

NEWS-LETTER

UNIVERSITY OF ILLINOIS

Department of Mining and Metallurgical Engineering Alumni

JANUARY, 1961

NEW CHANGES IN METALLURGY CURRICULUM

The curriculum in both options in metallurgy have undergone changes believed to strengthen our program. The changes going into effect have a two-fold objective: 1) to offer the student greater latitude in choosing courses to better fit his own needs and interests; and 2) to put more emphasis on basic science and principles.

The number of technical elective opportunities has been increased by placing some courses formerly required for the degree into an elective category along with selected courses in physics, math, E.E., and T. & A.M.

The sequence in process metallurgy has been extensively modified. The first course will be a survey of extractive metallurgy methods taught from a unit operations approach. The second course in the sequence will be a course in thermodynamics and kinetic (Met. 218) which will have applications in physical metallurgy as well. The third course will emphasize the application of chemical and physical principles to metal extraction. The course in electrometallurgy will be shortened and offered as an elective.

A new course in alloy steels and

special-purpose high-performance alloys (Met. 306) will also be offered as an elective. Other metallurgy courses in the elective category are: Met. 301, Welding; Met. 302 and 304, Powder Metallurgy; Met. 311, Multicomponent Systems; and Met. 260, Adv. Physical Met. Lab. Met. 205 and 211, the former process metallurgy courses have been dropped, as well as Met. 319, Elements of the Theory of Alloys. Most of the material in this course has been absorbed by the two new courses, Met. 306 and 218.

Another change on the college-wide level will affect students registering in the Fall of 1963. In addition to the present requirements in mathematics and English, entering freshmen after this date will be required to present two years of high school work in each of the fields of science, social studies, and foreign language. These changes mean the high schools must share an increasing responsibility in providing a stronger background for the engineer in the sciences as well as in the fields of social studies and humanities.

Prof. Read at Oxford on Sabbatical Leave;

Prof. Ricketts is Acting Dept. Head

Prof. T. A. Read has taken a sabbatical during the first semester of the current academic year. Tom was asked to accept a position as Visiting Professor in Metallurgy at Oxford University, Oxford, England. The Read family left for England this summer, and will return this January in time for the start of the Spring semester. Their son, Tom, was able to spend only a short time abroad, as he had to return to his studies at Oberlin College, where he is a sophomore. Tom has been carrying on some research on transformations while in England in addition to lecturing. He is giving a series of lectures on martensite crystallography. He has also been able to take advantage of the opportunity to visit many laboratories and compare notes with investigators who are active in areas of research closely allied with his own.

In Tom's absence, the administrative reins of the department have been in the very capable hands of Prof. B. G. Ricketts. The entire staff has the greatest respect for the way in which Barney has stepped into this difficult position. The progress of the department has continued in an uninterrupted manner, and Dr. Read should find affairs in good order when he returns to us in the near future.

New Cyclone And Pump

Mr. George L. Chedsey, President of Associated Engineers, Inc., and son of retired Prof. Wm. R. Chedsey, has donated a 4-inch cyclone to the department. A pump needed to operate the cyclone has been donated to the department by Nagle Pumps, Inc. The mining staff is very happy about

Committee Studies Petroleum Option

A thorough study of the petroleum option in mining engineering is being carried out by a committee including Profs. Eadie, Rose, and Wright. While the recommendations of the committee are not yet complete, increases in the engineering content of the program are likely. Also, the number of hours devoted to the humanities will be enlarged in accord with the College of Engineering requirements in this area.

Funds were received from the Ford Foundation to aid this study. With these funds the following industrial and academic authorities were brought here for discussions with the committee: Dr. C. D. Russell, Manager of Technical Services, French National Oil Co.; Dr. J. Quirk, soil physicist from the Univ. of Adelaide; Dr. Leendert deWitte, a well-known electric logging expert; Dr. Irving Fatt, Prof. of Pet. Engr. at the Univ. of California; and Dr. John Calhoun, Vice-Chancellor of Texas A & M. In Dean Calhoun's report, he proposed a separate petroleum engineering curriculum rather than its present option status in mining.

