



Missouri S&T Magazine, April 1962

Miner Alumni Association

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M S M

Alumnus

APRIL 1962



MSM Alumnus

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ON THE COVER



The Queen of Love and Beauty, reigning during St. Pat's celebration, Miss Joyce Logan. The patron saint, St. Pat in the person of Bob Tooke, on the right. They are flanked by maids of honor, knights and pages.

Issued bi-monthly in the interest of the graduates and former students of the School of Mines and Metallurgy. Subscription price, \$1.50, included in Alumni Dues. Entered as second-class matter Oct. 27, 1926, at Post Office at Rolla, Mo., under the Act of March 3, 1879.

MSM Alumni Association

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4.....	Frank C. Appleyard '37	N. Ill., Chicago Industrial Area in Indiana, Wisc., Mich., Minn., Province of Ontario	1963
5.....	Joseph W. Mooney '39	S. Ill., E. Mo., N. Ark.	1964
6.....	Bennett D. Howell '50	Iowa, W. Mo., Nebr., Kans., Okla.	1962
7.....	Rolla T. Wade '31	Texas, Arizona, New Mexico	1964
8.....	Harvey L. Tedrow '11	Ida., Montana, N. D., S. D., Wyo., Colo., Nev., Utah, Provinces of Manitoba, Sask., Alberta	1963
9.....	William B. Fletcher '34	Alaska, Washington, Ore., California, Hawaii	1964

Regal Float Transports 1962 Reigning Beauty



The St. Pat's Queen and her attendants on the float provided by Phi Kappa Theta.

St. Pat's Features Floats With TV Themes; Rolla Girl Is Queen for First Time in Decade

The 1962 St. Pat's celebration at MSM was one of the best. The parade of floats constructed by the social fraternities was outstanding. Formerly the parades were held Friday afternoon. This year it was changed to Saturday morning which permitted a larger number of spectators to view the beautiful entries. The themes depicted this year for the floats were television features and the winning float award was presented to Beta Sigma Psi for their entry, "Route 66". The second place award went to Theta Xi for their "Sea-hunt" float. The queen's float was constructed by Phi Kappa Theta, last year's winner.

The St. Pat's Queen of Love and beauty was Miss Joyce Logan, the daughter of Mr. and Mrs. Curtis Logan, of Rolla. She was the only entry from

Rolla among the 21 contestants, and the first girl from Rolla to hold the coveted title in a decade. Ten years ago, Miss Barbara Barner, of Rolla, now Mrs. Barbara Wilcox of St. Louis, was named queen. Miss Logan was sponsored by the Rolla Junior Chamber of Commerce.

St. Pat's representative on the campus who led the parade and crowned the queen was Bob Tooke.

There were many special functions on the campus during the week end and sponsored by fraternities. The highlights of all the social activities was the St. Pat's Ball held Saturday night in the Student Union Ballroom. An overflow crowd was present for the crowning of the Queen of Love and Beauty and to dance to the strains of the great Duke Ellington band.

A. J. Kiesler to Receive Medal From Foundrymen's Society

A. James Kiesler '40, of the General Electric Research Laboratory, Schenectady, New York, has been named to receive a gold medal award of the American Foundrymen's Society, international technical society for the foundry industry.

Kiesler and three other gold medal award recipients will be honored during the International Foundry Congress in Detroit, Michigan, May 7-11.

Gold medals are the highest award given by the Society, and are presented each year to individuals who have made outstanding contributions to industry in the fields of light metals; steel castings; international exchange of foundry technology; progress in metallurgy, process research and development; and education in the metal casting field.

Other recipients for 1962 will be Walter Bonsack, chief metallurgist,

"Route 66" Is Theme of Winning Float



Beta Sigma Psi won the float contest in the St. Pat's parade. Their float depicting the television theme "Route 66" had a replica of the sports car with a map of the U. S. in the rear and a white line tracing U. S. Route 66 from Chicago to Los Angeles.

Aluminum and Magnesium, Inc., Sandusky, Ohio; F. W. E. Spies, vice president of operation, Royal Dutch Iron and Steel Works, Ymuiden, Netherlands; and John F. Wallace, Professor of Metallurgy, Case Institute of Technology, Cleveland, Ohio.

Kiesler's citation for the Joseph S. Seaman medal reads, "for outstanding technical contributions to the society and the steel castings industry, and for his personal efforts toward a broader appreciation of cast products as engineering materials."

Kiesler is a metallurgical engineer in the materials application and evaluation section of the research Laboratory's Metallurgy and Ceramics Research Department. He has been with General Electric since 1946, first as a metallurgist in the Schenectady Works Laboratory, later as Chief Metallurgist in the Steel Foundry, and since 1954 with the Research Laboratory.

Previous honors accorded Kiesler include an honorary professional degree from MSM. He represented the United States last year at the International



A. James Kiesler

Foundry Congress in Vienna. Kiesler is past chairman of the Steel Founders Society of America, Division I, and

past chairman of the steel division of the American Foundrymen's Society. He recently was appointed to the Electric Furnace Executive Committee of the American Institute of Mining, Metallurgical and Petroleum Engineers.

Mr. and Mrs. Kiesler and their two children live at 2068 Coolidge Place, Schenectady.

Geology Awards Given By McNutt Foundation

Ten awards have been made in the Department of Geology from an unrestricted grant of \$3000 from the V. H. McNutt Memorial Foundation.

Three of these awards consist of Summer Field Camp scholarships to the outstanding geology majors for the costs of the University of Missouri Field camp and miscellany connected with it. Seven awards have been made to students of the Geology Department for use on graduate research projects.

MSM Alumnus

Dean Wilson Receives Medal for Outstanding Service to Military Engineering Education

Dean Curtis L. Wilson will receive the Tasker H Bliss Medal for 1961, the highest award offered annually by The Society of American Military Engineers for outstanding contributions to military engineering education.

The presentation will be made at the Annual Military Engineer Dinner on May 21, 1962, at the Mayflower Hotel, Washington D. C.

Dr. Wilson is recognized for his outstanding contribution to military engineering education by his actions as a strong advocate of the required basic ROTC course, his encouragement of students to enroll in the Engineer ROTC advanced course, and his efforts in the establishment of a program of schooling for active duty officers of the Army Corps of Engineers in undergraduate and graduate engineering. Through his policies, despite the relatively modest enrollment of MSM, the school supports the largest Engineer ROTC unit in the service and is the largest single source of commissions of engineer officers for the U.S. Army. For the past several years the school has had the largest enrollment of Engineer officers and non-commissioned officers selected for civil schooling at any civilian college or university.

Dr. Curtis Laws Wilson, 63, is a native of Baltimore Maryland. He graduated from the Montana School of Mines in 1920 and after some months as assistant research engineer for he

Anaconda Copper Mining Company, joined the faculty of the school in 1921 as an instructor in Metallurgy. He took graduate work at Columbia University and in 1928 received a Ph.D. degree from the University of Goettingen, Germany. He then returned to the Montana School of Mines as Professor of Metallurgical Engineering, and in 1941 accepted his present position at MSM. Dr. Wilson holds the honorary degree of Doctor of Engineering conferred by Washington University, St. Louis, Mo., and by the Montana School of Mines. He has been a member of the American Institute of Mining and Metallurgical Engineers since 1920 and has held many offices in that organization. He has served two, three-year terms on the Engineer's Council for Professional Development (ECPD) and the ECPD Education and Accreditation Committee. He is Chairman of the Governor's Science Advisory Committee for the State of Missouri.

The Bliss Medal, named in memory of General Tasker H. Bliss, Army Chief of Staff in World War I, is offered as an annual award to the engineering professor or instructor of a college or university at which a unit of the Reserve Officers' Training Corps of the Armed Forces is established, for the most outstanding contribution to military engineering education, or serving to promote recognition of the importance of technical leadership in the National Defense establishment.

Thirteen-Story Building in St. Louis Given To Missouri University by J. C. Penney

The University of Missouri has been given a 13-story J. C. Penney Company warehouse building at Fourteenth and Spruce in St. Louis, Missouri.

Dr. Elmer Ellis states that the building will be used initially for the university's extension program in the St. Louis area. Students taking extension courses may earn credits in the same manner as at the Columbia campus. Final plans for the use of the structure will not be made until university officials consult St. Louis community leaders, including those affiliated with educational institutions and programs.

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for expansion of educational programs in the building.

The building will be given a name, perhaps the J. C. Penney Center of the University of Missouri.

Mr. Penney is a native Missourian born at Hamilton, Mo. This is not his first gift to the University. In 1952, he gave the university a 770-acre tract near Columbia and a herd of 250 cattle valued at \$750,000 for a dairy breeding research center. In January 1953, he gave the university dairy company stock worth \$47,000 as an endowment to support the dairy herd. In June 1960, the J. C. Penney Company gave the university a \$27,000 grant for a national competition in journalism awards in fashion writing and women's pages.

'61 Mining Symposium Papers Are Published

The Missouri School of Mines and Metallurgy has announced the release of the two volume, 860 page publication, "Mine Research," which contains the complete presentations of the International Symposium on Mining Research held at MSM in 1961.

The books, edited by Dr. George B. Clark, Associate Director of Research Laboratories at MSM, former Chairman of the Mining Department, were released this winter.

The books are in 50 sections which are the technical papers of the latest advances in mining engineering and research as presented in the symposium. All the items in the book have been translated into this English language edition. World wide distribution has been made of the volumes. Originally at the Symposium all papers were presented in English, French and German.

The proceedings of the Symposium published by the Peramon Press Ltd., are priced at \$30.00 and the comment has been made that the two volumes will pay their way many times over to the mine operators, consultants and students who read and heed their contents. Geo Surveys, Washington D. C. has made the following comments.

"The volumes might be subtitled, 'How to Hold a Mine Together While Blasting it Apart.' The Editor, Dr. George B. Clark, describes them in more orthodox terms as studies in Dynamic and Static Rock Mechanics, and Explosives and Blasting.

"Mining and quarrying are among

the oldest of the human race. Fire and quenching were the earliest technological processes used to supplement manual labor in fracturing rocks and ores for easy handling. Gunpowder, the first significant innovation that modernized mining, found its first industrial application in German coal mines early in the 17th Century.

"Little progress was made with explosives until the middle of the 19th Century, starting with the development of guncotton in 1846, the pioneer manufacture of nitroglycerin in 1862, and the commercialization of dynamite by Alfred Bernhard Nobel in 1867. Nobel's experimental work ultimately produced the mixture of nitro-cotton and nitroglycerin known as blasting gelatin, the base of most blasting agents since 1876.

"What has been done with this base is a subject to which nearly a third of the symposium speakers devoted their attention. The comparatively recent use of ammonium nitrate and fuel oil mixtures for blasting is dealt with in detail, and the dual objectives of economy and efficiency, combined with maximum safety.

"Since the late Thirties, the use of industrial explosives in the United States has increased almost threefold, from 365 million pounds to 1,173 million. Twenty five years ago, one-sixth of the total was in the form of black blasting powder, which has since fallen into such disfavor that it now comprises a scant 0.13 per cent of the explosives used.

"Almost 80 percent of the production is used in mining and quarrying operations. And most of the remainder is employed in the closely allied construction industry and in seismological exploration. Only a little more than 1 per cent is needed for other purposes. Compared with nitrogen's use in fertilizers output for explosives is small, but capacity to increase production is ample for any foreseeable need.

"The Symposium Proceedings deal with every conceivable aspect of mining, from the stresses and strains in mine rocks to jet-piercing. But none receive as much detailed treatment as blasting. Yet only one author, Milo D. Nordyke of the University of California's Lawrence Radiation Laboratory, discusses the application of nuclear explosives to mining and cratering.

"Dr. Nordyke briefly mentions Russian use of nuclear explosives to excavate harbors, canals, and other depres-

sions for practical use and then proceeds to describe similar excavating for 'cratering' in the United States. The conference took place too soon for anything but a theoretical treatment of the detonation of nuclear devices beneath the surface, with such objectives as recovering oil for oil shale or generating power, as in New Mexico's Project Gnome.

"Participants in the Mining Research Symposium were single minded in their determination to blast mineral wealth from the earth efficiently and safely for the use of mankind. Unlike Nobel or the creators of the atomic bomb, who were troubled by the non-peaceful uses of their invention were put, the miners felt no qualms about waging violent warfare against the intractable crust of the earth.

"One suspects they know more about the peaceful uses of explosive energy than the diplomats who met in Geneva. Perhaps they should start planning a second Symposium devoted to nuclear energy as the new medium for mineral and power supply."

Prof. Robert Nau's Second Book Just Off the Press

Robert H. Nau, Professor of Electrical Engineering at MSM has written another textbook, "Alternating Currents and Network Analysis." It was released by the publisher, The Ronald Press, the first part of April and sent to interested university professors across the country.

Based on the author's wide professional and teaching experience, this book provides a detailed, lucid, interesting presentation of the modern concepts of alternating current theory and network analysis. The book is intended for both of the courses AC circuits and transient analysis by Laplace transforms as well as elementary network analysis.

It is the second of a series of books which the Ronald Press has published for Professor Nau. "Basic Electrical Engineering" (1958) has gained wide acceptance among the Major universities. Early reactions indicate that this book will be more popular because it is unique and timely.

The new text gives clear coverage of alternating waves, phasors and complex numbers in AC circuits, single-phase circuits, network theorems, Foster' and Cauers' network synthesis, duality,

polyphase circuits, symmetrical components, and Blondel's theorem as applied to polyphase systems all receive logical treatment.

Both the classical solution of integrodifferential equations and the Laplace transform method in linear transient analysis are covered. Equal emphasis is given to developing node-voltage and mesh-current methods in detail. The exponential function, or rotating phasor, is used to advantage throughout, yielding for instance, a simple derivation of Ohm's Law for AC circuits. Virtually all the important concepts, laws, rules and procedures are illustrated for further clarification in worked-out solutions of sample problems. A large number of thought provoking practice problems are presented at the end of each chapter.

Appendices provide helpful discussions of vector analysis and phasor algebra, and the use of trigonometric scales on the slide rule. An answer Manual is available. The preparation of the answers for the Answer Manual was an all summer job, there being some 4000 problems for student practice.

Prior to joining the MSM faculty, Professor Nau taught at a number of universities and also served as design and development engineer for Allis-Chalmers and Westinghouse. He has written many technical articles.

Weekly Colloquiums Held in EE Department

The Electrical Engineering Department has inaugurated weekly Colloquiums co-ordinated by Professor G. G. Skitek.

The speaker at the first Colloquium was Twyman Bowman of the Newport News Shipbuilding and Drydock Company. His talk covered Nuclear Reactor Instrumentation and Control. Mr. Bowman is a design supervisor in charge of reactor and propulsion power for sea-going ships and naval vessels.

The speaker at the second Colloquium was Wayne Hearater of the Boeing Airplane Company, Wichita, Kansas. His talk concerned the Ferrite Program at Boeing and its application to aeronautics. He was recently assigned to the Ferrite Program. He also inspected the research program on the campus that is sponsored by Boeing.

Professor Skitek is going to be employed at Boeing this summer as a member of their Antenna Staff Group.

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Over 100 Exhibits at Sixth Science Fair

The sixth annual South Central Missouri Science Fair was held on the MSM campus, April 5.

The annual Fair is sponsored by MSM and the Rolla Daily News and attracted more than 100 excellent exhibits that brought out the fine talent of many high school students.

The first grand prize was won by Everett J. Kastler, of Lebanon, Missouri. His earth science exhibit was a collection of bones and artifacts of early human life which he found on the Osage Fork of the Gasconade River. Young Kastler is a brother of George Kastler who won first prizes here in 1960 and 1961. He will be sent to the International Science Fair at Seattle, Washington.

The second prize went to his fellow student, Robert Cole of Lebanon, Mo., who constructed a rocket, mixed a solid propellant, fired it 1,000 feet in the air, and recovered the nose cone when it floated back to earth by parachute on his Lebanon farm.

Professor G. G. Skitek '43, Professor of Electrical Engineering, MSM, is Chairman of the Science Fair. His son, David, had an entry, a Wheatstone Bridge Computer, that won an award of \$10.00 and a plaque.

Noted English Geologist Gives Lectures at MSM

An internationally known scientist, Dr. Stuart O. Agrell, Lecturer and Curator of Museums and Mineralogy and Petrology of Cambridge University, Cambridge, England was a guest of the Department of Geology, at MSM, April 2 to 6.

Dr. Agrell is sponsored by the American Geological Institute and is touring various universities and colleges in the U. S. during a three-month period.

He presented a lecture in the Geology Department on igneous activity in Great Britain and a lecture to the Society of Sigma Xi on the electron probe microanalyser.

Dr. Agrell is a member of the Geological Society of London, the Mineralogical Society of London, and the Mineralogical Society of America. He is well known for his work with the X-Ray microanalyser and its application to

mineralogy, studies on igneous rocks, and the mineralogy of basic open-hearth slags.

At the completion of his stay at MSM he will lecture at the University of Chicago and the University of Minnesota.

