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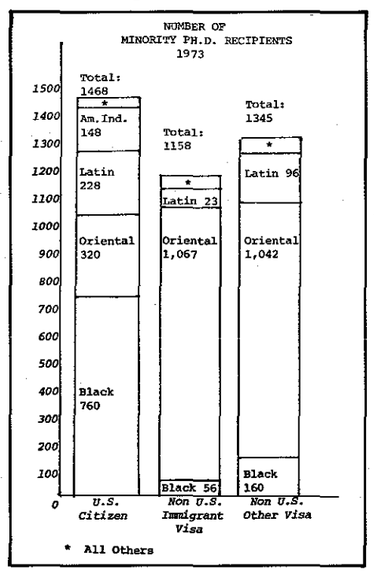
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Minority Doctoral Scholars Subject of Recent Study

In compiling information for a recent report, the Commission on Human Resources of the National Research Council found that of the nearly 4,000 doctoral degrees conferred on members of minority groups in United States universities in 1973, 63 percent were earned by non-U.S. citizens holding immigration or some other type of visas. Black Americans, Latins (includes Puerto Ricans, Spanish-Americans and Mexican Americans), Oriental Americans and American Indians comprised the remaining 37 percent.

The report, *Minority Groups Among United States Doctorate Level Scientists, Engineers, and Scholars, 1973*, contains primarily statistical data useful to organizations undertaking affirmative action programs.



In the fields of engineering and science, Orientals represent more than half of the minority doctorate holders. In fact, 5 of the 6.6 percent minorities in the Ph.D.-level science and engineering labor force in this country are Orientals; .8 percent Blacks; .6 percent Latins; less than .1 percent American Indians; and all other racial/ethnic groups comprise approximately .1 percent of the total. These findings relate to CHR's observation that each of the various racial/ethnic groups tends to favor a particular field. Orientals prefer employment in the physical sciences and engineering; Blacks and American Indians favor education; and Latins prefer the humanities. Further, non-U.S. citizens without immigration visas concentrate in the natural sciences.

Because of federal regulations, racial/ethnic identification was not included in the Doctorate Records File of the CHR prior to fiscal 1973. In the beginning of that year, a change in the regulation allowed the inclusion of a question designed to determine the racial/ethnic background of doctorate recipients, which will provide positive information to the CHR with regard to minority group identification.

Although this report, released in December 1974, includes no policy interpretations or recommendations, there are plans to explore these areas in a report which will be published sometime later this year, probably in June or July. This latter report will deal with policy-related questions and present extensive additional data as well as a review of the literature.

Results of future studies, including the one scheduled for early summer publication, on the numbers, education, and careers of minority group members within the doctorate level scientific population will be available from the National Board on Graduate Education, National Research Council, 2101 Constitution Avenue, N.W., Washington, D.C. 20418. A few complimentary copies of the December 1974 report are still available from the Commission on Human Resources, National Research Council.