Elsewhere in petroleum, four master's degrees were awarded during the year. Those receiving degrees, and their thesis topics are:

Paul Stewart, "An electrokinetic investigation of potentials at interfaces," June, 1960 (now with Shell in Houston).

A. R. Schleicher, "Application of electrokinetic effects for radial flow systems," Feb. 1960 (now with Magnovox).

Richard Mast, "Permeability anisotropy and shape of fabrics of cross-bedded Pennsylvanian sandstones," Aug. 1960 (now petroleum engineer with the Illinois State Geological Survey).

G. R. Ramagopal, "Dynamics of contact angle hysteresis," Aug. 1960, (now a doctorate candidate at the Univ. of California).

The addition of this unit to our Coal Preparation Laboratory. The equipment is now being installed and is expected to be in operation during the Spring semester.

NEWS OF THE ALUMNI

We thoroughly enjoyed hearing from C. H. Dodge, Min '24, and join him in his plea for news of some of the older alumni. Mr. Dodge was last on the campus in 1935—before most of our present students were born—when he received his Professional Degree of Engineer of Mines. Charles is Valuation Engineer for the Internal Revenue Service for the Pittsburgh District, and recommends this field as an intriguing career for mining engineers. Mr. Dodge's address is 1006 So. Trenton, Pittsburgh, Pa. He, as well as the Newsletter, would enjoy hearing from some of his old friends from the campus.

Stewart Sandberg, Met '49, has returned from California to Pittsburgh, and his present address is 321 Bryant Dr., Pittsburgh 35. Stew is still with Westinghouse in the Atomic Power Department. He is working on problems in direct conversion of heat to electricity via semiconductors.

Alphonso Merlini, who received his PhD in metallurgy in 1954, is head of the metal physics division of the Nuclear Research Center being set up at Ispra, Italy by the Italian Committee for Nuclear Research. At last report, the lab was in temporary quarters in Milan, and Alphonso was concentrating on staff recruitment. Alphonso had spent some time working with Earl Parker's group at Berkeley before returning to Italy.

Tom Dvorak, Met '57, was on the campus last December for a visit with the staff, and some of his classmates who are still here as graduate students. Tom is working at Douglas Aircraft in Santa Monica, Calif.

Orville Kimball, Met '55, has left his position with General Electric to return to full-time graduate study at Northwestern. Orville had received his M.S. at R.P.I. while a GE employee. We hope to see him now that he's returned to our vicinity. His present address is 7351 N. Damen, Apt. 2B, Chicago.

Walter Lucas, Min '54, has recently been promoted to Chief Engineer of the Sahara Coal Company.

Kenneth Wood, Min '60, has left U.S. Steel for the time being and is doing his bit for our country by

serving in the military at Ft. Leonard Wood.

Don Hise, Met '59, dropped by on his way to the NACE meeting in Dallas last winter, with recruiting stops on the way. Don is concerned with corrosion problems for Columbia Southern. He is anticipating an assignment in Paris when his plant starts a new operation there.

C. T. Wei, who received his PhD in Metallurgy in 1959 and remained with us for a year as a research associate has now joined the staff of the metallurgy department at Michigan State Univ. Chuan's present address is 205 S. Larch, Lansing 12, Mich.

Jack Webster, Min '50, and Jack Tisdale, Min '55, have been transferred back to Southern Illinois from the hills of Virginia. Both are employed by Old Ben Coal Corp. Jack Webster was General Superintendent of Coal Processing Corp, an Old Ben property a Norton, Virginia.

Walter W. Anderson, Min '30, Technical Director of Commercial Testing and Engineering Co, has moved to 22830 Sherman Rd, Chicago Heights, Ill.

Dick Ausfahl, Met '50, has left his post as plant metallurgist at Caterpillar's Aurora plant to take a position in charge of quality control at Cat's Glasgow, Scotland plant. Dick's friends may not be too surprised to hear that he was promptly involved in an automobile accident—driving on the wrong side of the road.

Gilbert L. Smith, Min '24, has retired from his position with the Goodman Manufacturing Co last February, and receives his mail now at his home address: 8621 So. Vernon, Chicago 19.