Seminar Lectures on Weather Study Given

Dr. Richard A. Schluesener, of the American Meteorological Society presented two seminar lectures on the MSM campus March 9th. They were entitled "Meteorology Today" and "Weather Modifications in Regards to Severe Storms and Hailstorms." Dr. Schluesener is on the staff of the Department of Atmospheric Science of Colorado State University.

Dr. Paul Dean Proctor, Chairman of the Department of Geology, was in charge of the seminars.

Dr. Schluesener's lecture on "Meteorology Today" emphasized the opportunities available in this area of Earth-Science-Engineering for prospective graduate students from the Science and Engineering Fields. He was available for consultation while here.

President of Geophysics Society Speaks at MSM

Dr. Lawrence V. Faust, National President of the Society of Exploration Geophysics spoke at MSM, March 22. Dr. Faust is Geophysical Supervisor of Amarada Petroleum and he has served as physicist with the Sun Oil Company and the W. C. McBride Company and geophysicist with the Geophysical Research Corporation of Tulsa, Oklahoma. His specific interests include Applied Geophysics, Seismographs, Fine Structure of the K-Radiation of the Lighter Elements and Seismic Velocities.

The Society of Exploration Geophysics is an international organization devoted to geophysical exploration and research and is comprised of 7300 members in world-wide chapters. There are only five student chapters, including the MSM group.

On April 12, the student chapter was presented a lecture by the Reverend William Stauder, S. J. of St. Louis University, on "Earthquake Studies."

Many Staff Members Take Part in ASEE Section Meet

Dean Curtis L. Wilson delivered the principal banquet address at the Missouri-Arkansas Section of the American Society for Engineering Education held at Fayetteville, Arkansas, April 14th. The topic of Dr. Wilson's speech was "Service Is Our Business." The speech climaxed the 44 session meeting.

Sessions were held on Agriculture Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Engineering Drawing, Engineering Mechanics, Industrial Engineering, Mathematics, Mechanical Engineering, Materials and Physics.

Dean Wilson is Vice President for General Divisions and Committees of the national ASEE composed of 500 institutions and 10,000 members. Professor Roger E. Nolte, Chairman of the Department of Electrical Engineering, at MSM, is the Missouri-Arkansas Section's Second Vice Chairman.

Other members of MSM's faculty who participated in sessions were: Dr. H. P. Leighly, Jr. and Professor G. E. Lorey who spoke at the Materials sessions; Professor Bill L. Atchley spoke at the Engineering Mechanics sessions; and Dr. Mailand Strunk addressed the Chemical Engineering group. Dean Wilson participated in the panel forum session, "Commission for Engineering Education," and Professor R. E. Nolte presides at the general session.

Dr. Maxwell Gets Ph.D From Columbia University

Professor James C. Maxwell of the department of Geology was recently awarded a Ph.D in Geology from Columbia University, New York, N. Y.

Dr. Maxwell was a member of the Geology Department at Columbia from 1954 to 1956 and he joined the staff at MSM in the fall of 1956. His research at Columbia was on quantitative geomorphic analysis of mountain watersheds in southern California.

Before going to Columbia University, Dr. Maxwell had been employed by the Boston University Physical Research Laboratories. While there he was in charge of geophysical studies of North Alaskan permafrost area and he was also a part time instructor of airphoto-interpretation. He earned his M. S. degree in Geology, at Boston U., with specialization in geophysics. He received

his B. S. degree from Harvard in 1951.

At MSM he teaches courses in quantitative geomorphology and geophysics. An avid mountain climber, Dr. Maxwell is well known for his conquest with the Harvard Expedition of Yerupaja, a peak of 21,769 feet elevation, in South America.

Max Fisher Promoted By U. S. Gypsum Co.

Max Fisher '35, has been appointed works manager, effective April 1 for the United States Gypsum Company's Gypsum, Ohio plant.

Mr. Fisher was employed by USG in their St. Joseph plant after his graduation from MSM in 1935. He was transferred to the company's Kansas City plant in 1939 where he was in charge of maintenance. In 1941 Fisher entered the U. S. Army. He served until 1946, and attained the rank of Major. Upon release from service he was appointed paper mill superintendent for USG's Gypsum plant. In 1953 he became works manager at the Oakmont, Pennsylvania plant. He returned to the Gypsum plant in 1956 as General Operations Superintendent.

Fisher is married and lives at 634 Laurel Avenue, Port Clinton, Ohio. He is active in the U.S. Army Reserve and holds the rank of Colonel.

L. A. Boston Tops Class Of 109 at Ft. Belvoir

Second Lt. Lawrence A. Boston '60, completed the Engineer Officer Orientation Course at Fort Belvoir, Virginia, March 17, 1962, with a standing of number one in a class of 109.

While a cadet at MSM, Lt. Boston received a number of awards; in 1959, from the Association of United States Army, the Society of American Military Engineers and Sons of the American Revolution; in 1960, from the Rolla Chapter Reserve Officers Association and Sons of the American Revolution. He was designated a Distinguished Military Student, in October 1959, and a Distinguished Military Graduate in May 1960.

Lieutenant Boston graduated in May 1960 with a B. S. in Civil Engineering and was appointed a second Lt. U. S. Army Reserve at the same time. He received a delay in reporting for active

duty to pursue graduate study. He then entered the Engineer School at Fort Belvoir on January 17, 1962.

Alumni Section News

The annual meeting of MSM Alumni during the national convention of the American Institute of Mining and Metallurgical Engineers in New York in February was a grand occasion. The North New Jersey Section of the Alumni Association was host to the 69 Miners, their wives, guests and professors from the school in attendance.

Dean Curtis Wilson was present to deliver the main address of the evening and Ike Edwards extended the greetings of the Alumni Association with a few remarks.

The toastmaster for the meeting was H. F. Bottcher who presided capably.

Those present were: Dean and Mrs. Curtis L. Wilson; Professor A. Legsdin; Dr. Phil Leighly; Professor A. H. Larson; Dr. H. R. Hanley; Professor Carl R. Christiansen; M. T. Worley; Dr. A. W. Schlechten; Professor Ray E. Morgan and Dr. Daniel Eppelsheimer, all from the MSM campus. The Miners and their guests present were: Dave Cutler '42; M. H. Murray '34; Peter Stern '61; Mr. and Mrs. R. J. Lappee '22; Mr. and Mrs. Larry Spanier '50; Andy Cochran '41; R. S. Park '31; Karl H. Del Porte '50; Mr. and Mrs. Frank M. Almeter '53; Norbert Neumann '52; Allen G. Wehr '58; Joseph G. Sevick '49; H. F. Bottcher '41; H. H. Weiser '18; H. W. Flood '43 C. A. Beckman '51; E. R. Werder Mr. and Mrs. Colin G. Rose '40; '58; Mr. and Mrs. Irving Klaus '50; Mr. and Mrs. D. D. Montgomery '51; Mr. and Mrs. G. W. King '60; E. A. Slover '20; Joseph Varanouskas '52; Blake Caldwell '50; Herman Mansfield '47; Russell J. Judah '50; Charles H. Lambur '33; W. J. Ruprecht '50; J. L. March '52; Mr. and Mrs. Edward Skalka '50; F. J. Bunge '46; J. W. Nichols '50; M. P. Nackowski '49; Mr. and Mrs. A. J. Kiesler '40; Herb Kalish '43; W. T. Andreas '58; Mr. and Mrs. S. Megeff '50; Don A. Corben; Mrs. R. S. Dean; Mr. and Mrs. J. H. Jacobs '39; Mr. and Mrs. J. S. Le-

Grand '38; C. C. Whittelsey '22; Mr. and Mrs. William Varga '59; and J. Craig Ellis '38.

The committee in charge, J. Craig Ellis, Larry Spanier and H. F. Bottcher are to be commended for arranging this outstanding meeting at the Brass Rail Restaurant. It was one of our most successful meetings.

Southern California Section

The Southern California Section enjoyed a real St. Pat's celebration at the Redwood Restaurant in downtown Los Angeles on March 17.

At the start of the meeting Don Huseman '43, enlivened festivities by presenting Chairman Barney Nuell '21, and Mrs. Nuell, on the occasion of their forthcoming European holiday a number of gag gifts. About the only one that can be mentioned here was a small supply of corks, which properly used would provide added buoyancy in case of emergency while crossing the Atlantic.

Johnny Wilms '43, showed some colored slides of those present at the last meeting of the local Section at Homecoming time.

Dick Robinson '61 and Wayne Huff '51, were appointed as a Special Events Committee to look into the possibility of a one-day golf outing for local MSM golfers this summer.

A sad note was the announcement of the recent sudden passing of Paul Halasey '28. He was one of our most faithful attendants at meetings during the past fifteen years and, with his wife Ettie, was very well liked by everyone who knew him.

Among those present were: Mr. and Mrs. Robert Aufderheide '61; Ray Borchers '33; Mr. and Mrs. Elbert Coleman '50; Mr. and Mrs. Edward G. Elliott '51; Mr. and Mrs. William Fletcher '34; Mr. and Mrs. Tad Graves '50; Mrs. Eva H. Greene '11; Mr. and Mrs. Jim Gostin '44; Mr. and Mrs. Don Huseman '43; Mr. Charles F. Hollenbeck '61; Mr. and Mrs. Wayne Huff '51; Mr. and Mrs. Louis Kueker '41; Mr. and Mrs. Laurel Lynn '49; Mr. and Mrs. Gene Mertl '60; Mr. and Mrs. Barney Nuell '21; Dick Robinson '61; Eli Schwartz '50; Mr. and Mrs. Ken Sheckler '37; Mr. and Mrs. Floyd Smith '44; Mr. and Mrs. Hubert Smith '48; Mr. and Mrs. Jack Stadelhofer '49; Mr. and Mrs. Ken Steffen '56; Mr. and Mrs. J. B. Terrell '32;

Southern California Section Alumni Group



Mr. and Mrs. Fred Todd '48; Mr. and Mrs. Tom Weir '22; John O. Wilms '43, and his guest Gale Willoughby; and Mr. and Mrs. Gerald Wilson '51.

Arizona Section

The Arizona Section met the evening of March 17, for their annual occasion honoring St. Pat.

Dan Huffman '22, arranged for the alumni and their guests to gather at the Smoke House Restaurant for an enjoyable dinner. Ben Cody '11 arranged for a St. Pat's honoring ceremony and Milan Detweiler '11 was selected the representative of St. Patrick and dubbed all the alumni present as knights of St. Patrick.

Those present were Mr. and Mrs. Harry Grigsby '48; Mr. and Mrs. Milan Detweiler '11; Mr. and Mrs. Robert Pennington '50; Mr. and Mrs. Ben Cody '11; Mr. and Mrs. George Ude '16; Mr. and Mrs. Bill Horky '59; Mr. and Mrs. Fred Drester '43; Mr. and Mrs. Jack Wright '49; Mr. and Mrs. Charles '48; Mr. and Mrs. Dan Huffman '22; Mr. and Mrs. Gordon Napp '51; Mr. and Mrs. Len Schuler '49; Mr. and Mrs. John Harman '28; and Mr. and Mrs. Douglas Carthew '51.

Seattle Section

An attempt is being made to get the Alumni in the Seattle, Washington, area together this summer. Tentative plans are for the first week in July and we have asked Colonel Ernest L. Perry '40 to assist. He is with the U. S. Army Engineers District, 1519 South Alaskan Way, Seattle. Alumni in the area who are interested in the meeting are requested to contact him. According to alumni office records there are fifty to sixty MSM alumni in driving distance of Seattle. Possibly an alumni section can be organized.

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Arizona Section Honors St. Pat



Standing, left to right: Harry Grigsby '48, Section's Vice President; Bob Pennington '50, Section's Secretary-Treasurer. Seated, left to right: Mrs. Harry Grigsby, Milan Detweiler '11, Section's President; Mrs. Detweiler and Mrs. Pennington.



Milan Detweiler dubbing Ben Cody a Knight of St. Pat.

New Research Laboratories Now Have Million-Dollar Capability; Should Reach Ten-Million Yearly by 1970

Dean Curtis L. Wilson has announced projected plans for the Research Laboratories at MSM.

The Research Laboratories were established in October, 1961 with Dr. George B. Clark as Associate Director and their purpose is to coordinate sponsored research projects from industry and government to be carried out at MSM using the equipment and staff of the School with a good portion of the actual laboratory research work being done by graduate students. Much of this research is accomplished by students on the Ph.D. level with projects used as thesis topics.

Dr. Clark emphasizes the ability of the School to handle these projects. He points out that since 1954 the School's graduate student enrollment has grown steadily from 50 to 243 at the present. During the same period students enrolled on the Ph.D. level have increased from 8 to 43. He stressed that nationwide, the interest in graduate work in science and engineering is increasing rapidly while undergraduate interest is on a slight decline. This increase is due to the more specialized and advanced needs in science and engineering technology. MSM is one of the few schools in the nation whose enrollment in engineering and science on the graduate level has steadily increased in the past five years, while virtually the rest of the nation has experienced a decline in the same fields.

Dr. Clark predicts that the School's enrollment in engineering and science will reach about 6,000 by the year 1970; that graduate students will number 1000 or more with at least one-fourth of that number on the Ph.D. level.

Proportionately the number of faculty members with Ph.D.'s is growing. The number has doubled in the past eight years.

The Research Laboratories at MSM are already functioning. The School received \$305,000 in sponsored research projects for the 1961 fiscal year. The 1962 figures will probably reach from \$335,000 to \$350,000. Dr. Clark estimates that without additional staff the school can handle research efforts of the magnitude of \$1,000,000 per year. With this level of capability, Dr. Clark would propose to the Missouri Legislature to support research at MSM, an appropriation of \$1,000,000 toward a research

building and \$500,000 for basic equipment which is not available from the research sponsored agencies. If this is accomplished, the National Science Foundation will be approached and asked for \$1,000,000 matching grant toward the building and an additional \$100,000 toward equipment. This would provide a much higher level of operations. An annual appropriation from the State of \$200,000 would be necessary to provide a skeleton research staff both academic and non-academic, and on both research and technical levels.

Additional regular academic staff will be required to take care of increased student enrollment and the ratio of staff to students must be increased, particularly at the graduate level in larger departments. At present in some departments the ratio of staff to student is 1 to 40. At comparable universities with graduate programs in the midwest this ratio is as low as 1 to 12.

If this becomes a reality in the near future, by 1970 the level of research effort of sponsored research should reach approximately \$10,000,000 per year, which is not out of line with schools of comparable size.

Basically, the total investment by the State of \$18,000,000 toward this effort over a period of ten years, including building and staff increased, could readily provide returns from sponsored research at the rate of \$50,000,000 for the same period.

A vigorously supported and enlarged research program would be of great value to the students at MSM. It would permit Missouri students to do their graduate work in Missouri, and would create an atmosphere of research in which the undergraduates could study. Staff members who otherwise do not have an opportunity to do research would have that opportunity and could pass on the results of their research to their students.

The direct utilization of results of blasting research already performed at MSM, jointly sponsored by Monsanto Chemical Company, is saving a large mining company in Missouri well over one-quarter of a million dollars annually.

As stated in the article concerning the MSM Research Laboratories, there are 238 graduate students at MSM. The enrollment in each department is

as follows: Mechanical Engineering leads with 35 graduate students; Civil Engineering is second with 34 enrolled; the Physics Department has 33; Metallurgical Engineering 26; Geology Department 25; Electrical Engineering 22; Chemical Engineering also has 22; Mining Engineering 19; Ceramic Engineering 7; Applied Mathematics, Nuclear Engineering and Chemistry have three graduate students each.

Does Your Firm Have "Matching Gift" Plan?

You have probably heard of large Foundations and Corporations giving educational institutions thousands or millions of dollars with the stipulation the institution would match the fund with an equal amount.

Did you know that probably your company does the same on amounts all alumni can afford and normally contribute to Alumni Funds of their alma maters.

As of January 15, 1962, there were 153 companies or corporations participating in a "Matching Gift" program to help support higher education and the number is increasing. While individual companies may vary in the operating details of their program, all are essentially alike in that they match, usually dollar for dollar, the contributions of an alumnus-employee to his college or university.

The "Matching Gift" idea is as simple as 2 plus 2 equal 4. When you make your contribution to the MSM Alumni Fund you fill in a short form provided by your employer, who sends an equal amount to MSM.

Determine if your employer has this program. If so, secure the "Matching Gift" form, complete it and send it with your gift to the Alumni Fund. Normally there are no stipulations on the amount. The General Electric Company is possibly the best known for their Corporate Alumnus Program. The MSM Alumni employed by General Electric is the group that has used the Matching Gift plan most extensively with us and many of them neglect to submit the form with their Alumni Fund contribution.

The Matching Gifts are very worthwhile programs and there is no better way to double your money.

MSM Alumnus



Who will go to college—and where?
What will they find?
Who will teach them?
Will they graduate?
What will college have done for them?
Who will pay—and how?

the
COLLEGE
of
TOMORROW

“WILL MY CHILDREN GET INTO COLLEGE?”
The question haunts most parents. Here is the answer:

Yes . . .

