

UNIVERSITY OF PENNSYLVANIA

Almanac

Fewer Seniors Make Plans For Graduate Studies

A marked decline has become evident over the past three years in the proportion of graduates of the College who have continued directly to graduate or professional school study. From a record 87 per cent of the members of the College's Class of 1967 who planned post-baccalaureate studies, this proportion declined to 64 per cent in 1968 and to 56 per cent in 1969.

Traditionally the College has sent a greater proportion of its graduates on to graduate or professional schools, than any of the other undergraduate divisions.

The proportion of students planning graduate studies from other undergraduate divisions given in percentages is:

	1969	1968	1967
Col. for Women	38	38	55
Engineering	25	35	59
Wharton	47	45	68

Responses from 1179 members out of 1398 students graduating in the Class of 1969 from these four undergraduate divisions were reported in the study, "Post-graduate Plans of the Class of 1969", compiled by James B. Yarnall, director of the Office of Fellowship Information and Study Programs Abroad.

The proportion of seniors entering military service was greater in 1968 than either 1967 or 1969. Comparative data as percentages are:

	1969	1968	1967
College	10.5	15	4
Engineering	7	12	1
Wharton	17	23	14

Plans for employment following graduation have shown a steady increase over the past three years. Comparative percentage data are:

	1969	1968	1967
College	13	7	5
Col. for Women	40	34	33
Wharton	24	21	12
Engineering	63	37	39

A substantial number of the students entering graduate or professional schools won fellowships and scholarships. Among these awards were 15 Thouron-University of Pennsylvania British-American Exchange Scholarships, 13 Woodrow Wilson National Fellowships, 7 Fulbright Awards, two Free University of Berlin Exchange Scholarships, one Rhodes Scholarship, and

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Council Acts on Benefits Items, Law Degree and Athletics

The University Council approved a recommendation at its regular meeting December 10 from its Committee on Faculty Affairs which reaffirmed that the University contribution for retirement benefits should be increased for employees over 40. The Council approved another recommendation from this Committee that direct grant scholarships for children of academic and administrative staff be increased.

University contributions for employees over 40 participating in the TIAA/CREF plan would be raised from 9 per cent to 10 per cent of annual salary. The Committee unanimously recommended that this be given high priority in allocation of funds.

Direct grant scholarships would be increased from \$900 to \$1050 in the 1970-71 fiscal year with the objective in subsequent years of reaching a level equal to one-half of the undergraduate tuition.

The Council also endorsed the report of

Computer Center Receives \$900,000 Grant from NSF

The Computer Center has been awarded a three-year grant of \$900,000 by the National Science Foundation to expand use of its computer for education and unsponsored research.

Some of the funds will be used to add 40 remote terminals to its IBM System 360/Model 75, which is the largest IBM-manufactured computer in the Delaware Valley. Among locations for the new terminals will be David Rittenhouse Laboratory, the Wharton School, and the Towne School. The remaining funds from the grant will provide for expansion of core and disk storage, increasing system productivity, and shortening "turnaround" times.

During 1968 and 1969, use of the Computer Center increased substantially. The Center now operates on a 21-hour day, six days each week to provide computing and support services within the University and to area non-profit organizations as well as other colleges and universities. Presently services are provided to over 100 research and business organizations, including those in the University City Science Center.

its Implementation Committee (the Council on Physical Education and Athletics) that the one-year physical education requirement for freshmen be rescinded and that an extensive, voluntary recreation and athletics program be offered.

The recommendation of the Law School faculty that the Law School henceforth grant the degree of J.D. (Doctor of Laws) rather than LL.B. (Bachelor of Laws) was approved. Holders of the LL.B. degree would be entitled to have the degree on their diplomas changed to J.D.

Annual Giving Proceeds Reach Record \$2.6 Million

Gifts to Annual Giving in the 1968-69 campaign totaled a record \$2,609,659. This reflects an increase of nearly 30 per cent over the previous year's total, while the number of contributors rose by nearly 2,000 to 28,072.

