 8-C, 3½ cu. yd., rated capacity. Literature is available from the manufacturer.

Additional information will be furnished on request.

General Electric Announces New Hook-On Wattmeter (724)

A new hook-on wattmeter applicable to active and reactive power measurements in single and polyphase circuits has been announced by General Electric's Meter and Instrument Divisions.

Designated as Type AK-2, the new device enables measurements to be taken without service interruption. It makes use of a removable magnetic hook to surround the current carrying conductor, and potential leads are connected as in a conventional single-phase wattmeter. In addition, a three phase balanced power measurement is made possible by the hook-on unit. This is accomplished by passing two



power leads through the hook, and connecting the potential leads to these same

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two power leads.

The instrument is designed to meet exacting requirements as to accuracy, weight, simplicity of operation, and range of full scale capacities. Through the use of a single dial switch, a selection of any one of six power measurement ranges is available to provide readings from 3 to 300 kilowatts full scale deflection.

The simple-switching, direct-reading scales of the new wattmeter, introduced as a companion unit to the AK-1 hook-on volt-ammeter, have resulted in one-hand operation with a minimum possibility of error in use. The new unit will be made available as a distributor item.

New Building Construction (725)

The revolutionary new CONAIR process of construction for everything from small homes to large super-structural buildings, has been approved by the Los Angeles Building Commission, which paves the way for CONAIR SALES, Inc., to immediately release their national program for licensing contractors to use their exclusive process for building these all-steel reinforced concrete units.

This enables the individual contractor to offer the public a lifetime home, school, or all-purpose building at a cost of less than five dollars per square foot.

All this is made possible by the invention of the CONAIR GUN which pneumatically projects liquid cement, mixed with insulation, water-proofing and other essential ingredients against steel forms and the sensational new Fiberglas balloon roof.

This new device results in a structure, which can be put up in twelve hours and which can be converted into every channel of construction purpose, whether it be for the individual home or for large industrial purposes.

Detailed information regarding this fabulous new building development can be obtained from the offices of CONAIR SALES, INC., 12147 Riverside Drive, North Hollywood, California, SUnset 21796 or STanley 74854.

New Bucket Loader (726)

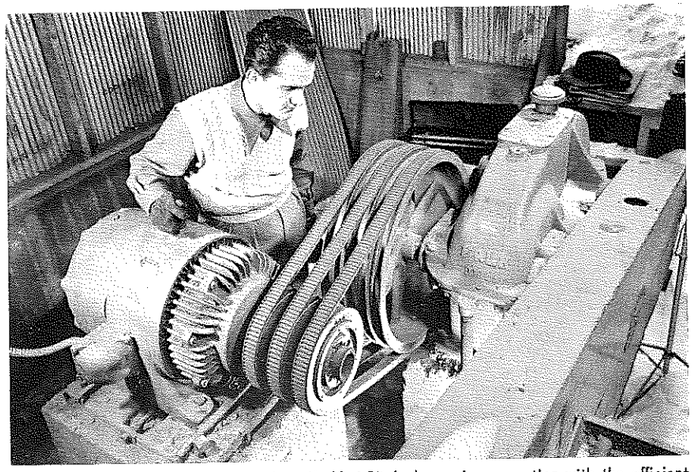
Newest addition to the Barber-Greene line of portable "Constant Flow" material handling equipment, is the new pneumatic-tired Model 543 Bucket Loader. Built by Barber-Greene Company, Aurora, Illinois, manufacturers of material handling equipment and road building machinery and represented by Frobes Company, Salt Lake City, Utah.

An outstanding feature, especially to those who have widely scattered stockpiles, is the 15 M.P.H. road speed of the 543. Steering, through a truck type worm and roller, is as simple as driving your truck, and allows easy maneuvering in cramped places.

Of practical design, the new B-G Bucket Loader is an economic tool, ideal for aggregate producers, counties, cities, state highway departments, industrial plants, material yards, railroads. Two forward and two reverse speeds allow operator to compensate for material being handled and power requirements. High reverse gives fast out-of-pile speed to escape caveins. Another interesting feature of the new Model 543 Truck Loader is the automatic load trimming advantage of the power hydraulic controlled swivel loading conveyor. Swivel conveyor may be purchased in either 13′ - 7″ or 16′ - 7″ lengths.

A welcome design feature is the power-hydraulic raising and lowering of the elevating boom, which controls the level of the feeding spirals and the follow-up scraper. Operators can quickly adjust according to operating conditions and type of material being loaded. As protection against overload damage, the 543 incorporates the famous B-G Overload Release Sprocket which automatically resets after overload.

It handles capacities of up to 3 cubic yards per minute. Essentially a stockpile loader, the 543 handles all bulk materials, such as crushed stone, gravel, sand, cinders, black dirt, fertilizer, chemicals, etc. Convertible to Snow Loader.



▼ Example of the use of a Texrope automatic Vari-Pitch sheave in connection with the efficient speed control of a pan feeder is shown in the wash plant of the Hawkins mine of Cleveland Cliff Iron Mine Co. at Nashwauk, Minn.

Variable Speed Control (727)

An economical and efficient form of speed control recently reveloped by Allis-Chalmers engineers for applications requiring frequent speed changes or for making adjustments without shutting down the drive is now being employed for the first time in various mines.

The combination consists of a new Vari-Pitch automatic sheave, companion sheave, wide-range Texrope belts and Texslide motor base. It assures easier and smoother starting and is being used for motion control speed change ratios up to 2 to 1.

Desired speed variances of the driven machine are quickly obtained by simply turning the adjusting screw on the Texslide motor base with any commercial wrench. The adjustment is only a matter of seconds compared to 10 to 15 minutes required to vary the speed of a stationary control sheave, users state.

The drive is particularly applicable to high starting torque since it permits the belts to ride at smaller pitch diameters during acceleration. It can be mounted at almost any angle when the motor base is in a horizontal position.

The new sheave utilizes the Vari-Pitch sheave principle of moving angular faced discs toward or away from each other, thereby changing the pitch diameter of the sheave as desired. An automatic belt tension stabilizer provides the proper sidewall pressure and belt tension regardless of the position of the belt in the groove.

The new sheave has been developed and standardized to accommodate standard motors from 1½ to 40 horse power with motor speeds from 900 to 1800 rpm. Additional information may be obtained from Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Produce New Series of Research Microscopes (728)

A new series of research microscopes and accessories that permit exhaustive study of a wide variety of specimens, have been developed by Bausch & Lomb Optical Company.

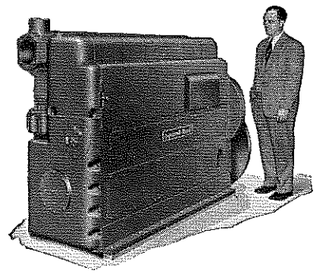
Known as the Series "E." all models have an inclined binocular body that can be interchanged with a graduated monocular draw tube for photomicrography, measuring, micro-projection and other research applications. The draw tube is adjustable and graduated from 146mm to 172mm in tube length. Three types of substages are also provided for routine, specialized and most critical research.

A deeply curved arm allows ample clearance for various specimens and full rotation of the microscope stage; coated optical elements afford maximum light transmission; and a low position, fine focusing adjustment is only 70mm above the table level, said to be the lowest fine adjustment control on any microscope available today.

Among the many available accessories which were developed especially for atomic energy research, food control, development of new drugs and biological studies are: condensers for phase contrast and dark field observation, disc polarizers and analyzers, a first surface aluminized plano mirror for single reflections and ultra-violet illumination, special slide holders and illuminators.

New Heavy-Duty Diesel Engine (729)

A completely new type of diesel engine, in the 195-375 hp range, has been announced by the Ingersoll-Rand Company, 11 Broadway, New York 4, N. Y. Designated as the TS diesel, this engine incorporates many new design features which have resulted in a previously unattainable combination of characteristics. According to the manufacturer, the TS diesel can easily be made portable, but is not automotive-type; it is small in size, but with big-engine design; light in weight, but with moderate speed; powerful, but with low exhaust temperature; perfectly balanced, but with no balancing



devices. It is a four-cycle, 7″-bore, 8½″-stroke, single-acting engine with a weight of about 30 lbs. per hp, and a fuel consumption of 0.40 lbs. per hp-hr.

This new, small-size, light-weight engine, in addition to design features of its own, includes many important design features which have heretofore been available only in much larger stationary units. Cylinders are provided with replaceable, wet-type liners and individual heads with overhead valves and intake and exhaust valve-seat inserts. The thick-wall, long-skirt pistons are of aluminum alloy, with ventilated oil-scraper rings above and below the full-floating piston pins. The perfectly balanced crankshaft is short and unusually strong, with a 5¼″ diameter at both crankpin and main bearings, eliminating torsional vibration without the use of dampers.

Both the main and crankpin bearings are provided with aluminum alloy, full-floating, interchangeable shells. The camshaft, blower, water pump and lubricating-oil pump are all gear-driven from the flywheel end of the machine, permitting power take-off from either end. Individual fuel injection pumps serve each cylinder, with two, single-hole, non-clogging nozzles per cylinder. The engine is full-pressure lubricated throughout, and is equipped with a gear-driven mechanical supercharger which supplies air for increasing initial pressure in the cylinders and for scavenging during the latter part of the exhaust stroke.

Normal starting is by 250-psi air admitted to all cylinders in turn through a starting-air distributor. Other methods of starting can also be furnished. The TS Diesel is designed for mounting either on a simple concrete base, or on welded-steel skids where portability is desired.

After more than two years of performance testing, the TS diesel is now in production, available in 6 or 8 in-line cylinder designs, capable of delivering 195 to 375 hp at 900 to 1000 rpm.

For literature or additional information write Ingersoll-Rand Company, 11 Broadway, New York, or any of its branches located throughout the world.

Plastic Map Presents U.S.A. in Three Dimensions (730)

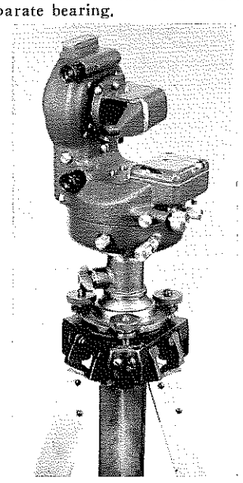
Americans of all ages can get a vivid, three-dimensional view of their country from a colorful, new Vinylite plastic relief map of the United States. Molded in this strong, waterproof plastic, the map measures 64 inches wide by 40 inches deep but weighs just 2¼ pounds. One inch on the map equals 50 miles. Its vertical exaggeration is 20 to 1. The map is lithographed in 11 brilliant colors which emphasize the relief character of the map, for the lightest colors are used at the highest points. Mountain peaks, for example, are a light lavender, shading down to deeper tones of peach and green in the lower areas.

A frame of the same durable plastic as the map itself contains grommets so the map can be hung from four small nails. Dust and fingerprints can be wiped off the map readily with a damp cloth. Easy to install in office, conference room, or reception room, the map is a decorative and useful addition. If more information is wanted concerning the map, write Robert Sohngen, Aero Service Corp., 236 E. Courtland Street, Philadelphia 20, Pa.

Microptic Transit (731)

A new and simply designed optical Transit, suitable for elementary survey work in collieries and for quarrying and metalliferous mining, has been developed by Hilger & Watts, Ltd., London, represented in Canada by S.C.I.E.X., Odeon Building, 20 Carlton Street, Toronto 2.

In construction the instrument follows the principles of the theodolite. The upper part is a single aluminum casting, incorporating the vertical circle and sighting device, which is mounted upon a vertical centre. The horizontal circle is carried on a separate bearing.



The sighting device is novel to the surveyor. The observer looks into an inclined plate of glass in which he sees, superimposed upon his field of view, the reflected image of an illuminated graticule. This is unlike the usual graticule in that it is an opaque disc with clear sighting lines which transmit light. It is ideal for sighting to the flame of a lamp.

The reflector is interchangeable with a telescope for trigonometrical levelling and for use above ground.

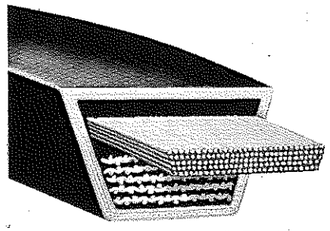
The instrument is attached by a spigot to a ball head metal tripod, the tripod

head being levelled and adjusted by three screws.

Horizontal and vertical circles are glass read by microscopes to 1 minute by interpolation.

New Line of V-Belts (732)

A new line of super-rated v-belts, named "HY-T," incorporating a chemically produced fibre of extremely high-strength, low-stretch and excellent shock absorbing qualities, has been developed by the Goodyear Tire & Rubber Company. The new synthetic cord is also water and mildew resistant. The great strength of the new fibre, used for the first time in the HY-T, enables this belt to handle 40 per cent more horsepower without excessive stretch.



Inherent resistance to shrinking is another advantage of the new fibre. This quality gives the belt greater length stability than belts manufactured prior to the development of the revolutionary cord.

The other materials which form the outside covering of the HY-T have been treated with a mildew inhibiting agent, thus assuring maximum protection from this malignant growth.

G.E. Announces New Tri-Clad* Brake-Motor (733)

General Electric is now offering its line of Tri-Clad motors equipped with Stearns magnetic brakes as unit apparatus, it was announced recently by the company's Small and Medium Motor Divisions.

All types of Tri-Clad motors up to 20 hp, 90 lb-ft static torque are available with the explosion-proof, electrically operated brake, a product of the Stearns Magnetic Manufacturing Company, Milwaukee.

The new compact brake-motor retains all the features of the standard Tri-Clad construction, it was said, and is for application on cranes, hoists, conveyors, machine tools, printing presses, laundry machines, etc. G.E. assumes unit responsibility for both brake and motor.