Charlett Bundy

CHRONICLE
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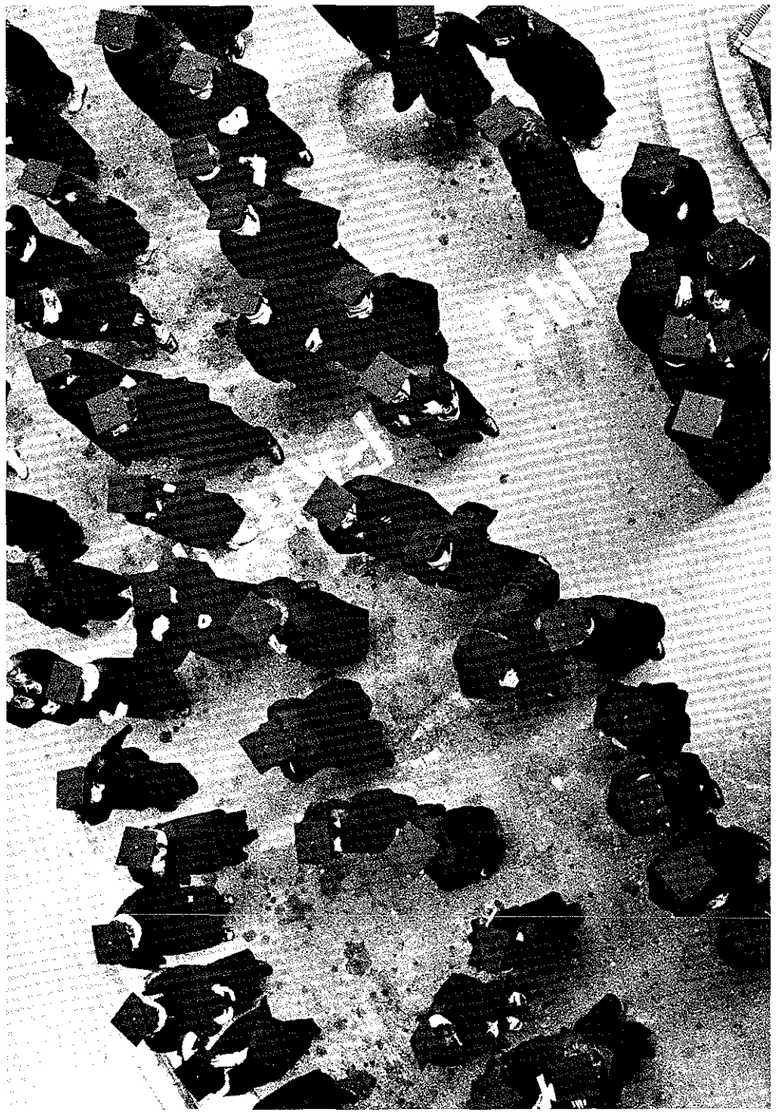
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University of Maryland Graduate School

Chronicle



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Kidd Addresses UMCP Graduate Faculty Assembly

Focus on "The Unfinished Agenda for Graduate Education"

The regular annual meeting of the College Park campus graduate faculty assembly was held on April 18, 1975. Dean for Graduate Studies David S. Sparks presided over the assembly, opening the meeting with introductory welcoming remarks and a brief report on the past year's activities by the Graduate Council and by his Office.

Guest speaker at the assembly was Dr. Charles V. Kidd, Executive Secretary of the Association of American Universities. Kidd's remarks focused on a series of formal questions posed by the presidents of A.A.U. institutions to the graduate deans of the Association of Graduate Schools of the A.A.U. General discussion followed the comments by Kidd.

The presidents' questions and deans' responses will be incorporated into a report on the research doctorate in the United States, which will be available by fall.

Some of the questions and a brief discussion of the issues involved in providing responses to them follow.

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1. What is the general assessment of the Association of Graduate Schools of the status of graduate education in this country and of the proper direction of change?

Among the fundamental needs of a dynamic society are a physically and psychologically healthy citizenry, a productive economy, a sound government, an effective educational system, a rich cultural heritage, and the continuing generation of new knowledge. Graduate education in the United States has in the past and is bound to continue in the future to contribute to society by helping to meet these needs.

In times of desperate national need, graduate education has responded especially vigorously with scientific and technological advances, increased personnel production, and increased service to society. Yet, equally as important as its contributions in times of periodic crisis are the contributions made by graduate education over a longer time span. The fundamental justification for centers of graduate education is the continuous production, sustenance and transmittal of the basic knowledge which will allow our society to maintain its dynamic quality.

The present economic and social situation in this country requires a careful balancing of three of graduate education's primary tasks. The country's citizenry must be educated to the highest possible intellectual levels. New knowledge must be added to our pool of resources while our cultural heritage is preserved and extended. Graduate education must avoid at all costs an ivory-tower posture; it must join other societal forces in the search for solutions to contemporary national problems.

2. What is the prospective supply and demand for Ph.D.s? What weight should be given to manpower forecasts?

Although there is not a general glut of Ph.D.s in this country, the supply and demand situation must be assessed field by field and not globally. If it appears that in some given field a high proportion of the Ph.D. recipients will have careers in which their skills will be underutilized, the prospect must be publicized and the potential advantages of public subsidy of that field must be carefully scrutinized. Painful results of such scrutiny for individual graduate students or graduate departments should not be allowed to interfere with the proper course of action in this respect. Naturally, one must always bear in mind the possibility of major developments which might completely upset carefully made and detailed projections.