- ▶ If they graduate from high school or preparatory school with something better than a “scrape-by” record.
- ▶ If they apply to the college or university that is right for them—aiming their sights (and their application forms) neither too high nor too low, but with an individuality and precision made possible by sound guidance both in school and in their home.
- ▶ If America’s colleges and universities can find the resources to carry out their plans to meet the huge demand for higher education that is certain to exist in this country for years to come.

The *ifs* surrounding your children and the college of tomorrow are matters of concern to everyone involved—to parents, to children, to alumni and alumnae (whatever their parental status), and to the nation’s educators. But resolving them is by no means being left to chance.

- ▶ The colleges know what they must do, if they are to

meet the needs of your children and others of your children’s generation. Their planning is well beyond the hand-wringing stage.

- ▶ The colleges know the likely cost of putting their plans into effect. They know this cost, both in money and in manpower, will be staggering. But most of them are already embarked upon finding the means of meeting it.
- ▶ Governments—local, state, and federal—are also deeply involved in educational planning and financing. Some parts of the country are far ahead of others. But no region is without its planners and its doers in this field.
- ▶ Public demand—not only for *expanded facilities* for higher education, but for *ever-better quality* in higher education—today is more insistent, more informed than ever before. With this growth of public sophistication about higher education, it is now clear to most intelligent parents that they themselves must take a leading role in guiding their children’s educational careers—and in making certain that the college of tomorrow will be ready, and good, for them.

This special report is in the form of a guide to parents. But we suspect that every reader, parent or not, will find the story of higher education’s future remarkably exciting.

Where will your children go to college?

LAST FALL, more than one million students enrolled in the freshman classes of U.S. colleges and universities. They came from wealthy families, middle-income families, poor families; from all races, here and abroad; from virtually every religious faith.

Over the next ten years, the number of students will grow enormously. Around 1964 the long-predicted "tidal wave" of young people, born in the postwar era and steadily moving upward through the nation's school systems ever since, will engulf the college campuses. By 1970 the population between the ages of 18 and 21—now around 10.2 million—will have grown to 14.6 million. College enrollment, now less than 4 million, will be at least 6.4 million, and perhaps far more.

The character of the student bodies will also have changed. More than half of the full-time students in the country's four-year colleges are already coming from lower-middle and low income groups. With expanding scholarship, loan, and self-help programs, this trend will continue strong. Non-white college students—who in the past decade have more than doubled in number and now compose about 7 per cent of the total enrollment—will continue to increase. (Non-whites formed 11.4 per cent of the U.S. population in the 1960 census.) The number of married students will grow. The average age of students will continue its recent rise.

The sheer force of this great wave of students is enough to take one's breath away. Against this force, what chance has American higher education to stand strong, to maintain standards, to improve quality, to keep sight of the individual student?

And, as part of the gigantic population swell, what chances have your children?

TO BOTH QUESTIONS, there are some encouraging answers. At the same time, the intelligent parent will not ignore some danger signals.

FINDING ROOM FOR EVERYBODY

NOT EVERY COLLEGE or university in the country is able to expand its student capacity. A number have concluded that, for one persuasive reason or another, they must maintain their present enrollments. They are not blind to the need of American higher education, in the aggregate, to accommodate more students in the years ahead; indeed,

they are keenly aware of it. But for reasons of finance, of faculty limitations, of space, of philosophy, of function, of geographic location—or of a combination of these and other restrictions—they cannot grow.

Many other institutions, public and private, *are* expanding their enrollment capacities and will continue to do so:

Private institutions: Currently, colleges and universities under independent auspices enroll around 1,500,000 students—some 40 per cent of the U.S. college population. In the future, many privately supported institutions will grow, but slowly in comparison with publicly supported institutions. Thus the total number of students at private institutions will rise, but their percentage of the total college population will become smaller.

Public institutions: State and locally supported colleges and universities are expanding their capacity steadily. In the years ahead they will carry by far the heaviest share of America's growing student population.

Despite their growth, many of them are already feeling the strain of the burden. Many state institutions, once committed to accepting any resident with a high-school diploma, are now imposing entrance requirements upon applicants. Others, required by law or long tradition not to turn away any high-school graduate who applies, resort in desperation to a high flunk-out rate in the freshman year in order to whittle down their student bodies to manageable size. In other states, coordinated systems of higher education are being devised to accommodate



students of differing aptitudes, high-school academic records, and career goals.

Two-year colleges: Growing at a faster rate than any other segment of U.S. higher education is a group comprising both public and independently supported institutions: the two-year, or "junior," colleges. Approximately 600 now exist in the United States, and experts estimate that an average of at least 20 per year will be established in the coming decade. More than 400 of the two-year institutions are community colleges, located within commuting distance of their students.

These colleges provide three main services: education for students who will later transfer to four-year colleges or universities (studies show they often do as well as those who go directly from high school to a four-year institution, and sometimes better), terminal training for vocations (more and more important as jobs require higher technical skills), and adult education and community cultural activities.

Evidence of their importance: One out of every four students beginning higher education today does so in a two-year college. By 1975, the ratio is likely to be one in two.

Branch campuses: To meet local demands for educational institutions, some state universities have opened branches in population centers distant from their main campuses. The trend is likely to continue. On occasion, however, the "branch campus" concept may conflict with the "community college" concept. In Ohio, for example, proponents of community two-year colleges are currently arguing that locally controlled community institutions are the best answer to the state's college-enrollment problems. But Ohio State University, Ohio University, and Miami University, which operate off-campus centers and whose leaders advocate the establishment of more, say that taxpayers get better value at lower cost from a university-run branch-campus system.

Coordinated systems: To meet both present and future demands for higher education, a number of states are attempting to coordinate their existing colleges and universities and to lay long-range plans for developing new ones.

California, a leader in such efforts, has a "master plan" involving not only the three main types of publicly supported institutions—the state university, state colleges, and locally sponsored two-year colleges. Private institutions voluntarily take part in the master planning, also.

With at least 661,000 students expected in their colleges and universities by 1975, Californians have worked out a plan under which every high-school graduate will be eligible to attend a junior college; the top one-third will be eligible for admission to a state college; and the top one-eighth will be eligible to go directly from high school to the University of California. The plan is flexible: students who prove themselves in a junior college, for



ILLUSTRATIONS BY PEGGY SOUCHECK

example, may transfer to the university. If past experience is a guide, many will—with notable academic success.

THUS IT IS LIKELY that somewhere in America's nearly 2,000 colleges and universities there will be room for your children.

How will you—and they—find it?

On the same day in late May of last year, 33,559 letters went out to young people who had applied for admission to the 1961 freshman class in one or more of the eight schools that compose the Ivy League. Of these letters, 20,248 were rejection notices.

Not all of the 20,248 had been misguided in applying. Admissions officers testify that the quality of the 1961 applicants was higher than ever before, that the competition was therefore intense, and that many applicants who might have been welcomed in other years had to be turned away in '61.

Even so, as in years past, a number of the applicants had been the victims of bad advice—from parents, teachers, and friends. Had they applied to other institutions, equally or better suited to their aptitudes and abilities, they would have been accepted gladly, avoiding the bitter disappointment, and the occasional tragedy, of a turndown.

The Ivy League experience can be, and is, repeated in dozens of other colleges and universities every spring. Yet, while some institutions are rejecting more applications than they can accept, others (perhaps better qualified to meet the rejected students' needs) still have openings in their freshman classes on registration day.

Educators, both in the colleges and in the secondary schools, are aware of the problems in "marrying" the right students to the right colleges. An intensive effort is under way to relieve them. In the future, you may expect:

► Better guidance by high-school counselors, based on

improved testing methods and on improved understanding of individual colleges and their offerings.

► Better definitions, by individual colleges and universities, of their philosophies of admission, their criteria for choosing students, their strengths in meeting the needs of certain types of student and their weakness in meeting the needs of others.

► Less parental pressure on their offspring to attend: the college or university that mother or father attended; the college or university that "everybody else's children" are attending; the college or university that enjoys the greatest sports-page prestige, the greatest financial-page prestige, or the greatest society-page prestige in town.

► More awareness that children are different from one another, that colleges are different from one another, and

that a happy match of children and institutions is within the reach of any parent (and student) who takes the pains to pursue it intelligently.

► Exploration—but probably, in the near future, no widespread adoption—of a central clearing-house for college applications, with students stating their choices of colleges in preferential order and colleges similarly listing their choices of students. The "clearing-house" would thereupon match students and institutions according to their preferences.

Despite the likely growth of these practices, applying to college may well continue to be part-chaos, part-panic, part-snobbishness for years to come. But with the aid of enlightened parents and educators, it will be less so, tomorrow, than it is today.

What will they find in college?

THE COLLEGE OF TOMORROW—the one your children will find when they get in—is likely to differ from the college you knew in *your* days as a student.

The students themselves will be different.

Curricula will be different.

Extracurricular activities will be different, in many respects, from what they were in your day.

The college year, as well as the college day, may be different.

Modes of study will be different.

With one or two conspicuous exceptions, the changes will be for the better. But for better or for worse, changes there will be.

THE NEW BREED OF STUDENTS

IT WILL COME AS NEWS to no parents that their children are different from themselves.

Academically, they are proving to be more serious than many of their predecessor generations. Too serious, some say. They enter college with an eye already set on the vocation they hope to pursue when they get out; college, to many, is simply the means to that end.

Many students plan to marry as soon as they can afford to, and some even before they can afford to. They want families, homes, a fair amount of leisure, good jobs, security. They dream not of a far-distant future; today's students are impatient to translate their dreams into reality, *soon*.

Like most generalizations, these should be qualified. There will be students who are quite far from the average, and this is as it should be. But with international tensions, recurrent war threats, military-service obligations, and talk of utter destruction of the race, the tendency is for the young to want to cram their lives full of living—with no unnecessary delays, please.

At the moment, there is little likelihood that the urge to pace one's life quickly and seriously will soon pass. This is the tempo the adult world has set for its young, and they will march doubletime to it.

Economic backgrounds of students will continue to grow more diverse. In recent years, thanks to scholarships, student loans, and the spectacular growth of public educational institutions, higher education has become less and less the exclusive province of the sons and daughters of the well-to-do. The spread of scholarship and loan programs geared to family income levels will intensify this trend, not only in low-tuition public colleges and universities but in high-tuition private institutions.

Students from foreign countries will flock to the U.S. for college education, barring a totally deteriorated international situation. Last year 53,107 foreign students, from 143 countries and political areas, were enrolled in 1,666 American colleges and universities—almost a 10 per cent increase over the year before. Growing numbers of African and Asian students accounted for the rise; the growth is virtually certain to continue. The presence of

such students on U.S. campuses—50 per cent of them are undergraduates—has already contributed to a greater international awareness on the part of American students. The influence is bound to grow.

Foreign study by U.S. students is increasing. In 1959-60, the most recent year reported, 15,306 were enrolled in 63 foreign countries, a 12 per cent increase in a period of 12 months. Students traveling abroad during summer vacations add impressive numbers to this total.

WHAT THEY'LL STUDY

STUDIES ARE in the course of change, and the changes will affect your children. A new toughness in academic standards will reflect the great amount of knowledge that must be imparted in the college years.

In the sciences, changes are particularly obvious. Every decade, writes Thomas Stelson of Carnegie Tech, 25 per cent of the curriculum must be abandoned, due to obsolescence. J. Robert Oppenheimer puts it another way: nearly everything now known in science, he says, "was not in any book when most of us went to school."

There will be differences in the **social sciences and humanities**, as well. Language instruction, now getting new emphasis, is an example. The use of language laboratories, with tape recordings and other mechanical devices, is already popular and will spread. Schools once preoccupied almost entirely with science and technology (e.g., colleges of engineering, leading medical schools) have now integrated social and humanistic studies into their curricula, and the trend will spread to other institutions.

International emphasis also will grow. The big push will be related to nations and regions outside the Western World. For the first time on a large scale, the involvement

of U.S. higher education will be truly global. This non-Western orientation, says one college president (who is seconded by many others) is "the new frontier in American higher education." For undergraduates, comparative studies in both the social sciences and the humanities are likely to be stressed. The hoped-for result: better understanding of the human experience in all cultures.

Mechanics of teaching will improve. "Teaching machines" will be used more and more, as educators assess their value and versatility (see *Who will teach them?* on the following pages). Closed-circuit television will carry a lecturer's voice and closeup views of his demonstrations to hundreds of students simultaneously. TV and microfilm will grow in usefulness as library tools, enabling institutions to duplicate, in small space, the resources of distant libraries and specialized rare-book collections. Tape recordings will put music and drama, performed by masters, on every campus. Computers, already becoming almost commonplace, will be used for more and more study and research purposes.

This availability of resources unheard-of in their parents' day will enable undergraduates to embark on extensive programs of independent study. Under careful faculty guidance, independent study will equip students with research ability, problem-solving techniques, and bibliographic savvy which should be of immense value to them throughout their lives. Many of yesterday's college graduates still don't know how to work creatively in unfamiliar intellectual territory: to pinpoint a problem, formulate intelligent questions, use a library, map a research project. There will be far fewer gaps of this sort in the training of tomorrow's students.

Great new stress on quality will be found at all institutions. Impending explosive growth of the college population has put the spotlight, for years, on handling large numbers of students; this has worried educators who feared that *quality* might be lost in a national preoccupation with *quantity*. Big institutions, particularly those with "growth situations," are now putting emphasis on maintaining high academic standards—and even raising them—while handling high enrollments, too. Honors programs, opportunities for undergraduate research, insistence on creditable scholastic achievement are symptomatic of the concern for academic excellence.

It's important to realize that this emphasis on quality will be found not only in four-year colleges and universities, but in two-year institutions, also. "Each [type of institution] shall strive for excellence in its sphere," is how the California master plan for higher education puts it; the same idea is pervading higher education at all levels throughout the nation.

WHERE'S THE FUN?

EXTRACURRICULAR ACTIVITY has been undergoing subtle changes at colleges and universities for years and is likely



to continue doing so. Student apathy toward some activities—political clubs, for example—is lessening. Toward other activities—the light, the frothy—apathy appears to be growing. There is less interest in spectator sports, more interest in participant sports that will be playable for most of a lifetime. Student newspapers, observes the dean of students at a college on the Eastern seaboard, no longer rant about band uniforms, closing hours for fraternity parties, and the need for bigger pep rallies. Sororities are disappearing from the campuses of women's colleges. "Fun festivals" are granted less time and importance by students; at one big midwestern university, for example, the events of May Week—formerly a five-day wingding involving floats, honorary-fraternity initiations, faculty-student baseball, and crowning of the May Queen—are now crammed into one half-day. In spite of the well-publicized antics of a relatively few roof-raisers (e.g., student rioters at several summer resorts last Labor Day, student revelers at Florida resorts during spring-vacation periods), a new seriousness is the keynote of most student activities.

"The faculty and administration are more resistant to these changes than the students are," jokes the president of a women's college in Pittsburgh. "The typical student congress wants to abolish the junior prom; the dean is the

one who feels nostalgic about it: 'That's the one event Mrs. Jones and I looked forward to each year.' "

A QUEST FOR ETHICAL VALUES

EDUCATION, more and more educators are saying, "should be much more than the mere retention of subject matter."

Here are three indications of how the thoughts of many educators are running:

"If [the student] enters college and pursues either an intellectual smörgåsbord, intellectual Teutonism, or the cash register," says a midwestern educator, "his education will have advanced very little, if at all. The odds are quite good that he will simply have exchanged one form of barbarism for another . . . Certainly there is no incompatibility between being well-informed and being stupid; such a condition makes the student a danger to himself and society."

Says another observer: "I prophesy that a more serious intention and mood will progressively characterize the campus . . . This means, most of all, commitment to the use of one's learning in fruitful, creative, and noble ways."

"The responsibility of the educated man," says the provost of a state university in New England, "is that he make articulate to himself and to others what he is willing to bet his life on."

Who will teach them?

KNOW THE QUALITY of the teaching that your children can look forward to, and you will know much about the effectiveness of the education they will receive. Teaching, tomorrow as in the past, is the heart of higher education.

It is no secret, by now, that college teaching has been on a plateau of crisis in the U.S. for some years. Much of the problem is traceable to money. Salaries paid to college teachers lagged far behind those paid elsewhere in jobs requiring similarly high talents. While real incomes, as well as dollar incomes, climbed for most other groups of Americans, the real incomes of college professors not merely stood still but dropped noticeably.

The financial pinch became so bad, for some teachers, that despite obvious devotion to their careers and obvious preference for this profession above all others, they had to leave for other jobs. Many bright young people, the sort who ordinarily would be attracted to teaching careers, took one look at the salary scales and decided to make their mark in another field.

Has the situation improved?

Will it be better when your children go to college?

Yes. At the moment, faculty salaries and fringe benefits (on the average) are rising. Since the rise started from an extremely disadvantageous level, however, no one is getting rich in the process. Indeed, on almost every campus the *real* income in every rank of the faculty is still considerably less than it once was. Nor have faculty salary scales, generally, caught up with the national scales in competitive areas such as business and government.

