

Faculty and Staff Misconceptions Slow Transfer of Technology

Preliminary findings from the Patent Awareness Program being conducted by Research Corporation (see Summer 1975 *Quarterly Bulletin*) point to misgivings, misconceptions and lack of interest on the part of faculties and administrations as major factors in hindering the public utilization of university research results. In most cases the halting or slowing of technology transfer is nurtured by a dearth of accurate information.

The purpose of the foundation program, funded in 1974 by a grant of \$198,700 from the National Science Foundation, is to heighten the awareness of faculty researchers and administrators to the possibility of inventive concepts resulting from government-supported research and to point out the steps that can be taken to bring research results into public use. Completion of this process provides a tangible return in the form of useful goods and services for the taxpayers who foot the bill for research funding, and may result in new income for the institution and the faculty inventor.

The program is based on experience gained by Research Corporation in more than 40 years of administering inventions for educational and scientific institutions. The foundation's Patent Program—an entity entirely separate from its Grants Program—currently makes available without charge a broad range of invention evaluation, patenting and licensing services to nearly 300 nonprofit institutions.

VARIETY OF ATTITUDES REVEALED

Through a series of seminars, smaller group meetings and individual conferences with faculty and administrators, members of the Research Corporation team have discovered tremendous variations in attitudes toward the handling of technology resulting from research.

Some administrators are acutely aware of their obligations to federal granting agencies, as well as the potential of additional income for the institution; they have evolved realistic patent policies which have been communicated to the faculty, they have set up effective procedures to review and evaluate research results, and in some cases they have provided in-house capabilities for patenting and licensing faculty inventions. At the other end of the scale, however, are many who make only a superficial effort or none at all.

Discussions with faculties have developed an equally broad spectrum of attitudes. Some feel that there is something unethical or unprofessional about seeking patents. Some think only of doing research, publishing and getting on with the next project. Many do not realize that they have a contractual obligation to report inventions to

the funding government agencies. In addition to these more general impressions, there appear to be four particular areas of confusion and uncertainty for researchers.

MAIN AREAS OF CONFUSION

- The kinds of academic inventions that can be protected by patents. "I can't see anything in my research area that might be patented," or "I do only basic research; nothing patentable will ever come of it."
- Effect of government sponsorship of research. "I'm working with federal funds, so anything I discover belongs to the government."
- Effect of publication on patenting. "It doesn't concern me; my only responsibility is to publish my research results, and if I publish I can't patent."
- The patent policy of the institution. "If there should be any income, do I share in it? Does my department?"

As to the kinds of academic inventions that can be patented, many researchers do not understand how basic work in chemistry, physics or biology can result in findings of potential value in pharmaceuticals, industrial processes, laboratory equipment, medical devices and other useful products or procedures. Since it is difficult to define precisely which research results may be of value, researchers are advised to disclose *all* summary data in detail to the designated university authorities for evaluation. This may often be done merely by submission of seminar or journal manuscripts before delivery or publication.

Just as troublesome to some—since the ground rules are different for each funding agency—is the question of ownership of rights to results of research supported by federal grants. The erroneous conclusion that the government requires sole ownership rights to such inventions has undoubtedly caused a number of patentable inventions to lie fallow in researchers' notebooks. In fact, the agencies generally encourage institutions to develop suitable patent policies and mechanisms to bring inventions *into use*. Through use of well established agency regulations, institutions having such policies and procedures may obtain rights to inventions, permitting development of the inventions through patenting and licensing, with both the institutions and their faculty inventors participating in royalties that may result.

(A frequently encountered belief is that inventions can be "dedicated to the public" by publishing, rather than patenting. In our capitalistic society, however, this is not the case. Firms are most reluctant to spend huge sums to develop new products or processes for which

there is no patent protection. Such protection is especially needed for new pharmaceuticals where development costs may run into the millions.)