Total graduate enrollment and the distribution of students by field has been and will continue to be governed by a complex mix of motives, opportunities, needs, perceptions of the future, changes in the labor market, as well as by fundamental changes in the values and choices of college graduates, policies regarding financial support for educational endeavors, and numerous other factors. An effort to control enrollment based solely on superficially derived forecasts might be far more disastrous than any results of the natural operation of the forces listed above.

A general leveling off of the graduate enrollments at our leading institutions should be accepted as providing a time for concentration on the quality of graduate education and for a realistic assessment of how best to realize positive changes in graduate education in a period of stability rather than rapid growth.

3. If more graduates will be going into non-academic positions, should graduate education be modified and, if so, how?

In the move to increased proportions of non-academic positions for Ph.D. graduates, much might be gained by a clear recognition of the need to look outside of the university for aid and definition of appropriate training; regional and professional accrediting organizations and professional societies may have guidelines which warrant some attention from academicians. In obtaining such advice and perspective, however, it will be necessary to move cautiously to avoid warping of the Ph.D. program from that of a fundamental educational learning experience to one of short-term manpower training, which move would diametrically oppose the basic concept of graduate education.

4. In responding to urgent national problems, what considerations are involved in making effective responses through graduate education?

At all costs, one must avoid rejection of the fundamental premise that

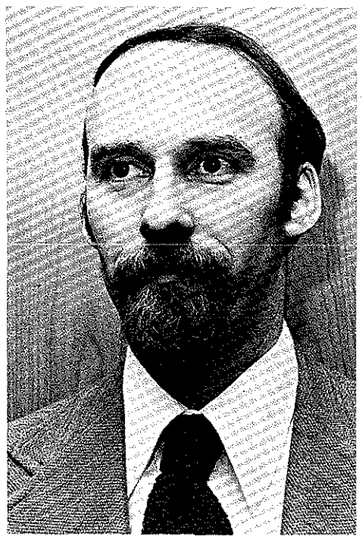


Photo by Robin West

Williams: The patent is the carrot which will get the corporation to pull the inventor's cart into the marketplace.

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weeks at the University giving seminars to groups of faculty and students in areas of research which have high invention potential. Dr. Abraham Bavley, Mr. Robert Goldsmith, Mr. Bernard Kosloski, and Dr. Williams will return to the campuses periodically to follow through on the third phase of the program.

Unfortunately, the attendance at seminars at the University of Maryland was not as great as had been originally hoped for, despite considerable advance notice given in various campus publications. In several instances, only two or three department members were present for the departmental seminar presentations. Fairly heavy turnouts were recorded at seminars for the Departments of Chemical Engineering (12), Electrical Engineering (17) and Physics and Astronomy (17) at College Park. At Baltimore, twenty-five faculty members and students attended the seminar for the School of Pharmacy; Dr. Bavley notes that this was "a magnificent turnout . . . potential inventions surfaced right at the meeting."

Additional opportunities will be available for those faculty members and students who were unable to attend the seminar series for their department. The third phase of the project will continue for several months, providing support in a continuing effort to identify inventive concepts. Research Corporation team members conducting the experiment in patent awareness will be available on the University campuses May 19 and 20, June 16 and 17, and the third Monday and the following day of subsequent months. Faculty members and graduate students doing research are urged to initiate contact with the team members concerning possible patentable ideas, regardless of how far-fetched they may sound. The benefits of a successfully licensed patent to the inventor, the institution, and the general public can be extraordinary.

The Chronicle *hopes to follow the progress of the patent awareness program through its final phases, providing the University community with coverage of patentable ideas brought to light by Research Corporation's efforts.*

— The Editor

An Exploration of Some Aspects of Grantsmanship

More often than not, the "business" of research alludes to the matter of financial support. The Conferences and Institutes Division of University College and the College Park Office of Contracts and Grants sponsored two seminars earlier this spring dealing with the financial aspect of research. Participants in the first seminar received current information from several national, state and private funding agencies, while the second seminar offered methods to improve proposal writing skills.

