



Missouri S&T Magazine, May 15, 1932

Miner Alumni Association

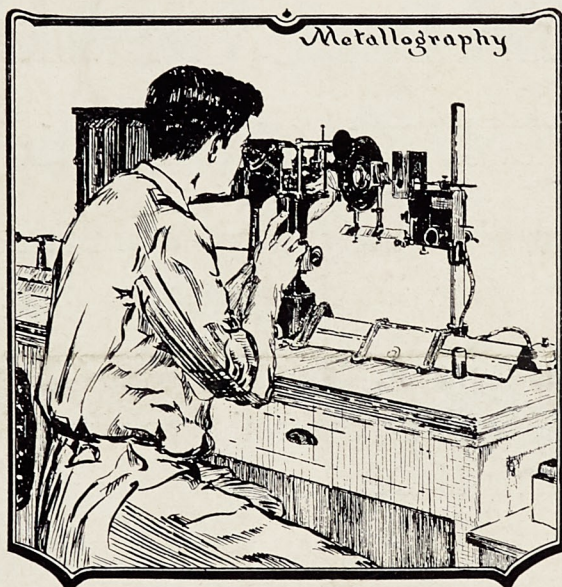
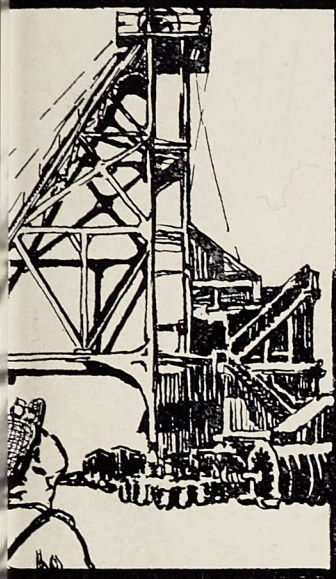
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MSM ALUMNUS



A School
of Technology for the
Mineral Industry

Volume
Six

May 15, 1932.

Number
Three

SCHOOL of MINES and METALLURGY

University of Missouri

ROLLA, MISSOURI

HOME COMING

NOVEMBER 4th and 5th 1932

Make your plans early to come back next fall for a visit. Write your old class-mates to meet you here.

The Rolla Section, Howard Katz '13, Chairman, will be prepared to entertain you with the usual Stag Banquet and Dance.

FOOTBALL

Saturday November the 5th 2 p. m.

MINERS vs MARYVILLE TEACHERS

This will be the last issue of the Alumnus until September so keep the dates in mind. Write for Hotel and Banquet Reservations to

M. H. THORNBERRY, Alumni Recorder

ALUMNUS
Volume Six

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MSM ALUMNUS

ALUMNI ASSOCIATION, SCHOOL OF MINES AND METALLURGY, ROLLA, MISSOURI

Volume Six

MAY 15, 1932.

Number Three

Ask More Rolla Funds

JEFFERSON CITY BUREAU
THE KANSAS CITY STAR

(By a Member of The Star's Staff.)

JEFFERSON CITY, May 9.—Members of the Rolla School of Mines executive committee of the University of Missouri board of curators conferred with Governor Caulfield today in an effort to obtain his approval to expenditures in excess of the amount called for in a budget order last fall requiring reduction of 26 per cent in all state expenditures.

Dr. Walter Williams, president of the University of Missouri, and Dr. Charles H. Fulton, director of Rolla School of Mines, accompanied the board of curators' committee, which included A. A. Speer, Jefferson City; C. F. Ward, Plattsburg, and George C. Willson, St. Louis.

NO ACTION TAKEN.

The conference lasted more than two hours in which the complete financial condition of the school of mines was discussed. At its conclusion the governor said no action had been taken nor had there been any agreement as to future expenditures. The governor promised to study the revenue situation and the school's financial figures to see what arrangements could be made.

"Whatever happens, however, the school of mines will not be closed," the governor told the school officials.

A total of \$605,000 was appropriated for the school of mines by the 1931 legislature, and of this amount the governor asked a cut of \$154,000. Dr. Williams and the curators' committee said the school could meet \$100,000 of the demand but could not successfully continue work if the full \$154,000 were trimmed from the appropriations.

More funds will be obtained by increasing students' fees to bring in \$12,000 or \$15,000 additional.

The committee agreed to withhold expenditure of \$50,000 appropriated for repairs and replacements, but indicated it would be impossible to meet a cut of \$50,000 ordered from the general operations fund.

A deficiency appropriation of \$37,000 was made for the school of mines by the 1931 legislature. One of the major items of expense last year was a \$35,000 salary payment to faculty members to make up a 15 per cent cut ordered in 1929 and 1930 when funds ran short in that biennium.

Governor Caulfield expects soon to determine his policy so the school may prepare its budget for the remainder of this biennium.

The above article is one that appeared in the Kansas City Star except that the following paragraph was deleted. The paragraph was as follows:

TEACHERS TAKE PAY CUT.

"A saving of \$46,000 is planned at Rolla by cutting all faculty members two months' salary, which has been agreed upon by the teachers, the governor was advised. More funds will be obtained by increasing students' fees to bring in \$12,000 or \$15,000 additional."

This paragraph is reproduced here in order that the true feelings of the Faculty maybe stated in the Alumnus. The statement to the effect that the Faculty has agreed upon a two months pay cut leaves an erroneous impression.

Late in April an agreement to accept two months pay cut was presented to some Faculty members for their signatures but the proposition met with so much opposition that it was withdrawn.

At the last Faculty meeting a resolution to the Board of Curators was unanimously adopted. The substance of this resolution was to the effect that the Faculty expects salaries unpaid in 1932 to be paid at some future time.

Hard Facing

By R. O. Day

Metallurgical research has made available to various industries alloys that have been developed with particular regard to one specific property. If the engineer must have great rigidity materials are available to meet his need. Likewise if he must have great toughness or such other properties as low coefficient of friction, low coefficient of expansion, heat or acid resistance, he is able to select a suitable material from the alloys now available. Coming to the matter under consideration, alloys are now available that possess to a very high degree the ability to resist abrasive wear. The application of such alloys, by welding methods, to the surface or edge of a machine part subjected to abrasive wear is known as hard facing.

ABRASIVE WEAR

Abrasive wear is the source of considerable trouble and expense to many industries and its reduction to a minimum will result in decided decreases in maintenance cost and very often increased production. The most direct cost of wear is due to the purchase of new parts or conditioning of such worn parts as can be returned to service, but the act of replacement creates costs that are often a considerable item. In addition to labor required, the machine must be shut down with consequent loss of production that must be considered if the time of replacement is long. Parts that wear out rapidly are usually worn or dull for a considerable length of time before they are replaced, which means that the machines are working less efficiently and probably producing less rapidly than if the working part were in better condition. The machines will also use more power, which in many instances must be considered as an item of cost, and this in turn usually causes increased maintenance or faster depreciation than would be necessary if the machines were in first class condition.

Prior to the introduction of hard facing, attempts to combat abrasive wear consisted in making wearing parts of alloys more suitable for the purpose than those previously used. The choice of alloys was limited by cost because the pieces were made solid and usually required a considerable volume of metal. The alloys had to have a certain minimum degree of strength and toughness because they were required to stand the strain of transmitting the power to the working or cutting surface; hence they could not be selected solely on the basis of resistance to wear.

Unfortunately an alloy that has been developed in regard to one specific property must often sacrifice other properties; hence we find that metals possessing great resistance to abrasive wear are comparatively weak and brittle as compared to steel. They are also handicapped economically in that they are made of semi-rare and therefore expensive raw materials that make it necessary for them to be sold at a price that is considerably higher than that of iron or steel. These two handicaps, the loss of strength and the higher cost, prohibit the use of these alloys in the production of solid wear resisting parts. Fortunately, the hard facing process enables the user to make the machine part of steel or iron, or a limited range of other alloys selected solely for strength, toughness, low cost or any other property except that of wear resistance, and to apply a comparatively thin coating or edge of the more expensive hard facing alloy at, and only at, points subject to abrasive wear.