For flexibility, brake combinations are selected to operate at 100 and 150 per cent of full-load motor torque. A single adjustment nut sets the torque for specific load conditions, thus enabling operation below maximum rated torque whenever possible to conserve brake linings and lengthen brake life.

Brake linings are fabricated of high-friction material for long life without replacement, and in normal operation the only maintenance required is the simple screwdriver adjustment which compensates for wear. A wear indicator, viewed through a plastic window, tells when this is necessary. Manual release, a standard feature on the new G-E unit brake-motor, is easily accomplished by removing the plastic window which covers the combination hand release and wear indicator.

All brakes, even on open motors, are totally enclosed, and the brake cover is sealed to the motor housing providing protection from harmful atmospheres, dust, and dirt. To safeguard against accidental harm to personnel and equipment, the brake will continue to hold even if power fails during operation, it was said, because of its spring-set, solenoid-release design.

*Registered Trade-Mark

New 9-Ton Tournarocker (734)

A new model rear dump hauling unit—the E-9 Tournarocker—is being announced by R. G. LeTourneau, Inc., Peoria, Illinois. Designed for loading by shovel, dragline, or backhoe the E-9 Tournarocker is powered by the D Roadster Tournapull prime mover with the GM4-71 engine and is especially suited for construction work.

The new model Tournarocker has a 9 ton or 10 cubic yards heaped capacity. Its big, 11′ by 7′ top opening and low body—only 7′ high for rear loading—permits easy spotting and loading. The load is carried down between the wheels, giving a low center of gravity for greater stability.

Positive power electric steering by Tournatorque motor plus a 90° left and right turning radius make the Tournarocker highly maneuverable. Able to turn around in a 14′ 5″ radius, the unit can operate in narrow cuts or side-hill jobs.

The Tournarocker dumps material behind its rear tires by raising the 'rocker body with a cable and sheave arrangement which is actuated by a Tournatorque electric motor. This arrangement enables the Tournarocker to dump over the edge of fills.

The D Roadster Tournapull which powers the Tournarocker features positive electric power steer, sliding gear transmission and patented torque-proportioning differential. This prime mover is interchangeable with the E-9 Carryall Scraper and also can be equipped with snow plow and bulldozer blade.

Additional information on the E-9 Tournarocker, designed to handle dirt and bulk material as well as rock, may be obtained from any LeTourneau Distributor or by writing directly to R. G. LeTourneau, Inc., Peoria, Illinois.

PLANT NEWS

Du Pont Stockholders

With its total of stockholders at 115,871, a new high, the Du Pont Company reports that owners live in every state of the union, with New York, Massachusetts, and Pennsylvania having the greater numbers.

The new high represented an increase, as of March 31, of 5,926 over the number of owners recorded at the close of 1949. The new total was an increase of 18,432 over the number on March 31, 1949. Of the stockholders who are individuals, about 57 per cent are women.

In the listing of states, New York has more than 17,000 owners of Du Pont common stock; Massachusetts, about 12,000; and Pennsylvania, more than 10,000. New Jersey and California have over 5,000 each. States with less than 5,000 but more than 2,000 included Delaware, Illinois, Connecticut, Ohio.

Among the 115,871 stockholders on March 31, were 98,648 holders of common stock, and 23,709 holders of preferred stock. These figures included 6,486 holders of more than one class or series of stock.

Goodyear Makes Changes in Sales Personnel

Changes in the Mechanical Goods Sales division of Goodyear Tire and Rubber Company have been announced by H. D. Foster, manager of the division.

R. C. STEIN

R. E. CHAPMAN

R. C. Stein has been promoted to manager of Molded Goods sales at the St. Marys, Ohio Goodyear plant. He joined the Goodyear organization in 1943 and was assigned to the Omaha, Neb. territory as a Mechanical Goods Sales representative in 1945, transferring to the South Bend, Ind. territory in 1948. Stein attended Harvard, Duluth, Minn. Business university and Akron university.

R. E. Chapman was appointed manager of Hose Sales, Akron, succeeding R. W. Sanborn, who is now representing the Mechanical Goods division in the Akron territory. He entered the Mechanical Goods organization at Chicago in 1937 and was appointed a field representative for the division at Des Moines, Iowa in 1946. He holds an engineering degree from Iowa State college and served in the armed forces from 1943 to 1946.

Effective May 1, H. R. Comstock has been appointed manager of the Central

H. R. COMSTOCK

division of Goodyear Tire and Rubber Company's Mechanical Goods sales with headquarters in Minneapolis, replacing H. E. Langdon, whose new duties have not been assigned.

Comstock has served the Goodyear company since 1929 when he began his duties as a general line salesman in Minneapolis. He entered mechanical goods sales in 1935 and was appointed mechanical goods district manager at Minneapolis in 1940.

Hercules Announces Appointments

Hercules Powder Company has announced a special assignment in the Sales Research Division for Henry N. Marsh, formerly manager of the Explosives Department's Smokeless Powder Division. Frederick M. Hakenjos has been appointed to the newly created post of manager of Smokeless Powder Sales.

Mr. Marsh is well known in sporting powder circles, having been identified with rifle, pistol, trap, and skeet shooting activities for many years. He has been a member of the Board of Directors of the Wildlife Management Institute since 1947, a member of the Executive Committee of the Sporting Arms and Ammunition Manufacturers' Institute since 1945, and Co-Chairman of the Powder and Explosives Committee of the American Ordnance Association since 1945.

Mr. Hakenjos was an executive assistant with the National Rifle Association from 1934 to 1941, when he joined Hercules' Smokeless Powder Division in March of the latter year. He holds a bachelor's degree from the University of Minnesota and a master's degree from Columbia University.

International Minerals Reports

Net sales of International Minerals & Chemical Corporation for the nine months ended March 31, 1950, totaled $39,327,528 as compared with $39,026,242 for the same period last year.

Net earnings for the nine-month period were $3,611,780 as compared with $4,135,734 for the corresponding period a year before.

Earnings per common share for the nine-month period were $4.20 per share as compared with $4.86 per share for the same period a year ago.

Wemco Coal Cleaning Plants For Belgium

Charbonnages d' Hensies Pommeroeul, Par Ville Pommeroual, Belgium, has placed an order with Western Machinery Company for the complete design and fabrication of two prefabricated heavy media separation plants as a result of pilot mill operation of a No. 30 Wemco Mobil-Mill operated by this company in 1949.

The first plant consists of two Wemco Cone Separator circuits to treat 200 tons per hour of 80 millimeter x 6 millimeter feed and the second plant will treat 100 tons per hour of 6 millimeter x 2 millimeter coal feed.

Western Machinery Company is represented in Belgium by the Ore and Chemical Co. of New York and their agent Agence Miniere & Maritime S.A. at Antwerp, Belgium.

Hardinge Adds Lime Equipment

Hardinge Company, Incorporated, York, Pennsylvania, has signed a contract with Ellicott Machine Corporation of Baltimore, giving the Hardinge organization exclusive manufacturing and sales rights for Kuntz lime and hydrate equipment.

The two major pieces of equipment which will be built and sold by Hardinge under this contract are the Kuntz Continuous Feed Automatic Type Lime Kiln and the Kuntz Lime Hydrator.

The contract also makes Hardinge Company, Inc., exclusive suppliers of repair parts for the Clyde and Schulthess Hydrators, as well as the Sobek Kiln.

Hallidayboro Coal Company Obtains Wemco Mobil-Mill

The Hallidayboro Coal Company, Inc. of Elkville, Illinois has purchased a No. 3C Wemco Mobil-Mill to clean 60 tons per hour of 4″ x ⅜″ coal feed.

Canadian Aero Service, Ltd., Organized

The organization of Canadian Aero Service, Limited has been announced by Aero Service Corporation of Philadelphia, Pennsylvania, and Spartan Air Service, Limited, of Ottawa, Ontario. The new concern will be an affiliate of both companies.

President of Canadian Aero Service, Limited is Thomas M. O'Malley. James Wells is Vice-President, and John Johnson, Secretary-Treasurer of the new company. Offices of the company will be at 346 Queen Street, Ottawa.

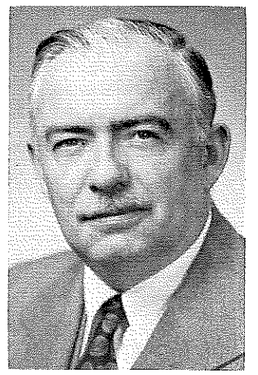
Organized to engage in aerial topographic mapping and airborne magnetometer surveys throughout the Dominion, Canadian Aero Service, Limited will draw on the extensive experience and technical background of its parent companies. Expert Canadian flight personnel, many of them RCAF men with broad experience in bush work, will pilot the mapping planes.

Olin Industries Elects New Board Members

The election of F. S. Elfred, general manager of the Explosives Division of Olin Industries, Inc., and Robert W. Lea, president of Johns-Manville Corporation, as members of the Board of Directors of Olin Industries, Inc., has been announced by John M. Olin, President.

Mr. Elfred is a member of the Board of Directors of the Equitable Powder Manufacturing Company, East Alton, Ill., and its affiliates the Columbia Powder Company, Tacoma, Wash., and the Egyptian Powder Company, Pollard, Ill. He joined the Olin organization in 1937, is a member of the American Institute of Mining and Metallurgical Engineers of New York City, and the Mining Club of New York City.

An outstandingly successful executive, Mr. Lea joined Johns-Manville Corpora-



F. S. ELFRED

tion in March, 1939, as Vice President for Finance, was elected a director in February, 1940. He became Executive Vice President in January 1946 and President in September 1946.

Mr. Lea is a director of the Curtiss-Wright Corporation, Universal Pictures Company, Inc., West Virginia Coal and Coke Corporation and is a member of the Board of Managers of the Delaware, Lackawanna and Western Railroad Company.

G.E. to Supply Electric Equipment For Portsmouth Plant of Detroit Steel Corp.

The electric equipment for Detroit Steel Corporation's new hot strip mill to be installed at its Portsmouth Division, Portsmouth, Ohio, will be supplied by General Electric, it was announced recently. This will include all electrical components for a two-high reversing roughing mill using two 2000 h.p. motors and a four-stand tandem hot strip mill, using three 3500 h.p. and one 3000 h.p. motors, as well as motor-generator sets, 180 auxiliary motors of approximately 5000 h.p. and controls, power distribution equipment, etc.

Strip Mill to Have Most Powerful Drives in Country

General Electric amplidyne-controlled drives will be used to provide a total of 17,500 horsepower for a four-stand, tandem cold strip mill. The new strip mill will make use of more connected horsepower than any other four stand mill in the country.

The new mill is being installed in an eastern plant of a major steel corporation as part of an over-all plant expansion program. It will be capable of delivering 66-inch wide sheet gauge steel strip at the rate of 3000 feet per minute. The entering strip will be between 0.125-inch and 0.080-inch thick, and delivered thickness will range from 0.074-inch to 0.015-inch.

Allis-Chalmers Elects Officers

The stockholders of the Allis-Chalmers Manufacturing Co. May 4 elected Walter Geist to his ninth term as president of the company, and re-elected all other officers and directors of the firm.

Re-elected as officers in addition to Walter Geist are W. C. Johnson, executive vice president in charge of the general machinery division; W. A. Roberts, executive vice president in charge of the tractor division; E. H. Brown, vice president in charge of engineering development; W. E. Hawkinson, secretary and treasurer; J. A. Keogh, vice president and comptroller; J. L. Singleton, vice president and director of sales for the general machinery division, and H. W. Story, vice president and general attorney.

The directors declared the regular quarterly dividend of 81¼c per share on the issued and outstanding 3¼% cumulative convertible preferred stock, payable June 5, 1950 and a quarterly dividend of 50c per share on the issued and outstanding common stock of the company, payable June 30, 1950.

Powell Coal Company To Install Wemco Mobil-Mill

The Powell Coal Company of Kattaning, Pennsylvania has contracted with Western Machinery Company for installation of a No. 3C Wemco Mobil-Mill to clean 60 tons per hour of 4″ x 10-mesh coal feed, and construction of feeding, conveying, crushing and screening facilities to complete the coal preparation plant, is expected to be completed in July of this year.

Goodyear Plans Plant Expansion

A one million dollar expansion and improvement program at Goodyear Tire and Rubber Company's St. Marys, Ohio plant is scheduled for immediate construction.

A. A. Teisher, manager of the St. Marys plant for Goodyear, said ground

(Continued on page 59)

CATALOGS AND TRADE PUBLICATIONS

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. These publications are FREE.

(5518) "THE BUSINESS OF FARMING" Spring, 1950, by United States Gypsum, 300 W. Adams St., Chicago 6, Ill. Sixteen pages containing illustrated articles and items of interest to farm dwellers. Includes ideas for better farming; homemaking hints, interior decorating plans and news of markets and farm produce prices.

(5519) "ACI NEWS LETTER," March 1950, by The American Concrete Institute. A 32 page magazine devoted to articles and items of interest to ACI members and to the concrete industry generally. This issue leads off with a description of the recent ACI Convention in Chicago.

(5520) "SOUND BUSINESS," March-April 1950, by United States Gypsum, 300 W. Adams St., Chicago, Ill. An 8 page illustrated magazine concerned chiefly with the use of sound-proofing materials in various types of buildings such as hotels, private homes and restaurants.

(5521) CLASSIFIERS & HEAVY-MEDIA SEPARATORS. Bulletin No. 39-B by Hardinge Co., Inc., 240 Arch St., York, Pa. Twenty pages describing and illustrating counter-current classifiers, heavy-media separators, heavy-media densifiers, hydro-separators and thickeners. Flow sheets and technical information provided including specifications and operating results.

(5522) "THE TIE-IN." 1st Quarter, 1950, by H. C. Price Co., Bartlesville, Okla. A 16 page illustrated company magazine featuring, in this issue, articles on the Company's coming project, the construction of 878 miles of gas supply line between the Ohio River and the City of Buffalo, N. Y.