The Research Resources Conference held March 4th provided current information on funding opportunities in such agencies as the National Science Foundation, U.S. Office of Education, and the Energy Research and Development Administration. Essentially, the meeting enlightened university and college faculty and staff members about current program priorities and funding levels of ten organizations, so that attendees might get a general feel for the overall resource market. Emphasis was on pinpointing funds available for research in the arts, humanities and social sciences.

A two-day Proposal Writers Institute followed the resources conference. In order to broaden the scope of the Institute, Dr. John H. Buskey, Director of the Conferences and Institutes Division, deviated from the structure he maintained in twenty previous proposal writing workshops. The expanded program included, in addition to Buskey, five other university staff members with proven expertise in the art of proposal writing.

According to Buskey, the Proposal Writers Institute covered the whole process of proposal writing; it presented a package of information to accommodate the needs of the wide range of registrants—information not redundant for those skilled in writing proposals and, at the same time, not too sophisticated for novice proposal writers.

Both programs attracted nearly 200 registrants from as far west as Idaho, and as far south as Puerto Rico. Evaluation forms have been mailed to participants in both programs to determine the effectiveness of and future need for such conferences. If results are favorable, the Research Resources Conference and the Proposal Writers Institute may become annual events or may be incorporated into a comprehensive program. This program, which may begin in the fall, would touch on all facets of grantsmanship but concentrate on project management and procurement.

For those who missed the Proposal Writers Institute, Buskey offers the following advice: "If you can sum up the proposed project in one simple, declarative sentence, then you have taken a major step toward writing a good proposal."

Charlett Bundy

Patents' Benefit to Inventor, University, and Society Stressed In Seminar Series

The December 1974 *Chronicle* introduced to the University graduate community the experimental "patent awareness programs" currently underway at eight universities in the country, including the University of Maryland. Operating on the basic assumptions that more inventions can arise from university research than are currently being patented and that these inventions can be put to practical use, Research Corporation, through a three year, $198,700 grant from the National Science Foundation, is conducting the four phase program, which includes a review of ongoing institutional research, a seminar series designed to educate university staff about patent procedures, a program of continuing support through monthly visits to the campuses by patent associates employed by Research Corporation, and a report of results at the program's conclusion.

Other participating institutions hosting teams from Research Corporation are the Polytechnic Institute of New York, Princeton University, the University of Michigan, the University of Washington, the University of Georgia, Case Western Reserve University, and Virginia Polytechnic Institute and State University.

The program aims at an earlier and more widespread identification of inventive concepts, which will guard against the possibility that important discoveries will be lost to the public, shorten the time between early observations and practical embodiments of innovative concepts, and increase the practical productivity of federal funds devoted to research. Currently over two billion dollars a year in federal funds are going into support of the university research endeavor. The academicians' increased awareness of proper patenting procedures might result in profits of more immediate social consequence from such an enormous investment.

A patent is a grant by a government to an inventor giving him the right to exclude others from making, using or selling his invention for a definite time period. In the United States, the grant is given in exchange for a full disclosure of a new, useful, and nonobvious invention.

A misconception prevalent in academic circles is that patenting precludes publishing and vice versa. This notion is not true; patenting and publishing need not be mutually exclusive if the proper time sequence is followed. If the patent application is filed before the submission of a manuscript for publication, the inventor derives full benefits from both actions.

Publishing without simultaneous patenting means that the right to patent is lost in a short time, six months for West German and Japanese patents and one year for patents in the United States. At this point, the invention, through publication, becomes part of the public domain, and the absence of a preferred market position may deter a commercial firm from risking capital when development costs are high.

Dr. Robert M. Williams of Research Corporation points out that in many cases, there is an extremely high risk and high cost in taking a product idea and "getting it to market." There is often serious conflict between innovation and public safety, and the inventor often has insufficient funds to carry through necessary testing and experimentation to ensure acceptability for public use. "The function of the patent," says Williams, "is to equilibrate the conflict between public safety and innovation . . . to reward the innovator."

Patenting provides incentives to industry to develop; gives the public new products and processes not otherwise available; may provide financial return to the inventor; allows for the retention of control by the patentee to prevent abuse; disseminates knowledge; and stimulates and supports further research by others.