A 27-member steering committee has been formed to lead the 1969-70 Annual Giving campaign under the chairmanship of Julian S. Bers, an alumnus of the Wharton School and a trustee.

The steering committee is comprised of the chairmen of the Annual Giving campaigns for alumni of the various schools and divisions in the University, as well as those from other special Annual Giving groups.

Gulf Oil Makes 2 Grants

The University has received two grants totaling \$20,000 from the Gulf Oil Foundation. One, in the amount of \$15,000, represents the second payment on a three-year pledge in support of the Near East Center. The second, a grant of \$5,000, is for support of the Gulf Graduate Fellowship in Public Finance at the Wharton School of Finance and Commerce.

The grant to the Near East Center was presented to its director, Dr. Thomas Naff, by Dr. A. Lewis, Jr., senior vice-president of Gulf Oil Corp. Also participating in the presentation of the grant was J. W. Burk, manager of Gulf's Philadelphia refinery. The funds will be used for developing, staffing and operating the Center.

Ocean Exploring System Is Being Developed

The Towne School of Civil and Mechanical Engineering has proposed an unmanned system for future exploration of the ocean depths.

After a year-long study comparing existing techniques for ocean exploration, Towne School engineers have developed a system which would consist of a stable, manned surface ship operating and controlling two types of vehicles—an unmanned, untethered craft for broad search missions, and an unmanned, but tethered vehicle for detailed assignments.

According to Reinout P. Kroon, project director and professor of mechanical engineering, the principal reason for selecting the unmanned design was because the Pennsylvania system is a "third generation" design aimed at operating near depths of 35,000 feet or more—a range that includes 99 per cent of the ocean's environment. Most current vehicles operate at maximum depths up to 6,000 feet and specifications for second generation types call for systems that can operate at depths up to 20,000 feet.

Equally important was the fact that the cost of operating manned underwater craft tends to rise sharply with increased depth. Some deep-diving operations for instance, have an estimated daily operating cost of nearly \$100,000.

The basic disadvantages of a manned system are human-oriented. The overall vehicle design is hampered because of the need to guarantee safety and a suitable environment for the crew. These life support systems reduce operational time, vehicle range and maneuverability, and cut down on power needed for instrumentation and communications. Elaborate surface support is also required in case of emergencies, thus adding to the general complexity. The high operating costs and limited application of manned deep-search vehicles make them impractical for extended service over broad areas. This proposal, however, calls for an all-purpose system that can provide extended service.

The mother ship would be a stable surface platform for manned operations. It would be ocean-going with accurate navigational equipment to locate and maintain its position and it would have adequate equipment for the launching, tracking, control and recovery of both the tethered and untethered vehicles.

The unmanned search vehicle would explore large areas of the ocean gathering bulk data for use in pinpointing sites for detailed search operations. Operating on a 24-hour basis, it could scan more than 300 square miles of ocean floor a month,

automatically placing buoys at places of interest along its trajectory. It would house its own navigation, inertial guidance and sonar equipment, travel at 5 miles per hour, and be maneuverable enough to follow the floor, slopes and walls of an undersea canyon. Its guidance system would allow it to react to both its own collected data and commands from the mother ship.

Once the broad search vehicle locates and marks an interesting site, the command ship would launch a tethered vehicle capable of detailed exploration in a hostile environment of up to 1,000 atmospheres of pressure. Operating like a robot, the craft would be able to maneuver around the clock, "see" terrain through its sonar and high-resolution TV or laser systems, and gather in sample objects of all shapes and sizes with its sensitive manipulator arm.

Instrument packages for measuring and evaluating samples will be interchangeable, and the storage system will maintain original ambient temperature changes and pressure conditions.

One of the major advantages of this tethered, unmanned search vehicle would be the direct cable to the command ship for power and communications which would also afford a means of recovery if the vehicle runs into trouble seven miles down.

The report indicates that commercial fisheries and the petroleum industry, whose objectives are essentially the same as those of the marine geologist and deep-sea biologist, would probably benefit equally with them from such a system.