Please note the following address changes: Chas. C. Boley, PhD Min '47, to 3888 Estes St, Wheat Ridge, Colo.; Joseph B. Darby, PhD Met '58, to 1303 Marcey, Wheaton, Ill; and W. R. Hoskins, MS Met '51, to 2651 Houston Rd, Cincinnati.

Lew Markow, Met '54, reports his current address as 2418 Manor Dr. Beloit, Wis. Lew is at the Beloit Works of Fairbanks Morse Co., and sends regards and an invitation to write to all his classmates.

Another sign of advancing years: currently enrolled as a freshman in engineering is Jeffrey Marx, whom we all remember as a little boy playing with his electric train when his dad, John, was on the staff here a few years ago. The Marx's address now is: 114 Harwood Dr., Bartlesville, Okla.

H. P. Leighley, PhD Met '52, has accepted a position on the staff of the Metallurgy Dept of the Missouri School of Mines at Rolla. Phil was formerly Chairman of the Dept of Metallurgy at the Univ of Denver. Phil is coauthor of a Pittman publication, "Engineering Metallurgy."

W. J. Karwoski, Min '60, is doing graduate work at the Colorado School of Mines.

Friends of Burton C. Schaner, Met '52, will be saddened to learn that Burt died of a heart attack August 11 while at work at Westinghouse's Bettis Plant. Our deepest sympathy is extended to the Schaner family.

E. B. Gempler, MS Met '51, has left General Electric, with whom he had been associated since graduation, to accept a position as senior metallurgist in the Central Research and Development Div. of Carrier Corp., Syracuse, N.Y.

Don Woodward, Met '57, has completed a course in business administration at Northwestern, and is now metallurgical engineer, Metals and Fabrication Div., Fansteel Metallurgical Corp.

Ira Potovsky, Met '55, has taken a position on the technical staff of Hughes Semiconductors, Newport, Calif.

Choh-Yi Ang, PhD Met '54, visited Prof. Wert and others in the department this fall. He has since resigned as Director of Materials Lab. at P. R. Mallory, and is now in Los Angeles doing solid state work in the electronics industry.

Mike Gedwill, Met '56, has returned to the campus this Fall for graduate studies. Mike had been working at Battelle Institute. He is now doing research studying phase transformations in cobalt whiskers with Prof. Wayman.

M. W. Senew, Met '39, was a visitor this year, and introduced

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ON THE STUDENT AS A PERSON

— Marvin Metzger

Departmental discussions of teaching problems have been concerned with questions of curriculum and course content. Our viewpoint has been subject-oriented; the student is seen as one of a number of unfinished undifferentiated articles to be overlaid with patches of Physical Chemistry, Nonferrous Metallography, etc. as he travels down the educational assembly line. The omission of any "essential" subject such as Tool Steels or X-rays would be lamentable since the product would then be unfinished. Now it may be profitable for us to borrow an attitude from the Education people and examine the conclusions to which a pupil-oriented approach would lead. In this view, we would emphasize 1) not that we are teaching metallurgy but that we are teaching students; 2) not that the student takes a course, but that he undergoes an experience.

In the pupil-oriented view, the student is not a blank sheet but a complex organism whose behavior is strongly influenced by subconscious factors and whose response patterns are already quite rigid. He comes to metallurgy after 1½ to 2 years of psychologically difficult university educational experience. In these years, the student must provide mental compartments for a number of diverse subjects which seem to him only distantly related to each other or to extramural experience. He has little idea of their relation to his long range goals except that they are "necessary" for reasons which will be apparent at some future time. He has no identification with the subject or the group. I suggest these circumstances are largely responsible for the difficulty many of our students have with certain subjects; for example, calculus.

It is worth noting that the courses in the first two years concentrate on fundamentals and point out some applications (almost never slanted toward metallurgy) in passing, rather than make a strong effort to tie fundamental material in with the student's previous experience and projected interest. It can be argued that the relation between physics or chemistry and general experience is something which should have been made apparent back in high school. Nonetheless, the fact remains that the student in the first two years has less than an adequate picture of the relation between his current experiences and those of his past and future.