(5523) SCIENTIFIC AND INDUSTRIAL MEASURING INSTRUMENTS, Folder 1001 by Baldwin Instrument Co., Ltd., Dartford, Kent, England. An illustrated folder describing various measuring instruments such as voltmeters, moisture meters, galvanometers, potentiometers and others.

(5524) "PAY DIRT." March 21, 1950, by the Arizona Small Mine Operators, Assn., 528 Title & Trust Bldg., Phoenix, Ariz. A 16 page illustrated magazine containing items and articles of interest to the Arizona mining industry. Lead article in this issue covers Donald A. Callahan's defense of depletion allowances. Other articles on federal tax laws, legislative problems for mining, the domestic copper industry and others.

(5525) ELECTRIC MOTORS, "The Louis Allis Messenger," March-April 1950, by the Louis Allis Co., Milwaukee 7, Wisc. Profusely illustrated, slick paper magazine containing poems, epigrams, drawings and color photographs interspersed with advertising matter concerning the Company's line of electric motors.

(5526) WELDING NEWS. "Linde Tips," April 1950, by The Linde Air Products Co., 30 E. 42nd St., New York 17, N. Y. A 28 page illustrated magazine containing articles and items about oxyacetylene welding. Lead article in this issue concerns the fusion welding of cast iron.

(5527) POWER WHEELBARROW. A 4 page bulletin by Kwik-Mix Co., Port Washington, Wisc., describing and illustrating the "Moto-Bug" power wheelbarrow. Gives construction features and shows advantages gained by the use of this unit on various type jobs. Specifications given.

(5528) "HEWITT-ROBINS ANNUAL REPORT, 1949." Eighteen pages (with illustrations) by Hewitt-Robins, Inc., 370 Lexington Ave., New York 17, N. Y. Complete coverage of Company progress and financial condition for 1949. Information listed under following headings: President's Report, Industrial Products, Consumer Products, Statement of Income, Summary of Financial Position, Profit and Loss, Statement of Surplus, Balance Sheet, and Ten Year Financial Operating Record.

(5529) CENTRIFUGAL PUMPS, Form 7212 by Ingersoll Rand, 11 Broadway, New York, N. Y. Illustrates and describes Cradle-Mounted Centrifugal Pumps for process and refinery service. Photographic section is shown, approximate dimensions and specifications. Available in four sizes, 1, 1½, 2 and 3 inch for capacities from 20 to 550 GPM and total heads up to 250 feet.

(5530) "DECO TREFOIL" and **"YOUR ENGINEERING NOTEBOOK"** by Denver Equipment Company, 1400 - 17th Street, Denver 17, Colo., for March-April 1950. Contains information on Yellowknife country in Manitoba, Canada, and a 16 page illustrated description of the milling operations of the Consolidated Mining and Smelting Company of Canada, Ltd., Yellowknife, N.W.T., Canada. An interesting historical sketch is given. Included are flowsheets showing the milling operation together with milling data and a description of problems encountered in this isolated northern country.

(5531) CLASSIFIER, Bulletin No. 48-S by Colorado Iron Works Co., 1624 - 17th St., Denver, Colo. Contains 8 pages illustrating and describing construction features of the Akins Classifier, operating details, special applications, outline drawings with general dimensions and information on capacity — a bulletin should be in the hands of every mill operator.

(5532) LABORATORY FURNITURE AND EQUIPMENT, Circular No. 10 by Leonard Peterson & Co., Inc., contains 4 pages illustrating and describing modern laboratory furniture. Sales representatives, Mine & Smelter Supply Co., Denver, Colo.

(5533) ALUMINUM. Alcoa Aluminum News-Letter, April 1950 by Aluminum Company of America, Pittsburgh 19, Pa. Illustrates many new uses where aluminum can be used to advantage. Among these is a power scythe which reduces labor in trimming around lawns and fences. Illustrations are included showing several advantages gained from using aluminum in construction.

(5534) NEW MEXICO MINER & PROSPECTOR, P. O. Box 503, Albuquerque, N. M., for May 1950, contains 12 pages of short news articles covering mining activities in New Mexico.

(5535) CONVEYORS. "The S-A Conveyor," Volume 192 by Stephens-Adamson Mfg. Co., Aurora, Ill., contains 20 pages illustrating and describing several industrial installations of conveying equipment. Among these is a very good article covering the Kern Rock Company's gravel plant, near Bakersfield, Calif.

(5536) FARMING, Late Spring 1950 Edition by United States Gypsum, 300 W. Adams St., Chicago, Ill., contains 16 pages including "Design for Better Living Farmhouse," "How to Arrange Furniture" and other information which may be used to advantage to make living more comfortable.

(5537) VULCO ROPES, "Industrial News," May 1950, by Gates Rubber Co., 999 So. Broadway, Denver, Colo., contains several short illustrated articles showing new applications of Vulco Rope Drives, among these is shown a short drive from an electric motor to a flat faced large pulley on a compressor handling a refrigeration load.

(5538) STANDARD OIL (NEW JERSEY) 1949 ANNUAL REPORT, 30 Rockefeller Plaza, New York 20, N. Y., contains 40 pages illustrating and describing the company operations throughout the world. Colored maps are included showing world's use of oil and also the operation of affiliates of the Standard Oil Co. Complete financial statements are included covering the operations of the company for 1949.

(5539) INDUSTRIAL HOSE, Bulletin No. 137 by Hewitt-Robins, Inc., 370 Lexington Ave., New York, N. Y., contains 6 pages of information covering the Hewitt-Robins All-Service Hose.

(5540) "MIN & CHEM," April 1950, by International Minerals & Chemical Corporation, 20 N. Wacker Drive, Chicago 6, Ill., contains 24 pages illustrating and describing operations of this company and the importance of their products. The conclave at Carlsbad between agriculture, labor and industry held March 31 and April 1, 1950, and its importance is discussed. An illustrated article showing the taxes paid on many everyday used items will be of great interest to all Mines Magazine readers. Order your copy, and see what your hidden taxes amount to.

(5541) "STORAGE BATTERY POWER," April 1950, by Thomas A. Edison, Inc., West Orange, N. J., contains 20 pages of short illustrated articles showing many new uses where the storage battery can be applied to advantage.

(5542) "BAROID NEWS BULLETIN," April 1950, Baroid Sales Div., National Lead Co., P. O. Box 2558, Terminal Annex, Los Angeles 54, Calif., contains 36 pages illustrating and describing the use of drilling muds, "On-Location Core Analysis" and other information of importance to oil well drillers.

(5543) ROD MILLS, Bulletin No. 25-B by Hardinge Co., Inc., York, Pa., discusses the new type, Convex-Head Hardinge Rod Mill as well as the standard Hardinge Conical-Ended Rod Mill. It shows a number of typical installations as well as details of construction of the various models, specifications, and performance data.

(5544) GEOLOGICAL LABORATORY, Chemical & Geological Laboratories, 521 S. Center St., Casper, Wyo. and 142d St. and 108th Ave., Edmonton, Alta., Canada, describe their chemical-geological and engineering service in an 8-page recent publication. They have established a very complete service which will be of interest to oil companies, drilling contractors, financial firms, and equipment manufacturers.

(5545) CONVEYORS. "Link-Belt News," April 1950, by Link-Belt Co., 307 N. Michigan Ave., Chicago, Ill., contains 8 pages of illustrated articles showing industrial uses for conveying equipment. These articles illustrate vibrating screens, electrofluid drives, variable speed drives and other important equipment essential to efficient operation of elevating and conveying equipment.

(5546) RECONDITIONED MACHINERY, Bulletin 501, by Morse Bros. Machinery Co., 2900 Brighton Blvd., Denver, Colo., contains 32 pages illustrating and listing a large variety of reconditioned machinery and equipment which will be found useful in connection with mining and industrial operation. Photographs illustrate the modern shops where used equipment is reconditioned and rebuilt.

(5547) "INDUSTRIAL ELECTRIFICATION" is a 4 page reprint by Apparatus Dept., General Electric Co., Schenectady, N. Y., discussing proper voltage as an efficiency factor and methods of voltage regulation.

(5548) DIESEL ENGINE, Form 10,028-A by Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., illustrates and describes the Ingersoll-Rand TS Diesel Engine. Specifications are given for 6 and 8 cylinder engines and cut-a-way photographs show the internal construction of the engine.

(5549) "ON TOUR," April 1950, by Union Oil Company of Calif., 617 West 7th St., Los Angeles 14, Calif., contains 24 pages telling the story of the first petroleum pipe line connecting the Atlantic and Pacific Oceans, the use of accounting machines in Union Oil Company's San Francisco, Seattle and Los Angeles offices and other items relative to the operation of the company.

(5550) SCIENTIFIC EQUIPMENT, "The Announcer" No. 50-8-38, by Burrell Corp., 1942 Fifth Ave., Pittsburgh 19, Pa., contains 16 pages describing modern nephelometry, high speed Dyna-Cath magnetic Mercury Cathode, the automatic measurement of micro volumes and other laboratory operations and equipment.

(5551) ELECTRICAL REVIEW, First Quarter 1950, by Allis-Chalmers, 848-A S. 70th St., Milwaukee, Wisc., contains 32 pages of articles pertaining to transformers and switch gear problems.

(5552) EXCHANGER TEST-SET, Bulletin 5002, by C. F. Braun & Co., Alhambra, Calif., illustrates and describes a new test-set manufactured by this company.

(5553) "POPULAR HOME," Late Spring 1950, by United States Gypsum, 300 W. Adams St., Chicago 6, Ill., contains 16 pages showing plans for construction of modern homes, methods of furnishing and the construction to be used in connection. Ideal arrangements are shown.

(5554) GROUND CLAMPS, Bulletin No. 26, by Blaco Mfg. Co., Cleveland 3, Ohio, illustrates and describes the Blaco adjustable ground clamp for high amperage circuits. Sizes and price lists are included.

(5555) RADIOACTIVE DETECTOR, A recent circular by Baldwin Instrument Co., Ltd., Dartford, Kent, England, describes the Baldwin Prospector's Portable Gamma Radiation Detector for use in geological prospecting for radioactive minerals.

(5556) "THE BEACON," April 1950, by The Ohio Oil Co., Findlay, Ohio, contains 38 pages portaining to the personnel associated with the various operations of this country. This issue reviews Ohio's operations for 1949 giving financial results for the 62nd year.

(5557) "HARDINGE HIGHLIGHTS," May 1950, by Hardinge Co., York, Pa., is a 4 page company publication descriptive of recent activities of this company.

(5558) "H & B BULLETIN," March-April 1950, by Hendrie & Bolthoff, P. O. Box 5110, Terminal Annex, Denver, Colo., contains 32 pages illustrating and describing tools and equipment as well as supplies carried in stock for contractors, manufacturers and mining companies.

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MINES MAGAZINE
734 Cooper Building
Denver, Colorado

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Alumni Business

MEETINGS

Executive Committee Meetings
3rd Monday of each month, Alumni Office, 7:30 P. M.

Alumni Council Meetings
4th Thursday of each month, Argonaut Hotel, 6:30 P. M.

Publication Committee Meetings
2nd Monday of each month, Alumni Office, 5 P.M.

Capability Exchange Committee, Meetings Wednesday 7:30 Week preceeding Executive Committee Meeting.

EXECUTIVE COMMITTEE MEETING

The regular meeting of the Colorado School of Mines Alumni Association was held in the Alumni office on Friday, May 19, 1950.

The meeting was called to order by President Colasanti at 7:35 P. M.

Roll Call

Members present: James Colasanti, President; A. George Setter, Vice President; Robert W. Evans, Secretary; Malcolm E. Collier, Treasurer; Robert J. McGlone. Committee chairmen: Addison B. Manning, Roger M. Schade, Bruce B. LaFollette for H. J. McMichael. Executive Manager, Frank C. Bowman.

Members absent: Harvey Mathews, Carl I. Dismant. Committee chairmen: Charles O. Parker, Edwin F. White, Lynn W. Storm, Harry McNeill, Herbert Heckt, John H. Winchell.

The minutes of April 17, 1950, were read and approved.

President Colasanti called for the Treasurer's report and reports of standing committees, as follows:

Treasurer's Report

Mr. Collier reported that the Association is in good shape financially, showing a net profit of $5736.62 for the first four months of 1950.

Moved by Mr. Collier the report be accepted; seconded by Mr. LaFollette; passed.

Alumni Endowment Committee

Mr. Schade reported income in April of $100.12, making a bank balance as of April 30, 1950, of $2039.53.

The Placement fund shows receipts in April of $442.21 and disbursements of $434.56, leaving a balance as of April 30, 1950, of $1175.48.

Moved by Mr. LaFollette the report be accepted; seconded by Mr. Manning; passed.

Athletic Committee

Mr. Manning reported that during April contributions amounted to $8.00. During the month one loan of $235.00 was paid in full and $10.00 was paid on another loan. As of April 30, 1950, the Loan Fund shows a balance of $1127.65 in the checking account; and $278.00 in outstanding loans.

Mr. Bowman reported that a loan of $250.00 was made the early part of May with payments of $25.00 a month to start July 1, 1950.

Moved by Mr. Setter the report be accepted; seconded by Mr. Schade; passed.

Capability Exchange Committee

Mr. LaFollette reported for Mr. McMichael. Letters have been written to all men on the active list asking them to bring their files up to date which resulted in decreasing the active list by six. Letters sent to former employers resulted in an increase of five jobs over last month. Individual letters to men benefited by the service resulted in an increase in contributions.

During April there were 23 calls for men; 13 recommendations made; 1 placement reported; 1155 letters mailed; 428 men are on the active list and 89 calls for men remain unfilled.