Both direct and indirect economies are realized from the use of the hard facing process. The initial cost of a hard faced tool is usually more than that of a simple steel part but may often be less because scrap parts may be rebuilt by the process thus eliminating the necessity of buying new parts, or because the parts may be made of a cheaper base

(Continued on Page 4)

MSM ALUMNUS

Issued quarterly, in the interest of the graduates and former students of the School of Mines and Metallurgy. Subscription price 50 cents, included in Alumni dues.

Entered as second-class matter October 7, 1926, at Post Office at Rolla, Missouri, under the Act of March 3, 1879.

Officers of the Association

D. C. Jackling, '92.....	President
George A. Easley, '09.....	Vice-President
Chas. Y. Clayton, '13.....	Treasurer
K. K. Kershner, '20.....	Secretary
M. H. Thornberry, '12.....	Recorder

Staff

Chas. Y. Clayton, '13.....	Editor in Chief
David F. Walsh, '23.....	Assistant to the Editor
A. L. Cairns, '20.....	Circulation Manager

Associate Editors

V. B. Hinsch, '09.....	M. H. Thornberry, '12
W. C. Zeuch, '18.....	C. E. Bardsley, '20
K. K. Kershner, '20.....	H. E. Ahrens, '28
Rex Williams, '31.....	

Alumni Meet to Organize

Section Established

Howard M. Katz, Class of 1913, Elected Chairman of Rolla Branch of the Association

A large number of M. S. M. Alumni gathered at the Sinclair Pennant Tavern Tuesday evening, Feb. 2. The meeting, the first to be held in Rolla, was sponsored by Prof. K. K. Kershner of the Chemistry Department of the School of Mines, and Prof. M. H. Thornberry in charge of the State Mining Experiment Station.

There are at least fifty alumni of the School of Mines and Metallurgy in Rolla, it was announced.

After partaking of the sumptuous dinner served, it was proposed that a section be organized and be known as the Rolla Section of the M. S. M. Alumni Association. The M. S. M. Alumni Association now has active sections in New York, Chicago, St. Louis, Tulsa, Joplin, California and the South East Missouri Lead Belt. It was felt that there were a sufficient number at Rolla to merit an organization here.

Howard M. Katz of the class of 1913 was elected Chairman of the Rolla Section, and D. F. Donahoe, ex '01, was elected Secretary. In addition to those named above, the following were present:

Prof. H. E. Ahrens '28; Dr. C. E. Bardsley '20; Prof. J. B. Butler '22; Prof. C. Y. Clayton '13; Prof. L. E. Garrett '01; Prof. H. R. Hanley '01; R. E. Heller ex '02; J. A. Holman '27; C. H. Jennings '30; Prof. A. J. Miles '30; W. B. Mix '08; F. B. Powell '06; E. K. Schuman '20; John W. Scott ex '02; V. X. Smith ex '16; Prof. D. F. Walsh '24; Prof. J. M. Willson, '29; Prof. W. C. Zeuch, '18.

The second meeting of the Rolla Section was held at the Sinclair Tavern on Tuesday evening, March 1st. The class of 1901 had the best representation with six members. They were: Prof. L. E. Garrett, Dr. H. R. Hanley, W. H. Powell of St. James, R. T. Rolufs of the Geological Survey, Robert Heller and Dan Donahoe.

The main speakers of the evening were B. E. Hammer, '22, who has just returned from Chile, and R. L. Mook, who told of the work being carried on at Onandaga Cave.

A communication was read from the St. Louis section inviting the Rolla section to attend a banquet in St. Louis in April. A committee was appointed to arrange for an entertainment for this year's senior class, to be held before the class goes on the senior trip.

Hard Facing

(Continued from Page 3)

material than previously used. Operating economies are realized because of the longer life of the parts; hence fewer shutdowns for replacements, thus creating a savings not only on labor of replacement but also by allowing continuous production for the time that the machine would otherwise be shut down. Hard faced parts stay in better condition thus permitting the machine to operate more efficiently and to produce a greater output with a smaller input of power.

HARD FACING APPLICATIONS

Space here is far too limited to allow anything but the briefest outline of present hard facing applications in the many industries that find the process economical. In addition to the many applications now in use, engineers are constantly finding new applications which, in practically every case, effect appreciable economies in operation or maintenance costs. Listed below are some typical applications in which hard facing has proved its worth.

In the mining industry are such applications as shovel teeth, ore car couplers, rock bits and drills of various types, and elevator buckets, all of which have shown a life from three to ten times as long after proper hard facing. Appreciable savings have been realized by laying a thin layer of hard facing alloy along the edge of hand shovels, thus greatly prolonging their life.

In the manufacture of brick are many applications for the hard facing process. Among them are such applications as pug mill blades, brick dies, knives, augurs and drills and many others.

In the oil fields hard facing has become a general practice on practically all types of oil well drilling bits. Fish-tail bits, undercutting reamers, core drills, multiple bladed bits and practically every type of the so-called "scraping" bits used in oil well drilling are now hard faced to withstand the heavy abrasive wear to which they are subjected.

Hard facing serves the iron and steel industry in many ways. The useful life of such parts as rolling mill guides, sculling hooks, sand slinger impeller tips, and mud gun parts, have been greatly prolonged with appreciable economies effected by properly hard facing them. Many other applications for this process are found in the iron and steel industry, a few of which are hot trimming dies, hot shears, hot punches, coke pusher shoes, edger rolls, and blooming mill driving spindles.

The cement industry offers many hard facing applications, such as Fuller-Kenyon pumps, pulverizer rings, stone crushers, guides and bearings, etc. A few of the highly economical applications to be found in the pulp and paper industry are such pieces of equipment as hog anvils, chipper knives, chipper chute linings, bearing shafts for centrifugal pumps, scrapers, and many others. In the aircraft industry the hard facing of tailskids has become almost universal.

The hard facing process has been a source of appreciable savings both to the user and to the builder of various types of machines and machine parts. Such parts as cams, grips, toggles, exhaust valves for aircraft and motor car and truck engines, ash and fuel handling equipment, conveyor systems, mixer arms of various types, are but a few of the miscellaneous uses of the process. In the rural district of the country the hard facing process is proving of value in many ways. Agricultural implements such as plowshares are being hard faced and are proving highly economical by lasting five times as long and by operating more efficiently, particularly as to power consumed in moving them. Actual tests have shown that on large scale farming there is appreciable savings in gasoline and oil consumed in drawing hard faced plows as compared with the fuel consumed in drawing ordinary steel plows. Highway maintenance has been made more economical by the use of hard facing on such machines as graders, scrapers, snowplows, etc.

While the above few paragraphs list very briefly but a few applications in which hard facing has effected worth while economies, the writer has tried to convey to the reader

(Continued on Page 5)

Hard Facing

(Continued from Page 4)

er the wide field covered and the many uses to which the process is applicable. No attempt has been made to give specific figures dealing with savings made by hard facing as such information is readily obtainable from the manufacturers of the several hard facing alloys now on the market.

HARD FACING ALLOYS

In general hard facing alloys have been developed with two objects in view. The first is of course that the alloy must give long life when subjected to abrasive wear, the other is that such alloys must be easily applied by the arc or welding torch. There are quite a number of hard facing alloys now on the market and the selection as to which to use must depend upon the ultimate economy to the user. Of course the most satisfactory and conclusive test is that which is run in the plant under actual operating conditions. There are, however, certain interesting theoretical considerations concerning the mechanics of wear and the cause of wear resistance that should be considered.