The effect of publishing on patenting is another area of uncertainty for many researchers, and for good reason; it is fraught with pitfalls. First, there is the question as to what constitutes a "publication." A printed abstract or a thesis cataloged in a library may be a publication in the patent sense. Then, there is the matter of timing. While the inventor has up to a year in the U.S. to file a patent application after publishing, there is no such leeway in most other countries. Thus the mere act of publishing can bar protection in areas where it may be needed either for local development or for international licensing. As noted earlier, one safeguard is to submit manuscripts for screening for patentable material before delivery or publication. In any case, the investigator should consult the institution's patent authorities before disclosing to any audience (even a reporter for a local paper) detail about discovery which might permit a person familiar with the field to duplicate it or put it to use.

There is a surprising lack of knowledge on the part of many researchers as to the patent policies of their own institutions, in spite of the fact that they are generally distributed widely. These should be "must" reading, for they spell out the responsibilities of researchers to disclose inventions, the procedures for evaluating, patenting and licensing, and the methods of sharing any resulting royalty income. Investigators should be urged to familiarize themselves with their institutions' stated policies, and if there are none, administrations should consider developing them at the earliest opportunity.

PROGRAM RESULTS SUMMARIZED

Based on the results of the Patent Awareness Program to date, it is clear that, given two conditions, a carefully planned, concentrated and continuing program can succeed in correcting misconceptions and supplying the needed information, leading to an awareness of the potential that lies in research results and an incentive to do something about it.

At one institution covered in the Research Corporation program, invention disclosure activity was increased some 300% within one year. At another so many inventive concepts have been surfaced that the administration is hard pressed to handle the evaluations. At others the results have been less spectacular, although in all cases there have been definite increases in disclosures.

The two conditions on which the success of the program hinges are positive attitudes of administrators, and enthusiasm on the part of department chairmen. Without an administration that processes invention disclosures rapidly and intelligently, keeping faculty inventors informed, and without the demonstrated support of department chairmen in the program, the chances are greatly reduced that inventions hidden in research results will ever be discovered, let alone put to use.

Cottrell Centennial to be Observed

The 100th anniversary of the birth of Frederick Gardner Cottrell, air pollution control pioneer and founder of Research Corporation, will be observed at California State College, Stanislaus in January 1977 with a Cottrell Centennial Symposium. The two-day program, scheduled for January 13-14, will be devoted to the sources of air pollution and its effects on the growth, quality and quantity of crops.

Speakers at the symposium will include scientists from universities, industry, and state and federal agencies. Joel Hildebrand, Emeritus Professor of Chemistry at the University of California, Berkeley, will speak of his recollections of Dr. Cottrell, his long-time colleague. James S. Coles, President of Research Corporation, will discuss the evolution and progress of the nonprofit organization Dr. Cottrell established in 1912 through his gift of patent rights in the electrical precipitation process for cleaning industrial gases.

Announcing the symposium, President Walter Olson of the college noted that the topic is appropriate in view of both Cottrell's contributions to the control of air pollution and the fact that agriculture is the primary interest of the San Joaquin Valley. The location is appropriate, too, in that the college is only some 100 miles from the site of the first successful commercial application of the Cottrell system of electrical precipitation.

Writing of this installation in his biography, "Cottrell: Samaritan of Science," Frank Cameron noted that in 1905 the indignant citizens of Solano County rose in protest against the Selby Smelting and Lead Company plant in adjacent Contra Costa County, "claiming that for eight months of the year the prevailing winds from the Pacific were carrying the smelter smoke across the county line and thereby causing manifold nuisances . . . Old-timers declared that in years gone by, Solano County had once produced the largest grain crops and the finest fruits in all California, but with the coming of the smelter and its pervasive fumes, the produce of the area had sadly deteriorated."

Dr. Cottrell, then a 30-year-old Assistant Professor of Chemistry at Berkeley, attacked the problem during his summer vacation in 1907, redesigning and scaling up his makeshift laboratory model to full working size. Within a few months he was able to record his first successful industrial application. Before the precipitator was turned on, dense white clouds of sulphuric acid, arsenic and lead salts trailed downwind from Selby stack #2. With the precipitator on, only the faintest of thin white puffs were noticeable, and from across Carquinez Straits in Solano County, that part of the smelter appeared to have been shut down. The Selby precipitator continued to operate successfully for nearly 40 years.