For biological studies, stereoscopically-mounted color television cameras or laser systems could track schools of fish or other marine life. Special lighting systems and high resolution conventional cameras

could take detailed pictures of underwater flora and fauna. For quantitative samples, a mechanical hand scoop could gather in hardshelled animals and fossils while monitored by a topside TV camera. Movie cameras, sound recording equipment and videotapes would aid in behavioral studies. Soft materials would be scooped up in a vertical, self-sealing cylinder. For geological purposes, it may also be possible to drill hard core samples for the first time, and take bottom photographs of unusual geographic features and areas where natural resources are most likely to occur. Measurements of gravity, slope stability and other factors could be made for construction purposes, and information on the ocean floor's composition would aid in determining its geologic history. Hydrographic and chemical analyses of the water itself, including acoustic measurements and magnetic and radioactive surveys would also be included.

Communications and data handling difficulties caused by signal loss in sea water must be considered, as well as the propagation of light underwater and the cable design for the seven-mile link with the mother ship. In addition, structural designs for the pressure hulls and navigation, and sonar and inertial guidance systems for controlling and tracking the search craft must be investigated and developed as must internal power systems.

Deans, directors and department chairmen have been requested by President Harnwell to meet at 10 a.m., Friday, December 19, to discuss the University's current budgetary situation in view of the continued uncertainty associated with the Commonwealth's appropriation to the University and the effects of continuing inflation. The meeting will be held in the Annenberg School of Communications Auditorium.

University financial officers and members of the Budget Committee will join Dr. Harnwell in presenting background information and data, and in answering questions. Dr. Harnwell has pointed out the need for administrative and academic officers to take certain prudent measures to assure an acceptable budgetary situation in fiscal 1969-70.

A complete report on the budgetary situation will appear in the January *Almanac*.

Graduate Studies . . .

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one Danforth Foundation Graduate Fellowship (four other students received honorable mention in this competition).

The remaining students in each school indicated that they would be engaged in such projects as the Peace Corps or VISTA or that they had not made definite plans at the time of the survey. In the Class of 1969, there were 21 students planning to enter the Peace Corps or VISTA, compared to 18 in 1968 and 14 in 1967. Three members of the Class of 1969 indicated status as conscientious objectors to military service, compared to two in 1968 and none in 1967.

Provost's Office Announces Promotions of Faculty

Additional faculty appointments and promotions approved by the Trustees last month were announced recently by the Provost's Office.

Newly appointed faculty in the College of Arts and Sciences are Dr. Fay Ajzenberg-Selove, research professor in physics; Dr. Irving Friedman, adjunct professor of geology; Mr. John G. Witthoft, associate professor of anthropology; and Dr. Peter van Sommers, visiting associate professor of psychology.

Dr. Thomas L. Saaty has been appointed professor of statistics and operations research in the Wharton School.

Appointments in the School of Medicine include Dr. Sukhamay Lahiri, associate professor of environmental physiology; Dr. James E. Wood, professor, and Dr. Peter A. Cassileth, Dr. Norman H. Edelman, Dr. John A. Kastor and Dr. James C. Shelburne, assistant professors, of medicine; Dr. Giuseppe G. Pietra, assistant professor of pathology; and Dr. Otakar Koldovsky, assistant professor of pediatrics.

Mr. David Polk in the Graduate School of Fine Arts has been promoted to assistant professor of architecture. In the School of Medicine, Dr. David S. Polk has been promoted to associate professor of clinical

Education Courses Expanded

Action has been taken by the Graduate School of Education to accommodate all undergraduate students desiring to enroll next semester in Education 240 and 241, which form part of the requirement for admission to the undergraduate Teacher Preparation Program.

The School had been planning on an increase in enrollment for these courses in the spring semester of 1970 comparable to the increase between the spring semesters of 1968 and 1969. The following statistics show the enrollment for the past three spring semesters, and the estimated pre-registration enrollment for next semester.