But the trend is encouraging. If it continues, the financial plight of teachers—and the serious threat to education which it has posed—should be substantially diminished by 1970.

None of this will happen automatically, of course. For evidence, check the appropriations for higher education made at your state legislature's most recent session. If yours was like a number of recent legislatures, it "economized"—and professorial salaries suffered. The support which has enabled many colleges to correct the most glaring salary deficiencies *must continue* until the problem is fully solved. After that, it is essential to make sure that

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the quality of our college teaching—a truly crucial element in fashioning the minds and attitudes of your children—is not jeopardized again by a failure to pay its practitioners adequately.

THERE ARE OTHER ANGLES to the question of attracting and retaining a good faculty besides money.

► The better the student body—the more challenging, the more lively its members—the more attractive is the job of teaching it. “Nothing is more certain to make teaching a dreadful task than the feeling that you are dealing with people who have no interest in what you are talking about,” says an experienced professor at a small college in the Northwest.

“An appalling number of the students I have known were bright, tested high on their College Boards, and still lacked flair and drive and persistence,” says another professor. “I have concluded that much of the difference between them and the students who are ‘alive’ must be traceable to their homes, their fathers, their mothers. Parents who themselves take the trouble to be interesting—and interested—seem to send us children who are interesting and interested.”

► The better the library and laboratory facilities, the more likely is a college to be able to recruit and keep a good faculty. Even small colleges, devoted strictly to undergraduate studies, are finding ways to provide their faculty members with opportunities to do independent reading and research. They find it pays in many ways: the faculty teaches better, is more alert to changes in the subject matter, is less likely to leave for other fields.

► The better the public-opinion climate toward teachers in a community, the more likely is a faculty to be strong. Professors may grumble among themselves about all the invitations they receive to speak to women’s clubs and

alumni groups (“When am I supposed to find the time to check my lecture notes?”), but they take heart from the high regard for their profession which such invitations from the community represent.

► Part-time consultant jobs are an attraction to good faculty members. (Conversely, one of the principal checkpoints for many industries seeking new plant sites is, What faculty talent is nearby?) Such jobs provide teachers both with additional income and with enormously useful opportunities to base their classroom teachings on practical, current experience.

BUT COLLEGES AND UNIVERSITIES must do more than hold on to their present good teachers and replace those who retire or resign. Over the next few years many institutions must add to their teaching staffs at a prodigious rate, in order to handle the vastly larger numbers of students who are already forming lines in the admissions office.

The ability to be a college teacher is not a skill that can be acquired overnight, or in a year or two. A Ph.D. degree takes at least four years to get, after one has earned his bachelor’s degree. More often it takes six or seven years, and sometimes 10 to 15.

In every ten-year period since the turn of the century, as Bernard Berelson of Columbia University has pointed out, the production of doctorates in the U.S. has doubled. But only about 60 per cent of Ph.D.’s today go into academic life, compared with about 80 per cent at the turn of the century. And only 20 per cent wind up teaching undergraduates in liberal arts colleges.

Holders of lower degrees, therefore, will occupy many teaching positions on tomorrow’s college faculties.

This is not necessarily bad. A teacher’s ability is not always defined by the number of degrees he is entitled to

write after his name. Indeed, said the graduate dean of one great university several years ago, it is high time that "universities have the courage . . . to select men very largely on the quality of work they have done and soft-pedal this matter of degrees."

IN SUMMARY, salaries for teachers will be better, larger numbers of able young people will be attracted into the field (but their preparation will take time), and fewer able people will be lured away. In expanding their faculties, some colleges and universities will accept more holders of bachelor's and master's degrees than they have been accustomed to, but this may force them to focus attention on ability rather than to rely as unquestioningly as in the past on the magic of a doctor's degree.

Meanwhile, other developments provide grounds for cautious optimism about the effectiveness of the teaching your children will receive.

THE TV SCREEN

TELEVISION, not long ago found only in the lounges of dormitories and student unions, is now an accepted teaching tool on many campuses. Its use will grow. "To report on the use of television in teaching," says Arthur S. Adams, past president of the American Council on Education, "is like trying to catch a galloping horse."

For teaching closeup work in dentistry, surgery, and laboratory sciences, closed-circuit TV is unexcelled. The number of students who can gaze into a patient's gaping mouth while a teacher demonstrates how to fill a cavity is limited; when their place is taken by a TV camera and the students cluster around TV screens, scores can watch—and see more, too.

Television, at large schools, has the additional virtue of extending the effectiveness of a single teacher. Instead of giving the same lecture (replete with the same jokes) three times to students filling the campus's largest hall, a professor can now give it once—and be seen in as many auditoriums and classrooms as are needed to accommodate all registrants in his course. Both the professor and the jokes are fresher, as a result.

How effective is TV? Some carefully controlled studies show that students taught from the fluorescent screen do as well in some types of course (e.g., lectures) as those sitting in the teacher's presence, and sometimes better. But TV standardizes instruction to a degree that is not always desirable. And, reports Henry H. Cassirer of UNESCO, who has analyzed television teaching in the U.S., Canada, Great Britain, France, Italy, Russia, and Japan, students do not want to lose contact with their teachers. They want to be able to ask questions as instruction progresses. Mr. Cassirer found effective, on the other hand, the combination of a central TV lecturer with classroom instructors who prepare students for the lecture and then discuss it with them afterward.

TEACHING MACHINES

HOLDING GREAT PROMISE for the improvement of instruction at all levels of schooling, including college, are programs of learning presented through mechanical self-teaching devices, popularly called "teaching machines."

The most widely used machine, invented by Professor Frederick Skinner of Harvard, is a box-like device with



three windows in its top. When the student turns a crank, an item of information, along with a question about it, appears in the lefthand window (A). The student writes his answer to the question on a paper strip exposed in another window (B). The student turns the crank again—and the correct answer appears at window A.

Simultaneously, this action moves the student's answer under a transparent shield covering window C, so that the student can see, but not change, what he has written. If the answer is correct, the student turns another crank, causing the tape to be notched; the machine will by-pass this item when the student goes through the series of questions again. Questions are arranged so that each item builds on previous information the machine has given.

Such self-teaching devices have these advantages:

- ▶ Each student can proceed at his own pace, whereas classroom lectures must be paced to the "average" student—too fast for some, too slow for others. "With a machine," comments a University of Rochester psychologist, "the brighter student could go ahead at a very fast pace."
- ▶ The machine makes examinations and testing a rewarding and learning experience, rather than a punishment. If his answer is correct, the student is rewarded with that knowledge instantly; this reinforces his memory of the right information. If the answer is incorrect, the machine provides the correct answer immediately. In large classes, no teacher can provide such frequent—and individual—rewards and immediate corrections.
- ▶ The machine smooths the ups and downs in the learn-

ing process by removing some external sources of anxieties, such as fear of falling behind.

► If a student is having difficulty with a subject, the teacher can check back over his machine tapes and find the exact point at which the student began to go wrong. Correction of the difficulty can be made with precision, not gropingly as is usually necessary in machineless classes.

Not only do the machines give promise of accelerating the learning process; they introduce an individuality to

learning which has previously been unknown. "Where television holds the danger of standardized instruction," said John W. Gardner, president of the Carnegie Corporation of New York, in a report to then-President Eisenhower, "the self-teaching device can individualize instruction in ways not now possible—and the student is always an active participant." Teaching machines are being tested, and used, on a number of college campuses and seem certain to figure prominently in the teaching of your children.

Will they graduate?

SAID AN ADMINISTRATOR at a university in the South not long ago (he was the director of admissions, no less, and he spoke not entirely in jest):

"I'm happy I went to college back when I did, instead of now. Today, the admissions office probably wouldn't let me in. If they did, I doubt that I'd last more than a semester or two."

Getting into college is a problem, nowadays. Staying there, once in, can be even more difficult.

Here are some of the principal reasons why many students fail to finish:

Academic failure: For one reason or another—not always connected with a lack of aptitude or potential scholastic ability—many students fail to make the grade. Low entrance requirements, permitting students to enter college without sufficient aptitude or previous preparation, also play a big part. In schools where only a high-school diploma is required for admission, drop-outs and failures during the first two years average (nationally) between 60 and 70 per cent. Normally selective admissions procedures usually cut this rate down to between 20 and 40 per cent. Where admissions are based on keen competition, the attrition rate is 10 per cent or less.

FUTURE OUTLOOK: High schools are tightening their academic standards, insisting upon greater effort by students, and teaching the techniques of note-taking, effective studying, and library use. Such measures will inevitably better the chances of students when they reach college. Better testing and counseling programs should help, by guiding less-able students away from institutions where they'll be beyond their depth and into institutions better suited to their abilities and needs. Growing popular acceptance of the two-year college concept will also help, as will the adoption of increasingly selective admissions procedures by four-year colleges and universities.

Parents can help by encouraging activities designed to find the right academic spot for their children; by recog-

nizing their children's strengths and limitations; by creating an atmosphere in which children will be encouraged to read, to study, to develop curiosity, to accept new ideas.

Poor motivation: Students drop out of college "not only because they lack ability but because they do not have the motivation for serious study," say persons who have studied the attrition problem. This aspect of students' failure to finish college is attracting attention from educators and administrators both in colleges and in secondary schools.

FUTURE OUTLOOK: Extensive research is under way to determine whether motivation can be measured. The "Personal Values Inventory," developed by scholars at Colgate University, is one promising yardstick, providing information about a student's long-range persistence, personal self-control, and deliberateness (as opposed to rashness). Many colleges and universities are participating in the study, in an effort to establish the efficacy of the tests. Thus far, report the Colgate researchers, "the tests have successfully differentiated between over- and under-achievers in every college included in the sample."

Parents can help by their own attitudes toward scholastic achievement and by encouraging their children to



develop independence from adults. "This, coupled with the reflected image that a person acquires from his parents—an image relating to persistence and other traits and values—may have much to do with his orientation toward academic success," the Colgate investigators say.

Money: Most parents think they know the cost of sending a child to college. But, a recent survey shows, relatively few of them actually do. The average parent, the survey disclosed, underestimates college costs by roughly 40 per cent. In such a situation, parental savings for college purposes often run out quickly—and, unless the student can fill the gap with scholarship aid, a loan, or earnings from part-time employment, he drops out.

FUTURE OUTLOOK: A surprisingly high proportion of financial dropouts are children of middle-income, not low-income, families. If parents would inform themselves fully about current college costs—and reinform themselves periodically, since prices tend to go up—a substantial part of this problem could be solved in the future by realistic family savings programs.

Other probabilities: growing federal and state (as well as private) scholarship programs; growing private and governmental loan programs.

Jobs: Some students, anxious to strike out on their own, are lured from college by jobs requiring little skill but offering attractive starting salaries. Many such students may have hesitated about going to college in the first place and drop out at the first opportunity.

FUTURE OUTLOOK: The lure of jobs will always tempt some students, but awareness of the value of completing college—for lifelong financial gain, if for no other reason—is increasing.

Emotional problems: Some students find themselves unable to adjust to college life and drop out as a result. Often such problems begin when a student chooses a college that's "wrong" for him. It may accord him too much or too little freedom; its pace may be too swift for him, resulting in frustration, or too slow, resulting in boredom; it may be "too social" or "not social enough."

FUTURE OUTLOOK: With expanding and more skillful guidance counseling and psychological testing, more students can expect to be steered to the "right" college environment. This won't entirely eliminate the emotional-maladjustment problem, but it should ease it substantially.

Marriage: Many students marry while still in college but fully expect to continue their education. A number do go on (sometimes wives withdraw from college to earn money to pay their husbands' educational expenses). Others have children before graduating and must drop out of college in order to support their family.

FUTURE OUTLOOK: The trend toward early marriage shows no signs of abating. Large numbers of parents openly or tacitly encourage children to go steady and to marry at an early age. More and more colleges are provid-



ing living quarters for married undergraduate students. Some even have day-care facilities for students' young children. Attitudes and customs in their "peer groups" will continue to influence young people on the question of marrying early; in some groups, it's frowned upon; in others, it's the thing to do.

COLLEGES AND UNIVERSITIES are deeply interested in finding solutions to the attrition problem in all its aspects. Today, at many institutions, enrollment resembles a pyramid: the freshman class, at the bottom, is big; the sophomore class is smaller, the junior class still smaller, and the senior class a mere fraction of the freshman group. Such pyramids are wasteful, expensive, inefficient. They represent hundreds, sometimes thousands, of personal tragedies: young people who didn't make it.

The goal of the colleges is to change the pyramid into a straight-sided figure, with as many people graduating as enter the freshman class. In the college of tomorrow, the sides will not yet have attained the perfect vertical, but—as a result of improved placement, admissions, and academic practices—they should slope considerably less than they do now.

What will college have done for them?

IF YOUR CHILDREN are like about 33 per cent of today's college graduates, they will not end their formal education when they get their bachelor's degrees. On they'll go—to graduate school, to a professional school, or to an advanced technological institution.

There are good reasons for their continuing:

- ▶ In four years, nowadays, one can only begin to scratch the surface of the body of knowledge in his specialty. To teach, or to hold down a high-ranking job in industry or government, graduate study is becoming more and more useful and necessary.
- ▶ Automation, in addition to eliminating jobs in unskilled categories, will have an increasingly strong effect on persons holding jobs in middle management and middle technology. Competition for survival will be intense. Many students will decide that one way of competing advantageously is to take as much formal education beyond the baccalaureate as they can get.
- ▶ One way in which women can compete successfully with men for high-level positions is to be equipped with a graduate degree when they enter the job market.
- ▶ Students heading for school-teaching careers will increasingly be urged to concentrate on substantive studies in their undergraduate years and to take methodology courses in a postgraduate schooling period. The same will be true in many other fields.
- ▶ Shortages are developing in some professions, *e.g.*, medicine. Intensive efforts will be made to woo more top undergraduates into professional schools, and opportunities in short-supplied professions will become increasingly attractive.
- ▶ "Skills," predicts a Presidential committee, "may become obsolete in our fast-moving industrial society. Sound education provides a basis for adjustment to constant and abrupt change—a base on which new skills may be built." The moral will not be lost on tomorrow's students.

In addition to having such practical motives, tomorrow's students will be influenced by a growing tendency to expose them to graduate-level work while they are still undergraduates. Independent study will give them a taste of the intellectual satisfaction to be derived from learning on their own. Graduate-style seminars, with their stimulating give-and-take of fact and opinion, will exert a strong

appeal. As a result, for able students the distinction between undergraduate and graduate work will become blurred and meaningless. Instead of arbitrary insistence upon learning in two-year or four-year units, there will be more attention paid to the length of time a student requires—and desires—to immerse himself in the specialty that interests him.

AND EVEN with graduate or professional study, education is not likely to end for your children.

Administrators in the field of adult education—or, more accurately, "continuing education"—expect that within a decade the number of students under their wing will exceed the number of undergraduates in American colleges and universities.

"Continuing education," says Paul A. McGhee, dean of New York University's Division of General Education (where annually some 17,000 persons enroll in around 1,200 non-credit courses) "is primarily the education of the already educated." The more education you have, the more you are likely to want. Since more and more people will go to college, it follows that more and more people will seek knowledge throughout their lives.

We are, say adult-education leaders, departing from the old notion that one works to live. In this day of automation and urbanization, a new concept is emerging: "time," not "work," is the paramount factor in people's lives. Leisure takes on a new meaning: along with golf, boating,



and partying, it now includes study. And he who forsakes gardening for studying is less and less likely to be regarded as the neighborhood oddball.

Certain to vanish are the last vestiges of the stigma that has long attached to "night school." Although the concept of night school as a place for educating only the illiterate has changed, many who have studied at night—either for credit or for fun and intellectual stimulation—have felt out of step, somehow. But such views are obsolescent and soon will be obsolete.

Thus far, American colleges and universities—with notable exceptions—have not led the way in providing continuing education for their alumni. Most alumni have been forced to rely on local boards of education and other civic and social groups to provide lectures, classes, discussion groups. These have been inadequate, and institutions of higher education can be expected to assume unprecedented roles in the continuing-education field.

Alumni and alumnae are certain to demand that they take such leadership. Wrote Clarence B. Randall in *The New York Times Magazine*: "At institution after institution there has come into being an organized and articulate group of devoted graduates who earnestly believe . . . that the college still has much to offer them."

When colleges and universities respond on a large scale to the growing demand for continuing education, the variety of courses is likely to be enormous. Already, in institutions where continuing education is an accepted role, the range is from space technology to existentialism to funeral direction. (When the University of California offered non-credit courses in the first-named subject to engineers and physicists, the combined enrollment reached 4,643.) "From the world of astronauts, to the highest of ivory towers, to six feet under," is how one wag has described the phenomenon.

SOME OTHER LIKELY FEATURES of your children, after they are graduated from tomorrow's colleges:

► They'll have considerably more political sophistication than did the average person who marched up to get a diploma in their parents' day. Political parties now have active student groups on many campuses and publish material beamed specifically at undergraduates. Student-government organizations are developing sophisticated procedures. Nonpartisan as well as partisan groups, operating on a national scale, are fanning student interest in current political affairs.