For convenience in discussing these theoretical considerations hard facing alloys may be divided into five classes. The first of these is made up of the cheap, short-lived alloys, some of which are merely cast irons with or without a small amount of alloy elements. They have had but very little success and are now limited to a very few applications.

The second class consists of what are essentially alloy steels. They contain varying amounts of such elements as chromium, tungsten, manganese, silicon, carbon, etc., the total of all alloying elements including carbon being usually below 20%. These alloys possess greater resistance to abrasive wear than ordinary steels, comparing favorably with Hadfield manganese steel, which is included in this list and is sometimes used in the hard facing process, but when used as a hard facing alloy their life will be considerably less than the harder hard facing alloys. The main use of alloys in this class is as a filler in building up badly worn parts preparatory to applying a final hard surface of the better grade alloys. Two properties, lower cost and toughness, make them admirably suited to this use.

The third class consists of alloys containing from 50 to 80% of iron alloyed with one or more of such elements as tungsten, chromium, carbon, silicon, manganese, and sometimes small amounts of cobalt and nickel. These alloys may be classed as true hard facing alloys in that they are used for the final wear resisting surface and are used for many applications that do not require the highest grade of wear resistance.

The fourth class consists of non-ferrous alloys of cobalt, chromium, and tungsten, of which Haynes Stellite is an example. These alloys are somewhat higher in cost but the increased life more than justifies the added expenditure for the material. These alloys are obtainable in the form of welding rod and are made in several grades all of which are highly resistant to abrasive wear and cover a wide range of physical properties. A peculiar advantage resulting from the use of cobalt instead of iron as a base metal lies in a high degree of red hardness which it imparts to the alloy. This matter will be discussed below.

The fifth class consists of the so-called diamond substitutes and is made up of alloys containing approximately 90% tungsten carbide with the remainder of cobalt, nickel, iron or similar metals added to facilitate manufacture and to give impact strength, toughness, and heat resistance to the tungsten carbide. These diamond substitutes are obtainable in the form of small castings of various shapes which are welded onto the wearing surfaces by means of a hard wearing alloy. While alloys in this class are not fusible under the oxy-acetylene flame they may be easily welded into place by other metals and anchored on the wearing surface. They are extremely hard alloys being nearly as hard as silicon carbide or carborundum and are close to the diamond on Mohs' scale of hardness but their use is somewhat more limited than that of hard facing alloys of the other classes mentioned.

A sixth class consists of a combination of a hard facing

(Continued on Page 6)

Enrollment on Increase

Gains 5.5 Per Cent

672 Students Register for 1931-1932 School Year; School Needs Money Support from State

According to H. H. Armsby, Registrar of the School, twenty-one new students have enrolled, and with the ending of the semester of several of the St. Louis high schools this week, the total number of new students enrolled will be materially increased.

The school year of 1931-32 has established a new record for total students enrolled at the institution. Total registration has so far amounted to 672 students for the year. This eclipses last year's record of 635 students enrolled by 37, or an increase of 5.5 per cent.

This enrollment, small though it may seem when compared to the enrollment of other good technical schools throughout the country, taxes the present facilities of the school to the utmost.

Registration is progressing every year, and unless an expansion of the college, both in buildings and faculty members, is soon made, the time when only a limited number of students can be admitted is not far distant.

The Registrar, in a statement issued yesterday, said "If the school could only obtain the proper support of the state it could, and would become one of the leading technical schools of the U. S. We have the foundation for building—both in equipment and faculty; all that we need is the money."—Rolla New Era.

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New York Alumni Have "Get-To-Gether"

The annual winter meeting of the American Institute of Mining and Metallurgical engineers was held in the Engineers building at 29 West 39th Street for four days, February 15th to 18th.

Most of the four days was given to technical sessions at which papers were presented in these fields: Petroleum, Mining Methods, Milling Methods, Mine Ventilation, Iron and Steel, Gases in Metals (A Symposium), Nonferrous Metallurgy, Rare Metals and Minerals, Coal Geophysical Prospecting, Nonferrous Alloys, and Engineering Education.

Some of the papers presented are of interest because these papers were written by M. S. M. men alone or in collaboration with others. A list follows:

"Soap Flotation of the Nonsulfides: Limestone, Phosphate Rock, Bauxite, Fluorspar, Rhodochrosite, Manganese Oxides, Barite, Siderite, Chromite, Scheelite and Ferberite, and Cyanite." By J. Bruce Clemmer. (T. P. 445.)

"The Explosive Shattering of Minerals." By R. S. Dean and John Gross.

"The Solubility of Gases in Metals." By V. H. Gottschalk and R. S. Dean. (Pre.)

"The Messina Stationary Basic Copper Converter." By R. G. Knickerbocker. (T. R. 458).

"Development of Gun Feed Reverberatory Furnaces at the Garfield Plant of the American Smelting & Refining Company." By R. A. Wagstaff. (T. P. 471).

"Teaching Management in Engineering Schools." By Eugene McAuliffe.

"On the Theory of Formation of Segregate Structures in Alloys." By C. H. Mathewson and D. W. Smith. (Pre.)

"Production Engineering." By E. H. Griswold.

"Discussion of Geological Significance of the Magnetic Map of the Tri-State Region." By H. A. Buehler.

At the smoker held on Monday evening M. S. M. was well represented. About thirty men were present.

The following M. S. M. men were around the Institute Headquarters: E. S. Tompkins, ex '16; Easley, '09; Wheeler, '22; Dean, '15; Gregg, '23; Mann, '08; Cox, '11; McAuliffe, '27; Barton, '17; Gill, '18; Weigel, ; Scott, '19; Buehler, '25; Kentnor, '24; Hoover, '27; Dana Smith, ex '29; Mazany, '09; Neal, '14; Pence, '23; Knight, ; Needles, '14; Thatcher, ; Foley, ; Christner, '22; Teas, '17; Munsch, '29; Mikell, '25; Weiser, '18; Wolfe, '31 and M. Kelly, '14.

Hard Facing

(Continued from Page 5)

metal and crushed tungsten carbide. Tungsten carbide pieces as generally used are uniform in shape and are approximately $\frac{3}{8}$ by $\frac{1}{4}$ by $\frac{5}{8}$ in. long. While this type of construction is good for many applications it has been found that a welding rod combining a hard facing alloy with the crushed tungsten carbide is highly desirable for many applications.

The main factor in resistance to abrasion wear is undoubtedly hardness, but hardness must be measured under the conditions at which the part is actually operating. While it is common knowledge that all friction produces heat it is probably not generally realized that the heat liberated on the surfaces in contact produces quite high local temperatures. These temperatures can be calculated not only mathematically but they can also be demonstrated by a fairly simple means. One of the most simple ways of demonstrating this fact is to cut the junction of an ordinary thermocouple, rubbing the two wires against each other in the manner of a violin and bow, and noting the temperature recorded on an indicating pyrometer. A reasonable degree of exertion in this way will result in a reading of 200°F on the instrument, but that these wires contain no appreciable heat and that this temperature is a surface condition only can be shown in two ways. First, the indicating needle will instantly swing to zero when the motion is stopped. The second demonstration is to place the two wires under water, whereupon it will be found that the same amount of work produces the same temperature reading. It is thus easy to see that the machine parts using greater amounts of power would produce higher surface temperatures and in many instances the temperatures are in the red heat range although of course not visible to the eye. When this fact is clearly understood it will be seen that if the hardness measurements are to be made to predict the ability of a metal to resist abrasive wear the determinations should be made at elevated temperatures.

Let us consider two alloys, A and B. If the hardness is measured cold, A is harder than B. If the alloys are heated and their hardness measured as the temperature increases it will be found that A becomes appreciably softer while B tends to retain its original hardness. In this particular case a temperature is soon reached at which the curves cross, and for all temperatures above this point alloy B is considerably harder than alloy A; hence under all conditions tending to develop surface temperature above this critical point alloy B although softer when cold will be superior in resisting abrasive wear. This property of an alloy to retain its hardness with but little loss through the red heat range is known as "red hardness".