Moved by Mr. McGlone the report be accepted; seconded by Mr. Setter; passed.

Budget and Finance Committee

No report.

Instruction Committee

No report.

Legislation Committee

No report.

Membership Committee

Mr. Setter reported that during April one life member, one annual member and one former member passed away; dues from 202 annual memberships were received; and 18 associate members paid.

Moved by Mr. LaFollette the report be accepted; seconded by Mr. McGlone; passed.

Nominations Committee

No report.

Public Relations Committee

Mr. Colasanti reported for Mr. White. There was a surplus of $19.00 from the testimonial dinner for Ben Parker. This money is to be saved as a separate account and will be used on a future dinner.

The Annual Alumni Banquet will be held Thursday, May 25, 1950, at Daniels & Fisher. Considerable interest has been shown by the class of 1925.

Mr. G. T. Harley, Manager, International Minerals & Chemical Corporation, will be the main speaker. Rut Volk will be toastmaster.

Moved by Mr. Evans the report be accepted; seconded by Mr. Setter; passed.

Publication Committee

Mr. Bowman reported for Mr. Heckt. For the 33 1/3% budget period, 33.5% of the income has been earned and 23.1% of the budgeted expenditures has been spent; there is an earned credit over the budget of $3382.47 to date.

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FROM THE *Local Sections*

ARIZONA

Two meetings in year, second Saturday in April and October. H. Z. Stuart, '36, Bisbee, Vice-Pres.; C. A. Davis, '27, Phoenix, Vice-Pres.; W. W. Simon, '15, Superior, Vice-Pres.; B. G. Messer, '36, Secretary-Treasurer, Rt. 1, Box 40, Globe, Ariz.

BAGUIO

Frank E. Delahunty, '25, President; Luther W. Lennox, '05, Secretary-Treasurer, Benguet Consolidated Mining Co., Baguio, P. I. Meetings upon call of secretary.

BARTLESVILLE

Burt R. Kramer, '42, President; John W. Tynan, '41, Vice President; Richard M. Bradley, '36, Secretary, Cities Service Oil Co., Bartlesville. Luncheon meetings every Friday noon in the Burlingame Hotel Coffee Shop.

BAY CITIES

Louis DeGoes, '48, President; George Playter, '30, Vice President; Clyde Osborn, '33, Secretary; James N. Peros, '38, Treasurer. Visiting Miners contact Secretary, c/o Western Machinery Co., 762 Folsom Street, San Francisco, Calif., Exbrook 2-4167.

BIRMINGHAM

Robert J. Blair, '39, President; Stanley M. Walker, Ex-'11, Vice President; Hubert E. Risser, '37, Secretary-Treasurer, Bradford Mine, Dixiana, Alabama. Meetings held upon call of secretary. Visiting "Miners" please contact secretary.

CENTRAL OHIO

Roland B. Fischer, '42, President; Frank M. Stephens, Jr., '42, Secretary-Treasurer, Battelle Memorial Institute, Columbus, Ohio.

CENTRAL WYOMING SECTION

Herbert Schlundt, '43, President; Lynn D. Ervin, '40, Secretary-Treasurer, c/o Stanolind Oil & Gas Co., Casper, Wyoming. Meetings, first Saturday, March, June, September, December.

CLEVELAND

Joseph R. Gilbert, '42, Secretary, 14513 Northfield Ave., East Cleveland 12, Ohio. Meetings last Friday of each month at the Carter Hotel, Cleveland.

COLORADO

E. S. Hanley, '34, President; Herbert W. Heckt, '36, Vice President; David Roberts, '40, Treasurer; William J. Holtman, '43, Secretary, 930 Downing St., Denver, Colo. Meetings upon call of Secretary.

EASTERN PENNSYLVANIA

Names of Officers and notice of Meetings to be announced later.

GREAT LAKES

Francis W. Mann, '43, President; R. D. Fernald, '37, Vice President; Stanley Ohlswager, Ex-'49, Secretary. Meetings: Fourth Friday, January, April, October. Visiting Miners contact President, c/o Standard Oil Co. (Ind.), Pipeline Dept., 910 So. Michigan Ave., Chicago 1.

The Great Lakes Section, Mines Alumni Association, held their regular meeting the evening of April 28, 1950.

Those present were:

J. A. Appleton, '37; Richard Downey, '44; Robert Edison, '49; Russ Fernald, '37; Morton Frank, '06; Harry Lawrence, '48; F. W. Mann, '43; John Moody, '39; Stanley Ohlswanger, '49; H. A. Raab, '37; Ray Watson, '43; Fred Werhle, '49. Guests: Mrs. Richard Downey, Mrs. Russ Fernald, Mrs. H. A. Raab, and Ted Bergstrom.

A movie of the 1949 Mines-Western State football game was shown. The fighting spirit of a good football squad and occasional glimpses of Miner's acetylene torch lights in the stands brought back fond memories of days gone by. Those present enjoyed having as guests the wives of three of the alumni. Also present as a guest was Ted Bergstrom, selected by the Great Lakes Section as a candidate for an athletic scholarship award at Mines. Ted is currently attending Dubuque University in Iowa.

I. *Old Business.*

Mr. Watson reported on the progress of the Scholarship Awards Committee. Through extensive correspondence and with the aid of the Chicago Tribune, the committee has been able to obtain very encouraging results in contacting scholarship candidates.

Mr. Ohlswanger reported a balance of $1.00 in the Petty Cash Fund. Contributions were made to supplement the Fund.

II. *New Business.*

It was suggested that, at some date in the latter part of September, the section hold a family picnic. Russ Fernald offered the use of his home for the affair. It was suggested that transportation facilities be pooled as the Fernald home is in an outlying district.

There being no further business, the meeting was adjourned.

HOUSTON

Albert L. Ladner, '27, President; McKay G. Donkin, '29, Vice President; W. Bruce Barbour, '37, Secretary, c/o The Second National Bank of Houston, Oil & Gas Div., Houston. Monthly luncheon meetings held on the first Tuesday at Noon, Tenth Floor of the Houston Club. Visitors please contact the secretary at The Second National Bank of Houston.

KANSAS

All activities suspended.

MANILA

John R. Wagner, Jr., '40, President; Ernesto C. Bengzon, '21, Vice-President; M. M. Aycardo, Jr., '41, Secretary-Treasurer, 3rd Floor Soriano Bldg., Manila, P. I. Luncheon meetings second Saturday all even months of the year.

MONTANA

A. B. Martin, '23, President; M. R. Hoyt, Ex-'08, Vice-President; C. B. Hull, '09, Secretary, 646 Galena, Butte, Montana. Meetings upon call of Secretary.

NEW YORK

Russell J. Parker, '19, Rupert B. Lowe, '22, Co-Chairmen; Fred D. Kay, '21, Secretary-Treasurer. Room 2202, 120 Broadway, New York 5, N. Y. Telephone: Worth 2-6720. Monthly meetings.

A meeting of the New York Section, Colorado School of Mines Alumni Association, was held at the Mining Club on the evening of Thursday, May 4th, 1950.

Eleven Mines Alumni of New York Section gathered for a very enjoyable meeting. Those present were as follows:

Donald Dyrenforth, '12; Rupert B. Lowe, '22; Harry J. Wolf, '03; A. K. Seemann, '22; James Ashley Clark, '21; Domingo Moreno, '22; Fred D. Kay, '21; Arthur L. O'Toole, '26; G. F. Kaufmann, '21; William Henry Nikola, '41; George B. Paulding, '39.

After having an hour or so to again renew acquaintances and, as at all meetings, where somebody meets somebody else they have not seen for a number of years, the same happened with two of the younger group who attended this meeting.

After a very enjoyable meal, a short business meeting was held, at which it was decided that the future Governing Body of the New York Alumni Section would be a Board of Governors, probably consisting of men from the various age groups. This Board will elect their own leader. In order that they will be held over from year to year, the terms of office of this group will be staggered. Don Dyrenforth is appointed Chairman of a nominating committee of three to offer a slate along these lines at our meeting probably to be held the early part of June.

The preliminary address list was given to each man present. With the next letter announcing a meeting, cards will go out asking each man to give detailed information as to his location, position, etc., in order that a printed list can be sent out in the late summer.

After the business was dispensed with, films of two 1949 football games were shown, both of which were quite enjoyable to those present.

NORTH CENTRAL TEXAS

E. J. Brook, '23, President; J. W. Peters, '38, Vice President; H. D. Thornton, '40, Secty.-Treas. (Ft. Worth) 506 Neil P. Anderson Bldg., Fort Worth, Texas, Telephone: 3-3058; Henry Rogatz, '26, Secty-Treas. (Dallas) 1215-16 First Natl. Bank Bldg., Dallas, Texas, Telephone: Riverside 4846. Four meetings during year, second Monday of month, February, May, September and November.

OKLAHOMA

Carl R. Holmgren, '38, President; M. E. Chapman, '27, Edgar R. Locke, '28, C. O. Moss, '02, Vice Presidents; Philip C. Dixon, '31, Secretary-Treasurer, Midstates Oil Corporation, National Bank of Tulsa Bldg., Tulsa, Okla.

A dinner meeting of Oklahoma Section, at Tulsa, was held the evening of April 18, 1950, honoring Mr. Fritz Brennecke, Athletic Director at *Mines*.

About 25 persons attended the dinner, including several prospective students, and a good time was had by all.

Election of officers for the coming year was held which resulted as follows:

President, Carl Roger Holmgren, '38; Vice Presidents, Martin Edward Chapman, '27, Edgar R. Locke, '28, and Cleveland Osgood Moss, '02; Secretary-Treasurer, Philip C. Dixon, '31.

OKLAHOMA CITY

J. S. "Monty" Montgomery, '31, President; H. M. "Hugh" Rackets, '42, Vice President; M. O. "Shorty" Hegglund, '41, Secretary-Treasurer, c/o Stanolind Oil and Gas Co., First National Building, Oklahoma City, Okla. Meetings, first and third Thursdays of each month at the Oklahoma Club. Luncheon 12:00 Noon. All Mines Men are cordially invited to drop in.

PACIFIC NORTHWEST

A. R. Kesling, '40, President, 2915 Holgate, Seattle; Phone: PR-7392. W. I. Sedgely, '40, Secy-Treas., 6040-36th Ave., S. W. Seattle 6; Phone: AV-8641. Meetings upon call of Secretary.

PENNSYLVANIA-OHIO SECTION

William H. Sparr, '39, President; George G. Yeager, '40, Secretary, 3229 Circle Drive, Pittsburgh 27, Pa. Meetings upon call of officers.

SOUTHERN CALIFORNIA

John Biegel, '39, President; A. J. Heiser, '43, Vice President; C. J. Cerf, '41, Treasurer; Franklin S. Crane, '43, Secretary, c/o Oilwell Supply Co., 934 North Alameda St., Los Angeles. Telephone: MUtual 7311.
Scheduled meetings second Monday of January, April, July and October, at Officers' Club, 2626 Wilshire Blvd., Los Angeles, 6:30 P.M. Phone Secretary for reservation.

ST. LOUIS

James E. O'Keefe, '37, President; Floyd M. Belleau, '23, Secretary-Treasurer, 955 Tuxedo Blvd., Webster Groves, Mo.

UTAH

H. J. Vander Veer, '30, President; Wallace W. Agey, '39, Secretary-Treasurer, 852 So. 19th East St., Salt Lake City 5, Utah.

WASHINGTON, D. C.

Marcus G. Geiger, '37, President; Frank E. Johnson, '22, Vice President; Leroy M. Otis, '14, Secretary-Treasurer, Muirkirk, Maryland.

Scheduled evening meetings called for the third Thursday of every other month at the Continental Hotel, Washington, D. C. Special meetings arranged when warranted.

WEDDINGS

McCallum - Harris

Jean McCallum, of the class of 1910, and Mrs. Sally E. Harris were married at noon on May 11th in the Episcopal church, Riverside, California, the bride being given in marriage by her son, Frank B. Harris, '41. A reception followed at Riverside Mission Inn.

Mr. McCallum who retired last year from his duties as Vice President and Manager of St. Louis Smelting & Refining Company at St. Louis, is now Consulting Mining and Metallurgical Engineer.

Mrs. McCallum was the widow of Arnold W. Harris, '12, who was killed in an automobile accident in 1938 in Australia where he was doing consulting work.

The couple are now at home at 5656 Chelsea Avenue, La Jolla, California.

MINES TODAY

The Rocky Mountain Section

of the American Society for Engineering Education held its annual convention last month at *Mines*.

President John W. Vanderwilt gave the welcoming address, following which prominent leaders of engineering education in the Rocky Mountain region presented papers in a program which lasted throughout the day.

Among the principal speakers were: C. M. Knudson, dean of the school of engineering, University of Denver; A. R. Deschere, associate professor of mechanical engineering, University of Colorado; E. J. Lindahl, professor and head of mechanical engineering, University of Wyoming; P. J. Waibler, professor of mechanical engineering, University of Utah; A. M. Krill, coordinator of the co-operative engineering plan at the University of Denver; T. H. Evans, dean of the division of engineering, Colorado A. & M. college, Fort Collins; and T. A. Kelly, professor and head of civil engineering at *Mines*.

At the luncheon meeting, three foreign students at the school spoke, Hassan M. Elkholi of Cairo, Egypt, Amalendu Roy of Calcutta, India, and Hendrik K. Van Poollen of The Hague, Holland. They told briefly of engineering education in their respective countries as compared to what they are experiencing here.

Mines Also Played Host

to the Rocky Mountain Section of the Geological Society of America this spring when they met for a two-day conference.