► They'll have an international orientation that many of their parents lacked when they left the campuses. The presence of more foreign students in their classes, the emphasis on courses dealing with global affairs, the front pages of their daily newspapers will all contribute to this change. They will find their international outlook useful: a recent government report predicts that "25 years from now, one college graduate in four will find at least part of

his career abroad in such places as Rio de Janeiro, Dakar, Beirut, Leopoldville, Sydney, Melbourne, or Toronto."

► They'll have an awareness of unanswered questions, to an extent that their parents probably did not have. Principles that once were regarded (and taught) as incontrovertible fact are now regarded (and taught) as subject to constant alteration, thanks to the frequent toppling of long-held ideas in today's explosive sciences and technologies. Says one observer: "My student generation, if it looked at the world, didn't know it was 'loaded'. Today's student has no such ignorance."

► They'll possess a broad-based liberal education, but in their jobs many of them are likely to specialize more narrowly than did their elders. "It is a rare bird today who knows all about contemporary physics and all about modern mathematics," said one of the world's most distinguished scientists not long ago, "and if he exists, I



haven't found him. Because of the rapid growth of science it has become impossible for one man to master any large part of it; therefore, we have the necessity of specialization."

► Your daughters are likely to be impatient with the prospect of devoting their lives solely to unskilled labor as housewives. Not only will more of tomorrow's women graduates embark upon careers when they receive their diplomas, but more of them will keep up their contacts with vocational interests even during their period of child-rearing. And even before the children are grown, more of them will return to the working force, either as paid employees or as highly skilled volunteers.

DEPENDING UPON THEIR OWN OUTLOOK, parents of tomorrow's graduates will find some of the prospects good, some of them deplorable. In essence, however, the likely trends of tomorrow are only continuations of trends that are clearly established today, and moving inexorably.

Who will pay—and how?

WILL YOU BE ABLE to afford a college education for your children? The tuition? The travel expense? The room rent? The board?

In addition:

Will you be able to pay considerably more than is written on the price-tags for these items?

The stark truth is that you—or somebody—must pay, if your children are to go to college and get an education as good as the education you received.

HERE is where colleges and universities get their money:

From taxes paid to governments at all levels: city, state, and federal. Governments *now* appropriate an estimated \$2.9 billion in support of higher education every year. *By 1970* government support will have grown to roughly \$4 billion.

From private gifts and grants. These *now* provide nearly \$1 billion annually. *By 1970* they must provide about \$2.019 billion. Here is where this money is likely to come from:

Alumni	\$ 505,000,000 (25%)
Non-alumni individuals	505,000,000 (25%)
Business corporations	505,000,000 (25%)
Foundations	262,000,000 (13%)
Religious denominations	242,000,000 (12%)
Total voluntary support, 1970 ..	\$2,019,000,000

From endowment earnings. These *now* provide around \$210 million a year. *By 1970* endowment will produce around \$333 million a year.

From tuition and fees. These *now* provide around \$1.2 billion (about 21 per cent of college and university funds). *By 1970* they must produce about \$2.1 billion (about 23.5 per cent of all funds).

From other sources. Miscellaneous income *now* provides around \$410 million annually. *By 1970* the figure is expected to be around \$585 million.

These estimates, made by the independent Council for Financial Aid to Education*, are based on the "best available" estimates of the expected growth in enrollment in America's colleges and universities: from slightly less than 4 million this year to about 6.4 million in the

*To whose research staff the editors are indebted for most of the financial projections cited in this section of their report. CFAE statisticians, using and comparing three methods of projection, built their estimates on available hard figures and carefully reasoned assumptions about the future.

academic year 1969-70. The total income that the colleges and universities will require in 1970 to handle this enrollment will be on the order of \$9 billion—compared with the \$5.6 billion that they received and spent in 1959-60.

WHO PAYS?

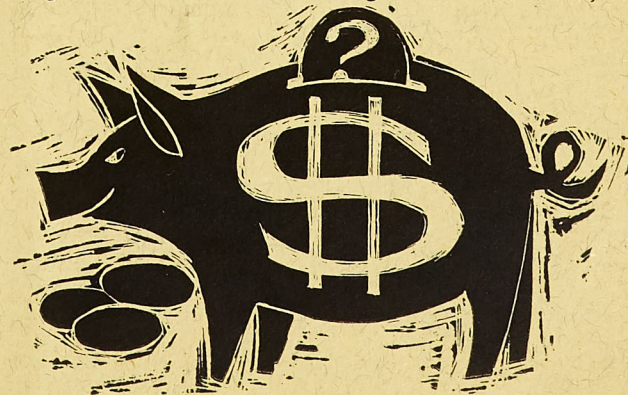
VIRTUALLY EVERY SOURCE of funds, of course—however it is labeled—boils down to you. Some of the money, you pay directly: tuition, fees, gifts to the colleges and universities that you support. Other funds pass, in a sense, through channels—your church, the several levels of government to which you pay taxes, the business corporations with which you deal or in which you own stock. But, in the last analysis, individual persons are the source of them all.

Hence, if you wished to reduce your support of higher education, you could do so. Conversely (as is presumably the case with most enlightened parents and with most college alumni and alumnae), if you wished to increase it, you could do that, also—with your vote and your checkbook. As is clearly evident in the figures above, it is essential that you substantially increase both your direct and your indirect support of higher education between now and 1970, if tomorrow's colleges and universities are to give your children the education that you would wish for them.

THE MONEY YOU'LL NEED

SINCE IT REQUIRES long-range planning and long-range voluntary saving, for most families the most difficult part of financing their children's education is paying the direct costs: tuition, fees, room, board, travel expenses.

These costs vary widely from institution to institution. At government-subsidized colleges and universities, for



example, tuition fees for state residents may be non-existent or quite low. At community colleges, located within commuting distance of their students' homes, room and board expenses may consist only of what parents are already paying for housing and food. At independent (non-governmental) colleges and universities, the costs may be considerably higher.

In 1960-61, here is what the *average* male student spent at the *average* institution of higher education, including junior colleges, in each of the two categories (public and private):

	Public Institutions	Private Institutions
Tuition	\$179	\$ 676
Board	383	404
Room	187	216
Total	\$749	\$1,296

These, of course, are "hard-core" costs only, representing only part of the expense. The *average* annual bill for an unmarried student is around \$1,550. This conservative figure, provided by the Survey Research Center at the University of Michigan for the U.S. Office of Education, does not include such items as clothing. And, as we have attempted to stress by italicizing the word "*average*" wherever it appears, the bill can be considerably higher, as well as somewhat lower. At a private college for women (which is likely to get relatively little money from other sources and must therefore depend heavily upon tuition income) the hard-core costs alone may now run as high as \$2,600 per year.

Every parent must remember that costs will inevitably rise, not fall, in the years ahead. In 1970, according to one estimate, the cost of four years at the *average* state university will be \$5,800; at the *average* private college, \$11,684.

HOW TO AFFORD IT?

SUCH SUMS represent a healthy part of most families' resources. Hard-core costs alone equal, at public institutions, about 13 per cent of the average American family's annual income; at private institutions, about 23 per cent of average annual income.

How do families afford it? How can *you* afford it?

Here is how the typical family pays the current average bill of \$1,550 per year:

Parents contribute	\$950
Scholarships defray	130
The student earns	360
Other sources yield	110

Nearly half of all parents begin saving money for their children's college education well before their children are ready to enroll. Fourteen per cent report that they borrow money to help meet college costs. Some 27 per cent take on extra work, to earn more money. One in five mothers does additional work in order to help out.

Financing the education of one's children is obviously,

for many families, a scramble—a piecing-together of many sources of funds.

Is such scrambling necessary? The question can be answered only on a family-by-family basis. But these generalizations do seem valid:

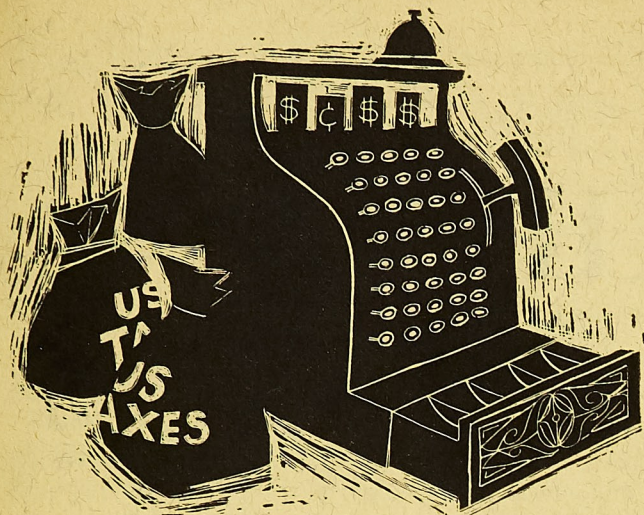
► Many parents *think* they are putting aside enough money to pay most of the costs of sending their children to college. But most parents seriously underestimate what these costs will be. The only solution: Keep posted, by checking college costs periodically. What was true of college costs yesterday (and even of the figures in this report, as nearly current as they are) is not necessarily true of college costs today. It will be even less true of college costs tomorrow.

► If they knew what college costs really were, and what they are likely to be in the years when their children are likely to enroll, many parents *could* save enough money. They would start saving earlier and more persistently. They would gear their family budgets to the need. They would revise their savings programs from time to time, as they obtained new information about cost changes.

► Many parents count on scholarships to pay their children's way. For upper-middle-income families, this reliance can be disastrous. By far the greatest number of scholarships are now awarded on the basis of financial need, largely determined by level of family income. (Colleges and other scholarship sources are seriously concerned about the fact, indicated by several studies, that at least 100,000 of the country's high-school graduates each year are unable to attend college, primarily for financial reasons.) Upper-middle-income families are among those most seriously affected by the sudden realization that they have failed to save enough for their children's education.

► Loan programs make sense. Since going to college sometimes costs as much as buying a house (which most families finance through long-term borrowing), long-term





repayment of college costs, by students or their parents, strikes many people as highly logical.

Loans can be obtained from government and from private bankers. Just last spring, the most ambitious private loan program yet developed was put into operation: United Student Aid Funds, Inc., is the backer, with headquarters at 420 Lexington Avenue, New York 17, N.Y. It is raising sufficient capital to underwrite a reserve fund to endorse \$500 million worth of long-term, low-interest bank loans to students. Affiliated state committees, established by citizen groups, will act as the direct contact agencies for students.

In the 1957-58 academic year, loans for educational purposes totaled only \$115 million. Last year they totaled an estimated \$430 million. By comparison, scholarships from all sources last year amounted to only \$160 million.

IS THE COST TOO HIGH?

HIGH AS THEY SEEM, tuition rates are bargains, in this sense: They do not begin to pay the cost of providing a college education.

On the national average, colleges and universities must receive between three and four additional dollars for every one dollar that they collect from students, in order to provide their services. At public institutions, the ratio of non-tuition money to tuition money is greater than the average: the states typically spend more than \$700 for every student enrolled.

Even the gross cost of higher education is low, when put in perspective. In terms of America's total production of goods and services, the proportion of the gross national product spent for higher education is only 1.3 per cent, according to government statistics.

To put salaries and physical plant on a sound footing, colleges must spend more money, in relation to the gross national product, than they have been spending in the past. Before they can spend it, they must get it. From what sources?

Using the current and the 1970 figures that were cited earlier, tuition will probably have to carry, on the average, about 2 per cent more of the share of total educational costs than it now carries. Governmental support, although increasing by about a billion dollars, will actually carry about 7 per cent less of the total cost than it now does. Endowment income's share will remain about the same as at present. Revenues in the category of "other sources" can be expected to decline by about .8 per cent, in terms of their share of the total load. Private gifts and grants—from alumni, non-alumni individuals, businesses and unions, philanthropic foundations, and religious denominations—must carry about 6 per cent more of the total cost in 1970, if higher education is not to founder.

Alumnae and alumni, to whom colleges and universities must look for an estimated 25 per cent (\$505 million) of such gifts: please note.

CAN COLLEGES BE MORE EFFICIENT?

INDUSTRIAL COST ACCOUNTANTS—and, not infrequently, other business men—sometimes tear their hair over the "inefficiencies" they see in higher education. Physical facilities—classrooms, for example—are in use for only part of the 24-hour day, and sometimes they stand idle for three months in summertime. Teachers "work"—i.e., actually stand in the front of their classes—for only a fraction of industry's 40-hour week. (The hours devoted to preparation and research, without which a teacher would soon become a purveyor of dangerously outdated misinformation, don't show on formal teaching schedules and are thus sometimes overlooked by persons making a judgment in terms of business efficiency.) Some courses are given for only a handful of students. (What a waste of space and personnel, some cost analysts say.)

A few of these "inefficiencies" are capable of being curbed, at least partially. The use of physical facilities is being increased at some institutions through the provision of night lectures and lab courses. Summer schools and year-round schedules are raising the rate of plant utilization. But not all schools are so situated that they can avail themselves of even these economies.

The president of the Rochester (N.Y.) Chamber of Commerce observed not long ago:

"The heart of the matter is simply this: To a great extent, the very thing which is often referred to as the 'inefficient' or 'unbusinesslike' phase of a liberal arts college's operation is really but an accurate reflection of its true essential nature . . . [American business and industry] have to understand that much of liberal education which is urgently worth saving cannot be justified on a dollars-and-cents basis."

In short, although educators have as much of an obligation as anyone else to use money wisely, you just can't run a college like a railroad. Your children would be cheated, if anybody tried.

In sum:

WHEN YOUR CHILDREN go to college, what will college be like? Their college will, in short, be ready for them. Its teaching staff will be competent and complete. Its courses will be good and, as you would wish them to be, demanding of the best talents that your children possess. Its physical facilities will surpass those you knew in your college years. The opportunities it will offer your children will be limitless.

If.

That is the important word.

Between now and 1970 (a date that the editors arbitrarily selected for most of their projections, although the date for your children may come sooner or it may come later), much must be done to build the strength of America's colleges and universities. For, between now and 1970, they will be carrying an increasingly heavy load in behalf of the nation.

They will need more money—considerably more than is now available to them—and they will need to obtain much of it from you.

They will need, as always, the understanding by thoughtful portions of the citizenry (particularly their own alumni and alumnae) of the subtleties, the sensitiveness, the fine balances of freedom and responsibility without which the mechanism of higher education cannot function.

They will need, if they are to be of highest service to your children, the best aid which you are capable of giving as a parent: the preparation of your children to value things of the mind, to know the joy of meeting and overcoming obstacles, and to develop their own personal independence.

Your children are members of the most promising American generation. (Every new generation, properly, is so regarded.) To help them realize their promise is a job to which the colleges and universities are dedicated. It is their supreme function. It is the job to which you, as parent, are also dedicated. It is *your* supreme function.

With your efforts and the efforts of the college of tomorrow, your children's future can be brilliant. If.



“The College of Tomorrow”

The report on this and the preceding 15 pages is the product of a cooperative endeavor in which scores of schools, colleges, and universities are taking part. It was prepared under the direction of the group listed below, who form EDITORIAL PROJECTS FOR EDUCATION, a non-profit organization associated with the American Alumni Council. Copyright © 1962 by Editorial Projects for Education, Inc., 1707 N Street, N.W., Washington 6, D.C. All rights reserved; no part of this supplement may be reproduced without express permission of the editors. Printed in U.S.A.

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"Chap" Whittelsey Directs World-Wide Operations With "Hard Boiled" Drive Under Southern Geniality

A recent Sunday edition of the New York Times carried a feature article by William M. Freeman about Dr. Charles C. Whittelsey '22, one of our illustrious alumni. Dr. Whittelsey was awarded an honorary Doctor of Engineering degree, in 1960, by his alma mater.

The article relates that "Chap," as he is known by many alumni, is a southerner, an engineer and a professional buyer of all sorts of things, to a total value far in excess of \$1,000,000,000. He is a genial Southern relaxed type, and he is also a hard-boiled engineer who likes to get a job done on time.

He is a builder who has played a major role in putting up some major industrial complexes and he lists among his accomplishments a share of the work that went into the first synthetic rubber plant and the Oak Ridge atomic energy installation.

He directs a staff of several hundred engineers and specialists on widely varied projects, from investigating the commercial possibilities of muskrat farming in Louisiana to analyzing the operations of the United States Steel Corporation.

He has had a hand lately in rebuilding a railroad in Australia, analyzing investment opportunities in Turkey, putting gas pipelines underground in Illinois, forecasting the asbestos market on a world scale and marking buildings in this country that are safe from nuclear fall-out.

Mr. Whittelsey, as head of Ford, Bacon and Davis, founded in 1894, and now one of the country's oldest engineering and management consultant companies, came up through the construction arm, the Ford, Bacon and Davis Construction Corporation, which has its headquarters in Monroe, La.

The company got its start electrifying horse-drawn trolleys, then moved into the management of utilities and other enterprises. It was a pioneer in the building of high-pressure long-distance pipelines. Now it serves as an independent appraiser of the feasibility of a major undertaking. In addition the company engages in a wide variety of design engineering and construction work.