In mid-March, four patent associates from Research Corporation spent two

Bavley: It is a little known fact that a tremendous number of Nobel laureates are inventors. . .and a great many of these are at universities.



Photo by Robin West

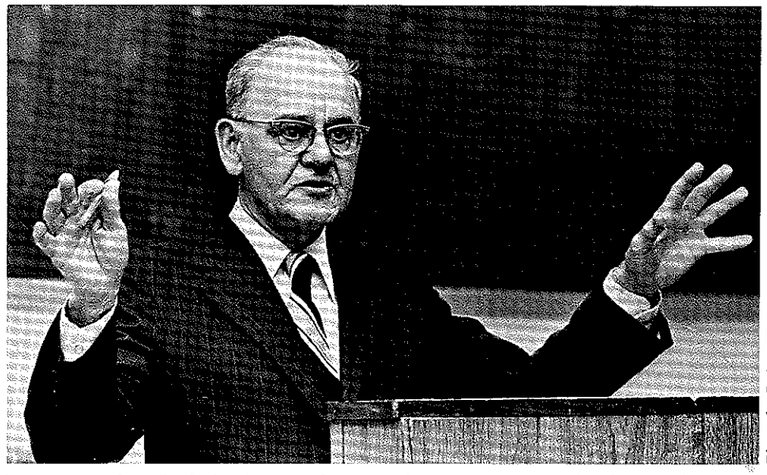


Photo by Robin West

basic research and scholarship are the functions that graduate education and research can perform most effectively for society. The capacity of graduate education and research to serve society is imperiled by efforts to convert them into instruments to procure quick solutions to problems now seen as urgent. Short term priorities threaten the search for knowledge that will make possible the answers to problems that will confront future generations.

Appropriate responses of graduate education to national needs must include the maintenance of the highest possible standard of intellectual excellence, providing students with a sound education in the fundamentals of a basic discipline while instilling in them an awareness of the perishable nature of all knowledge and of the interrelationships among various fields. A premium should be placed upon a spirit of inquiry and an attitude of flexibility with respect to areas of eventual application of individual abilities and acquired experience.

The university must protect its capacity for independent assessment of emerging and potential problems. While graduate schools have an obligation to provide specialized manpower forces for government and industry, they must avoid over-accommodation in this respect, and must maintain their integrity as educational institutions rather than training institutes.

5. What principles should guide the allocation of resources to graduate education by universities, state and federal governments? What can be done to use most effectively—either within or among universities—the resources required for high quality graduate education?

Hard decisions about resource allocation to educational institutions must be based on explicit criteria, stressing such factors as quality of programs, academic interrelationships, the number and quality of students, and the regional and national role of programs. As important as the formulation of such explicit criteria is the creation of a structure and procedure for their application. There is a pronounced need for a mechanism by which to review graduate programs, at all levels from university or campus to trustees or state legislature. It is important that the power to resolve details, however, rest ultimately with the individual university.

Economies are most likely to be found through all forms of institutional sharing of resources (faculty, library and research facilities, student access to academic programs) and by rigorous review of proposals for new programs. The graduate dean will have an extremely important role to play in the construction of inter-institutional arrangements for resource sharing since such arrangements almost invariably involve matters affecting the total graduate enterprise.

6. How can graduate education and research contribute more effectively to the teaching of undergraduates?

Concepts developed by graduate education and research continually infuse new vitality and quality into the undergraduate curriculum. They provide new clusters of knowledge which, investigated at the graduate level, can be adapted to undergraduate education, adding breadth as well as depth to the college curriculum. The graduate teaching assistant can be a potent positive influence, serving both as mentor and academic colleague to the undergraduate student, providing a vital link between faculty research and the undergraduate education program.

In addition to the effects of the content of graduate education on undergraduate, the processes of the one contribute greatly to the improvement of the other. Ph.D. training stresses active participatory learning; made accessible to the pre-baccalaureate student, the independent study, the colloquium, honors thesis work, the seminar series, and internship opportunities uplift the quality and variety of undergraduate teaching.

Naturally the full benefits of this sort of interaction require that the two levels of education are purposely intertwined.

7. What should be the A.A.U. posture with respect to equal access to grad-

uate education?