The importance of red hardness can be shown from a brief description of the history of metal cutting tools. The rate of production of machine tools has been increased by the introduction of special alloys, the order being briefly, first, plain carbon steels, second, Mushet steel, third, chromium-tungsten high speed steel, fourth, chromium-tungsten-cobalt high speed steel, fifth, cobalt-chromium-tungsten alloys, and more recently tungsten-carbide. Leaving tungsten-carbide out of the picture, it will be noted that none of these alloys are harder when cold than their predecessors but they have a greater red hardness and are therefore capable of cutting at higher speeds. In this same way red hardness is of value in resisting abrasion. Cobalt-chromium-tungsten alloys have the highest degree of red hardness of any known alloy except tungsten-carbide, this property being conferred by the use of cobalt instead of iron as a base for the alloy.

Another property of alloys to be considered in connection with resistance to abrasion is coefficient of friction. Given two alloys of equal hardness but different coefficients of friction, the one with the lower coefficient of friction will develop lower surface temperatures and hence will remain harder and will better resist abrasion. Any plant having a welding shop can do hard facing, the only expenditure necessary being the purchase of rods. Any competent welder can, with very little instruction and practice on the technique, learn very quickly to produce good hard

facing jobs.

METHODS OF APPLICATION

Both the oxy-acetylene and the metallic arc welding methods can be used for hard facing. Each method has its particular field in which it excels the other, with as usual a center field in which both metals are satisfactory. While no definite line of division can be made, certain general rules can be followed in deciding which method to use. If the job is small, especially if it is on particular work such as trimming dies, and if the hard facing must be ground to definite dimensions and shape the oxy-acetylene torch is undoubtedly far superior. On the other hand if the job is large and surface cracks are not objectionable the arc is often preferred.

In ordinary welding it is advisable to secure a certain degree of inner alloying or penetration so that the two metals will be thoroughly bonded together. This is not only unnecessary but is objectionable in hard facing because it results in the dilution of the hard facing alloy which depends for its property on a high percentage of non-ferrous metals and hence any dilution with iron will tend to reduce its ability to resist abrasive wear. This fact is particularly true of the cobalt-chromium-tungsten hard facing alloys. A certain amount of interalloying is unavoidable in the arc process but it can and should be kept to a minimum. Hard facing can be done with a torch with practically no interalloying. In conclusion it may be said that hard facing offers an opportunity to reduce costs and eliminate trouble in almost every industry. It can be tried in any plant at such slight expense that it should be investigated as a means of keeping abrasive wear at a minimum.

The author of this paper Roger Day, graduated in 1925. He is now with the Union Carbide and Carbon Research Laboratories on Long Island.

ROD:R-6

Why Students Come to the Missouri School of Mines and Metallurgy

In order to ascertain what factors influence students to come to this institution a survey was made among freshmen, sophomore and junior classes asking the following questions:

1. How did you first learn of the School of Mines and Metallurgy?

2. What induced you to come to this school?

Some very interesting answers were received and these are tabulated below:

NUMBER OF REPLIES	REASONS GIVEN
13	Talks by Prof. Armsby.
90	Graduates, Friends and Former Students.
62	Reputation of the School.
65	Desire to Study Engineering.
62	Finances.
29	M. S. M. Bulletin.
22	Live Near Rolla.
15	High School Teacher.
14	Parents.
6	Football.
7	Scholarships.
11	Location.
6	Small Enrollment.
12	Low Entrance Requirements.
4	Few Women Students.

A study of these figures should impress the Alumni with the fact that it is through their efforts and the reputation they have built that young men seek to make their mark with an education from our school.

During this year due to low financial condition a great many activities in the way of so-called advertising will have to be curtailed. It is up to the Alumni to carry on.

Despite the lack of money the teaching efficiency of the institution will not be decreased. Students entering this coming fall will have the same opportunity that students have had in the past.

Keep on boosting M. S. M.

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On Febru Steel Corp showed mot company.

John P. Metallurgic experiences pany in Ec tion engine

On March plants of t gave an illu of the Ozar the student Engineers.

On March vey, was th ctiy. He s flint and b presented mation and

W. B. Fis Power Com Institute of ject of the Mr. Fisher countered l ing the ins trical equip

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A. A. Bo Greene E C. C. Irw E. M. Gu K. V. Mo Mo.

L. H. Sch Sta., Chic W. O. Ke Mo.

D. H. M sion, 4952 F. K. M. Ronald I W. L. Co Co., Breck W. H. W

Speakers

Numerous speakers from the industry have appeared before the students in the various student chapter meetings and at the mass meetings during the past semester.

Major P. S. Reinecke, Chief Engineer of the Mississippi River Commission, addressed the student chapter of the American Society of Civil Engineers on March 28 on the subject, "Harbor Construction on Lake Erie and Lake Ontario". Major Reinecke spoke on the General Lectures program that night, describing his work on the Lower Mississippi River and showing the methods employed by the government in its attempt to control floods on the Mississippi.

On February 12, A. C. Crockett, of Jones & Laughlin Steel Corporation, spoke at the mass meeting hour and showed motion pictures of one of the new plants of this company.

John P. Harmon, MSM '28, spoke to the Mining and Metallurgical Association on February 15, describing his experiences with the South American Development Company in Ecuador, where for several years he was ventilation engineer for their mines.

On March 1, E. H. Tenney, Chief Engineer of power plants of the Union Electric Light and Power Company, gave an illustrated lecture on the Bagnell Dam and the Lake of the Ozarks. Mr. Tenney appeared under the auspices of the student chapter of the American Society of Mechanical Engineers.

On March 22, H. S. McQueen of the State Geological Survey, was the speaker at an open meeting of the Orton Society. He spoke on the clays of Missouri, chiefly diaspore, flint and burley clays of the Ozark region. Mr. McQueen presented all the recent discoveries as to the origin, formation and use of these clays.

W. B. Fisher, engineer with the Union Electric Light and Power Company, spoke to the local chapter of the American Institute of Electrical Engineers on January 27. The subject of the talk was "Electrical Construction Practice", and Mr. Fisher discussed some of the duties and problems encountered by the electrical construction organization during the installation and preliminary operation of the electrical equipment in a modern steam electric power plant.

New Addresses

W. H. Baxter, '21.—W. H. Baxter Company, Investments, 40 Wall St., New York City.

C. E. Peterson, '16—90 West St., New York City.

D. H. Miller, '30—3644 Castleman Ave., St. Louis, Mo.

E. T. Harvey, '30—Goldfield, Iowa.

R. E. Rutherford, ex '18—Box 458, Canton, Mo.

R. B. Allen, ex '30—19 Linwood Terrace, Westport Station, Kansas City, Mo.

R. A. Lindgren, '23—7722 Clyde Ave., Windsor Park Station, Chicago.

S. M. Hayes, '22—1415 West Cherokee Ave., Enid, Oklahoma.

A. A. Boyle, '25—2123 College Ave., Alton, Illinois.

Greene Erskine, '16—6141 McPherson Ave., St. Louis, Mo.

C. C. Irving, '25—637 Slade Ave., Elgin, Illinois.

E. M. Guy, '23—682 Jay St., Elgin, Illinois.

K. V. Moll, ex '04—406 West Swan Ave., Webster Groves, Mo.

L. H. Schuette, '29—7927 Marquette Ave., South Chicago Sta., Chicago.

W. O. Keeling, '23—610 North River Blvd., Independence Mo.

D. H. Morgan, '16—Secretary of the City Plan Commission, 4952 Chippewa St., St. Louis, Mo.

F. K. M. Hunter, '23—47 Broad St., New York City.

Ronald D. Ward, '25—719 Yeatman, Webster Groves, Mo.