The Centennial Symposium in honor of Dr. Cottrell was conceived by V. S. Tuman, Professor of Physics at California State College, Stanislaus, who is chairman of the program committee. Inquiries about the symposium may be addressed to Dr. Tuman at the college, 800 Monte Vista Avenue, Turlock, California 95380.

Cottrell Grants of \$542,000 to Aid Physical Science Research

Cottrell grants amounting to \$541,883 were made in May by Research Corporation for support of basic research, mainly in the physical sciences. In the Cottrell College Science Program, 31 grants totaling \$211,545 were awarded to 24 private, predominantly undergraduate colleges. In the Cottrell Research Grants Program, 54 grants amounting to \$330,338 were made to 47 graduate institutions and public undergraduate universities.

In the college program, 30% of the applications were for basic research in organic chemistry, 19% in inorganic chemistry, 16% in physical chemistry, 7% in physics and 28% in other sciences. In the Cottrell Research Grants Program, 28% of the applications were for work in physics, 26% in physical chemistry, 20% in organic chemistry, 11% in inorganic chemistry and 15% in other sciences. In both programs, most proposals categorized as "other" were those with biological implications. With the Cottrell Programs' emphasis on the physical sciences, these were evaluated primarily on the physical or chemical techniques proposed, rather than upon the biology.

Cottrell College Science Grants

- ERROL R. ARCHIBOLD, Morehouse College
Molecular studies on bacterial plasmid replication in *Escherichia coli* and *Salmonella typhimurium*—\$6,000
- CHARLES F. BEAM, JR., Newberry College
Novel syntheses with multiple anions—\$5,810
- BRUCE B. BENSON, Amherst College
Accurate aqueous solubilities of gases and the structure of water—\$7,500
- MEREDITH BLACKWELL, Hope College
A study of distribution, development and evolution of Laboulbeniomyces restricted to bat flies (Diptera: Nycteribiidae, Streblidae)—\$3,835
- SALLY CHAPMAN, Barnard College
Classical trajectory study of vibrational energy requirements for reaction (two-year program)—\$4,000
- FRANK P. DeHAAN, Occidental College
Mechanisms of electrophilic aromatic substitution reactions—\$11,725
- DAVID G. DeWIT, Augustana College, Illinois
Reactivity of rhenium carbonyl monomers in oxidation and substitution reactions (two-year program)—\$14,400
- EARL DOOMES, Macalester College
Cyclophane diene chemistry—\$6,150
- WILLIAM EISINGER, University of Santa Clara
Effects of ethylene gas on pea cell expansion—\$1,840
- ROBERT C. HILBORN, Oberlin College
Atomic spectroscopy using tunable dye lasers—\$6,800
- J. ROBERT HIPPENSTEELE, Illinois Wesleyan University
Identification of the microvessels providing tissue-level redistribution of flow within skeletal muscle (two-year program)—\$11,758
- DONALD M. HUFFMAN, Central University of Iowa
Cytological studies of cytoplasmic male sterility in corn—\$4,500
- PATRICK R. JONES, University of the Pacific
Chemical activation by electron impact (two-year program)—\$9,747
- GEORGE J. KASPEREK, Connecticut College
The role of propinquity catalysis in the cleavage of the sulfur oxygen bond—\$3,600
- MAX J. KECK, John Carroll University
An investigation of the dependence of human visual motion-analyzing mechanisms on the spatial characteristics of simple moving stimuli—\$3,600
- STEPHEN W. KIRTLEY, Smith College
Mechanistic and synthetic studies of the reduction of VIB metal hexacarbonyls with sodium tetrahydroborate; a search for a rational metal cluster synthesis (two-year program)—\$9,600
- HAROLD M. KOLENBRANDER, Central University of Iowa
Study of the effects of ethionine on rat liver urocanase—\$1,800
- ALLEN KROPP, Amherst College
The structure of visual pigments as elucidated by analogues—\$9,000