	Ed. 240	Ed. 241
1967	86	115
1968	125	127
1969	199	158
1970	480	280

Dr. Neal Gross, dean of the School, said, "When we learned of the situation, efforts were immediately initiated to explore means by which the increased demand could be met. More specifically, a search was immediately begun to recruit

Among other things...

APPOINTMENTS:

GEORGE L. HASKINS, professor of law, has been elected to a two-year term as president of the American Society for Legal History.

DR. RALPH M. SHOWERS, professor of electrical engineering, has been appointed chairman of the U.S. Standards Committee on Radio-Electrical Coordination. He also was a member of the committee which prepared the report published by the Joint Technical Advisory Committee of the Institute of Electrical and Electronic Engineers and the Electronic Industries Association

pediatrics; Dr. Herbert Lipshutz to associate professor of clinical plastic surgery; Dr. Harold Dillon to associate professor of clinical psychiatry; Dr. David B. Geselowitz to associate professor of electrical engineering in medicine; Dr. Lee W. Henderson to associate professor of medicine; Dr. Zachary B. Friedenbergl to professor of orthopaedic surgery; Dr. Chaun-Pu Lee to associate professor of physical biochemistry; Dr. Aaron Katcher to associate professor of psychiatry; Dr. James E. Griffin to professor of physical therapy; and Dr. Robert Ravdin to professor and Dr. Stanley Dudrick to associate professor, of surgery.

on "Spectrum Engineering—The Key to Progress, a Report on Technical Policies and Procedures Recommended for Increased Spectrum Utilization."

AUTHORS:

DR. JOHN SILVERIO, associate in pediatrics, is author of an article on "Organic Phosphorus Insecticide Poisoning in Children" in the November issue of the *Journal of School Health*.

JERRE MANGIONE, professor of English, is author of *America Is Also Italian*, the first in a series of books about immigrant groups in America to be published this month by G. P. Putnam's Sons.

ARNOLD R. POST, associate in the Government Studies Center of the Fels Institute of Local and State Government, is author of a research report on "Mobility Analysis as an Appropriate Technique in Small Area Demography" in the November issue of the *Journal of the American Institute of Planners*.

DR. LAWRENCE EISENBERG, assistant professor of electrical engineering, is author of a paper "A Closed-Loop, Time-Domain Method for the Approximation of System Responses," published in the *Instrument Society of America Transactions*, Vol. 8, No. 3.

DR. STEVEN J. GITOMER, assistant professor of electrical engineering, had a paper on "Electromagnetic Instability in an Electron Cyclotron Resonance Plasma" (with J. L. Shohet) published in the November issue of *Physics and Fluids*.

DR. NABIL FARHAT, assistant professor of electrical engineering, is author of "Relation between Wave Structure Functions Looking Up and Looking Down through the Atmosphere" (with A. Decu) and of "Time Dependent Resolution of Liquid Crystals" respectively in the *Journal of the Optical Society of America* and *Applied Optics*.

DR. WILLIAM C. McDERMOTT, professor of classical studies, is author of an article "De Luceis" in *Hermes*.

HONORS:

DR. BRITTON CHANCE, professor and chairman of the department of biophysics and director of the Johnson Research Foundation, has been named to receive the Dr. R. P. Heineken Prize in 1970 by the physics section of the Netherlands Academy for Sciences.

DR. HENRY L. BOCKUS, emeritus professor of medicine and gastroenterology, has been named to receive the 1970 Distinguished Service Award of the American Medical Association.

Among other things . . .

DR. PHILIP RIEFF, Benjamin Franklin Professor of Sociology, has been named a Fellow for life of the Royal Society of Arts in Great Britain.

STAFF APPOINTMENTS:

ROBERT M. ENGMAN and NEIL G. WEL-LIVER, professors of fine arts, have been appointed co-chairmen of the department of fine arts, effective July 1, 1970.