W. L. Couch, '23—Assayer & Chemist, Royal Tiger Mines Co., Breckenridge, Colorado.

W. H. Weimer, '24—308 North Sheridan Road, Peoria, Ill.

Sigma XI Speakers

The School of Mines Chapter of Sigma XI, has enjoyed the following list of speakers during the year:—

Relation Between Magnetic Measurements and Geologic Structure—Dr. H. A. Buehler.

Electrical Resistivity Measurements and Geologic Structure—Prof. F. C. Farnum.

Correlation of Rock Formations by Means of Insoluble Residues—H. S. McQueen.

Preparation of Crystals in Silica Gels—Dr. C. J. Monroe.

Methods of Estimating Gas Reserves—Dr. E. A. Stephenson.

Estimation of Alumina Content of Diaspore and Burley Clay From the Silica Content—Dr. M. E. Holmes.

The Effect of Grog on Pressure Transmission in Dry Pressing—Dr. M. E. Holmes.

Missouri Hard Flint Clay Fire Brick—M. J. Paul.

Concentration of Lead Ores—F. J. DeVaney.

Grinding of Telescope Mirrors—S. R. B. Cooke.

Soap Flotation of Non-Sulphides—Wm. Coghill.

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St. Pats Review

St. Pats—Gone But Not Forgotten

The yearly party (known to some as St. Pats) is, for another year, gone but not forgotten. Don't worry too much though, because its only 352 days (daze to some of us) until we will, in all probability, enjoy another celebration—one that will be broadcast far and wide as 'a bigger and better St. Pats.' The fact that St. Pats of '32 is gone simply gives us something to look forward to. (No, gentle reader, we don't mean semester quizzes.)

Just in case some of the readers of this article were in such a condition that they didn't know just what was happening during their last holiday we'll hastily review it for their benefit.

To begin with St. Pats (as is the custom) started, officially, on March 17 at 8:00 p. m., with dances held at the various fraternity houses. The Triangles, Kappa Sigs, and Independents had the privilege of being the first to entertain and the dancing continued far into the wee small hours of the morning. At 3:00 our good friends, the Pi K. A.'s entertained with a breakfast dance. The next night, ah, the next night. If we remember correctly, we were privileged to hear that orchestra, perhaps we should say 'the orchestra,' but then 'the best little band this side of—what we mean is, Jan Garber played a five hour program for the Masked Ball. Say listen, that Masked Bill was a 'dinger' and any one who missed it really missed one of the best dances of St. Pats. Unlike the engineers at dear old M. U., we, the Miners of the Missouri School of Mines and Metallurgy, succeeded in keeping track of our St. Pats queen, who as all of you know, was Miss Emily McCaw. Consequently, the coronation took place at the prescribed time and place, which was no other than Jackling Gym the night of the Masked Ball. After so long a time Jan and his boys, to say nothing of the Miners, got warmed up and from then on out every one had one of the best times they ever can expect to have. Jan's services were secured for the Formal Dance as well as for the Masked Bill, and again no one was disappointed in the quality of the music that was dispensed on this occasion. Most of you are quite aware that the Formal Dance was held Saturday evening.

A little more seriously, this St. Pats has been proclaimed by competent authorities, to have been the best St. Pats in many a moon, and we feel sure that all who were fortunate enough to attend the celebration feel exactly the same way about it. The success of the occasion was in no small measure, due to the wonderful work of the St. Pats Board and we feel sure that the whole school joins us in offering them our heartiest congratulations.

A rough check of the St. Pats Board's books showed a profit of approximately \$550.00 it was announced by officials of the Board.

—THE MISSOURI MINER.

Canadian Minerals

The department of geology has recently acquired a very valuable addition to its collections as a gift from the Canadian Government. The gift consists of the entire Mineral and Natural Resources Exhibit which the Canadian Department of Immigration maintained as its Kansas City office, together with the display case in which the material was exhibited.

About a year ago, through the kindness of Mr. W. O. Keeling, MSM '23, the department of geology was informed that the immigration office was to be closed and that this collection could probably be obtained for the School of Mines. The necessary steps were immediately taken and through the help of Mr. Keeling the collection was packed and shipped to the school.

There are approximately fifty specimens representing the mineral wealth of Canada both metallic and non-metallic and many of them are among the finest in the school's collections. They include, among others, examples of copper, iron, nickel and cobalt, gold, and silver ores and a number of the more important non-metallic minerals such as feldspar, gypsum, strontium minerals and mica.

It was largely due to Mr. Keeling that the School of Mines obtained this splendid collection and the department of geology wishes to express their appreciation of his work.

The geology department also wishes to acknowledge their gratitude to the Canadian Government for this exhibit which has been properly labelled and displayed in accordance with their wishes.

R. S. Dean Explains His Recent Investigations

Prominent Engineer Discusses Explosive Shattering of Minerals.

R. S. Dean, B. S. '15, M. S. '16, Met. E. '22, M. S. M., who is Chief Engineer in the Metallurgical Division of the U. S. Bureau of Mines, Washington, D. C., made public his report of investigations recently.

He explained his discovery of Explosive Shattering of Minerals as a substitute for crushing preparatory to ore dressing before the American Institute of Mining and Metallurgical Engineers at New York, Feb. 16. This discovery advances the possibility of very much reducing the cost and labor of the preparation of minerals for ore dressing and also possible use of mine products that have been discarded as wastes.

The paper on this subject, prepared by Mr. Dean and his co-worker, Mr. John Gross, was given favorable publicity in the New York Times of Feb. 15th.

Mr. Dean also read a paper before the A. I. M. E. on "The Solubility of Gases in Metals" in the preparation of which Mr. V. H. Gottschalk had a part. Mr. Gottschalk was formerly head of the Chemistry Department at M. S. M.

Mineral Industry Education

The organization of a fifth division of the A. I. M. M. E., to be known as the "Mineral Industry Education Division" was completed at the spring meeting of the Institute, and Director Charles H. Fulton of MSM was elected chairman. Dr. Fulton has been active through the past year in canvassing the situation to see if there existed a sentiment among those engaged in educational work for the mineral industry for such a division. The matter was thoroughly discussed at the Joplin meeting of the Institute last fall, following which Dr. Fulton sent out letters to those engaged in educational work of this nature, asking for an expression from them regarding the organization of such a division, of the 108 replies 81 were favorable, 16 non-committal, and 11 opposed. The newly formed division will take the place of the old Education Committee of the Institute.

Dr. Eugene A. Stephenson, professor of petroleum production at MSM, was elected secretary-treasurer of the newly formed division.

Increased Fees

Noel Hubbard

One of the results of the "depression" has been a revision of fees, both at the School of Mines and at the University at Columbia. The revision at the School of Mines includes the addition of a matriculation fee of \$10.00, chargeable only at the time of first registration at the school. A "repeat fee" of two dollars per credit hour has also been added to cover courses in which the student has received a grade of failure. This fee was provided to in part care for the trailer sections which are provided for the convenience of those receiving failures in class.

The registration, hospital and library fee has been increased from \$16.00 per semester to \$30.00 per semester, and the non-resident tuition charge has been raised from \$30.00 per semester to \$40.00 per semester.

These fees, which become effective next September, are estimated to return to the school between fifteen and twenty thousand dollars annually, while on account of the small amount for the individual student will place but little additional burden upon the student body.



Comrade Adel of the Trade Union Council, Comrade Oblan of the R. K. L., and Engineer Cook, as our artist Ryan Walker saw them

Workers News—Moscow

Paul Cook, '07, is Consulting Engineer with Tzoetmetzolto Moscow U. S. S. R.

Six Graduate at End of First Semester

The mid-year graduating class of six included three Mining Engineers and three Civil Engineers. The graduates are H. C. Chaden, J. H. Delaney and R. W. McClusky, Mining Engineers; J. T. Sturm, C. H. Webb and C. S. White, Civil Engineers.