- ROBERT G. LANDOLT, Muskingum College
Oxidation of coal model compounds—\$5,000
- RICHARD A. LEVIN, Oberlin College
The development of an *in vitro* genetic exchange system in the plant pathogen, *Agrobacterium tumefaciens*—\$6,000
- JOHN L. MAIN, Pacific Lutheran University
The properties of mechanisms involved in the ecotypic differentiation of *Agropyron spicatum*—\$4,895
- JERRY R. MOHRIG, Carleton College
Chemical models of enzyme-catalyzed *syn*-elimination reactions (two-year program)—\$8,400
- LILA G. PEASE, Amherst College
Solution conformations of model peptides by ¹H and ¹³C nuclear magnetic resonance—\$9,000
- BEVERLY K. PIERSON, University of Puget Sound
The role of cytochromes in photosynthetic and respiratory electron transfer in *Chloroflexus aurantiacus*—\$5,850
- JOHN B. REID, JR., Hampshire College
The petrology and geochemistry of high pressure mafic and ultramafic inclusions from Salt Lake Crater, HA; Kibbourne Hole, Potrillo Maar, and the West Potrillo Mts., NM—\$7,500
- MERLYN D. SCHUH, Davidson College
Unimolecular radiationless decay of and steric hindrance to collisional quenching of triplet state alkylbenzene vapors (two-year program)—\$12,150
- HENRIE M. TURNER, Morris Brown College
Characterization of developmental changes and synchronization of *Physarum polycephalum myxamoebae*—\$8,500
- PAUL VAN EIKEREN, Harvey Mudd College
Models for NADH dependent enzymes—\$1,755
- GERALD R. VAN HECKE, Harvey Mudd College
Volume changes of thermotropic liquid crystals measured by birefringence and dilatometry—\$1,830
- ALAN S. WAGGONER, Amherst College
Use of NMR to determine the membrane binding sites of potential-sensitive dyes—\$9,000
- C. DAVID WEST, Occidental College
Development of abnormal glow discharge system for solids analysis by mass spectroscopy—\$10,000

Cottrell Research Grants

- JAMES L. ANDERSON, North Dakota State University
Resonance Raman—A new structural probe of oxidation-state dependent structural changes in multi-component redox enzymes—\$10,000
- OREN P. ANDERSON, Colorado State University
Synthetic and structural studies on ligand-stabilized copper(II) mercaptide complexes—\$7,500
- HAROLD D. BALE, University of North Dakota
Small angle X-ray scattering from metal-ammonia solutions—\$2,700
- JAMES C. BARBORAK, University of North Carolina at Greensboro
Synthesis of elusive organometallic complexes by transition metal catalyzed rearrangement of olefins—\$1,300
- ROBERT BERNHEIM, Pennsylvania State University
Kinetics of the helix-coil transition in poly (α ,L-glutamic acid) by dynamic laser light scattering—\$7,000
- ROBERT R. BIRGE, University of California, Riverside
Solvent effects on Raman excitation profiles. A method of studying low-lying "forbidden" electronic transitions in polyenes—\$8,770
- PHILIP BOUDJOUK, North Dakota State University
 π -complexes of trimetal clusters—\$3,400
- HANS M. BOZLER, University of Southern California
Coupled NMR and zero sound studies of liquid ³He—\$10,000
- WILBUR H. CAMPBELL, State University of New York College of Environmental Science and Forestry
Higher plant nitrate reductase—\$1,000
- FRANK O. CLARK, University of Kentucky
Study of magnetic fields and internal conditions in dense interstellar clouds—\$5,350
- ALAN F. CLIFFORD, Virginia Polytechnic Institute and State University
Investigation of the higher oxidation states of cesium and their potential role in the catalysis of fluorination reactions by cesium fluoride—\$10,000
- THOMAS T. COBURN, Boston University
Mild techniques for modification of the nitrite functionality—\$8,000