In order to avoid these problems and provide an environment in which juniors and seniors can have satisfying educational experiences and thus learn more effectively, it is necessary that the content of every metallurgy course be personally meaningful to the student. This normally requires establishment at the start of the connection with previous experience through the discussion of specific cases which will include familiar alloys and applications. Subsequent or concurrent presentation of theory or fundamentals would be connected with previous experience through these specific cases. As far as fundamentals are concerned, this makes for less efficient presentation by the instructor, but more efficient learning by the student whether he is a prospective engineer or research metallurgist. It is the writer's opinion that assimilation of the fundamentals ought to be our principal objective (a pupil-oriented view does not itself indicate what division of emphasis between fundamentals and applications is desirable). It is with this objective in mind that the writer asserts, from considerations of learning efficiency as discussed above and of the largely non-classical nature of metallurgy, that the fundamentals can be presented properly only in relation to applications in the broadest sense.

In the present view, for example, to teach theory of electron properties of alloys and quantum mechanics as subjects essential for the understanding of recent and future developments makes little sense unless the student has a clear picture of recent and probable future developments and of the way in which these subjects actually will come in.

Another desideratum is integration of the total metallurgical experience—to teach X-rays and crystal structure properly, it is necessary that a course be devoted to them, but the sufficient condition is not satisfied unless these topics are also part of the material presented in previous and subsequent courses. Along these lines, for example, experience with graduate students has shown that advanced math courses, which stand in the junior year of the research option in splendid isolation from almost everything in the undergraduate curriculum are very poorly retained.

With regard to our own courses, the recommendation of the present

BRUCKNER PLANS WELDING COURSE

Prof. Walter Bruckner was general chairman of a four-day short course in Welding Engineering sponsored jointly by the Departments of Civil, Mechanical, and Mining and Metallurgical Engineering, and held on the campus in December. This was the first such course on our campus. It was well-attended and enthusiastically praised, and is planned to be a biennial event.

Of the fifteen outside speakers who contributed to the program, two were alumni of the department. In addition to Walter's talk on the metallurgy of welding, Roy Lorentz ('39) presented a lecture on residual stresses, and Ernst Huschke ('55) discussed brazing principles and methods. Roy is with Combustion Engineering in Chattanooga, and Ernst is with the General Electric Applied Research Laboratory in Cincinnati.

One of the attendees of the short course was Dick Falck, '57, now with Warren Electric Brake and Clutch, Beloit. Dick lives at 322 Logan, Rockford.

Bond Issue Passage To Permit Expansion

Those alumni who are not residents of Illinois may not have heard that the \$195,000,000 bond issue for building facilities at State-supported institutions of higher education was endorsed by a comfortable margin at the election last November. This result means that the University can begin at once to prepare for the large influx of students which is anticipated in the near future.

Passage of the bond issue from a departmental point-of-view will mean that the new Physics Building will be completed, and the old Physics Laboratory will become available to our department. Perhaps the long-awaited time when our staff will finally be housed under one roof is at last at hand.

view is that we be less concerned with "completeness" of coverage and more concerned with effective presentation. To squeeze in additional "essential" topics for the sake of "completeness" is senseless unless these topics can be properly integrated and thus retained.

NEWS ABOUT THE STAFF

Bruckner Wins Award

Walter Bruckner received the 1960 Adams Memorial Award of the American Welding Society during the recent AWS meeting in Los Angeles. The award was established to encourage and assist teaching of welding engineering. Walter's citation reads "In recognition of his outstanding teaching activities which are advancing the knowledge of welding technology in his educational institution."

Voskuil Retires

The department bid a reluctant adieu to the Walter Voskuils this summer as Walter reached the compulsory retirement age, and was forced to conclude his career at the University. However, Walter is much too young in mind and body to retire, and has accepted a post as Distinguished Visiting Professor of Mineral Economics at the Mackay School of Mines, Univ. of Nevada. Walter's reputation and ability are such that his lectures are attended not only by the regularly enrolled students, but the faculty of the Mackay School, the staff of the Nevada Bureau of Mines, and many leaders of the mining profession in the vicinity as well.