Among the papers presented were: "Contributions to the Geomorphology of the Raton Mesa Area" by William S. Levings, '20, *Mines* geology professor; "High-Level Gravels West of Golden, Colorado, and Their Physiographic Significance" by C. F. Erskine, G. B. Morgan, and L. B. Robertson, *Mines* graduate students; "Petrochemical Studies of Alkaline Rocks, Monotu District, Sakhalin," by Kenzo Yagi, graduate student; "Additional Comments of the Stratigraphic Distribution of Orbaline Universa d'Orbiguy" by Prof. L. W. LeRoy; "Sand Pockets and Breccia in the Leadville Limestone, Star Basin Area, Colorado," by H. L. Garrett, graduate student; and "Hydrothermal Alteration Effects in the Leadville Limestone and their Relation to Mineralization" by R. N. Davidson, also a graduate student.

At a special session on Engineering Geology eight papers, each pertaining to some phase of engineering geology, were read.

Dr. Ben H. Parker, ex-president of Mines, acted as co-chairman of the meeting with Mr. C. J. Hares, Denver geologist. An Ohio Oil company geologist for many years, Hares is the president of the Rocky Mountain section of the society. Dr. F. M. Van Tuyl, head of the Mines geology department, is vice chairman, and Dr. Warren O. Thompson, head of the Colorado university department of geology, is the secretary.

Dr. Thomas C. Poulter

a distinguished explorer and geophysicist, was a visitor at the school the early part of May when he presented the library with two of his books:

Geophysical Studies in the Antarctic. This report deals primarily with those phases of the scientific program which in one way or another relate to geophysics and more particularly to those aspects of the geophysics program which would be of particular interest to any one contemplating seismic studies of ice fields whether on shelf ice, ice caps, glaciers, permafrost, or ice and snow covered areas.

The Poulter Method of Geophysical Exploration. The material presented in this paper is the result of an extensive research program sponsored by the Institute of Inventive Research in San Antonio, Texas, for the purpose of developing and making available to the petroleum and geophysical industries the new seismic method of geophysical exploration which they have chosen to call the Poulter Seismic method.

The Oredigger

has been awarded a First Class honor rating for the first semester, 1949-1950, by the All-American Critical Service of the Associated Collegiate Press.

Judged in comparison with 383 other American college newspapers, The Oredigger earned 940 out of a possible 1000 points. Of a possible 250 points in each of four general phases of newspaper publication, The Oredigger scored 225 on news values and sources, 230 on news writing and editing; 245 on headlines, typography, and makeup; and 240 on department pages and special features.

Classed among 78 weeklies published at colleges and universities with enrollments of 1000 to 2499 students, The Oredigger was one of 32 newspapers to earn between 825 and 950 points for the First Class or excellent award. Had The Oredigger scored 10 more points, it would have ranked with 17 other papers in its class which earned the All-American or superior award.

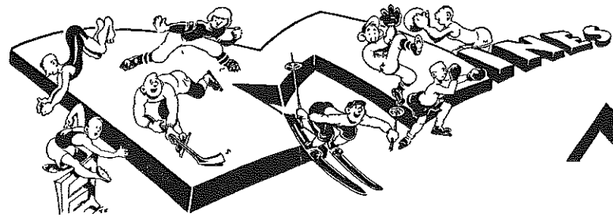
Twenty-one newspapers in The Oredigger's class earned 700 points for Second Class rating, and five earned 575 points for Third Class rating. Publications scoring below 575 points were not included in the A. C. P. statistical report. Of the 384 collegiate publications in all classes judged, 83 earned the All-American rating, 155 earned First Class, 112 earned Second Class, and 28 earned Third Class.

Eighty Educational Institutions

will participate in a nation-wide program of geological field work during the 1950 field season this summer, according to a recent announcement by the American Geological Institute of Washington, D. C. With the 1950 field season marking an all-time high of almost 3,000 students attending the summer geology camps, Colorado will be host to more students than any other state. Thirteen institutions, ten outside the state, will operate camps in Colorado.

All over the United States the students will study at 78 camps or travel from place to place in eight special survey courses. More than 150 separate courses are located in 31 different states with most of the courses be-

(Continued on page 60)



Sports MARCH

By BILL ANDERSON

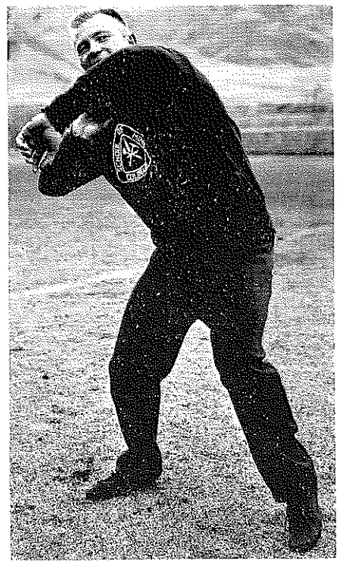
Track Men Win 3 Lose 2

The Mines Track Men have completed their third season without a defeat by conference rivals in dual meet competition, but once more failed in their attempt to annex the conference championship.

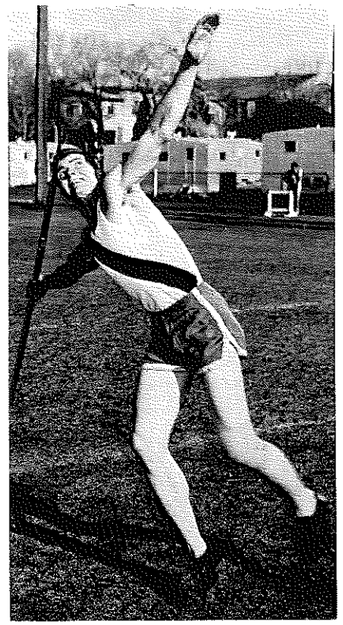
The Mines Track Team opened their outdoor dual season against Colorado College at Colorado Springs and breezed to an easy 90-41 victory at Washburn Field. The Miners took first place in 10 of the 15 events and tied for first in another. Wes Bitzer, with firsts in the 100 and 220 yard dashes, and a second place in the broad jump, tallied 13 points to lead the Orediggers. Roy Essary won both the shotput and the discus for other Mines points.

The Summary:

100-YARD DASH — Bitzer, Mines; Marsh, Mines; Baird, CC. Time :10.
220-YARD DASH — Bitzer, Mines; Pozzo, Mines; Baird, CC. Time :23.2.
440-YARD DASH — Dickinson, Mines; Owen, Mines; Brown, Mines Time :53.8.
880-YARD RUN — D. Pfeiffer, CC.; Brown, Mines; Betton, CC. Time 2:09.6.
MILE RUN—Vaughn, Mines; D. Pfeiffer, CC.; Montgomery, Mines. Time 4:36.7.
TWO-MILE RUN—J. Pfeiffer, CC.; Bymaster, CC.; Leaf, Mines; Time 11:20.1.
HIGH HURDLES—Gaulke, Mines; Beardsley, Mines; Johnston, Mines. Time :16.6.
220-YARD LOW HURDLES — Beardsley, Mines; Siebert, CC; Nichols, CC; Time :27.0.
HIGH JUMP—(Tie) Irish, Mines, and Powell, CC; Adams, Mines. Height: six feet.



ROY ESSARY
1949 Conference Shotput Champion



STEWART COLLESTER
Senior Javelin Thrower

BROAD JUMP—Nichols, CC; Bitzer, Mines; Moreland, CC. Distance 20 feet ½ inch.
POLE VAULT—Powell, CC; Champion, Mines; Brothers, CC. Height 12 feet 6 inches.
SHOTPUT — Essary, Mines; Johnston, Mines; Lewis, CC. Distance 45 feet 1⅞ inches.
DISCUS — Essary, Mines; Johnston, Mines; Diver, Mines; Distance 123 feet 1¾ inches.
JAVELIN—Collester, Mines; Hamilton, Mines; Lewis, CC. Distance 158 feet 4¼ inches.
MILE RELAY—Won by Mines (Pozzo, Owen, Brown and Dickinson) Time 3:35.8.

With Jerome Biffle scoring three firsts and a second place, the Denver University Pioneers defeated the Colorado School of Mines Track Men by a score of 87½-43½ at Golden on April 26, 1950. Paul Vaughn scored two firsts for the Mines Team by winning the mile and the two-mile runs. Sophomore Edgar Gaulke showed excellent form in winning the high hurdles with a time of 15.6. Roy Essary's 44′ 10½″ in the shot put and Stuart Collester's 157′ javelin throw accounted for Mines other first places in this meet.

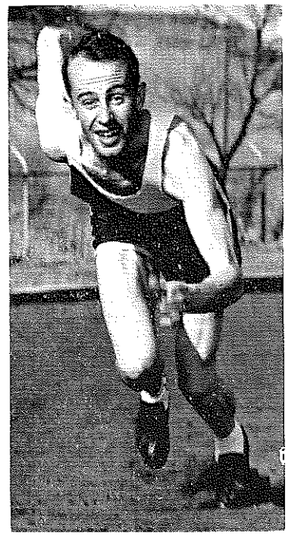
The Summary:

100 YARD DASH—Biffle, D; Scott, D.; Bitzer, M. :09.9.
220-YARD DASH — Benich, D.; Biffle, D.; Bitzer, M. :22.2.
440-YARD DASH — Benich, D; Senter, D; Weber, D. :50.2.
880-YARD RUN—Teel, D; Goodwin, D; Dickinson, M. 2:03.7.
MILE RUN—Vaughn, M; Goodwin, D; Montgomery, M. 4:35.4.
TWO-MILE RUN—Vaughn, M; Fleming, D; Kovar, D. 10:58.3.
LOW HURDLES—Hiserman, D; Zwirlein, D; Beardsley, M. :25.7.
HIGH HURDLES—Gaulke, M; Webb, D; McGaughey, D. :15.6.
JAVELIN — Collester, M; Hamilton, M; McGaughey, D; 157 feet.
SHOTPUT — Essary, M; Preciado, D; McCarthy, D. 44 ft. 10½ in.
DISCUS—McCarthy, D; Essary, M; Diver, M. 139 ft. 11¾ in.
POLE VAULT—Heyer, D; Servatius, M; Champion, M; and Parkins, D. tied for third, 11 ft. 4 in.
HIGH JUMP—Biffle, D; Irish, M, and Finberg, D, tied for second. 5 ft. 10¾ in.
BROAD JUMP—Biffle, D; Finberg, D; Bitzer, M. 23 ft. 7 in.
MILE RELAY—DU (Webb, Holbrook, Senter, Benich), Mines 3:31.

The Mines Track Team won firsts in 11 events to take a dual Rocky Mountain Conference Track Meet from Colorado State by a score of 77 2/3-53 1/2 on May 2. Hank Beardsley was high point man for the Orediggers winning the low hurdles and the broad jump and placing third in the high hurdles. Paul Vaughn won the mile and two-mile runs for Mines.

The Results:

100-YARD DASH — Bitzer, M; Knapp, CS; Dickinson, M. :10.5.
220-YARD DASH—Dickinson, M; Reith CS; Pozzo, M; Sharp, CS, :23.6.
440-YARD DASH — Pozzo, M; Brown, M; Reith, CS, :52.8.
880-YARD RUN—Pope, CS; Brown, M; Connell, M. 2:08.7.
MILE RUN — Vaughn, M; Montgomery, M; Guenzi, CS. 4:38.8.
TWO-MILE RUN — Vaughn, M; Guenzi, CS; Lutton, M. 11:22.



ART DICKINSON
1948 Conference Champion in the 880

Book Reviews

These books may be obtained through the Book Department of The Mines Magazine.

Principles of Petroleum Geology

By Cecil G. Lalicker, Professor of Geology, University of Kansas. Appleton-Century-Crofts, Inc., New York. 1949. 377 pages, 157 figs., 67 tables. $5.00.

This book comprises a thorough study of one of the younger and perhaps the most active of the various branches of economic geology. It is designed to inform the reader rather than to impress him with the author's erudition; consequently, it presents the material clearly and factually.

The introduction to the text sketches briefly the development of the science of petroleum geology and describes the work of the petroleum geologist. In the first chapter, the author gives in detail, for the first time, the geographic and stratigraphic distribution of petroleum.

Other chapters describe the "Chemical and Physical Properties of Petroleum and Related Substances"; "The Origin of Petroleum"; "Migration and Accumulation of Petroleum"; "Petroleum Discovery Methods"; "Geological Considerations in Recovery Methods"; and "Valuation of Oil and Gas Properties."

In addition to the foregoing subjects, the author describes, with examples, the various types of oil-bearing structures such as anticlines, domes and synclines; reservoirs caused by faulting; salt domes; buried hills; and stratigraphic and porosity type fields.

The importance of petroleum geology to the oil industry increases yearly as known reserves diminish and new reserves become increasingly hard to find. Consequently, the need for accurate, up-to-the-minute information on the subject is always present. The volume at hand is just that—dependable, complete and up-to-date information on petroleum geology, ably written and clearly and simply presented.

An Index of Nomograms

Edited by Douglas P. Adams,* joint publication of John Wiley & Sons, Inc., and the Technology Press of the Massachusetts Institute of Technology, M.I.T., 1950, $4.00.

This book gives the location and content of seventeen hundred alignment diagrams published extensively in current technical journals. Emphasizing the use of nomograms — graphical devices designed to yield quick, accurate solutions to mathematical formulae—in practical engineering problems requiring the repeated use of the same equation, the Index covers a wide range of fields. Among these are: chemistry and chemical engineering; mathematics; physics; electricity, electronics and radio; hydraulics and power; aeronautics; waterworks and sewage; illumination; heating, piping and ventilating; oil and gas; building and surveying; mining; machine tools and design; metals; textiles; medicine; food; and transportation.

*Associate professor of graphics at Massachusetts Institute of Technology and a visiting lecturer in engineering sciences at Harvard University.

Kent's Mechanical Engineers' Handbook 12th Edition. In two volumes.

John Wiley & Sons, Inc., New York 16, N. Y. 3000 pages. $8.50 per volume. Flexible binding.