JOHN R. CONRAD, University of Wisconsin-Madison
Ion production in the beam-plasma interaction—\$12,000

FRANK C. DE LUCIA, Duke University
Millimeter- and submillimeter-wave spectroscopy of active laser plasmas—\$9,000

SLAYTON A. EVANS, JR., University of North Carolina at Chapel Hill
Coupling reagents: phosphonium salts—\$6,500

WILLIAM M. FAIRBANK, JR., Colorado State University
Spectroscopic search for quarks—\$10,650

BARBARA J. FINLAYSON, California State University, Fullerton
The effect of molecular oxygen on the gas phase mercury photosensitized decomposition of simple epoxides—\$4,500

A. LEWIS FORD, Texas A&M University
Nonadiabatic allowed dipole transitions in the HD molecule—\$2,200

ANSELM C. GRIFFIN, III, University of Southern Mississippi
An investigation of lateral substituents as structural probes in liquid crystalline systems—\$6,971

M. C. GUPTA, University of Missouri-Columbia
Radiation effects on phase transformations using acoustic emissions—\$7,000

H. LESLIE HODGES, University of California, Santa Cruz
A kinetic investigation of electron transfer in micelle models of metalloproteins—\$5,800

LAURIE B. ISAACSON, University of Massachusetts, Amherst
Paleomagnetism and magnetic stratigraphy of the Deerfield basin, Massachusetts—\$4,250

WARREN C. JONES, JR., University of Virginia
Development of a modified solid phase peptide synthesis technique—\$4,000

MOSES K. KALOUSTIAN, Fordham University
The synthesis and chemistry of peroxonium salts—\$7,312

KENNETH J. KAUFMANN, University of Illinois
Picosecond studies of proton transfer in the excited state—\$11,000

PETER A. KAZAKS, New College of the University of South Florida
Theoretical investigation of pion-nucleus scattering—\$3,800

PAUL KEYES, University of Massachusetts, Boston
Light scattering and high pressure investigations of liquid crystal phase transitions—\$6,500

ROY R. KNISPEN, University of Wisconsin-Oshkosh
Proton rotating frame relaxation investigation of the physical effect of biopolymers on the dynamics of water—\$7,000

PHILIP J. KOCIENSKI, State University of New York at Binghamton
The total synthesis of some biogenetically related sesquiterpenes—\$6,050

HARUO KOJIMA, Rutgers University
Experimental investigation of anisotropic properties of superfluid ^3He —\$9,500

JOHN LEONG, University of California, San Diego
Microbial transition metal ion transport of cobalt, copper and iron—\$7,050

DON H. MADISON, Drake University
Distorted wave calculation of atomic ionization by charged particle impact—\$750

PAUL E. MASLIN, California State University, Chico
A comparison of *in situ* algal culture techniques for limiting-nutrient bioassays—\$760

FLOYD D. McDANIEL, North Texas State University
Auger electron studies of heavy-ion induced inner-shell ionization—\$8,000

HUGH R. MILLER, Georgia State University
The history of the optical variability of quasars, BL Lac objects, and compact galaxies—\$200

PEDRO A. MONTANO, West Virginia University
Investigation of the magnetic properties of disordered systems using matrix isolation techniques—\$5,300

PAUL A. MUELLER, University of Florida
Geochronology and geochemistry of early Archean rocks, southeastern Beartooth Mountains, Montana—\$3,500

ROBERT L. MUTEL, University of Iowa
Observations and analysis of interplanetary turbulence using interferometer visibility scintillations—\$9,340

HARRY NICKLA, Creighton University
Molecular basis of lethality and genital disc differentiation in *Drosophila melanogaster*—\$4,000

TIMOTHY A. NIEMAN, University of Illinois
Simultaneous multicomponent chemiluminescent analysis of trace metals—\$8,000

JOHN R. PLADZIEWICZ, University of Wisconsin-Eau Claire
Electron transfer reactions of superoxide anion—\$11,000