TRAVELERS & SPEAKERS:

DR. HOWARD E. MITCHELL, director of the Human Resources Center and 1907 Foundation Professor of Urbanism and Human Resources, visited residential centers for children in Austria and Switzerland in relation to the responsibility of the Human Resources Center for planning of a model interracial residential center and pre-school unit for dependent and neglected children in Mansfield, Ark.

DR. DAVID W. C. SHEN, professor of electrical engineering, gave a special course on "Introduction to Adaptive and Learning Techniques in Engineering Cybernetic Systems" to the NASA-ASEE Summer Faculty Institute and the NASA-ASEE Faculty Systems Engineering Institute at the Manned Space Center in Houston. He also presented the following papers: "Sensitivity and Optimal Control of Multivariable Systems" at the Joint Automatic Control Conference in August (coauthored by Dr. Robert Chen); "A Self-Optimizing Distortionless Filter" presented at the Eighth International Symposium on Space Technology and Science (with James Rome); "A Multilevel Ap-

proach to the Adaptive Control of Large-Scale Engineering Cybernetic Systems" with Dr. Donald Orr; "Response Time Distribution in a Command and Control System with High Traffic" with Charles Theobald at the International Congress of Cybernetics in September. He was also invited by the International Cybernetic Congress Committee to serve as a co-chairman with Professor Gordon Pask of Great Britain in the Session on Cybernetics and Industry and published a joint paper with Dr. B. Chandrasekaran on "Stochastic Automata Games" in Volume 5, No. 2 issue of IEEE Transactions on Systems Science and Cybernetics, 1969.

DR. STEVEN C. BATTERMAN, associate professor of engineering mechanics, attended the first International Conference on Pressure Vessel Technology in Delft, The Netherlands, in October.

DR. ROGER ALLEN, assistant professor of Arabic, gave a paper titled "Mir'at al-Alam by Ibrahim al-Muwailihi and Layali Satih by Hafiz Ibrahim" at the annual meeting of the Middle East Studies Association in Toronto in November.

DR. LEONARD NANIS, associate professor of chemical engineering, lectured on "Atomic Structure of Electrode Surfaces" at Trenton State College in November.

BRITTON HARRIS, professor of city and regional planning, was a discussant on "Urban Density Functions" at a conference of the Committee on Urban Economics in Cambridge, Mass., in September. He was chairman of a panel on "Examples of Past Experiences" at the Engineering Foundation Research Conference in Deerfield, Mass., in August. Mr. Harris also was chairman of the Conference on General Systems Aspects of Urbanism at Wayne State University in June. That month he also addressed a conference on the Environmental Design Research Association

at Chapel Hill, N. C., on "Understanding and Insights: Content as Opposed to Process".

DR. WILLIAM ROACH, professor of Romance languages, spoke on "Francisque Michel: A Pioneer in Medieval Studies" at the annual general meeting of the American Philosophical Society held in November in Philadelphia.

DR. STANLEY BAUM, associate professor of radiology, was a lecturer at the Lahey Clinic in Boston in a symposium on "Diagnostic Radiology of the Gastrointestinal Hemorrhage" in November. He also participated in a course on "Recent Advances in Gastroenterology" in Santo Domingo, Dominican Republic and was a guest speaker at the Detroit Roentgen Ray Society.

DR. ALFRED KIDDER, professor of anthropology and curator of the American Section of the University Museum, spoke on "Pre-Columbian Art of the Mayan and Peruvian Cultures" at the Allens Lane Art Center in Philadelphia in November.

DR. FRANK P. BOWMAN, professor of Romance languages, spoke this month at Bryn Mawr College "Form and Language in Autobiography".

The University has been assigned identification numbers for use by area radio and television stations in announcements of closings of schools and colleges because of snow. The code number for the University (excluding the College of General Studies and the Wharton Evening Division) will be 102. The number to be used to identify class cancellation in the College of General Studies and the Wharton Evening Division will be 2102.

Almanac is published monthly during the academic year by the University for the information of its faculty and staff.

News items should be sent by the first of the month to:

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