The new handbook has been completely rewritten in clear and accurate language. In the Kent tradition, it stresses practice rather than theory. All the text and illustrative material that has made "Kent" a dependable source of data for thousands of engineers in earlier editions has been recompiled from the most thoroughly verified sources.

Although much of the material from the eleventh edition has been condensed, both volumes are now larger than their predecessors in order to present the most recent data and the latest practice. A new index, carefully worked out by the editors, makes each piece of information doubly accessible. One hundred and sixty-eight specialists, all well known in their respective fields, have contributed to the new "Kent," as compared to the seventy-five contributors to the outgoing edition.

Sales Managers Handbook Six Edition Revised

Edited by John Cameron Aspley. The Dartnell Corporation, Chicago, Ill. 1950. 1150 pages. 48 sections. 5 x 8. Flexible. $10.00.

The material contained in this book has been carefully selected to help sales executives meet the problems which always come from a buyer's market.

Basic data appearing in previous editions of the handbook have been brought up to date to meet the change in conditions. A large amount of new material has been added to help meet the new over-all sales management problems, and much of it is published in this book for the first time.

In the first chapters, the American Market, methods of selling and distribution, pricing policies, and establishing sales potentials are discussed. Pricing policies, sales budgeting, departmental organizations, field organizations, employees contracts and compensations, training schools and conferences, sales help, time controls, sales supervision and incentive plans are only a few of the important subjects covered but give one an idea of the broad coverage of this important subject by the book.

Throughout the book are found many tables and forms which will be useful in planning and organizing work and helping to solve the many problems presented in the sales and marketing of products. An appendix contains tables of population and buying power data, marketing factors, Federal laws affecting selling, and a well arranged index, all of which adds to the value of the book.

This handbook should be a valuable companion for every sales executive, salesman and others interested in marketing and sales.

Applied Sedimentation

A Symposium from 35 specialists edited by Dr. Parker D. Trask, former professor of geology at Yale and Wisconsin Universities and geologist with U. S. Geological Survey. John D. Wiley & Sons, Inc., New York 16, N. Y. 1950. 707 pages, Illustrated, over 1000 references. 30 page index. $5.00.

This book, prepared under the direction of the Committee on Symposium on Sedimentation of the Division of Geology and Geography of the National Research Council, considers the practical application of sedimentation as presented by thirty-five different authors, each a specialist in his own field, covering pure geology, mining geology, petroleum geology, engineering geology and related subjects.

The articles contained are grouped under, (1) Basic principles of sedimentation, (2) Engineering problems involving strength of sediments, (3) Application of processes of sedimentation, (4) Application involving nature of constituents, (5) Economic mineral deposits, (6) Petroleum geology problems, and (7) Military applications.

Part (1) discusses the factors and processes affecting sedimentation; the orgin of soils; Geophysics place in applied sedimentation; the role of the geologist in soil mechanics; and ground water related to various environments.

Part (2) brings out the importance of a knowledge of sedimentation when considering highway construction, foundation problems, earth dam construction, soft ground tunneling, and levee construction. Illustrations used are well selected and add greatly to the value of the text.

In Part (3) the application of processes of sedimentation considers those features of sedimentary deposits contributing to landslides and methods of combating, factors effecting perma-frost and their engineering significance, factors influencing the control of shore lines, channel control in rivers and harbors, conditions and processes influencing debris formation and methods of control, reservoir sedimentation and remedies, causes of silting and control, soil erosion and rates of sedimentation and cause of gullying and corrective treatment.

In Part (4) are discussed the importance of sediment constituents in selecting material for industrial application.

Part (5) brings out the importance of sedimentary mineral deposits, problems encountered in production, sedimentary rocks as hosts for ore deposits including vein and replacement deposits and methods of geochemical prospecting for ores.

Part (6) in considering petroleum geology problems, has covered: subsurface techniques including electric logging, thermal logging, mud logging, caliper logging, radioactivity logging, core analysis and sample logging, with drawings, charts and discussions, a large amount of information concentrated in a few pages; the importance of porosity, permeability, and capillary properties of petroleum reservoirs with a discussion of these factors and their effect on petroleum production; and, carbonate porosity and permeability with suggestions for future research.

Part (7) discusses the importance of the principles of sedimentation in connection with military operations and especially its application to naval problems.

Each subject discussed accentuates the need and importance of additional research. One of the great values of this book to the student, investigator or research worker is the very complete list of references made available covering the entire subject treated.

NEWS ATOMIC ENERGY

(Continued from page 36)

Production has always started at the exposures along the rims of the mesas, and the ore bodies have been traced back by mining development and closely spaced drilling. The rim deposits and their inward extensions have a limited life, and therefore the future productivity of the region is dependent upon the discovery of ore deposits away from the rims of the canyons where there are no ore outcrops. Our exploration program has been designed specifically to develop ore-finding criteria and to discover ore in those areas where industry does not find it profitable to operate under present conditions.

Owing to the difficulty experienced to date in the development of satisfactory ore-finding techniques, we have felt that a dual exploration and research effort would provide the best possibility of attaining ultimate success. Consequently, our Plateau exploration program is being carried out by two cooperative groups, one under the direct guidance of the Commission and the other sponsored by the Commission but under the immediate direction of the Geological Survey, each group operating in different areas to avoid duplication of effort.

The results of the drilling have been satisfactory so far as finding ore is concerned, and geological data that will be helpful in further exploration are gradually being developed by both organizations.

In addition to purely geological methods of ore finding, various methods are being tested that utilize the disintegration products of uranium. Such possibilities include the detection in drill cores of radon and radiogenic helium and lead, the definition of areas showing higher than average surface radio-activity, and the radiometric logging of drill holes, using either Geiger-Muller tubes or ionization chambers.

Colorado Front Range. The second area of special interest to the Commission is the "Mineral Belt" of the Colorado Front Range. This area extends from southwest of Idaho Springs to Jamestown, Colorado, and contains numerous primary vein deposits which for a century have produced ores of gold, silver, lead, zinc, tungsten, fluorite, and some uranium. These deposits have provided our only domestic production of pitchblende ores. The mines of Quartz Hill in this area, near Central City, appear to have yielded 325 tons of pitchblende ore, containing about 50 tons of U_3O_8, from 1872 through 1919. No significant production has been recorded since that period.

The most northerly occurrence of uranium is in some of the fluorite mines in the Jamestown district, where the exposed veins are filled with brecciated sulphides and fluorite of several generations. Finely disseminated uraninite occurs in the fluorite.

About 14 miles southwest of Jamestown, pitchblende has been found on the 1040 foot level of the Caribou Mine. Here the pitchblende is associated with sulphides of lead, zinc, and silver.

The most widespread occurrences of pitchblende in the Mineral Belt are in the mines of Quartz Hill near Central City. In this area, comprising some four square miles, there are at least seven mines in which pitchblende has been known to occur in primary veins closely associated with pyrite, sphalerite, tennantite, galena, chalcopyrite, and quartz. The veins have been worked principally for the gold values contained in the late sulphides.

Farther to the south, in the Idaho Springs district, the lowest level of the Joe Reynolds vein has been found to carry some botryoidal fragments of pitchblende embedded in a matrix of quartz, siderite, galena, and chalcopyrite. Some torbernite and other secondary uranium minerals have been found at the surface in the Peabody veins.

Unfortunately, many of the mines in the Colorado Front Range are now idle, and consequently their lower workings are generally inaccessible. Geologists of the Geological Survey and the Commission are working together to relate the known occurrences of pitchblende to the various components of the complex geology in which they are found. This program includes radiometric reconnaissance, geological mapping, sampling, chemical and spectographic analyses, together with studies of the various dikes and country rock, and of the properties of the primary vein minerals.

Sunshine Mine, Coeur d'Alene District, Idaho. One of the most interesting recent discoveries of primary uranium ores in the United States was made in the Sunshine Mine in the Coeur d'Alene district in July 1949 by Ernest E. Thurlow, a Commission geologist, accompanied by Raymond Robinson, chief geologist of the Sunshine Mining Company, and Thomas Gillingham, geologist for the Bunker Hill and Sullivan Mining and Refining Company.

The Silver Belt, in which the Sunshine Mine is located, occupies a fairly well-defined zone bordered on the north by the Osburn fault and the south by the Big Creek fault. The veins of the Sunshine Mine are closely associated with the Silver Summit fault and cut the over-turned limb of the asymmetric Big Creek anticline, the largest and most persistent fold in the district.

The initial discovery of pitchblende was made in a vein some 300 feet in the footwall of the Sunshine vein on the 3700 foot level. Subsequent discoveries have been made in highly sheared stringer zones in the footwall of the Sunshine vein proper on both the 3000 foot and the 3100 foot levels. Between the 3100 and 3700 foot levels, the mine workings have not been extended far enough to the west to determine the continuity of the pitchblende zone found thus far.

The pitchblende is generally associated with pyrite, tetrahedrite (freibergite), arsenopyrite, siderite, and fine-grained hematite which gives the wall rock a red coloration. Detailed mineralogical studies of the veins are now in progress.

Upper Peninsula of Michigan. Our hopes that the uranium province on the east shore of Lake Superior, in Canada, would extend westward into the United States were encouraged by the discovery of a uranium-bearing vein in Baraga County in the Upper Peninsula of Michigan in August 1949. The discovery was made by Eiler Hendrickson, a geologist who was employed by the Jones and Laughlin Steel Corporation. Samples of the radioactive ore submitted to the Commission's New York Mineralogical Laboratory were found to contain uraninite.

The discovery, in a gorge in the Huron River, is in a silicified shear zone five to fifteen feet wide. The uranium mineralization, as the outcrop, was confined to a calcite-bearing zone about one and one-half feet thick in the footwall of the shear zone.

Marysvale, Utah. Another group of uranium deposits, which appear to be assuming considerable significance, was discovered early in 1949 in the vicinity of Marysvale, Utah, by Pratt Seegmiller, on claims previously staked for fluorite. The claims which appear to be most promising, at this stage of exploration, are being developed by the Bullion-Monarch Mining Company and the Vanadium Corporation of America. The Commission has established an ore-buying station in the area, and we intend to follow closely the course of the development work.

The rocks in the Marysvale district consist chiefly of Tertiary volcanics, from basaltic to rhyolitic in composition, intruded by stocks of quartz-monzonite. All of the known uranium deposits are found in hydrothermally altered zones in the quartz-monzonite. On the claims being developed by the Vanadium Corporation of America, the zone of hydrothermal alteration, which embraces the main deposit, follows and elongate and well-defined fracture zone. On the Bullion-Monarch Mining Company claims, the altered monzonite zone is intruded by a felsitic dike and the alteration and fracturing extend over a wide area with no apparent directional trend.

The principal uranium mineral, which has been deposited along tight fractures and other minor openings, is autunite, with minor amounts of schroeckingerite, torbernite, and meta-torbernite also occurring. In addition, uraninite has recently been identified in the workings of a prospect operated by the Vanadium Corporation of America, at a depth of about 70 feet below the collar of an inclined shaft. The presence of uraninite, a primary mineral, indicates hydrothermal origin of the deposit and encourages the belief that mineable ore will be found in the district at a considerable depth below the zone of oxidation. Drilling to date has been shallow, but further drilling, trenching, and prospecting by shallow shafts are now in progress.

Low-Grade Deposits. Finally, the Commission has given special attention to the concentrations of uranium in certain types of marine sediments, particularly black shales and phosphorites. Many sediments of this type contain 0.01% to 0.02% uranium, and similar percentages have been found in some Tertiary lignites. Although these very low-grade deposits represent huge reserves, the problems involved in recovering their uranium content are formidable, and they will probably not be utilized unless an extreme emergency develops or unless the uranium can be obtained as a by-product of some other industry.

The Devonian and lower Mississippian Chattanooga shales of Tennessee and Kentucky are the most promising rocks of this type yet explored. The highest concentra-

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NEWS ATOMIC ENERGY

(Continued from page 51)

tion of uranium in phosphates occurs in the deposits of the Pliocene Bone Valley formation in Florida and the Permian Phosphoria formation of Wyoming, Montana, and Idaho.

These phosphate formations also constitute the principal source of raw materials for the phosphate fertilizer industry, and in studying the occurrence of uranium in phosphorites we have utilized a vast amount of exploration data furnished by mining companies and supplemented by pit and mill sampling.

We have now almost completed our program of exploration on these very low-grade deposits. The principal objective of the program has been to determine what reserves of uranium are available in such deposits, what specific areas show the highest grade of ore and appear to be most susceptible to mining, and what physical and chemical factors have been most important in controlling origin and distribution.

CONCLUSION

To sum up briefly, our program has accomplished the following results:

1 It has located many additional deposits of carnotite ore bodies on the Colorado Plateau as a result of intensive exploration and mining activity.

2 It has established the fact that primary uranium vein deposits do exist in the United States. These have been found in the Colorado Front Range, in the Coeur d'Alene mining district in Idaho, and in the Upper Peninsula of Michigan.

3 It has led to the discovery of numerous occurrences of both primary and secondary uranium minerals in western areas off the the Colorado Plateau, such as those at Marysvale, Utah.

4 It has developed extensive information concerning low-grade uranium deposits in shales and phosphates, and this information indicates that under certain conditions it might become feasible to mine and recover uranium from these very low-grade ores.

MID-CENTURY SURVEY

(Continued from page 24)

Rules for Success Remain Unchanged

But the old personal rules for success remain unchanged. Brains, of course—and making them work. But they are not much good unless they are mixed with generous quantities of lasting determination, character, integrity, an ordinary humility, and a willingness to acknowledge your mistakes, a generous and warm feeling for your fellow man. Also, I think you must feel that the game is fun. You must like what you are doing. It must stimulate you for itself—above and beyond the gains. If it fails to do this, it fails to capture the best in you. And if this package can be overlaid with a sense of humor, it will hurdle the rough places—and there are always many. Real success is never an overnight affair. It is the accumulation of your daily living. It is the sum of your experiences. If you want the prizes, I am sure you can get them. They will be there. Not all want them, for the road is not easy, though rewarding.