SEPPO O. SARI, University of Arizona
Photoelectrolysis of water—\$2,500

EDWARD M. SCHULMAN, University of South Carolina
Room temperature phosphorescence of organic compounds—\$6,500

IRA S. SCHWARTZ, University of Massachusetts, Amherst
Characterization of ribosome binding sites for initiation and elongation factors—\$6,000

PETER S. SHERIDAN, State University of New York at Binghamton
Photoreactive excited states—\$8,960

STEPHEN R. STOBART, University of Victoria
Bivalent derivatives of germanium, tin and lead with chelating sulphur and selenium donors—\$5,000

BRUCE N. STORHOFF, Ball State University
Metal promoted reactions of organonitriles—\$400

TIMOTHY C. K. SU, Southeastern Massachusetts University
Mechanism of gas phase ion-molecule reactions—\$5,500

ISRAEL L. TYLER, University of Missouri-Kansas City
Stokes line broadening mechanism in stimulated electronic Raman scattering—\$5,000

JOHN D. WILEY, University of Wisconsin-Madison
Investigation of the electrical and optical properties of single-crystal, orthorhombic GeS—\$9,000

MARSHALL WILT, Centre College of Kentucky
Coriolis X-Y perturbations between E vibrational states—\$1,100

AARON WOLD, Brown University
New electrode materials for photoelectrolysis cells—\$5,000

GEORGE K. L. WONG, Northwestern University
Nonlinear optical properties of liquid crystals—\$9,425

LOLITA ZAMIR, State University of New York at Binghamton
Biosynthesis of aflatoxins—\$9,000

Jones Awards for Cytogenetics Research

Grants of \$49,965 were approved in February under the Donald F. Jones Program of cytogenetics related to major food crops. These were the last of the awards to be made by the program established in Research Corporation in 1972 with a share of royalties on the Jones patent covering the production of hybrid seed corn, which was to expire in 1973.

Of necessarily limited life, the program aimed for maximum impact by concentrating on the highly specialized field of cytogenetics concerned with major agricultural crops. The grants were awarded to make it possible for graduate students to train with experienced investigators, and for postdoctoral fellows to conduct original and independent research.

Jones Scholarships

DAVID A. SOMERS (Andris Kleinhofs), Washington State University
Genetic control of protein synthesis and accumulation in barley—\$7,423

SEJII TSUJI (Shivcharan S. Maan), North Dakota State University
Investigation of cytoplasmic homologies among *Aegilops* species with D-genomes—\$5,942

Jones Fellowships

TETSUO SASAKUMA, North Dakota State University
A simple cytoplasmic male sterility-male fertility restoration system for hybrid wheat—\$11,000

KHAIRY M. SOLIMAN, University of California, Davis
Intergenic transfer of high protein from *Agropyron* to common wheat—\$14,642

STEPHEN STACK, Colorado State University
Localization of highly repetitive DNA in the chromosomes of *Allium cepa* and certain cereal grains—\$10,958

Final Grants Made for Medical Mycology

The last grants to be made under the Brown-Hazen Program for support of research and training programs in medical mycology were approved in June. These, plus grants made earlier in the year, brought to a total of \$201,345 the Brown-Hazen awards not previously reported in the *Quarterly Bulletin*.

The June grants marked the end of the program which was initiated in 1957 for general support of biomedical research and reoriented in 1973 to a concentrated attack on fungal diseases through research and training in mycology. Supported by royalties from the patent on the antifungal antibiotic nystatin, which was donated to Research Corporation by the scientist-inventors Rachel Brown and Elizabeth Hazen, the program began phasing out last year after the 1974 expiration of the patent and the cessation of royalties.

The final 15 program grants will aid research projects in mycology to be conducted at ten institutions, and will continue the support provided by previous Brown-Hazen grants for training programs at the medical schools of three universities. One grant provides travel funds for a medical mycology investigator, and one will assist in supporting the American Type Culture Collection.