J. T. Sturm and C. H. Webb have already obtained employment. Sturm will work with the Upper Mississippi Valley Division of the War Department in St. Louis. Webb will be with the State Highway Department.

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General Alumni News

1931

W. T. (Bill) Sharp has been working in Louisiana with the U. S. Engineers for three months but is now back home in Henryetta, Oklahoma. The high water in the lower Mississippi Valley played havoc, not only with the citizens of the state, but with the Engineers' jobs as well.

Ralph Thomas is with the Illinois State Highway Department and may be reached at Forrester, Illinois.

William Makin spent several days visiting in Rolla, and is now at Point Pleasant, New Jersey, where he is working for the Point Pleasant Ice and Coal Company.

Charlie K. Harrington has returned from Germany and is living in Rutherford, New Jersey.

Clarence Hangosky has accepted a position as metallurgical chemist with Pratt and Letchworth Company of Buffalo, N. Y.

1930

Richard R. Payne has resigned his position with the Anglo-Chilean Consolidated Corporation at Tocopilla, Chile; and is now at his home in Washington, Illinois.

Eugene Woodman is a graduate student at the University of Missouri.

R. B. Allen is now residing at 19 Linwood Terrace, Westport Station, Kansas City, Mo.

G. L. Traband is now at 304 Acton Avenue, Woodriver, Illinois. He is with the Standard Oil Company of Indiana at this place.

J. C. Barton is with the Missouri State Highway Department and may be reached at 815 East High St., Jefferson City, Mo.

C. W. Johnson is in the Mechanical Engineering Department of Swift and Company at St. Joseph, Mo. His residence address is 210 Illinois Ave., St. Joseph, Mo.

Wayne Berry is temporarily located at his home in Cape Girardeau, Missouri. Wayne has been with the General Electric Company in Schenectady.

Troy Gaffey was in Rolla recently. Gaffey is an elevator inspector for an insurance company in Tulsa, Oklahoma.

H. F. Kirkpatrick came back for a few days early in September. Kirk is with the G. E. Co., but will be in Springfield, Mo., for several months.

1929

M. V. Thompson who has been with the Anglo-Chilean Consolidated Nitrate Corporation at Tocopilla, Chile, is now at his home at Portageville, Missouri.

Arthur Bradford is attending Washington University in St. Louis, working for a Ph. D. degree.

E. J. Crumm is in the Metallurgical Department of the Bethlehem Steel Company at Sparrow's Point, Maryland.

L. H. Schuette's present address is 7927 Marquette Ave., South Chicago Station, Chicago, Ill.

W. L. Couch, Assayer and Chemist for the Royal Tiger Mines Company at Breckenridge, Colorado.

Emmett Kirn is working with the Standard Oil Company's Research Department of Whiting, Indiana.

1928

Theodore Herman is in the Advertising Department of the Bethlehem Steel Company at Bethlehem, Pa. His home is at 125 East Garrison Street.

J. E. Antener whose last address was 728 Cottonwood, Independence, Kansas, is now living at 410 South 9th Street of the same city.

C. B. Weiss' present address is 1508 Geddes Ave., Ann Arbor, Michigan. Weiss is attending the University of Michigan working for the degree of Doctor in Chemical Engineering.

1927

S. E. Craig who has been with the Gulf Pipe Line of Pennsylvania, 706 Victoria Building, St. Louis, Mo.; has been transferred to Tulsa, Oklahoma. His address is Box 2044, Tulsa, Okla.

Paul Weber is at present enrolled at Purdue University, Lafayette, Indiana. He will receive the degree of Doctor of Chemical Engineering in June. His present address is c/o Chemistry Department, Purdue University, Lafayette, Indiana.

Ned O. Kraft is with the Aluminum Company of America in St. Louis. Kraft was here last year and the year previous giving a lecture each time and he is expected to be back soon.

Perry Love is now proprietor of a haberdashery in Rolla, Mo.

1926

R. E. Keim's present address is now 3019 Wabash Avenue, Kansas City, Mo. He has been in San Antonio, Texas, for the last two years.

J. B. Sinnett has moved from 5656 Hamilton Avenue, Cincinnati, Ohio; to 1920 South Webster St., Ft. Wayne, Indiana.

Bernard Costello is working as Chemist with the Goodrich Rubber Co., at Los Angeles, Calif.

1925

Kenneth Ellison is with the Wilcox Oil and Gas Company of Tulsa, Oklahoma.

A. L. Heitman, at present located at 126 Oglesby St., Lincoln, Illinois, has announced himself as a candidate for the office of county surveyor for his local county. He has previously been employed by the Eagle Picher Mining and Smelting Company at Henryetta, Oklahoma, but the closing down of the plant at that place has caused him, for the time being, to be without a job. Mr. Heitman hopes to return to employment of Eagle-Picher when its new plant at Salina, Kansas is ready for operation.

1924

John L. Andrews is with the Edison General Electric Appliance Company at Chicago.

Robert Abbett is an instructor at Sheffield Scientific School, Yale University in New Haven, Conn.

1923

Mr. and Mrs. W. E. Remmers and son visited with Mrs. Remmer's parents, Dr. and Mrs. S. L. Mitchell during the early part of January.

Hamilton Moore is representative for Laclede Christy Fire Brick Company in the South. His headquarters are at New Orleans, La.

C. C. "Chap" Whittelsey, who is with Ford, Bacon & Davis of New York City, is at present in Amarillo, Texas.

S. M. Burke has moved from 5127 St. Louis Avenue to 1155 Moorlands, St. Louis, Mo.

M. P. Weigle is connected with the Aluminum Ore Co., in East St. Louis, Ill.

C. C. Tevis is now Assistant Division Construction Engineer for Division No. 2 of the Missouri State Highway Department. His present address is 321 Burke St., Macon, Mo.

Lt. G. A. (Pinkie) Zeller writes from Damascus where he stopped on his way home from the Philippines. Pinkie graduated in metallurgy and would naturally be interested in the birthplace of the famous Damascus steel.

1922

E. J. Hollow was the chief speaker on a program at a banquet given by the Engineers Club of the Hannibal-La Grange College. Hollow is with the State Highway Department, and is located at Hannibal, Missouri.

Emilio de Cardenas is at the present time prospecting in the vicinity of Aguascalientes, Mexico. Cardenas states that while this new adventure does not bring in any compensation he is hoping to find something worth while.

F. P. Kohlbry is now at 8 North Wisner, Park Ridge, Illinois. He has been with the Halpin-Kohlbry Incorporated Company at 4116 Clayton Ave., St. Louis, Mo., for the last four years.

W. W. "Bill" Bolt, former Miner fullback, was in Rolla February 6th. "Bill" is now Superintendent of Green River Fuel Company's Mines at Central City, Kentucky.

Ben Hammer who has been in Chile for the last ten years, has been visiting friends in Rolla.

1921

Wm. Kahlbaum has been promoted to Assistant Superintendent of Research of the Midvale Steel Company in Philadelphia.

Wayman Crow expects to make his home in La Jolla, California after the first of March.

Herb Mundt is with the Missouri State Highway Department, and is living at 4927a Highland Avenue, St. Louis, Mo.

1920

Mr. and Mrs. A. V. Eulick and sons, Eric and John, of Kansas City, and Mrs. Ronald White and daughter, Sallee, held a family reunion in Rolla the last week in February.

Ben Nichols was in Rolla the latter part of February.

Tom Leach is doing consulting geology work at Tulsa, Oklahoma. He has recently been working in Texas.

W. W. Weigel is with the St. Joseph Lead Co., at Leadwood, Mo.

W. G. Hippard is Superintendent of the Clyde Mines, for the W. J. Rainey Inc., Uniontown, Pa. He has been with this Company for the last five years, and is living at Fredricktown, Pa.