Gentlemen, I wish you luck for your 50 additional years of life expectancy. Because you are engineers, you are better able than most to make your way in the world. *Use your engineering knowledge to the full. But, more vital than this, function actively as citizens—to make this world the place you would like to live in.*

BIRTHS

Glenna Lynn Mote arrived at the home of her parents, Mr. and Mrs. Morris W. Mote, Jr., 225 Jackson Street, Pueblo, Colorado, on January 24, 1950 and would like to hear from any interested contemporaries.

Her father, of the class of '49, is Junior Metallurgist for Colorado Fuel & Iron Corporation at Pueblo.

Mr. and Mrs. Joseph L. Barber announce the arrival of a son, Lance Alan, on April 7. He tipped the scales at 6 lbs. 4 oz., and his parents are pleased that he is the image of their first son, Bruce, now 6 years of age.

Mr. Barber, '39, is engineer in the general engineering and consulting laboratory of General Electric Company at Schenectady, N. Y. The family home is 149 No. Toll Street, Scotia, N. Y.

Mr. and Mrs. Oscar Davila are the parents of a son, Gonzalo Davila-Poblete, born April 12, and weighing 7 pounds, 10 ounces.

Mr. Davila, '47, is metallurgist for Patino Mines & Enterprises Consolidated in whose care he is addressed, Potosi, Catavi, Bolivia.

Mr. and Mrs. Robert R. Allen announce the birth of a son, Michael Maynard, on May 17; weight 6 pounds, 15½ ounces. The baby is the grandson of Mrs. Myrtle Allen of Golden and the late Maynard C. Allen, '06.

Robert Allen, of the class of '40, is Fuel Technologist for the U. S. Bureau of Mines. He and the family reside at 806-16th Street, Golden.

PERSONAL NOTES

(Continued from page 35)

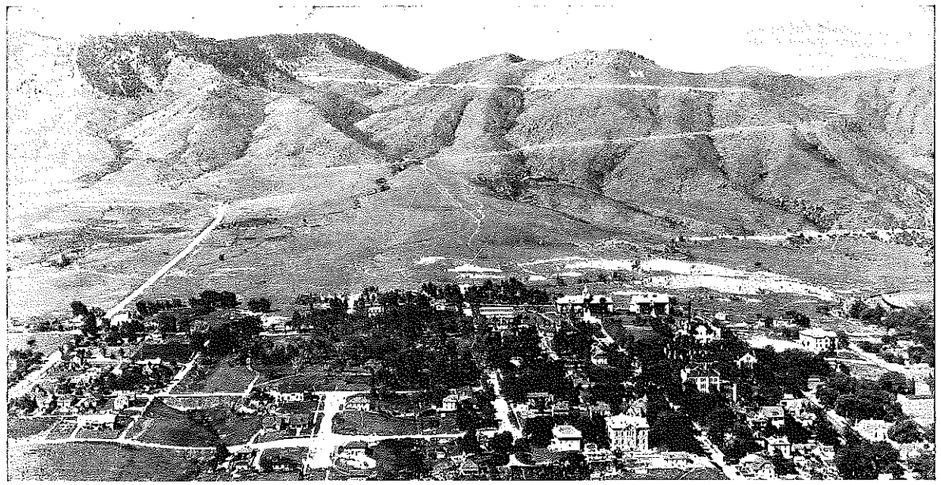
cently accepted position of Assistant General Manager, Patino Mines and Enterprises, at Catavi, Bolivia. His son, Kenneth B. Larson, is majoring in Metallurgy at *Mines,* Class 1951.

Peter W. Leidich, '43, is associated with Iron Mines Company of Venezuela, with address in their care, San Felix, Edo. Bolivar, Venezuela.

Andrew J. May, '12, has a change of address from Vanadium, to 1017 North Canal Street, Carlsbad, New Mexico.

E. J. Mayhew, '41, Production Manager, Building Products division, Great Lakes Carbon Corporation, was in Denver for a few days last month and called at the Alumni office. His home address is 63 Naomi Avenue, Arcadia, California.

(Continued on page 58)



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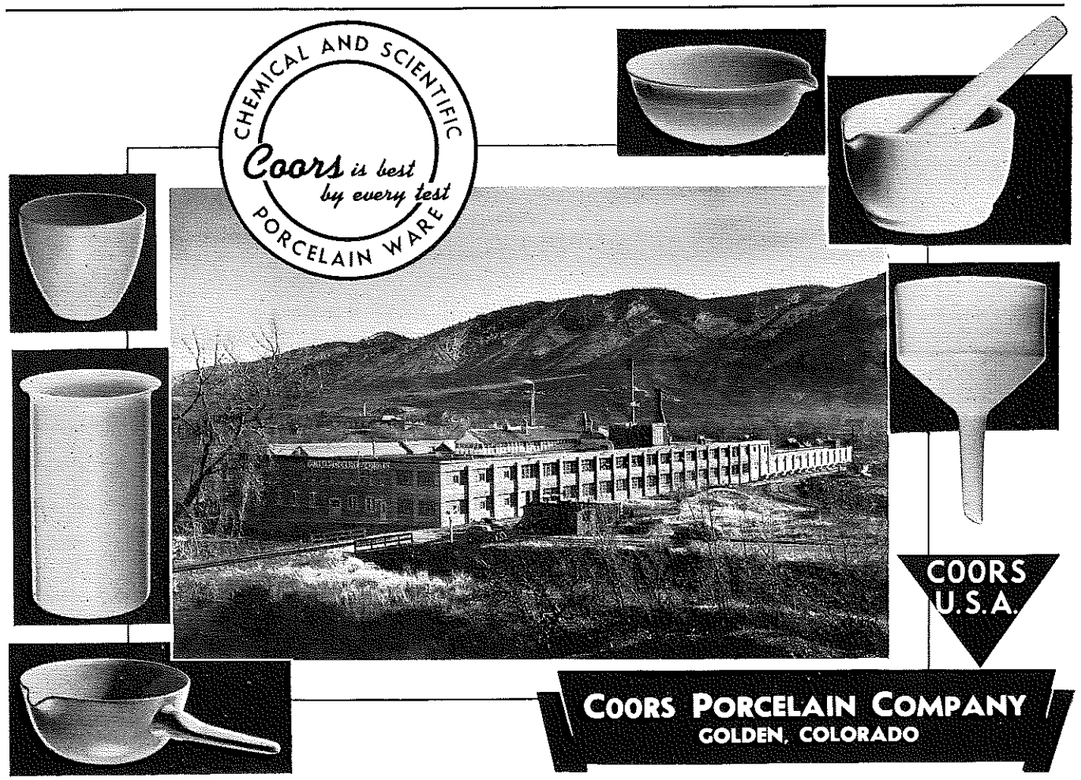

CONTRIBUTORS TO PLACEMENT FUND

(Continued from page 10)

Preston Grant, Ex-'33
Lester S. Grant, '99
T. H. Garnett, '11
Jno. C. Mitchell, '39
W. W. Lowrey, Ex-'41
Robt. E. Simon, '48
R. E. Watson, '43
R. C. Cutter, '49
C. E. Stiefken, '41
Heine Kenworthy, '32
Ardris Haig, '36
F. M. Nelson, '25
W. P. Morris, '32
C. E. Dismant, '31
G. Keith Taylor, '23
T. L. Wells, '29
Jean Goldsmith, '41
Oscar Davila, '47
V. L. Mattson, '26
D. C. Deringer, Jr., '24
J. W. Hyer, Jr., '42
M. G. Zangara, '48
C. E. Prior, Jr., '13
LeRoy G. Hall, '35
Ralph Bowman, '48
G. Featherstone, Jr., '43
Orville P. Smith, '49
John A. Bowsher, '34
J. C. Stipe, '40
Chas. L. Wilson, '44
Victor R. Martin, '41
D. J. McMullen, '44
Paul B. Davis, '39
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E. C. Philpy, '49
V. G. Gabriel, '31; '33
Robert G. Wheeler, '49
Dale Nix, '26
E. E. Hand, Jr., '12
W. E. Burleson, Ex-'26
John C. Dyer, '27
Geo. M. Thomas, '44
Ninetta C. Davis, '20
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Chas. M. Tarr, '38
George E. Norris, '27
A. W. Heuck, '36
William G. Park, '49
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Jno. B. Botelho, '42
D. B. Mazer, '47
Joe T. Robison, '49
James W. McLeod
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Chas. T. Pease, '48
John H. Winchell, '17
C. W. Gustafson, Ex-'34
M. L. Talley, '49
L. F. Bombardieri, '41
T. E. Howard, '41
D. M. Coleman, '49
C. J. McGee, '47
Andrew Milek
Chas. B. Hoskins
Jack F. Frost, '25
C. E. Osborn, '33
John M. Suttie, '42
H. Z. Stuart, '36
R. E. Lintner, '43
M. O. Whitlow, '49
Clark W. Moore, '32
Ben E. Terry, '33
Jack D. Duren, '48
P. M. Ralph, '48
W. E. Ellwanger, '43
John Robertson, Jr., '49
F. L. Stewart, '43
K. E. Lindsay, '40
L. H. Shefelbine, '43
L. E. McCloskey, '47
C. A. Einarsen, '47
J. H. McKeever, '47
A. N. Nelson, '26
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David P. Morse, '49
Thos. P. Bellinger, '47

(Continued on page 58)

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(Continued from page 56)

Robert J. Black, '49
R. W. Parker, '49
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G. H. Lancaster, '41
Marvin E. Lane, '44
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C. W. Gustafson, Ex-'34
T. E. Phipps, '49
D. W. Thompson, '42
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W. H. Kohler, '41
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Russell Badgett, Jr., '40
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Glenn E. Worden, '48
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S. H. Stocker, '42
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R. W. Moyar, '41
E. L. Honett, '47
V. L. Lebar, '36
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P. E. Leidich, '43
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C. L. Fleischman, '30
Jos. E. Hatheway, '41
Mario Fernandez, '39
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R. E. Marks
C. M. Hales, '48
Walter H. Ortel, '49
Peter C. Cresto, Ex-'50
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D. W. Gunther, '39
Eugene F. Klein, '43
Silas DoFoo, '41
John E. Moody, '39
Edw. S. Larson, '23
Alan E. Hall, '39
Edw. W. Anderson, '43
L. S. Woeber, '22

PERSONAL NOTES

(Continued from page 53)

Capt. Harold W. McCullough, '27, is now being addressed 60th Genl. Depot, A.P.O. 246, c/o Postmaster, San Francisco, Calif.

J. R. Medaris, '49, Junior Engineer, Phillips Petroleum Company, receives mail at his home, 302 No. Oak Street, Apt. 2, Pauls Valley, Oklahoma.

Robert E. Michaelis, Jr., '47, has moved his residence to 335 So. Negley Avenue, Pittsburgh 6, Pa. He is Research Spectrographer for Carnegie-Illinois Steel Research Laboratory.

Domingo Moreno, '22, Chief Engineer, Mining Department, American Smelting & Refining Co., has a new home address, 241 Old Short Hills Road, Short Hills, N. J.

(Continued on page 60)

LETTERS

(Continued from page 16)

25th Anniversary celebration of our class. It seems that I have missed one letter but it doesn't make much difference.

Fortunately, or unfortunately, I have just recently been transferred to some new duties out here in Regina and will find it impossible to leave to be present at the reunion, a fact which I regret very deeply since I am sure that a meeting with a lot of you would be very pleasant and interesting.

It has always been a source of amazement and vicarious pride to find how well known the school is, no matter where one travels, and how obliquitous its graduates are. I have been down in South America, up in Canada, and it seems that the boys get around. On top of that they seem to have left a good taste as well as a good reputation with the people with whom they have come in contact. It is astonishing to know that a school with as small an enrollment as "Mines" should have such a universal appeal for anyone contemplating engineering, especially in foreign countries. It seems to be as conventional for any of the South American boys, who contemplate geological or geophysical work, to go to "Mines" as it is for a bride to wear white at her wedding.

The most striking thing when I am looking back at it is not so much the technical training that "Mines" offers, because frankly I believe that through the years other schools offer as good or better training in the physical sciences and purely technical courses, but the ability, practically universal, of the "Mines" graduates to be willing to get their hands dirty and their feet wet when the occasion warrants it and think

(Continued on page 59)

PLANT NEWS

(Continued from page 41)

will be broken immediately for a new building to house molded and extruded goods manufacture, warehousing and engineering services. Located directly opposite present plant buildings, bordering on U. S. highway 66, the new addition is to be 170 feet wide and 660 feet long, giving 112,000 square feet of floor space. Plant structure is to be a one story, monitor type (raised roof portions to improve lighting and air circulation), constructed of concrete blocks and steel. Steel contract was awarded to Burger Iron and Steel Co., Akron, and the Clemmer Construction Co., also of Akron, was named general contractor.

LETTERS

(Continued from page 58)

nothing of it. In addition they seem to have a far better than average ability and desire to understand the people with whom they are living, especially in foreign lands. That may explain why so many of them stay in foreign work and make a success of it. Without meaning to oversentimentalize the situation at all, it is gratifying and pleasant, to use a mild word, to see the extraordinary spirit of friendliness and "camaraderie" which exists whenever "Mines" graduates meet, over and above, the normal amount usually associated with the graduates from the same school.

Anyway let me express my regrets at not being able to attend the reunion, but I do hope to be able to visit you and the others some time this year.