Brown-Hazen Grants

- AHMED T. H. ABDELAL, Georgia State University
Regulation of pyrimidine biosynthesis and uptake in medically important fungi—\$7,200
- ERNEST I. BECKER, University of Massachusetts, Boston
Evaluation of nystatin as a control procedure for Dutch elm disease—\$16,400
- JOAN W. BENNETT, Tulane University
The use of mutations in studying the biosynthesis of aflatoxins—\$3,710
- FRITZ BLANK, Temple University Health Sciences Center
Research training grant in medical mycology—\$10,000
- GEORGE BOGUSLAWSKI, University of Kansas, Lawrence
Mechanism of conversion in *Histoplasma capsulatum*—\$5,225
- RICHARD A. CALDERONE, Georgetown University
Interaction of *Candida albicans* and *Cryptococcus neoformans* with rabbit alveolar macrophage—\$3,500
- ANTONINO CATANZARO, University Hospital of San Diego County, California
Evaluation of transfer factor in the therapy of coccidioidomycosis—\$47,000
- ERNEST W. CHICK and NORMAN L. GOODMAN, University of Kentucky School of Medicine
A comprehensive training program in medical mycology—\$3,000
- JIM E. CUTLER, Montana State University
Phagocytic cells and defense against *Candida albicans*—\$5,000
- MORRIS A. GORDON, New York State Department of Health, Division of Laboratories and Research
Evaluation of isoflavonoid phytoalexins and their derivatives as therapeutic agents in human mycoses—\$13,618
- HENRY E. JONES, University of Michigan Medical Center
Host resistance mechanisms in the cutaneous mycoses—\$40,000
- S. C. JONG, American Type Culture Collection
National Resource Center for Living Cultures of Health-Related Fungi—\$18,050
- LAURENCE S. KAMINSKY, New York State Department of Health, Division of Laboratories and Research
Travel grant to Third International Symposium on Microsomes and Drug Oxidations, West Berlin—\$642
- GEORGE S. KOBAYASHI and GERALD MEDOFF, Washington University School of Medicine
Training grant in medical mycology—\$13,000
- MARGARITA SILVA-HUTNER and RICHARD L. EDELSON, Columbia University
Host and parasite responses at the site of *Candida* lesions—\$10,000

Williams-Waterman Grants Awarded for Nutrition Research and Training

Foundation grants of \$914,417 under the Williams-Waterman Program were approved in June for research and the advanced training of professionals in public health nutrition. All but one grant—the Norman Jolliffe Fellowship awarded to Columbia University—will fund programs in Latin America and the Caribbean or aid in training nutrition workers from those regions.

Largest of the May grants, \$722,907 for the Institute of Nutrition of Central America and Panama, is for a three-year continuation of a program in agricultural and food sciences inaugurated in 1971 with the aid of an earlier Williams-Waterman grant. Results of this INCAP program so far include a process for substituting corn for wheat in bread flour, which has enormous economic potential for Central America, and technology for large-scale utilization of coffee pulp and hulls in livestock feeds, creating a new export crop and releasing for human consumption grains previously used as animal food.

Another grant for work by INCAP scientists will help support the surveillance of a salt iodization program scheduled to begin in Nicaragua later this year. Iodine deficiency, which results in endemic goiter, hypothyroidism, deafness and cretinism, is a major public health problem in Central America and parts of South America. The remedy is supplementation of iodine in the diet, but the recent iodine fortification of food supplies in Costa Rica and Panama, while using technology thought to be maximally safe, appeared to produce a sharp rise in the incidence of thyroid-related diseases. The INCAP investigators will monitor the effects of the new iodization program in Nicaragua, being prepared to move quickly to change dosage if any such problems arise there. The study also has possible implications for the industrial nations which are presently iodizing salt.