William M. Taggart, wholesale leather dealer of St. Louis, visited Rolla in April.

1918

Hanley Weiser is now with the Nassau Smelting & Refining Company, Staten Island Station, Tottenville, New York. Weiser has been with the Western Electric Company of Chicago for the last two years.

1917

Mr. and Mrs. F. S. Elfred of Baxter Springs, Kansas, and St. Louis, Missouri, visited Mr. and Mrs. Lee Wynn in late February.

Joe C. Barton is with the St. Joe Lead Company in New York City. He is living at 3527 76th St., Jackson Heights, Long Island, N. Y.

R. C. Henschel, who has been with the Hunt Engineering Co., 701 New York Life Bldg., Kansas City, Mo.; is now at Bay City, Texas.

E. J. Weimer is Superintendent of the Wildwood Mine at Wildwood, Pa. He was employed by the Butler Consolidated Coal Company, Butler, Pa., in 1928 to superintend the construction at Wildwood of the most modern mechanically equipped coal plant in the state of Pennsylvania. The plant is an Allen & Garcia installation.

1916

E. H. Woolrych is now connected with the Broddon Sheet Metal Company, 4659 Page Blvd., St. Louis, Mo.

1915

Durward Copeland has returned to Santiago, Chile, after a short visit in the States.

1914

Enoch R. Needles, a member of the firm of Ash-Howard-Needles and Tamman of 55 Liberty Street, New York City,

1913

R. A. Wagstaff is Assistant Manager of the Utah Department of the American Smelting & Refining Company with headquarters at Salt Lake City. He was a campus visitor St. Pats week.

R. G. Knickerbocker, who is with the Titanium Company of America and located at Malvern, Arkansas, visited the campus late in March.

Prof. H. H. Armsby spent the last week in March, lecturing at the various high schools in Kansas City and Joplin.

Dr. Stevenson and Dr. Dakes attended the meeting of the American Association of Petroleum Geologists which was held in Oklahoma City.

Prof. C. J. Millar has announced his candidacy for Alderman for the 1st Ward in the City of Rolla.

1912

C. L. (Cliff) Conway of the United States Gypsum Company is back in Boston after a holiday in the South.

Paul E. Coaske dropped into E. D. Lynton's office in Los Angeles during the early part of January. He is at present in business for himself, selling certain by-products manufactured by the Union Oil Company of California. He can be reached at 901 North Western Avenue, Los Angeles, Calif.

1911

Duncan Smith has returned to Brussels, Belgium from East Africa, and will devote his time to consulting work.

D. L. Forrester and Mrs. Forrester spent Christmas and New Year's Day in Pasadena, Calif. Mr. and Mrs. E. D. (Teddy) Lynton had the pleasure of having dinner with them at the home of Mrs. Alice Knipe, sister of Henry F. Adams, '12. "Red" says that conditions in the copper mines in Arizona are very bad, so many of the mines being compelled to shut down, including the Old Dominion at Globe, with which "Red" was associated.

1910

T. S. Dunn is Professor of Mining at Stanford University, Palo Alto, California.

Jack D. Harlan spent the Christmas holidays in Los Angeles with his wife and two daughters. Jack recently came down from Fairbanks, Alaska, on a business trip. He is returning to Alaska at the end of January. He says Bob Mackey and A. W. Hackwood are both in Alaska.

Walter Dobbins was in Rolla on January 19th and 20th renewing acquaintances. He was enjoying a vacation in the States as he has been with the Chile Copper Company at Chuquicamata, Chile, for the last twelve years. His contract recently expired but he was fortunate enough to renew it for another three years.

Reuben C. Thompson who was reported as having been killed several years ago is still very much alive, and is now with the Phelps-Dodge Corporation at Warren, Arizona. Thompson made a name for himself while in school here as being an all-around good man. Not content with being one of the greatest football ends the school had ever turned out, he succeeded in getting his letter in baseball, and in making good enough grades to be elected to Tau Beta Pi. While in school, Thompson was a member of the Grubstaker's Club, which is now known as the Triangle Fraternity.

1909

M. S. Mazany, formerly Smelter Superintendent of the Braden Copper Company at Rancagua, Chile, has opened a Consulting Engineers office in New York City. He will live at Montvale, N. J.

George Easley has returned from a business trip to London. While in London he visited with P. K. Horner, '06, who is a Consulting Engineer in London.

F. X. Nachtmann, accompanied by his wife, returned for homecoming. His address is 655 Fiarview, Webster Groves, Mo.

1908

D. M. Neer, who has been residing at 4105 Speedway, Austin, Texas; is now living at 27 Palina Plaza of the same city.

Mr. and Mrs. D. P. Hynes of Evanston, Illinois, made a short visit to Rolla in April. Hynes is with H. L. Hollis, consulting engineer of Chicago.

1907

Ira L. Wright, a prominent mining engineer of Silver City, New Mexico, visited in Rolla in February. He was the guest of Prof. and Mrs. J. H. Underwood at dinner. He also called at the Pi Kappa Alpha fraternity house. He

was one of the charter members of that fraternity at the School of Mines. He also called on other old friends at Rolla. He left Rolla for Milwaukee, Wisconsin, to attend a meeting of the Board of Directors of a mining company.

1906

J. S. Root, a prominent business man of Des Moines, Iowa, visited in Rolla in February. He was accompanied by his daughter, Miss Edith Root. They had attended the Mardi Gras at New Orleans, Louisiana, and were returning to their home by way of Kansas City. Mr. Root came to Rolla to show his daughter where he had attended college.

Ted Raney, formerly instructor in the Vocational Department, was around town March 11th. Ted with Sam O'Hara was on his way to Washington. Both men are with the Geological Survey.

D. P. Pray of Monett visited in Rolla the latter part of February.

Harry Kessler is metallurgist for the Banner Iron Works, St. Louis. He resides at Kingshighway and Shaw.

O. D. "Red" Niedermeyer who is on the staff of Real del Monte, Pachuca Hidalgo, Mexico, is now in Honduras, Central America doing exploration work.

Elmer John Sperling of Cape Girardeau, Missouri, in a National contest, received word a few days ago that he has been awarded for the academic year 1932-1933, the American German Student Exchange Scholarship known in Germany as the Deutscher Akademische Ausstauschdienst Mitgliedschaft. Mr. Sperling's special field of study abroad will be Hydraulic Engineering.

Fred Clearman of the Research Department of Eagle-Picher Lead Company of Joplin, was in Rolla early in May carrying on some investigations in the laboratories of the Department of Metallurgy and Ore Dressing.

Improvement in Local Unemployment Problem

Through the kind efforts of the Chief (Dr. H. A. Buehler) five MSM men will join Topographic Survey parties in the southern part of Missouri. The work is being done as a cooperative job between the State and Federal Geological Surveys. Those reporting were:—J. O. (Chalky) Holman '27, L. M. Robinson '27, H. D. Thomas '28, Chas. McCaw '31 and Ray Runder '32.

1932 First Semester

August 15.....	Monday, second summer surveying class begins.
September 10.....	Saturday, second summer surveying class closes.
September 6.....	Tuesday, entrance examinations and registration for Freshmen.
September 7.....	Wednesday to { placement examinations }
September 10.....	Saturday { and orientation lectures }
	{ for Freshmen. }
September 12.....	Monday, 8 a. m., Freshmen class work begins.
September 12.....	Monday, registration for three upper classes.
September 13.....	Tuesday, 8 a. m., class work for three upper classes begins.

Football Schedule 1932

Date	Opponent	Place
Sept. 24	Pittsburg Teachers	Rolla
Oct. 1	Arkansas University	Fayetteville
Oct. 7 or 8	Open	
Oct. 15	Drury College	Rolla
Oct. 21	Kirksville Teachers (night)	Kirksville
Oct. 28	Springfield Teachers (night)	Springfield
Nov. 5	Maryville Teachers	Rolla
Nov. 12	Tulsa University	Tulsa
Nov. 19	St. Viator College	Rolla

Gold Mining Among the Head Hunters of New Guinea

To those who think that romance and the pioneering spirit is gone from mining, attention is called to a new project in New Guinea.