P. S. Just a small contribution enclosed towards the "Mines" Foundation.

REGRETS CANNOT ATTEND REUNION

From CONSTANTINE S. STEPHANO, '25, *1016 Walnut Street, Philadelphia 7, Pa.*

I have received your letter in reference to the 25th Anniversary of our class of 1925 at the Colorado School of Mines.

I regret that I will be unable to attend the class reunion on May 25 at commencement time.

In view of the long standing custom of presenting the "Mines" Foundation with one silver dollar for each original member of the class, enclosed please find my check for $5.00 to help make up for some of the missing ones.

Best wishes.

ALUMNI BUSINESS

(Continued from page 43)

The May magazine has been mailed; the 1949 Directory and Year Book has been mailed; the 1949 Index will be mailed within a few days. Plenty of material for the June issue is assured and the advertising is coming in very well.

Letters are being sent out requesting articles for the Annual Petroleum number but no material has as yet been received.

Moved by Mr. Evans the report be accepted; seconded by Mr. Setter; passed.

Research and Investigation Committee

No report.

General Report

Mr. Bowman reported that receipts for the first four months of this year are slightly less than for the same period in 1949. Contributions for the Placement Service are ahead of previous years.

Special Business

An application for associate membership, submitted by Howard Wesley Green of San Angelo, Texas, was read by Mr. Setter. Mr. Green met all requirements and had remitted the proper fees.

Moved by Mr. Setter the application be accepted; seconded by Mr. Manning; passed.

Adjournment

The meeting adjourned at 9:15 P. M.

CATALOG REVIEWS

(Continued from page 42)

(5559) "PAY DIRT," April 21, 1950, by Charles F. Willis, 528 Title and Trust Bldg., Phoenix, Ariz., contains 16 pages of short, timely articles and news items of importance to the mining industry. A discussion of importance by the Arizona Copper Tariff Board is contained in this issue.

(5560) DIAPHRAGM PUMP, Bulletin 5002 by The Dorr Company, Barry Place, Stamford, Conn., illustrates and describes the newest diaphragm pump, Type W expressly designed for heavy duty operation. The construction and advantages of this pump are set forth while outline drawings give an excellent idea in regard to the various working parts of this equipment.

(5561) "ELECTRICAL DEVELOPMENTS OF 1949" by General Electric Co., Schenectady, N. Y., contains 48 pages illustrating and describing advances made in the design and construction of electrical equipment, for industrial uses, illumination, aviation, transportation, chemistry and metallurgy, electronics, household appliances and other important uses.

(5562) CORE DRILL, Bulletin No. 138, by Sprague and Henwood, Inc., Scranton, Pa., contains 8 pages illustrating and describing core drill equipment manufactured by this company. Specifications for their No. 138 diamond drill and list of equipment included, are given.

(5563) "NICKEL TOPICS," May 1950 by International Nickel Co., 67 Wall St., New York, N. Y., contains 12 pages of short illustrated articles showing many uses for nickel.

(5564) "BUSINESS — BIG AND SMALL — BUILT AMERICA," is the title of a statement made by Benjamin F. Fairless, President, United States Steel Corp., before the subcommittee on the study of Monopoly Power, Washington, D. C., April 1950. This statement contains several important facts of value and interest to anyone following up government investigations of so-called "big business."

(5565) "CARE OF AC ROTATING EQUIPMENT," Bulletin No. 05R7417, by Fraser Jeffrey, Asst. to Chief Electrical Engr., Allis-Chalmers Mfg. Co., Milwaukee, Wisc., contains 24 pages covering a subject that is of vital interest to those operating electrical equipment. The booklet is broken down broadly into preventive maintenance and machine repairs. Such subjects as drying moist insulation, measuring insulation resistance, bearing clearances and proper machine applications are covered. Also machine repair including data on stator coil and slip ring rotor repairs and balancing of rotating equipment. Publication is well illustrated and includes charts and examples for calculation.

(5566) CLARIFICATION, Bulletin No. 6691-C, by The Dorr Co., Barry Place, Stamford, Conn., contains 12 pages illustrating and describing the Dorr Clarigester construction used for sedimentation and digestion in connection with small sewage treatment plants.

(5567) "RARIN'-TO-GO" for June 1950, by Frontier Refining Co., Cheyenne, Wyo., tells the story of ten years progress of the Frontier Refining Co. and gives many items on present company activities.

(5568) LABORATORY BALANCES, recent circular covering the Christian Becker laboratory balances illustrates and describes many important features included in up-to-date laboratory balance construction. The Mines & Smelter Supply Co., Denver, Colo. are sales representatives.

(5569) "MINERAL INFORMATION SERVICE," May 1, 1950, by California Dept. of Natural Resources, Ferry Bldg., San Francisco, Calif., contains 12 pages of news items covering ore and market activities in California. Also includes comments on California's cement industry.

(5570) AIR CONTROLLED POWER SHOVEL, Bulletin 4831, by Osgood Co., Marion, Ohio, contains 16 pages illustrating and describing Type 100 Osgood air controlled shovel, dragline, clamshell and crane. Photographs show the construction and operation of this equipment, and its many advantages.

(5571) "EMILY GRIFFITH OPPORTUNITY SCHOOL," a recent 32 page publication by The Denver Public Schools system illustrates and describes this well-known educational institution located at 12th and Welton, Denver, Colo.

(5572) METAL CLEANING, "Oakite News Service," March-April 1950, by Oakite Products, Inc., 22 Thames St., New York 6, N. Y., contains 24 pages with illustrated articles showing methods for cleaning metals and industrial equipment.

(5573) FIRE FIGHTING, a new 12 page booklet entitled "Abundant Wet Water for Fire Fighting" by Aquadyne Corp., 220 E. 42nd St., New York 17, N. Y., describes equipment developed by this company for fire fighting and its application.

(5574) ROOF PINNING, Sales Manual, Sheets No. 525, 3 and 3-A by Joy Mfg. Co., Oliver Bldg., Pittsburgh, Pa., describes methods for roof pinning and equipment adapted to this work. Drawings are included.

(5575) "CATERPILLAR PRODUCTS," Form 12597, by Caterpillar Tractor Co., Peoria 8, Ill., contains 36 pages illustrating and describing new products and complete line of caterpillar equipment. Specifications are included.

(5576) "RESISTANCE OF NICKEL AND ITS ALLOYS TO CORROSION BY CAUSTIC ALKALIES," is covered in Technical Bulletin T-6. A 24 page publication by The International Nickel Co., 67 Wall St., New York 5, N. Y. Illustrations and 46 tables of data show the performances of the materials in a variety of fields.

(5577) "THE GRAPEVINE," April 1950 by United Geophysical Co., Inc., 595 E. Colorado St., Pasadena, Calif., contains 8 pages of letters from the geophysical parties of this company working in various sections of the United States and foreign countries. Interesting photographs illustrating work on the job are included. It is announced in this issue that Norman Christie, '25 has resigned from United Geophysical Co. to join a new firm with headquarters in Canada. Wayne Denning, '26 will assume the duties of Christie as area supervisor in mid-continent area.

MINES TODAY

(Continued from page 46)

ing given west of the Mississippi river. Camps will be located, however, from the shores of Puget Sound to eastern Nova Scotia and south to the Big Bend country of Texas west of the Pecos.

Most geology camps occupy modern buildings to which students return each night from their field studies. Other courses involve transcontinental travel and study of mineral producing areas scattered from the Atlantic coast to the far western states. Some groups of advanced students, by contrast, will camp out in tents high in the mountains of Colorado and Idaho.

We Congratulate . . .

. . . 1950 Graduates

(Continued from page 14)

CLASS 1927
ALBERT L. LADNER
3362 Del Monte Drive, Houston, Texas
WENDELL C. MUNSON
860 E. Street, Salem, Oregon

CLASS 1931
V. G. GABRIEL, M.S.
P. O. Box 213, Rolla, Missouri

CLASS 1935
JAMES COLASANTI
4522 Grove Street, Denver 11, Colorado

CLASS 1936
W. E. BURLESON, Ex.
824 "G" Street, Salida, Colorado

CLASS 1937
THOMAS F. BRADLEY
2206 North Reese Place, Burbank, California

CLASS 1938
C. WIN PAYNE
Box 671, Midland, Texas

CLASS 1940
H. L. MUENCH
512 East 5th Street, Leadville, Colorado

CLASS 1942
RICHARD L. SCOTT
2219 Market Street, Denver, Colorado

CLASS 1943
WILLIAM F. SHELTON
1405 Canal Building, New Orleans 12, Louisiana

CLASS 1948
ALAN L. STEDMAN
1422 Leyden No. 2, Denver, Colorado

CLASS 1949
JOHN S. PHILLIPS
P. O. Box 72, Gilman, Colorado

PERSONAL NOTES

(Continued from page 58)

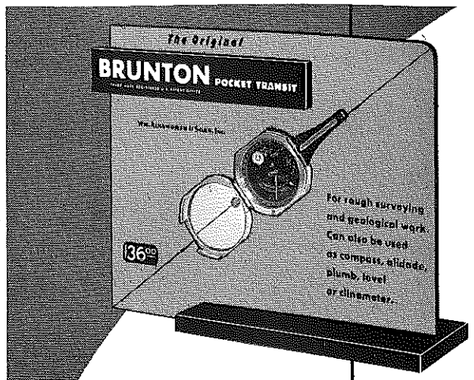
Robert P. Obrecht, '34, is employed in the Torrance, California, Research & Development department of the Hauffer Chemical Company, and received mail at his home, 4417 Lucera Circle, Palos Verdes Estates, California. He wrote of having attended the last meeting of the Southern California section where he enjoyed having renewed old friendships.

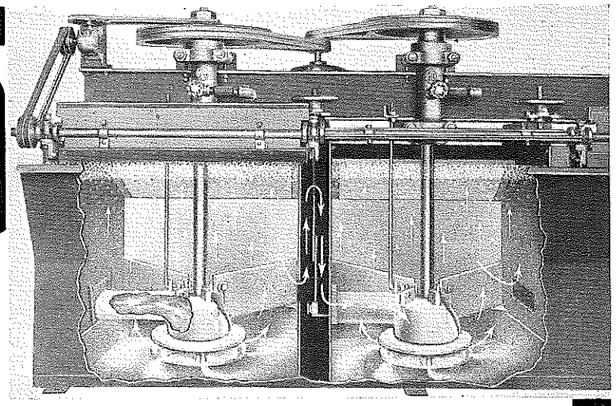
C. G. Purcell, '30, has accepted a position with the Pure Oil Company as Plant Foreman at their Worland Gasoline Plant No. 21. His new mailing address is R.F.D. No. 1, Worland, Wyoming.

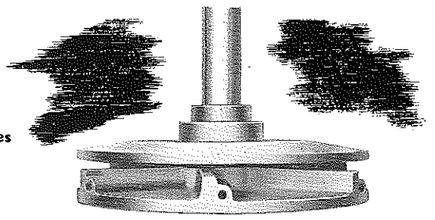
George R. Rogers, '48, Geophysical Engineer for Phelps Dodge Corporation, has been transferred from Douglas, Arizona, to Tyrone, New Mexico.

Max C. Scheble, Jr., '30, Plant Industrial Engineer for Geneva Steel Company, has a new residence in Provo, Utah, 1014 Fir Avenue.

J. J. Sanna, '41, was on vacation in Denver last month from his duties as Service Engineer for Christensen Diamond Products Company. His home address is 5405 Knoll Crest Avenue, Murray, Utah.







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BY _____
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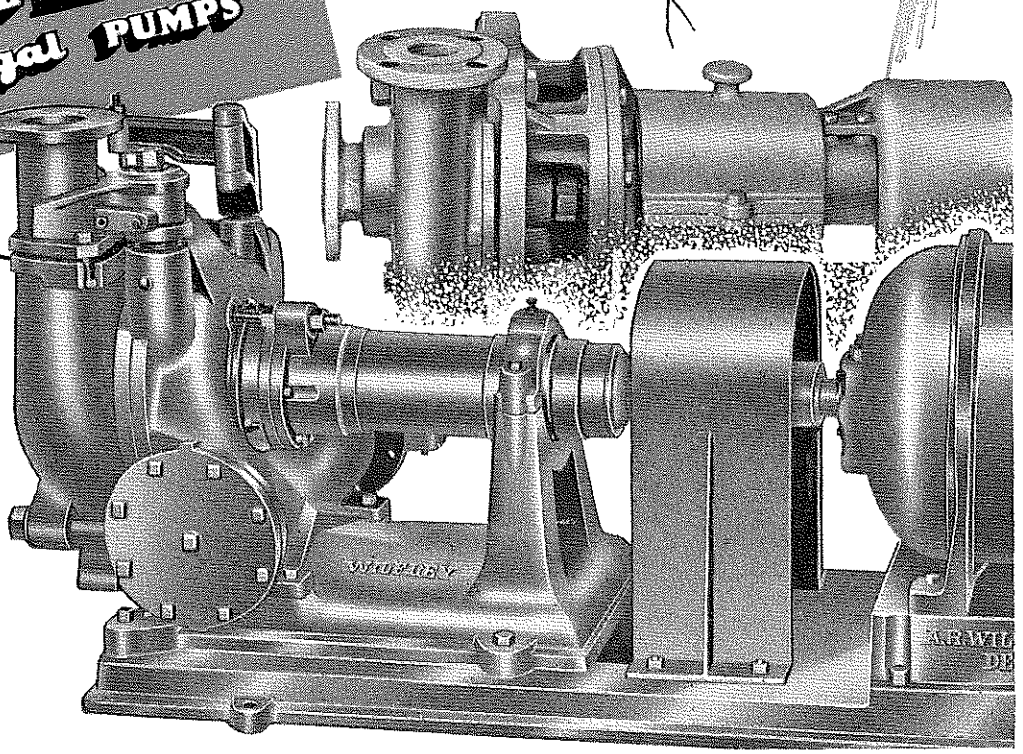

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