It is imperative that individuals of comparative academic ability and potential have equivalent access and opportunity to engage in and complete graduate study. There are compelling moral, legal and pedagogical reasons for positive action to ensure that opportunities for graduate study be independent of sex, race, origin or economic status. A more diverse racial and ethnic population of graduate students will have important positive educational by-products for the entire university community.

Two major obstacles stand in the way of ensuring the successful completion of any program to provide increased opportunities for underrepresented groups in graduate education. The first is the reality that the size of the pool of minority students qualified for graduate work is limited by the extremely difficult financial situation of most predominantly black institutions and by widespread deficiencies in the elementary and secondary education of a substantial proportion of minority students. Improved access of minority students to graduate education will depend, in the long run, on the elevation of general education standards at all levels simultaneously.

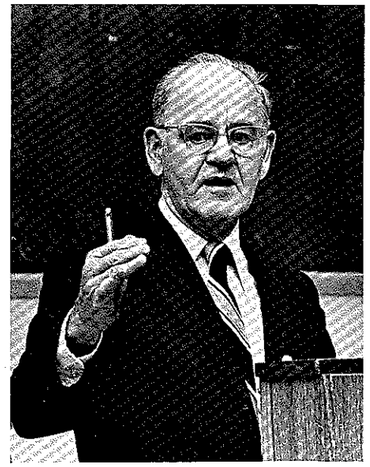


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An important short range problem is the absence of data. A.G.S. is analyzing and distributing more reliable data on sex, race and ethnic origin of graduate students and advanced degree recipients, relying heavily upon data and reports of the Commission on Human Resources of the National Research Council.

8. How can the A.G.S. itself play a more useful role in confronting the problems of graduate education?

Many issues facing graduate education today still require careful analysis and extended discussion. Among the topics which will require further investigation in coming months are those concerned with policy and with research. The constituencies of the university must be more clearly defined and analyzed so that policy regarding them can be arrived at more readily. The university structure will have to be studied further regarding structural changes, faculty development, the "new depression" in graduate education, the governance of graduate education, the evaluation of existing and proposed programs, and alternate degree programs.

Supply and demand imbalances must somehow be resolved, a program of Ph.D. placement most advantageous to society and the degree holder must be formulated, and the data base on graduate education must be expanded.

Graduate education must be periodically assessed if its mutually beneficial symbiotic relationship with society at large is to flourish.

SIGMA XI AWARDS ANNOUNCED

Three doctoral students have been chosen to share the $1000 Annual Research Excellence Award of the Maryland Chapter of Sigma Xi. Bryan Wolf and Gregory Carey are both working toward doctorates in the Department of Chemistry at UMCP, and Michael Gene Bramucci is pursuing his Ph.D. in Experimental Biology-Health Sciences at UMBC.

Now in its third year, the award is given to support outstanding research leading to an advanced degree. Applicants are required to submit research proposals in the format suggested for grant applications by the National Science Foundation. Emphasis is placed on originality, design and logic of the presentation, and the adequacy with which a question posed is to be answered.

Bramucci's project, which involves the isolation of genes that control sporulation and the construction of a plasmid for *Bacillus subtilis*, requires the purchase of isotopes for labeling DNA [deoxyribonucleic acid]. The award from Sigma Xi will be used to defray the cost of the isotopes.

Carey, whose project involves *in vitro* synthesis of myelin specific proteins in normal and myelin deficient mutant mice, says that the award will pay for radio tracers, animals and animal supplies needed for his research.

Wolf intends to use the $333 award for publication costs and travel costs so that he can present his research project, entitled "Criteria for Binding to and Transport by the GABA [gamma-aminobutyric acid] Carrier in Rat Brain Synaptosomes," at a national meeting.

In addition to its support of graduate student research in the sciences, Sigma Xi also presents an annual Achievement Award for Contribution to Science to a member of the faculty at the University. This year's winner, Professor Shih-I Pai of the Institute for Fluid Dynamics and Applied Mathematics, was announced at the Sigma Xi annual initiation and banquet on April 30th. The winner of the faculty award is selected through an informal nomination procedure; members of Sigma Xi are invited to suggest outstanding colleagues in the sciences for this honor.