TROPICAL SPRUE RESEARCH

The Williams-Waterman Program's ten-year support of research directed by Frederick A. Klipstein of the University of Rochester was extended by a grant made in May. The research team at Rochester and at the Tropical Malabsorption Unit at the University of Puerto Rico is seeking the cause and a means of prevention of tropical sprue, a disease that may afflict 80% of the people living in many underdeveloped tropical regions, contributing directly to nutrition-related deaths and disabilities. The work to date has identified *Klebsiella pneumoniae*, *Enterobacter cloacae* and *Escherichia coli* as the bacteria which can damage the small intestine, reversing its character from absorptive to secretive and causing not only physical distress but inefficient utilization of already inadequate food intakes. Continuing work by Dr. Klipstein's group leads him to believe they are now on the way to finding a means of preventing the disease.

The grant to Johns Hopkins University will allow continuation of a study of the factors influencing the growth of children from the slums of Lima, Peru who have been hospitalized for malnutrition. The work will focus on

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A Foundation for the Advancement of Science

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Nutrition Grants of \$914,000 Approved

(Continued from page 5)

environmental and other influences on the feeding and food utilization of the formerly malnourished children after they are returned to their homes. The results should find application for the combat of infant malnutrition in other slum populations which are mushrooming in urban centers of the developing world.

Other Williams-Waterman grants approved in May include a postdoctoral and a predoctoral fellowship for nutrition workers from Haiti and Guatemala, respectively; assistance to INCAP in completing research projects interrupted by the devastating Guatemalan earthquake; and travel for Latin American nutritionists to a hemispheric scientific conference.

Williams-Waterman Grants

COLUMBIA UNIVERSITY, INSTITUTE OF HUMAN NUTRITION

Norman Jolliffe Fellowship in Human Nutrition—\$15,000
Postdoctoral fellowship in clinical nutrition—\$12,815

UNIVERSITY OF ILLINOIS

Predocorral fellowship in human nutrition and food science (three-year program)—\$22,306

JOHNS HOPKINS UNIVERSITY

George G. Graham. Factors affecting nutritional status of Peruvian children—\$10,000

PAN AMERICAN HEALTH AND EDUCATION FOUNDATION/ INSTITUTO DE NUTRICION DE CENTRO AMERICA Y PANAMA

Ricardo Bressani and Carlos Tejada. Research and graduate training program in agricultural and food sciences (three-year program)—\$722,907
Fernando E. Viteri. Surveillance of salt iodization program in Nicaragua—\$60,004

Supplement for nutritional research projects interrupted by Guatemalan earthquake—\$7,585

UNIVERSITY OF ROCHESTER

Frederick A. Klipstein. Roles of enterotoxins in cause and prevention of tropical sprue—\$36,000

SOCIEDAD LATINOAMERICANA DE NUTRICION

Travel of Latin American nutritionists to IVth Scientific Meeting of Sociedad Latinoamericana de Nutricion, Caracas—\$21,000

QUARTERLY BULLETIN

SUMMER 1976

Research Corporation, 405 Lexington Avenue, New York, N.Y. 10017

A foundation for the advancement of science, Research Corporation has a dual mission in serving educational and scientific institutions. Through its Grants Program it supports basic research in the natural sciences and basic and adaptive research in public health nutrition. Through its Patent Program it speeds the practical application of scientific discovery through technology transfer.

GRANTS PROGRAM

Cottrell College Science Grants support academic research programs in the natural sciences at private undergraduate institutions.

Cottrell Research Grants support basic research in the physical sciences and engineering in graduate institutions and public undergraduate universities.

Brown-Hazen Grants support work directly related to mycology, stressing research, training in research and medical applications. (Program no longer active.)

Williams-Waterman Grants support research programs for the combat of nutritional diseases, particularly in the developing nations of the Western Hemisphere.

PATENT PROGRAM

Services contributed without cost to educational and scientific institutions include evaluating faculty and staff inventions, accepting assignment of those which appear to be useful and marketable, applying for patents through qualified counsel, licensing issued patents to industry, and defending against infringement when necessary.

Royalties received from patents assigned to the foundation are apportioned among the inventor, his institution and Research Corporation, with the institution's patent policy determining the inventor's share. The foundation's share is used to help support its programs of technology transfer and grant-making.

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