One of its ventures after World War I was the sponsorship of Tony Fokker, the German aircraft designer; it or-

ganized Atlantic Aircraft to build the Fokker tri-motor plant in this country. Over the years, with a client list that reads like a high-class directory, it has handled 7,000 assignments involving \$20,000,000,000 worth of property, 4,000 clients in 150 industries in thirty countries, 70 industrial and utility companies in 16 states, over 700 utility valuations and more than 2,500 appraisals and reports.

Mr. Whittelsey joined the concern as a \$175-a-month field engineer in 1925 fresh from MSM. This was at the time when natural gas pipeline systems were beginning a great era of expansion, and Mr. Whittelsey was in on the opening of the great Monroe and Amarillo, Texas gas fields and the construction of the pioneer lines that carried natural gas to New Orleans, Memphis, St. Louis and Denver.

It was he who directed the preliminary engineering, economic studies and applications for government approval on these and other similar projects. From all of this he has distilled a philosophy that causes him to insist that big pipelines are the most efficient and economical mass freight movers that can now be conceived. Some day, he believes, great pipelines will cross the contry with cargoes of ore, grain, coal and other bulk products now carried by truck and rail.

In the course of this work he built a reputation for getting things done in a hurry, and, influenced by the depression of the '30's, with a sharp eye for cost factors. Some of this was acquired the hard way. He rashly made a low estimate on a compressor station and was promptly handed the job of building it. He worked seven days a week and put the station in operation 20 days ahead of the contract deadline, and thereby won a \$20,000 bonus — a large amount in those days.

"Pipelines is one business where you know every night whether you made or lost money," he said, "You've got to make so many feet a day to break even. Over that is a profit, under that is a loss. So you very quickly learn to use a sharp pencil."

One of the sharpest pencils he had was used in the depression days to figure out an estimate on a pipeline job. He was instructed by a superior execu-

tive to submit a bid 10 cents a foot below the figure he had worked out. "We got the contract," he recalled with a grin, "and we lost exactly ten cents a foot."

It was his achievement of a reputation for speedy work that put him on a barren field near Charleston, W. Va., one early day in World War II with the assignment for building a \$60,000,000 plant for volume production of synthetic rubber, the deadline date eleven months away. He succeeded. The plant was in operation two months ahead of schedule. "Nobody had ever tried to spend that kind of money before on a single plant, let alone that fast," he recalled. "When they sent us down to Charleston, I thought, 'It's just a lot more steel, a lot more concrete, more pipes and tanks, more engineers than we were used to.' Of course, I didn't know what I was talking about.

"Anyway, we ran into every possible complication, and some impossible ones, too. But they told us that, if we could get the thing into production by January 1943, it would make a lot of difference in the outcome of the war. I assumed they meant how soon we would win. What they really meant was how soon who would win."

About the time the plant was close to completion a rush call came from the New York headquarters that he was needed on another crash project in Tennessee.

What was wanted was a multi-million-dollar plant for "some new kind of explosive." It had to be finished and in production within a year. This job had a newer and even higher priority than the Charleston plant, and it, too, had something to do with ending the war and also winning it.

The mysterious project turned out to be the Oak Ridge atomic bomb plant, built in secrecy under the "Manhattan District" code name by several prominent engineering and construction concerns, Ford, Bacon and Davis among them.

Mr. Whittelsey remarked that the job was and still is the most complex and costly single construction effort in history.

The engineer-administrator who started in the construction subsidiary eventually shifted to the parent company. He became executive vice president of the parent in 1955, president in 1957, and chairman in 1959.

Stripping Granite Quarry in Georgia



R. Lee Aston, '50, consulting mining engineer and geologist of Aston Mineral Engineering Service, Elberton, Georgia, has been appointed by Goggins Granite Industries of Elberton, Georgia, to supervise exploration, development and production of new quarries. Mr. Aston is shown in the photograph inspecting progress of the stripping in a newly proven area at the Berkeley Quarry, Carlton, Georgia. This new area will open up 1,500,000 cubic feet of high-quality gray granite for monumental and building stone.

Stripping of 25,000 cubic yards of overburden was done by an earth-moving contractor. Subsequent removal of 3700 cubic yards of "sap" rock (granite saprolite) was carried out by Aston's 4-man stripping crew. This crew worked one D-7 bulldozer, one TD-9 front end loader and a 1½-yard dipper, and two four-yard dump trucks in a period of 24 days. One crew member alternately drilled and shot up "sap" rock for loading out.

He likes "outside" work and dislikes paperwork and staying in the office. He is only in his office at No. 2 Broadway, which has a magnificent view of New York Harbor and the Lower Bay, about half the time. The remainder is spent visiting field offices, traveling on business and visiting his home on Bayou Road in Monroe, not far from Birmingham, Ala., where he was born on May 28, 1901.

Mr. Whittelsey is a hunter and a fisherman—quail and dry flies—and often visits the Creole back country to keep his skills fresh.

He is married to the former Miss Alice Yeidell of an old Louisiana family. This fact, he recalled with a chuckle, made it possible for him to persuade a gentleman of the Old South to sell him a pipeline right-of-way across his property.

Quinn Manages Pacific Accounts for Allis-Chalmers

Joseph S. Quinn '49, has been appointed manager, Pacific accounts, for Allis-Chalmers' newly organized cement industry department. His headquarters are in Los Angeles, California.

The new department serves the domestic cement and lime industries by providing a focal point for the many products benefiting these industries. It will function closely with other departments, the Industries Group sales organization and the construction machinery division in Tractor Group.

The department is composed of a process engineering group located at the West Allis (Wis.) Works and account managers in strategic market centers.

Process engineering consists of a staff of specialists in the various operations of cement manufacture and in the processes, equipment, and electrical applications involved.

Quinn's responsibility will be to develop and manage all phases of cement industry accounts in the Pacific area.

ENGINEERS WANTED

For information concerning the positions listed below write to Assistant Dean Leon Hershkowitz, MSM, Rolla, Missouri and include the File Number.

CHEMIST—New product development food products. Southwest Missouri. Refer File No. 74.

GEOLOGIST-MECHANICAL ENGINEER-CHEMIST—Geologist working closely with personnel in underground metal mine. M. E. work with Concentrator Superintendent of a large copper mine operation. Chemist, 5 to 10 years experience in analytical work. Able to supervise technicians and organize department of major copper mining company. Refer File No. 76.

TOOL DESIGN ENGINEER—Non-ferrous metals fabricator. Work in

MSM Alumnus

development and improved modifications on existing equipment. Minimum of five years experience. Refer File No. 75.

MECHANICAL ENGINEER — In maintenance and production department large oil company. Refer File No. 77.

SALES ENGINEER — Midwest foundry. Met. M. E. or Ch.E. graduate, Refer File No. 78.

ENGINEERS ALL TYPES—Midwest manufacturing company. Some no experience required. Others 3 to 15 years. Refer File No. 79.

CHEMISTS AND CHEMICAL ENGINEERS—Company in Chicago area. Food products. Refer File No. 80.

METALLURGICAL ENGINEER—Ore dressing. Experienced in concentration of iron ore by gravity and magnetic methods. Age 30 to 45. Mine of large steel company in California. Refer File No. 81.

MECHANICAL - MINING - ELECTRICAL—Large machinery company. Midwest. Sales and design engineering. Refer File No. 82.

ENGINEERS, ALL TYPES—Government agency in its office of construction. Grade 11 and 12 with experience. Refer File No. 83.

METALLURGICAL ENGINEER—Experience, Midwest. Semiconductor division of company. Refer File No. 86.

MECHANICAL - ELECTRICAL—Instrumentation Engineer for physical science laboratory. Standardization, design, research on new devices and solid state circuits. East coast. Refer File No. 85.

CIVIL-MECHANICAL—Position of resident engineer, handling job-site construction problems. Oil company in southwest. Refer File No. 84.

ENGINEER, ALL TYPES—Product, Field Development. Large rubber company in Ohio. Experience required in most categories. Refer File No. 88.

MECHANICAL ENGINEERS—Manufacturer of packaging and cartoning machinery. Design and modification. Experience, 35 to 45 years of age. Salary in middle teens. Manufacturer electro-mechanical equipment, packaging machinery. Salary also good. Refer File No. 89.

STUDENT SALES ENGINEER—No experience required. Engineering degree. One year training period at company's headquarters in Wisconsin. Manufacturer of air conditioning and heating equipment. Refer File No. 91.

SALES ENGINEER—Foundry, Midwest. Experience in selling quality castings. Man should have capability of becoming sales manager. Refer File No. 92.

CHEMICAL - MECHANICAL - ELECTRICAL—Methods, Project, Maintenance and Chemical engineers. Midwest chemical company. Salaries good. Refer File No. 96.

CIVIL ENGINEER—Project Manager directing construction salt industry facility in the Bahamas. Experience required, age not a factor. Good salary. Refer File No. 98.

METALLURGICAL ENGINEER—Perform research and development with tungsten carbide and refractory alloys using cast and powdered metals techniques. Advance degree preferred. Excellent salary. Refer File No. 99.

ELECTRICAL ENGINEER—Progressive company in suburban St. Louis, Missouri. Three years experience in design electronic and electrical products, and original design of circuits employing solid state devices required. Refer File No. 100.

METALLURGICAL ENGINEERS—Sales Engineering. Midwest and East Coast. Age 25 to 35. Refer File No. 1.

MINING ENGINEER—100 per cent open pit mining at present. One or more years experience preferable, including designing, programming and scheduling mine operations. In Wyoming. Under 40 years. Refer file No. 3.

CHEMIST OR CHEMICAL ENGINEER—Five years experience in industrial sales-service with emphasis on chemical or paint products. Calling on production, purchasing and management personnel. Most business Kansas City, Missouri area revolving around automobile assembly plants. Good salary, car furnished. Refer File No. 14.

MECHANICAL - ELECTRICAL—Electronic field. Ground support equipment connected with Apollo space program. Write Mr. J. A. Bowman, North American Aviation, International Airport, Los Angeles 9, California. Salaries good.

ENGINEERS ALL TYPES—Large controls company in all divisions largely diversified. Throughout the U. S. Salaries excellent. Refer File No. 5.

MARRIAGES

Maxton - Weiss

Ralph C. Maxton '60 and Miss Martha Lou Weiss, of Jackson, Missouri, were married December 3, 1961.

Mrs. Maxton is a graduate of the Deaconess School of Nursing and is a registered nurse in Columbia, Ohio. Ralph is an associate engineer, Hydrodynamics Research Center, Columbus. The newly-weds address is 1450 King Ave., Apt. 32, Columbus 12.

Baskin - Mansur

Charles G. Baskin '59 and Miss Molly Mansur, of Cheshire, Connecticut, were married March 3, 1962. Charles is assistant superintendent of the golf course at Waterbury, Conn., and their address there is 116 Gaylord Drive.

Crandle - Murray

Kenneth R. Crandle '57 and Miss Doreen Joy Murray were married January 6, 1962, in Los Alamos, New Mexico. Kenneth is working at the Los Alamos National Laboratories in computer programming. His wife is a nurse from Alberta, Canada. Their address is 3789 Gold, Apt. 5, Los Alamos.

Jordan - Simmons

Thomas M. Jordan '60 and Dolores Ann Simmons were married November 22, 1961 and are living at 1637A Rickenbacker Road, Baltimore 21, Maryland. Tom is employed at the Glen Martin Company, Baltimore.

Evrenos - Duey

Athila Ismail Evrenos '61 and Lynne Maureen Duey were married June 10 1961, in Laguna Beach, California. They are living at 5530 Leavenworth, Omaha, Nebr. Athila is with the Northern Natural Gas Co.

Graves - McClellan

George H. Graves '60 and Miss Mary McClellan, of Rolla, Mo., were married July 15, 1961, at the St. Pat's Church in Rolla. After graduation George joined the Guide Lamp Division of General Motors Corp., Anderson, Ind. He spent 6 months as a 2nd Lt. in the Chemical Corps at Ft. McClellan, Ala., and he and his bride are back in Anderson, Indiana, residing at 2210 Central, Avenue.

Troutner - Still

John R. Troutner '57 and Miss Barbara R. Still, of Greensboro, N. C., were married December 30, 1961. They are residing at 5910 Carlyn Spring Road, Alexandria, Virginia.

Slusher - Heinzelman

Richard E. Slusher '60 and Miss Shirley Heinzelman were married at Easton, Kansas, December 30, 1961. Richard spent last year at the U. of California working toward his doctorate in Physics on a Woodrow Wilson Fel-

lowship. He had a teaching fellowship in the fall of 1961 and now has a full time research assistantship. Their address is 5445 Vicents, Apt. 12, Oakland, California.

Crofts -

Duane E. Crofts '58, was married March 10, 1962. He is with Albion Malleable Iron Foundry, Albion, Michigan. His residence address is 1247 North Elm, Muncie, Indiana.

Blood - Doherty

Paul E. Blood '61 and Miss Peggy Doherty were married October 7, 1961. Paul is with Owens-Illinois Glass Co. Their address is 1450 S. Waterford Dr., Florissant, Mo.

Shy - Seabough

Paul Norman Shy '61 and Miss Susan Pinson Seabough, of Springfield, Mo., were married December 23, 1961, at the National Avenue Christian Church, Springfield. Paul is employed by Southwestern Bell Telephone Company, St. Louis, Mo.

BIRTHS

Mr. and Mrs. Orville L. Schaefer '58 announce Carol Diane's arrival, January 10, 1962. She has three brothers, Stephen, Michael and Thomas. Orville is with the General Electric Co., Phoenix, Arizona, as an electronics engineer. Their address there is 2410 W. Anderson Ave., Phoenix 23.

Mr. and Mrs. Francis H. Henninger, Jr. '57, now have two daughters upon the arrival of Nancy Lee, September 7, 1961. Laurie Jeanne, the older girl, is now 4 years old. The father is with the Bendix Corporation, Teterboro, N. J., and their residence at 682 8th St., Secaucus, N. J.

Mr. and Mrs. Donald C. Griffin '50, welcomed their fifth child, Donna Carol, November 9, 1961, at the Boston Lying-In Hospital. Don is engineering manager, Electronics Products, Inc., Burlington, Mass. Their address is 17-2 Garden Circle, Waltham, Mass.

Mr. and Mrs. Earl R. Dill '53, also advised us of the arrival of their fifth child, January 4, 1962, bringing their total to 3 boys and 2 girls. They live in St. Louis, Mo., 10509 Sappington Lane, where Earl is senior engineer with Southwestern Bell Telephone.

Mr. and Mrs. Michael DeLucca, Jr. '52, are proud of Tommy, born July 27, 1961. This makes four children in the DeLucca family. They live at 214 Haworth Ave., Haworth, New Jersey

and the father works in New York, N. Y. as resident metallurgical engineer for the U. S. Steel Corp., 71 Broadway.

Mr. and Mrs. R. P. Abendroth '53, began their family expansion upon the arrival of Paul Melvin, January 19, 1962, which naturally disrupted things around the household for a while. Dr. Abendroth is research scientist at the Owens-Illinois Technical Center, Toledo, Ohio. Their Toledo address is 5030 Pickfair.

Mr. and Mrs. John O. Englund '53, announce the birth of a daughter, Elsa Ida, born April 1, 1961. They are living in Lima, Peru, where John is Superintendent, Fines Beneficiation Plant. Their address is c/o Marcona Mining Co., Apartado 1229, Lima, Peru, So. America.

Mr. and Mrs. Richard B. Leisure '55, announce the arrival of Nadine Carol, December 12, 1961. Dick is a mud logging engineer with Caran Engineering Company, San Antonio, Texas. They reside at 643 Olney Drive, San Antonio 9.

Mr. and Mrs. Ralph Boze '55, belatedly advise us of Daniel William, born July 13, 1961. He is their second child. Ralph is with Texaco, Inc., in Lottie, Louisiana. His mailing address is P. O. Box 72, Lottie, La.

Mr. and Mrs. Gilbert J. Rekaté '50, have a son, Gilbert Mark, born October 19, 1961. They reside in Seattle, Washington, 16460 Marine View Drive, S. W. The new father is with Boeing Airplane Company as a supervisor.

Mr. and Mrs. Paul O. Herrmann III, '58, are proud of Kathy Ann who arrived at their home, September 25, 1961. Paul is an application engineer at Emerson Electric Mfg. Co., and the Herrmanns live at 8640 Gregory Court, St. Louis 34, Mo.

Mr. and Mrs. John D. Wenser '58, 3854 Horn, Alton, Ill., have a sister for their 2 year-old son. She was born December 8, 1961. John is a design engineer for Laclede Steel Co. He also has his own ceramic shop in his basement as a hobby, and recently he was promoted to 1st Lt. U. S. Army Reserve.

Lt. and Mrs. James West '61, are proud parents of their first child, Michael Dale, born January 16, 1962, at the Phelps County Memorial Hospital, Rolla, Mo. The Wests reside at 8B Pulaski, L. H., Ft. Leonard Wood,

Mo., where Lt. West is on active duty with the U. S. Army.