Pai, the author of several books and over a hundred published journal articles, has been on the IFDAM faculty since 1949. He is the fourteenth outstanding University scientist to be selected to receive the prize since its inception in 1963.

There are approximately 500 members of Sigma Xi at the University of Maryland; all are eligible to nominate colleagues for the Annual Achievement Award and to sponsor student proposals for the Research Excellence Awards. Maryland Chapter President Wesley L. Harris (Department of Agricultural Engineering) can provide further details about both awards to any interested individual.

Breneman Report on "New Depression" Released

The widespread fear that graduate education in the United States would be unsettled and suffer impaired vitality in the period of adjustment following rapid growth in the sixties was not wholly justified, according to a recent study by the National Board on Graduate Education. The "new depression in higher education" has not resulted in a shift of students and financial support from high calibre to low quality graduate programs; rather, the effects of the recession seem to have been distributed equally among graduate programs, threatening most those smaller, less prestigious programs located primarily in poorly financed private institutions and less-known public institutions.

Polling over 1200 graduate departments, the study investigates the changes brought about between the years 1968 and 1973 in 14 disciplines in the physical sciences, social sciences, and engineering. The author of the study findings, National Board on Graduate Education staff director David W. Breneman, reports that financial stringencies have not in fact resulted in any drastic changes in graduate education.

"Most departments visited. . .seem to be following a conservative 'enclave' strategy designed to maintain the status quo."

Substantial declines in doctoral enrollment in the physical sciences can be traced in part to discouraging labor market information, rather than placing total blame on a decline in fellowships and traineeships, says Breneman. In spite of bleak employment outlooks for new Ph.D.s in the humanities and social sciences, there has been no significant decline in graduate applications in those fields.

Breneman warns in his study that "it would be premature to conclude that graduate education in the United States will necessarily continue to evolve in the next decade in a socially desirable fashion," despite the "remarkable stability and resiliency" graduate programs have shown in recent economic hard times.

In an introduction to the study findings, the National Board on Graduate Education endorses Breneman's conclusions, noting however: "Quality in graduate education involves many subtle factors that are not easily captured by quantitative techniques. Many knowledgeable observers believe that severe damage to the quality of graduate education and research is occurring in dimensions not included in this study."

The report, *Graduate School Adjustments to the "New Depression" in Higher Education*, is the third in a series of technical reports by Breneman for the National Board on Graduate Education. Copies are available from the Printing and Publishing Office, National Academy of Sciences, 2101 Constitution Avenue, N.W., Washington, D.C. 20418.

Three Programs to Participate in National Survey

Three departments on the College Park campus have been invited to participate in a field study jointly sponsored by the Council of Graduate Schools in the United States and the Graduate Record Examinations Board. The study is designed to provide educators and administrators with a better understanding of the meaning of quality of graduate education and to suggest some ways in which the assessment of quality might be improved.

According to David A. Goldberg, Assistant Dean for Graduate Studies at College Park, who is acting as campus coordinator for the project, department chairmen C. J. Bartlett (Psychology), Walter Rundell (History), and Joseph Vanderslice (Chemistry) have all agreed to participate in the study. Among the sources being tapped for information in this project are faculty members, doctoral students, recent doctorate recipients, and departmental records. Brief questionnaires, currently being completed by the participating departments, have been distributed to all department faculty who teach doctoral students, all experienced doctoral students (usually students in their third year of graduate study or beyond), and samples of individuals who received doctoral degrees from the departments between 1970 and 1972. In addition to the questionnaires, each department chairman has been asked to provide basic descriptive information about his department, such as number of students and faculty members, admissions data, financial assistance data, specializations and placement of graduates.

Approximately twenty universities that award doctorates in psychology, history and chemistry have been invited to participate in the field study. The list includes institutions broadly distributed geographically, programs varying widely in size, and some new or relatively unknown programs as well as some with top national reputations.

After completion of the current project, the steering committee hopes it will be possible to set up workshops on uses and interpretation of the data which have been collected. The study aims not merely at arriving at a rigid set of criteria for quality by which to make judgments about specific programs, but rather at identifying information which is meaningful from program to program, and useful for program self-study and improvement, internal and external decision making, and guidance of prospective students.

Dimensions of Quality in Graduate Education
Steering Committee

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