New Guinea located north west from Australia was formerly a German possession but is now under the mandate of Australia. It is a wild country that has been explored very little, and offers an attractive field for young mining graduates even though it is a country inhabited by man-eating tribes.

In 1930 Bulolo Gold Dredging, Limited, was incorporated with a capital of \$4,000,000 to develop and equip the recently discovered alluvial gold field in the island of New Guinea. The financing of the project was done by the International Mining Corporation and associates in New York.

The dredging territory is located in the eastern part of the island in a vast jungle 40 miles in direct line from the coast. It is a very rugged country with mountain ranges reaching an altitude of 11,000 feet.

Transportation to the gold field was the big original problem as there was no road to the property and a high range of mountains lay between it and the coast. The question to decide was whether to build a road or transport a power plant, dredges and all supplies by airplanes. A 90 mile road would have been necessary at a cost of about \$1,250,000 and two years would have been necessary for its construction. The maintenance cost of the road when constructed would have been unusually high.

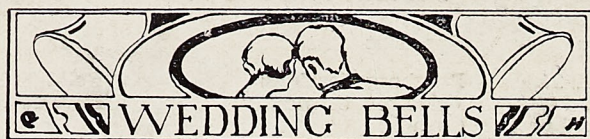
To avoid the large sum and long time necessary for road construction, it was decided to attempt transportation by airplanes. This was a bold move in pioneering as transportation on such a huge scale had never been attempted by air. Two tri-motor (each motor develops 450 h. p.) Junker monoplane airplanes were bought at a cost of approximately \$150,000 each placed in New Guinea. To date these planes have carried nearly 3,000 tons of freight to the gold fields over a range of mountains 7,000 feet in altitude without any accidents. The life of these planes is estimated at 12 years. Single pieces weighing up to 7,000 lbs. have been carried by the planes. A 11,000 K. W. hydro-electric power plant, one 10 cubic foot bucket dredge and part of a second dredge have been transported.

The first dredge will start operating in the later part of March. Had it been decided to build a road, the road's construction would not yet have been completed. It is planned to put in operation an additional dredge every six months until five dredges are operating in the field.

About 100,000,000 cubic yards of payable gravel have been developed to date in the New Guinea gold field by drilling. It is estimated that it will take 11 years to dredge out the territory and that approximately 40c per yard will be recovered at an estimated cost of 10c per cubic yard.

There are two most interesting points in connection with this Bulolo project—first, the possibility of mining gravel containing only 40c worth of gold per cubic yard, and second, the possibility of using air transportation in other remote districts. International Mining Corporation with associates will start drilling in the near future an area in South America where air transportation will be necessary.

The data for this short article was furnished by George A. Easley, '09, a director of the Bulolo Gold Dredging, Limited,



McCURDY—CROWDER

Frank A. McCurdy, '29, and Miss Virginia Crowder were married January 30 at Ada, Oklahoma. Mrs. McCurdy is a graduate of the East Central State Teachers College of Oklahoma; her home was formerly at Roff, Okla. Frank comes from Sedalia, Missouri. For the past few years he has been employed in the oil fields of Oklahoma. Mr. and Mrs. McCurdy's mail address is given as Hughesville, Mo.

WARE—POWELL

Walter J. Ware, '31, was married to Miss Anna Orma Powell, M. S. M. '31, in Rolla, just before Christmas. Walter is Junior Engineer in the U. S. Engineers Office, 609 Postal Telegraph Bldg., Kansas City, Mo.

BARNES—LEONARD

Miss Eva Ruth Leonard, daughter of Mr. and Mrs. E. L. Leonard of Rolla, became the bride of Byron A. Barnes, Sunday, December 20. Mrs. Barnes is a Rolla girl; she graduated from the R. H. S.; and served as a maid of honor to the 1931 St. Pat's Queen. Barnes graduated from M. S. M. with the class of 1931 in Mine Engineering.

RAY—BARNETT

E. M. "Charlie" Ray ex '30, was married in December to Miss Lois Barnett of Fort Smith, Arkansas; they are planning to make that city their home.

KENTNOR—McGUFFIN

C. B. Kentnor, Jr., '24, of Brooklyn, N. Y., and Miss Jean McGuffin of Louisville, Kentucky, will be married during the latter part of March. They will make their home in Brooklyn.

SMITH—THOMPSON

Cabanne Smith '26 and Miss Lucy Montford Thompson, daughter of Mr. Guy A. Thompson of Washington Terrace, St. Louis, were married April 2nd. After a motor trip to Monterey and Mexico City, Mexico, Mr. and Mrs. Smith will be at home at 2026 Bissonnet St., Houston, Texas.



A son was born to Mr. and Mrs. August F. Mohri (Chesterton, Indiana), on January 25th. Mohri is a metallurgist of the class of 1923; since his graduation he has been employed by the Inland Steel Company at Indiana Harbor, Indiana.

Mr. and Mrs. Donald F. Updike announce the arrival of a baby boy. The Updikes live at Greenwich, Conn. Mr. Updike completed his studies in metallurgy at M. S. M. in 1922.



ANDRUS, Eli Dexter was born at Rockford, Illinois, on October 20, 1885, and died at Tuscon, Arizona, August 6, 1931. After attending the University of Arizona for a year he went to the Missouri School of Mines, from which he was graduated in Mine Engineering in 1913. Beginning as a mill operator at Miamia, Okla., in 1914, he held various positions in Arizona, California, and Mexico, becoming mill superintendent for the Eagle-Picher Lead Co. plant at Ruby, Arizona in 1928, where he remained until his death.

ERSKINE, Mrs. Lucian died March 3rd at her home, 6356 Clayton Road, Richmond Heights, at the age of 38. She is survived by her two children, Lucian Jr. and Frank, and by her husband, Lucian Erskine, ex '17.

WEBSTER, Brig. Gen. Frank D., U. S. Army Retired, died February 21 at his home in Leavenworth, Kansas. He was a native of Rolla, attended the School of Mines with the class of '84, and was a graduate of West Point. He commanded the Eighth National Army Brigade in France during the World War, retiring just before the Armistice because of disability. He saw service in the Spanish-American War, the Philippine Insurrection, and with the Punitive Expedition in Mexico in 1916. He is survived by his widow and two daughters.

PACK, James A., E. M. '77, passed away at his home in Seattle, Washington, February 14th. He is survived by a brother, John Wallace Pack, M. S. M. '74, who is reported as our "oldest alumnus."

POWELL, Mrs. Fanny, passed away at her home in Rolla, Thursday, March 17th. She is survived by her eight children, Walbridge Powell; Mrs. W. M. Weigel; Frank B. Powell; Mrs. Howard Katz; Mrs. F. E. Dennie; Mrs. Grace Boyer Powell; Mrs. W. A. Werner and William Clark Powell.

Commencement Week Program 1932

Sunday, May 15	11:00 A. M.	Parker Hall
Baccalaureate Sermon The Right Reverend William Scarlett The Bishop Coadjutor of Missouri St. Louis, Missouri		
Wednesday, May 18	8:00 P. M.	Chemical Hall Lecture Room
Sigma Xi Lecture Dr. William J. Robbins Dean of the Graduate Faculty, University of Missouri Columbia, Missouri		
Friday, May 20	7:15-9:30 P. M.	Director's Residence
Director's Reception to Students, Faculty, and Visitors		
Saturday, May 21	10:00 A. M.	Parker Hall
Commencement Exercises Address by Dr. Walter E. McCourt Assistant Chancellor, Washington University St. Louis, Missouri		