Mr. and Mrs. James A. Berkel '59, now have a daughter, Linda Anne, born February 2, 1962. She is their second child. They are residing at 322½ South River, Montgomery, Illinois. Jim is with the Caterpillar Tractor Co., Aurora, Ill.

Mr. and Mrs. George E. Stourton '59, of the Stourton Engineering Co., have George M. Stourton for introductory exhibition, completed on schedule, January 30, 1962, and may be inspected at 4191 Domenico Court, Bridgeton, Missouri. The father recently accepted a position with St. Louis Housing and Land Clearance Authority.

Mr. and Mrs. William Curson '61, announce the birth of their first son, Gregory Scott, born January 31, 1962. The Cursons have two daughters, Tami and Shari. Bill is in the Industrial Engineering Department of ALCOA in Davenport, Iowa. Their residence address is 1331 East 10th St.

Mr. and Mrs. Eugene Dale Brenning '60, 900 East Park St., Carbondale, Illinois, welcomed to their home last November 15th, Laura Jean. Gene is with the Illinois State Highway Department.

Mr. and Mrs. Roger Lashley '59, are parents of a second daughter, Tara Elise, born November 21, 1961. Her big sister, Tamia Denese, is 2½ years old. Roger is with Douglas Aircraft currently working on the Nike-Zeus Project at Pt. Mugu, California. Their residence is at 2221 "K" St., Oxnard.

Mr. and Mrs. Jay E. Krath '48, 1416 E. Tate, Brownfield, Texas, have a son, Joseph Kelly Krath, born February 14, 1962. Jay is a petroleum engineer.

Mr. and Mrs. Richard W. Bolander '61, welcomed their second child, Deborah Sue, born October 23, 1961. Her brother will be two years old in May. Dick is doing graduate study in Physics at Texas Christian U. Their Ft. Worth address is 4712 Marshall St.

Mr. and Mrs. Salvatore A. Fasone '61, announce the arrival of Anthony Charles, February 27, 1962, at their home 5310 Countryside, Wichita 18, Kansas. The father is with Boeing Airplane Company.

Mr. and Mrs. Jorge Jackson '48 belatedly announce the arrival of Daniel Martin born June 9, 1961, bringing their total to seven, four boys and 3 girls. Jorge is with Cia Shell of Vene-

zuela, Refineria Cardon, PTO Fijo Edo. Falcon, Venezuela.

Mr. and Mrs. Jerry B. Overton '56, are elated over Cynthia Gale, their first child who arrived April 5, 1962. They reside at 7314 Variel, Apt. 5, Canoga Park, California where the father is Head of the Acoustics and Environmental Department, Calval Research and Development.

Mr. and Mrs. Warren R. Wieland, 17 Sunnydale Drive, Belleville, Ill., now have six children upon the arrival of their youngest, December 19, 1961. Three boys and three girls. Warren is chief engineer with Neal J. Campbell, consulting engineer, St. Louis, Mo.

Mr. and Mrs. John McCarthy '55 have a new daughter, Kathleen Ann, born January 20, 1962. They reside at 531 South 25th Ave., Bellwood, Ill. The father is with Shell Oil Co.

Mr. and Mrs. Rene J. Leonard '61 began their family upon the arrival of Vivian Janet, born December 29, 1961. They are residing at 9843 115th Ave. S. S., Renton, Washington. Rene is a staff member in the development unit of Boeing Airplane Co.

Mr. and Mrs. G. C. "Chuck" Heilig '61, welcomed the arrival of Charles Cullen, born March 9, 1962. They are living at 4811 4th Ave., Apt. 201, Oxen Hill 21, Maryland. Chuck is in the process characterization group of the R & D department of the U. S. Naval Propellant Plant.

Mr. and Mrs. Gerald M. Leach '60 are parents of Brent Maurice, who arrived June 20, 1961. They are in Orlando, Florida where Gerald is with the Martin Company. Their address is 907 W. Oak Ridge Road.

DEATHS

Paul A. Halasey '28

Paul A. Halasey '28, died suddenly February 4, 1962, in North Hollywood, California. Paul was a faithful member of the Southern California Section of the Alumni Association attending practically every meeting in the last fifteen years since the Section was organized. He is survived by his widow, Ettie, at 5335 Aukland Avenue, North-Hollywood; a brother Frank, MSM '22, and sisters, Mrs. Joseph Bremmer, Mrs. Mary Parker and Eva Halasey.

George W. Harris '04

George William Harris '04, passed away in Ojai, California, March 18, 1962. He received his degree in Metal-

lurgy and gained his professional degree Metallurgical Engineer in 1915. He had been on a retired status in his profession since 1953. He was residing at 418 North 7th, Santa Paula, California at the time of his death.

James H. Bock, Jr. '17

James H. Bock, Jr. '17, died August 3, 1961 in Tampa, Florida. He entered the hospital for an examination for kidney stones and a few days later he went into a state of shock and did not recover. He had been retired several years. Mrs. Bock is now living at 11303 Carrollwood Drive, Tampa 12.

Oscar D. Niedermeyer '28

Oscar David Niedermeyer '28, prominent mining engineer and general manager of National Lead Company's St. Louis Smelting and Refining Division in Fredericktown, Missouri, died suddenly, February 28, 1962, the result of a stroke. After graduation he joined Union Pacific Coal Co., in Wyoming, and after one year received his first foreign assignment in Zacatecas, Mexico. Later he went to Pachuca, Mexico, then back to Zacatecas as general superintendent of the Carnegie Bote Mining Co. He was also mining superintendent of several organizations in Boliva. He joined National Lead in 1948 directing two mines in Mexico. Managing Texas Mining and Smelting at Laredo, Texas, and was president of two Mexican mining companies controlled by National Lead. In 1952, he was named assistant manager of National's nickel mine and plant in Oriente, Cuba. A year later he was named vice president and general manager. He was transferred to National's office in New York and in 1957 was made general manager of the Fredericktown operation.

Survivors include his widow; sons, Thomas William at home and O. D. Jr., of Stanford, California; three sisters, Mrs. Clayton McCaw of Cohasset, Minn., Mrs. Hoover Opperman of Princeton, Ill., and Mrs. Geo Ehrmantraut of Bloomington, Ill.; two brothers, Dr. William, of Mt. Carroll, Ill., and Carl of Phoenix, Arizona.

Lucian Erskine '35

Lucian Erskine '35, died February 8, 1962, at Houston, Texas following surgery. He is survived by his widow residing at 3721 Clifton, St. Louis 9, Mo.

Wael J. Mismar '62

Wael Jamil Mismar '62, age 24, was fatally injured in an automobile accident, April 9, 1962, two miles west of

St. James, Mo., on Highway 66. He completed his degree requirements in Mining Geology in January 1962. He had been living in St. Louis and was making plans to return to Jordan his native country.

Stuart M. Rathbone '25

Stuart M. Rathbone '25, died January 9, 1962. He was Asst Chief, Project Management, Div. B, Construction Service, Veterans Administration Washington 25, D. C.

William McElroy '09

William McElroy '09, passed away April 23, 1961, age 83. He was residing in Coyote, California at the time of his death.

Alumni Personals

1914

Riley M. Simrall submitted an information card with remarks for his business "Retired" and under title or position "President and Co-owner." In interpreting this, Mrs. Simrall, he admits, has labored equally as hard to achieve retirement that became effective August 1961. Consequently they are "Co-owners of Retirement" with all of its opportunities for travel, relaxation and the pursuit of many interesting but deferred hobbies. They are operating from their home address in Liberty, Missouri, except in summers at least and they hope to remain retired.

1916

J. R. Maher, 633 S. Wilder St., St. Paul Minnesota, retired November 30, 1961.

1921

Barney and Mrs. Nuell departed for a two-month tour of Europe during April and May. They will visit Madrid, Rome, Florence, Venice, Geneva, Copenhagen, Paris and London. We wish them a bon voyage.

Abner D. Hahn has been named head of a new field office established by the Bureau of Mines at Socorro, New Mexico. The new office will serve as an operating base for mineral-resources studies in the area and an information center for industrial firms and others interested in resource data and scientific research programs of the Bureau. Mr. Hahn formerly was at the Bureau's Office of Mineral Resources in Bartlesville, Oklahoma. He was professor of Mining and Metallurgy at N. M. School of Mines before joining the Bureau. He also served with the

N. M. Bureau of Mines and has published several papers on the State's mineral resources. The new office is on the N. M. Institute of Mining and Technology's campus.

M. S. Badollet was recently given a citation by Vincennes University, Vincennes, Indiana. The citation read as follows: "M. S. Badollet, because of his distinguished career as a research chemist which has brought him world recognition as an authority on asbestos fiber, because of his worthwhile contribution to the advancement of sugar chemistry research, and because of his extensive and valuable additions to the literature of science is by action of the faculty awarded The Alumni Citation of 1962." Mr. Badollet is now with Johns Manville Research Center, Plainfield, N. J., residing at 35 Farragut Road, Plainfield.

1 9 2 2

Edwin G. Machin, Box 175, Nashville, Illinois is general superintendent supervising a barge canal to connect Kentucky Lake and the future Barkley Lake, Gilbertsville, Kentucky.

1 9 2 3

Ragan Ford has the distinction of being the only oil man in the state of Louisiana selling water. He is the owner of the public utilities in Minden, La. Ragan is also the new vice president of the Ark-La-Tex Section for 1962. His address is 407 Germantown Road, Minden, La.

H. E. "Hank" Zoller and A. B. Wilkerson met aboard the M/S Kungsholm, without either's knowledge, that they had booked passage on this 89 day world cruise. During a Rotary meeting aboard ship they decided they should let their alma mater know they recognized each other after 39 years in spite of their bald pates and rotund figures. They sailed from New York on January 20, via the Mediterranean, Suez Canal and Far East, returning to Honolulu, Los Angeles, Guadeloupe, Acapulco, Canal Zone and to New York on April 20. Mr. Wilkerson is in Fresno, California. He has two steel foundries, and to quote "Hank," "He is a steel pudler."

1 9 2 8

Philip J. Boyer has retired to a small estate on the coast of Southern California, where he can participate in fishing, golf and gardening all year 'round. It keeps him mighty busy and very

happy. His address is 1640 Eolus Avenue, Encinitas, California.

1 9 3 3

William J. Jabsen is giving a series of lectures at Kalamazoo College on basic principles of heat treating and he has been selected to serve on the committee to write the "Martempering" chapter for Volume II, of the A. S. M. Handbook. Bill is in the commercial heat treating business in Kalamazoo, Michigan. His address is 150 Blaine St.

1 9 3 4

William R. Power left Cities Service Oil Company after 20 years to join Universal Oil Products Company, at Houston, Texas, in their catalyst sales department. His new Houston address is 2410 Possum Creek and his business address is 2435 North Blvd.

1 9 3 6

Herman J. Pfieler, Jr. is now Region Manager, Union Carbide Metals Co., a division of Union Carbide Corp., with offices at 230 North Michigan Ave., Chicago, Ill. His new residence address is 914 Sterling Ave., Flossmoor, Ill. He formerly was located in Bethlehem, Pa.

1 9 3 7

Lt. Col. S. S. Post informs us that his daughter, Elizabeth, after receiving a B. A. degree at Douglas College, in mathematics, put multiplication to practical use and he is now a grandfather. Col. Post is with the Ordnance Corps, U. S. Army, as Special Assistant for Accelerated Programs at the Ordnance Special Weapons-Ammo Command, Dover, New Jersey.

1 9 3 8

John R. Long is plant engineer with Meramec Mining Company. The Longs moved to Sullivan, Missouri about two years ago, and reside at 46 East Street.

1 9 4 0

Clayton W. Bentley is being transferred to the Douglas Aircraft Co., Long Beach, California, facilities to assume the position of consultant for the Transport and Military Design Engineers Department.

Charles E. Hall has been transferred to East Pakistan for two and one-half years. His wife and daughters, age 12 and 8, will accompany him. His address there will be International Engineering Co., Inc., P. O. Box 160, Ramna, Dacca 2, East Pakistan.

Col. Ernest L. (Roy) Perry is now

District Engineer, U. S. Army Corps of Engineers, Seattle, Washington, and is looking forward to all of his friends visiting him when they attend the Seattle Worlds' Fair this year. His address is 1519 Alaskan Way South, Seattle 4.

Vernon W. Rieke has been appointed assistant chief mechanical engineer in charge of closures, fasteners, cooking utensils, customer service and end product engineering of the Aluminum Company of America. He joined Alcoa in 1940 at New Kensington, Pa. Following service at the company's Chillicothe, Ohio works, he returned to New Kensington, where he became works chief engineer in 1956. He was named a senior mechanical engineer in the mechanical engineering department at Pittsburgh in 1961.

Dr. Clyde L. Cowan received a citation award from Washington University, St. Louis, Mo. Dr. Cowan is a physicist at Catholic University, Washington, D. C.

1 9 4 1

Colonel Richard G. Rhodes was recently promoted to this rank in Germany where he is assistant engineer of the VII Corps at Stuttgart. Col. Rhodes entered the Army in July 1941 and arrived overseas on the present tour of duty in October 1959.

1 9 4 2

Nicholas J. Nicola is mine manager for Cargill, Inc. The company recently bought a mine site at Belle Isle, Louisiana and they are in the process of sinking a 16 ft. shaft by the freeze method to 1,500 ft. to start salt operations between 1,120 and 1,200 ft. They hope to be in production by late Fall 1962. Nick resides at 836 Ashton St., New Iberia, La.

Hugh Harness has been assigned as Production Superintendent of Alcoa of Australia, Proprietary Ltd., a company to establish and operate a multi-million dollar integrated aluminum complex in Australia. This is Alcoa's newest overseas venture and Hugh will be located in Perth, Western Australia. His new address is Western Aluminum, No Liability, 4th Floor, Cecil Building, 6 Sherwood, Court, Perth, Western Australia.

Ben E. Weidle, who is a sales engineer with Westinghouse, has been transferred from Dayton, Ohio, to St. Louis, Mo. His address is 3 Count Fleet Court, Florissant, Mo. He has been with Westinghouse for 16 years.

E. A. Rassinier is Chief Petroleum Engineer, Trunkline Gas Co., Houston, Texas. He states that he started mining flagstone and groundwater last year as a hobby and it might be a fulltime career if his old Peele's Handbook wears out too soon. His mailing address is Box 1642, Houston 1, Texas.

Cdr. Leonard C. Wolff, USN, U. S. Naval Mission to Peru, c/o U. S. Embassy, Lima, Peru, has recently been designated the Executive Officer of the U. S. Naval Mission to Peru, in addition to his assignment as Engineering Advisor.

1943

Don Coolidge muses at the thought, if he would return for his 20th Class Reunion in 1963, he would win the distinction of having traveled the longest distance. He is architectural engineer. His address is 835 Ninth Ave., Anchorage, Alaska.

James R. Paul has been promoted to District Manager, Dowell Division, Dow Chemical Co., and transferred from Denver Colorado, to Amarillo, Texas. His address there is 630 Petroleum Building.

1947

J. Walter Liddell has been with the investment brokerage firm of Reinholt and Gardner since November 1960, and reminds Miners that any inquiries on stocks, bonds, or mutual funds will be gladly handled. His business is located at 17 N. Meramec Ave., Clayton 5, Mo.

George H. Wagner has been appointed Service Metallurgist, Los Angeles, by the Columbia-Geneva Steel, a division of U. S. Steel Corporation. George was previously in the San Francisco area with Columbia-Geneva.

1948

Fred A. Todd joined C. F. Braun and Co., Engineers, January 2, 1962, as senior process engineer. His address is 826 S. Westchester Drive, Anaheim, California.

Robert L. Day is now residing in Muncie, Indiana, 2012 Cambridge Drive. The Days' three children are: Robert L., age 13; David Scott, 7 years; and Nancy, 4½.

1949

Adolph F. Hemme was an alumni office visitor in February. Al was on the campus recruiting from potential graduates. He is head, Works Laboratory, National Carbon Co., Lawrenceburg, Tennessee, and he has been in

this present position for five years. He has a son who has engineering tendencies and he hopes that he will enroll in a few years. His Lawrenceburg address is 232 Caperton Avenue.

Jack Stadelhofer is still jumping for Joy (Mfg. Co.) in California. He is predicting that his family will be five, rather than four, as of the end of April. Their address is 433 N. Alabama, San Gabriel, Calif.

Ralph C. Axsom is eastern representative for the Southwest Grease and Oil Co., Wichita, Kansas. The Axsoms have a family of five children and reside at 6237 Anita Drive, Parma Heights 30, Ohio.

Francis V. Breeze was selected as one of the 150 participants in the 41st session of the Advanced Management Program of the Harvard Business School from February 18 to May 18. Mr. Breeze is Plant Manager, Pittsburgh Plate Glass Company, Crystal City, Missouri. The Advanced Management Program, one of the oldest senior management development courses by a university, has been in continuous operation since its beginning in 1943. The program offers a concentrated course of study in six major areas of prime interest to today's top management, and uses the case method of instruction.