Our course in mineral economics formerly taught by Prof. Voskuil is now being very capably presented by Dr. Hubert Risser, of the State Geological Survey.

Read Is IMD Chairman

Tom Read has climaxed a long career of service to the AIME by his election to the Chairmanship of the IMD Division for 1960. Tom was on the Programs Committee in 1943. From 1952 to 1955 he was AIME representative to the Engineers Council for Professional Development. He also served on the IMD Special Programs Committee, Publications Committee, and Executive Committee. Tom has also been chairman of the IMD Education Committee of the Council of Education. In addition to these activities at the national level, he was chairman of the Philadelphia Section several years ago.

Beck Lectures In Europe

Prof. Paul Beck had a splendid opportunity to visit many European laboratories this year when

he was invited to give talks at several institutions in England and the Continent. The results of long and hard work by Paul and his students on electronic specific heats of b.c.c. transition element alloys have just been published, and Paul discussed this work at Harwell Atomic Energy Establishment in England and at the Polytechnic Institute in Zurich, Switzerland. He gave an invited lecture at the annual meeting of the German Metallurgical Society in Vienna on grain boundary mobility. Paul also gave other lectures on recrystallization and textures at the Max Planck Institute for Research on Steel at Dusseldorf, at the School of Mines at Clausthal, Germany, and at the Atomic Energy Research Laboratory at Saclay, France. In spite of this extensive itinerary, Paul was gone only about three weeks.

Visits Australia

Prof. David Lieberman has the record for long distance travel, as he spent two weeks in Australia this Fall to attend a symposium on Phase Transformations in Metals and Alloys at the University of Melbourne. He received a special National Science Foundation grant to cover his travel expenses, and his subsistence was covered by the AEC which supports his research here. Dave presented two papers on work done by his group: "Some Isothermal Aging Effects in 47.5 atom percent Au-Cd", and "Quenching Effects and Isothermal Martensite Transformation in Au-Cd."

Dave took advantage of the opportunity to visit the Tribophysics Lab and the Baillieu Metallurgy Lab at the Univ. of Melbourne, and the Aeronautical Research Laboratory in Melbourne. He also spent some time at the new metallurgical laboratories of the Univ. of New South Wales and the Australian Atomic Energy Commission at Sydney. Dave was very much impressed with the intense research activity and the calibre of the work being done in Australia in metallurgy.

Prof. Street Resigns

Prof. Norman Street, who has been on our staff in petroleum engineering since the Fall of 1957, has resigned to take a senior appointment with C.S.I.R.O. in Australia. We will miss the Streets, but sympathize with his

interest in the opportunity to accept a challenging position in his native Australia. Several candidates are being considered to fill the vacancy created by Norman's resignation.

Misfortune For Wuerkers

Misfortune has struck the Wuerker family during the past few months. Mrs. Wuerker is just out of the hospital after a several weeks' confinement after suffering a fall which resulted in a broken leg. Prof. Wuerker has had a heart condition diagnosed and has been forced to curtail his activities. Rudy is still able to meet his classes, and in addition serves as nurse to Isabel, who is still unable to get around without aid.

Departmental Seminars

A new series of seminars has been initiated to keep the staff up-to-date on research in the department. Research has grown to such an extent that it is difficult for us to keep mutually informed on all the work being carried on. It is expected that graduate students will give most of the talks, which will be good experience for them, and also allow the staff to know our students better.

ALUMNI NEWS

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his charming family to staff members who were here. He is operating an industrial x-ray laboratory in Chicago, and was interested in radiation effects on materials, and the University's program in nuclear engineering.

Bill Albert, Met '56, and his wife left their two children at home and had a short holiday this Fall, and visited us during Homecoming. Bill is in the Blast Furnace Div at U.S. Steel's Fairless Works in New Jersey.

Joe Enrietto and Jim Stanley, who both received their doctorates last year, now stand even in the baby derby with four each. Jim was on the campus last month and visited his friends in the department. He is at Oak Ridge in the Solid State Div., while Joe is at Jones & Loughlin's Research Lab in Pittsburgh.