1950

S. I. Megeff, his wife Tina, and daughters Margaret and Robin are comfortably settled in their new home which they occupied a year ago. Seymour is section head at Leeson Moos Labs, Jamaica, New York. The residence address is 23 Kingswood Drive, Old Bethpage, New York.

Rolland L. Hardy was recently Acting Chief, Industry Division, U. S. Aid Mission, Sudan and is now completing requirements for a doctorate in engineering at the Technical University, Karlsruhe-Durlach, Germany. His address is Am Burgweg, Karlsruhe-Durlach, Germany.

Cletus F. Voiles is with Lago Oil and Transport Co., Ltd., Aruba, Netherlands, Antilles. It is a subsidiary of Standard Oil Co., of N. J. His address is Seroe Colorado, Aruba, Netherlands Antilles.

Robert C. Wood returned recently from three years in Algeria and has a temporary address 5559 Delmar Blvd., St. Louis 12, Mo.

Robert W. Jones is an engineer with Gilfillian Co., Los Angeles, California,

and in November he was sent to Tokyo, Japan on a special assignment with a Japanese air line. His address is c/o Hiroshi Nagai, 3-15 Nishihara, Shibuya-Ku, Tokyo, Japan.

W. D. Humphrey is assistant chief engineer for the Pittsburg and Midway Coal Co., with offices at 15 West 10th St., Kansas City, Mo. The Humphreys have three children Crissy, 14; Jan 11; and Jimmy 5. They live at 7305 Willow, Raytown 38, Mo.

1951

Truman E. McClard is project engineer, missile development, U. S. Army Ordnance Missile Command ORDXM-YS, Huntsville, Alabama. He has been at this location for eight years. We wish to extend our sincere condolences to Truman in the death of his wife, Faith, recently. Her death was due to a heart ailment. Truman has two children, a boy 8 years and a girl, 11 years old. His residence address is 1014 Locust Ave., S. E., Huntsville.

Robert D. Martin, Civil Engineer, U. S. Geological Survey, Menlo Park, California, returned from an assignment in Antarctica on February 20, where he was establishing basic control for the mapping of the Navy Air Facility at McMurdo Sound.

Ross F. Crow is departmental foreman, Koppers Co., Monaco, Penn. The Crow family keeps growing. The latest addition is Ronald Gentry, age 1. Ronald has a brother and sister.

Stewart B. Tulloch, Jr., is with the General Electric Company in Burlington, Vermont. His address is 79 Curtis Avenue.

Douglas J. Carthew, Christmas Mine, Winkelman, Arizona is with Inspiration Consolidated Copper Company, Inspiration, Arizona.

1952

Donald S. Maday is associate safety and fire protection engineer, V. A. Building, Vermont and "H" Streets, Washington 25, D. C. The Duke sends his regards to all and invites Miners to visit him when in the national capital. He resides at 1601 South 26th St., Apt. 5, Arlington 6, Va.

Joseph H. Geers was recently appointed Industrial Sales Representative for Johns-Manville Pipe Division, covering Eastern Missouri, Southern Illinois, Western Kentucky and Tennessee and Northern Mississippi.

Lee Bilheimer recently was appointed

Head Mining Research Engineer, St. Joseph Lead Co., Bonne Terre, Mo.

Wayne D. Jackson advises he is the only MSM alumnus at Orinoco Mining Company and competing with four graduates of the Colorado School of Mines. He wishes to know when some help is going to be sent. His address is Orinoco Mining Company, Puerto Orday, Venezuela.

Jack Thompson is foundry superintendent, Bodine Foundry Co., St. Louis, Mo., with residence at 10339 Monarch Drive, St. Louis 36.

1953

Dr. Jerry D. Plunkett, Vice-President and Manager of the Dynatech Corporation, has been named joint manager of the corporation's new department of Materials Research. Jerry received his B. S. and M. S. degrees in Ceramic Engineering from MSM and his Ph. D. in Ceramics from M. I. T. His professional activities lie mainly in the fields of optical, thermal and physical measurements on ceramics, metals and graphite materials. Basic research studies on inorganic pigments resulted in the conception of an active solid state temperature control system for satellites based on phototropic phenomena. The new department will serve both government and industry in conducting research and development studies designed to overcome various materials barriers which impose restrictions on expanding technology. Mrs. Plunkett is the former Virginia Wilson of Rolla.

1954

Bruno H. Hake joined Battelle Institute at Frankfort, Germany, January 1, 1962, after receiving his Ph. D. in Industrial Economics, and has been appointed Head of Battelle's Department of Industrial Planning. On September 2, 1961, he was married to Eva Bochmann of Recklinghausen, Germany.

1955

Anthony J. Berenato, 880 Patricia Ave., Sharon, Pa., is serving on the Board of Directors of Youngstown, Ohio, Section of the ASME for a two-year term. He is a factory engineer with Westinghouse.

Gerald D. Spann, of the Venice Plant, Union Electric Co., St. Louis, Mo., has been promoted from senior assistant engineer to engineer. He joined Union Electric in 1955, entered military ser-

vice later the same year. He returned two years later, advanced to assistant engineer (in training). Transferred to Venice in 1958, he worked as an assistant electric power plant engineer, senior assistant electric power plant engineer. The latter title was changed to assistant senior engineer in 1961.

Dr. James C. Mullen, now with Argonne National Laboratory, has an article published in the December 15, 1961 issue of the Physical Review entitled "Effect of Bardeen-Herring Correlation on Vacancy Diffusion in Anisotropic Crystals."

Harry R. Springer has been recalled to active military duty and is stationed at Seymour Johnson AFB, North Carolina. He expects to return to St. Louis, Mo., in September, 1962.

1956

Gilbert Jurenka is a petroleum engineer with Mobil Oil Co., and living in Shreveport, Louisiana. Gil is married to the former Shirley Amey, and they have three children, Mark, Jodi and David.

Fred E. Jackson, a civil engineering graduate with the Missouri State Highway Department, has been named resident engineer in the Columbia area. He joined the Highway Department in 1956 and was promoted to engineer inspector II, in March 1957 and engineer inspector III, in September 1960.

1957

Gilbert F. Metz, Jr., sales engineer with A. P. Green Fire Brick Company, Mexico, Mo., was assigned to the Chicago area last November after completing a three-month training program. His residence address is 255 S. Marion, Oak Park, Illinois.

Edward B. "Ted" Campen, a field engineer with Schlumberger Well Surveying Corp., received a promotion and transferred to Newcastle, Wyoming. The Campens have one child, Linda Carol. Mrs. Campen attended Culver Stockton College, Canton, Missouri.

Clifford C. Tanquary is Assistant Research Engineer with The Marley Co., Kansas City, Mo. There are three children in the Tanquary family: Steve, age 4; Diana, age 2; and Roger who arrived at the household on November 4, 1961. They reside at 14215 Denver, Grandview, Missouri.

Kermit R. Kreder, wife and son are making their home in Los Angeles, California where he is employed in the non-metallic laboratory of North Ameri-

can Aviation. Their address is 12917 Short Ave., Los Angeles 66.

Captain Thomas J. Street addressed the student chapter of the Society of American Military Engineers, on the MSM campus, his subject being, "Intercontinental Ballistics Missile Base Construction." Captain Street is the Resident Engineer of the Conway Residency of the Little Rock Area Office on IBM Base Construction. From 1954 to 1957, he was ROTC instructor at Alabama Poly. Auburn, and after graduation at MSM he was resident engineer on the eastern extension of the DEW line.

Lloyd C. Laciny has resigned his position as Thermodynamics Head, Preliminary Design, Electronics and Avionics Division of Emerson Electric Co., St. Louis, Mo., to accept a position with Autonetics, Division of North American Aviation, Anaheim, California. He will serve as Project Administrator assigned to the Minuteman Rocket.

1958

Ronald D. Jurenka is a junior petroleum engineer with Mobil Oil Company. Ron was married, September 2, 1961, to Jerry Anne Wilburn, in Edna, Texas, and they have adopted a daughter Marilu. Their address is 205½ South Hanover, Edna, Texas.

Robert J. Boshert is now with Ryan Electronics, San Diego 17, California, as a design engineer. He was formerly with Emerson Electric, St. Louis, Mo., and moved west December 1, 1961.

Calvin W. Foster resigned a position as bridge designer for the Missouri State Highway Department to accept a position with the U. S. Air Force as structural engineer. He is now assigned at the Richards Gebaur AFB, Mo. His residence address is 13608 Craig, Grandview, Mo.

Robert O. Capps, wife Donna and three children, Karen Sue, age 3; Bennett Seth and Kenneth Scott, identical twins, 15 months old, are now in Denver City, Texas, where they were transferred after Continental Oil Company's office was closed at Big Spring, Texas. Their mailing address is Box 1542.

Arch Burk is assistant plant engineer at Pittsburgh Plate Glass Company's plant in Henryetta, Okla. They also have three children; Kathleen, 9 years; Mike, 6½ years, and Diane, 4 years. They live at 802 Euclid.

Robert O. Hayes is with General Dy-

MSM ALUMNI PERSONALS

namics Astronautics as field service engineer. At present he is working as a technical representative for the Air Force on the "Silo" type Atlas Missile Bases. His specialty is the propellant loading systems. Address, 1413 Winona, Salina, Kansas.

B. B. "Bill" West recently was assigned as special project engineer for the Chicago Mine Department at the Sperry Plant of U. S. Gypsum. Previously he had been mine engineer at the Sperry Plant. His residence address is 1207 Madison Ave., Burlington, Iowa.

Lt. Kenneth R. Schultz has been integrated into the Regular Army Basic Branch CMLC, Detailed Artillery and assigned to Ft. Benning, Ga. His address is 444 Craig Drive, Ft. Benning.

William T. Smith is now employed by McDonnell Aircraft Corp., St. Louis, Mo., with residence at 1730 Crowder Drive, Florissant, Mo.

R. Larry Miller is vice president and general manager of Miller Clay Products, Inc., Mexico, Mo. The Millers have purchased a new home at 926 Ringo St. There are three Miller children, Diana 6, Eric 4, and Gary 2 years.

1959

2nd Lt. Philip R. Johnson has been recalled to active duty with the 416th Engr. Bdg. at Ft. Polk, Louisiana, for the Berlin situation.

1960

Gilbert Cirrincione, 9 Granview, Quincy, Illinois, a junior engineer with Gardner Denver Company has been elected secretary of the Quincy Engineering Club for 1961-1962.

Allan A. Dunnavant is attending the Officer's Fixed Aviator Course at the U. S. Army Aviation School, Ft. Rucker, Alabama. His address is Officer Student Detachment, Box D-17, Ft. Rucker, Ala.

William R. Coats II is platoon leader, 23rd Engr. Bn., Co. A, APO 165, New York, N. Y., located at Hanau, Germany.

2nd Lt. Karl J. Daubel is a sanitary engineer with the U. S. Army Medical Service Corps, Rodriguez U. S. Army Hospital Dispensary, Ft. Buchanan, Puerto Rico. His mailing address is Dispensary—RUSAH, APO 851, New York, N. Y.

Ralph E. Shepard joined Olin Mathieson Chemical Corporation, February 1960, as an explosive sales trainee. He

was transferred to Saltville, Va., in October 1960, as a mining engineer in their underground limestone mine. On January 23, 1960, Ralph and Miss Carol J. Meise, of Washington, Missouri, were married. Their address is General Delivery, Saltville, Va.

Ralph Robert Thater is with the Missouri State Highway Department and is engaged in subsurface soundings for bearing data of bridges throughout the State of Missouri. His address is 618 Madison Street, Apt. 1, Jefferson City, Mo.

2nd Lt. Richard Lawhon is with the 9th Engr. Cn (c) "C" Company, APO, 162, New York, N. Y. Prior to his tour of active duty he was with the R & D Division, U. S. Navy Propellant Plant, Indian Head, Maryland.

Lt. Kenneth D. Jobe completed Airborne School at Ft. Benning, Georgia, in April 1961, and is now stationed at

Ft. Benning, Co. "C" 577 Engr. Bn., as operations officer.

Ernesto L. Ahnert left the employment of the San Francisco Mines of Mexico, Ltd., to join in business with his father in the state of Zacatecas, Mexico. His address is V. Carrillo 24 Sur Torreon, Coahuila, Mexico.

Fred A. Halleman has been appointed to the position of foreman, Wet Side, in the Chloride Dept. of Pittsburgh Plate Glass Co., Chemical Division (formerly Columbia-Southern Chemical Corp.) Barberton, Ohio.

1961

2nd. Lt. James H. Stovesand is assigned to the 714 Medical Company at Ft. Stewart, Ga. He previously was assigned at Ft. Sam Houston, Texas, and prior to entering on active duty he was employed by the Illinois Highway Department.

Edwin L. Crow is a graduate stu-

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Name

My new address is

My Company or Business Is

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Here's Some News for the MSM ALUMNUS:

MSM ALUMNI PERSONALS

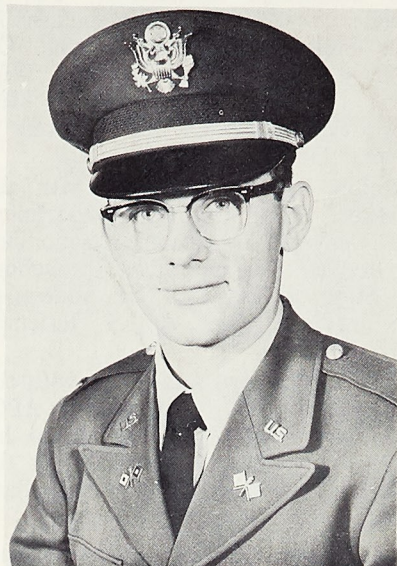
dent at the U. of Missouri and has received a fellowship for the study of "Acyclic Quaternary Unsaturated Hydrocarbons" under the direction of Dr. Norman Rabjahn, from the Petroleum Research Fund of the American Chemical Society. He also announces that he is engaged to Miss Shirley Arnhart and they are planning on a June wedding. His address is Old Chemistry Building, U. of Missouri, Columbia, Mo.



2nd Lt. James H. Stovesand

2nd Lt. Charles A. Homan has completed the Signal Officer Orientation Course at the Army Signal Training Center, Fort Gorgon, Ga.

Robert C. Mitchell, Cml C Exhibit Museum, Army Chemical Center, Maryland, is serving a two-year tour



2nd Lt. Charles A. Homan

with the Army as Chemical Corps Exhibit Officer.

Salvatore A. Fasone has a change of jobs and address. He was transferred to the Boeing Airplane Company's Wichita Division from the Aero Space Division, Seattle, Washington. His Wichita address is 5310 Countryside, Wichita 18, Kans.

Captain Donald E. Wuerz is with Hq. 3rd Corps, G2, Ft. Hood, Texas. He was on temporary duty at Ft. Holabird, Maryland, three months, February to April, attending the Intelligence School-Collection Officer Course. He claims the distinction of being the only graduate finishing MSM, October 1, 1961 and being the first and last in his class scholastically.

Joseph F. Waddell has been transferred from Ft. Leonard Wood, Mo., project to the Corps of Engineers, Kansas City District Office, and is working as a civil engineer in the River Development Section. His Kansas City, Mo., address is 3358 Baltimore.

Robert M. Laurenson is working on his Master's degree in Mechanical Engineering at the U. of Michigan and will finish in June this year. He is a teaching fellow. His address is 2230 Cram Place No. 1, Ann Arbor, Michigan.

Carl D. St. Onge is now with Union Carbide Nuclear Company's Oak Ridge Gaseous Diffusion Plant, Oak Ridge, Tennessee.

Terry F. Lehnhoff has been awarded the National Science Foundation Summer Teaching Assistant Fellowship. He will continue his research through the summer months of 1962. Terry is an outstanding student pursuing studies leading to his M. S. degree in Mechanical Engineering. His Rolla address is 1105 Rolla Street.

2nd Lt. Donald A. Ostmann is taking a ten-month army aviation course at Ft. Rucker, Alabama. His address is Officer Student Det. Box O-11.

2nd Lt. Leland G. Robinson is engaged in instruction of basic electricity and mechanics to student inputs at the U. S. Army Ordnance Guided Missile School, Redstone Arsenal, Alabama. His address is 132 Goss Circle, Apt. 15-C.

2nd Lt. Fred V. Huff recently arrived in Germany and is stationed near Stuttgart. He is a sanitary engineer in a preventive medicine company that supports the 7th U. S. Army. His mailing address is 485 Med. Co., (Prvnt. Med.) APO 154, New York, N. Y.

2nd Lt. James M. Burns graduated from Ordnance Officers Orientation Course at Aberdeen Proving Grounds, Maryland, February 9, 1962, and is presently stationed with the 123rd Maint. Bn. in the newly reactivated 1st Armored Division, Ft. Hood, Texas.

Juan Leu has been working with Brown, Boveri and Co., Ltd., Baden, Switzerland since November 1960, in the Turbine Department, Special Tests Group. His address is Av. General Guisan 44, Pully, Lausanne, Switzerland.

MSM ALUMNI ASSOCIATION

ROLLA

MISSOURI

TO

Mr. Walter T. Jones '37
627 Sierra Drive, S.E.
Albuquerque, New Mexico