THEODORE O. POEHLER

APL'S PARTICIPATION IN FULL-TIME GRADUATE PROGRAMS

For the past three decades, many staff members of the Applied Physics Laboratory have participated in the programs of The Johns Hopkins University academic divisions.

INTRODUCTION

The general purpose of The Johns Hopkins University can be described as public service through education, research, and the application of knowledge to human affairs. The Applied Physics Laboratory, as a division of the University, has participated in this general goal by applying science and technology to the enhancement of the security of the United States and by conducting basic research in areas in which its staff and facilities can make an especially favorable contribution. Although APL does not grant academic degrees, its contributions to the Hopkins graduate educational programs have been increasing over the years. As a result of this strong participation in educational programs, APL's mission statement was recently changed to reflect the Laboratory's contributions to education; the statement now recognizes education as an official role for the Laboratory and its staff members.

APL's most visible involvement in education has been its extensive participation in the part-time educational programs of the G. W. C. Whiting School of Engineering. These programs began in 1964 when the APL Education Center opened under the auspices of The Johns Hopkins University Evening College and have grown to become the largest part-time engineering programs in the United States, reaching more than 2000 students annually. Although on a numerical basis the part-time programs have been the strongest and most visible educational activity in which APL participates, other interactions with the educational and research programs of the University deserve emphasis, even though they are a smaller part of the Laboratory's participation in graduate education. For the past three decades, APL staff members have been appointed, both formally and informally, to other divisions of the University, and University faculty and students have been appointed to positions at APL. Because of these interactions, strong relationships have developed between APL and other divisions of the University, particularly Arts and Sciences, Engineering, and Medicine.

ADVISORY BOARD FELLOWSHIPS AND PROFESSORSHIPS

Several formal programs have been instituted over the years with the objective of promoting improved working relationships between APL and the Hopkins academic divisions. The first was the William S. Parsons Fellowship, begun in 1955 by P. Stuart Macaulay, who was then Provost of the University. A committee composed of Frank McClure (Chairman), Richard Kershner, Walter Good, and Alvin Schulz, all from APL, and Theodore Berlin, Russell Morgan, Leslie Kovasznay, and William Huggins, all from other divisions of the University, recommended the creation of a program that would allow a few APL staff members to spend a year in residence on a Hopkins academic campus, during which time they would be involved in teaching, research, or other activities of interest. The objective was to promote more working relationships between the different divisions of the University. APL would benefit from the revitalized viewpoints of its staff members in regard to problems of interest to the Laboratory, and the divisions that hosted the APL staff members would benefit in the areas of modern scientific technology in which the staff members were engaged. The program was expected to demonstrate the importance of interdisciplinary activities in physics, chemistry, engineering, mathematical sciences, and medical research. The original objectives are as valid today as the committee anticipated they would be during its deliberations more than 30 years ago.

In May 1955, the APL Advisory Board approved the recommendations of the advisory committee and instituted the William S. Parsons Fellowship Program. One of the fundamental principles of the program is that at least two such appointments will be made each year and at least one will be made to a senior APL staff member with the equivalent of at least eight years of postdoctoral experience. Candidates are selected on the basis of the needs of both the Laboratory and the other divisions of the University. Candidates must initiate their own applications, which require the endorsement of the Director of APL and the faculty of the appropriate Hopkins division.

A joint APL–faculty committee coordinates the program and selects candidates. The first such standing committee was the *ad hoc* committee, already described, that recommended the program, and the first William S. Parsons Fellow was Robert W. Bogle, who had been Supervisor of the Variable Time Fuze Research and Development Group during the early 1950s. Bogle began his tenure as a fellow in September 1956, working

with Gerhart Dieke of the Department of Physics. Since then, 32 William S. Parsons Fellows have been appointed. The current William S. Parsons Fellow is Bruce W. Hamill of the Mathematics and Information Science Group, who is working with Howard Egeth of the Department of Psychology on human factors in visual cognition. Appointees to fellowships are listed in Table 1.

In 1965, the William S. Parsons Fellowship Program was revised to allow APL personnel at the principal professional staff level to be appointed as William S. Parsons Visiting Professors if such an appointment was appropriate and initiated by a University department. The first William S. Parsons Professor was Chih K. Jen of the Microwave Physics Group of the Milton S. Eisenhower Research Center, who spent the 1966–67 academic year in the Department of Chemistry working with Walter Koski. Since that time, nine William S. Parsons Professors have been appointed (Table 2).

The program has been broadened and strengthened to make as many as four visiting professorships or fel-

Table 1—Fellowship program appointees.

Year	*Appointee*	*Department Appointment (sponsor)*
	William S. Parsons Fellowship	
1956	R. W. Bogle	Physics (G. Dieke)
1957	E. P. Gray	Physics (G. Dieke)
1958	R. W. West	Radiology (R. H. Morgan)
1958	P. M. Whitman	Mathematics (W. L. Chew)
1959	R. M. Fristrom	Mathematics (H. E. Hoelscher)
1960	A. G. Carlton	Electrical Engineering (F. Hamburger)
1960	B. E. Amsler	Electrical Engineering (F. Hamburger)
1961	L. J. Viernstein	Physiology (V. Mountcastle)
1962	L. M. Spetner	Biophysics (M. Bear)
1964	A. D. Cutchis	Statistics (J. S. Watson)
1965	G. B. Swartz	Electrical Engineering (F. Hamburger)
1965	A. Michelsen	Radiological Science (T. Merz)
1966	W. Spohn	Mathematics (P. Hartman)
1967	J. R. Apel	Electrical Engineering (F. Hamburger)
1967	V. O'Brien	Mechanics (O. M. Phillips)
1968	I. Katz	Mechanics (O. M. Phillips)
1969	V. M. Pidgeon	Earth and Planetary Science (O. M. Phillips)
1970	C. A. Young	Earth and Planetary Science (O. M. Phillips)
1971	H. D. Black	Biomedical Engineering (R. J. Johns)
1971	C. L. Yates	Mechanics (S. Corrsin and W. Schwarz)
1972	R. L. Hickerson	Physics (P. Feldman)
1972	V. L. Pisacane	Electrical Engineering (V. D. VandeLinde)
1973	A. Eisner	Cardiovascular Research Project (K. Sagawa)
1974	D. Dods	Medical Care (J. T. Bledsoe)
1975	L. C. Kohlenstein	Geography (C. Ravelle) Environmental Engineering (J. Cohon) Mathematical Science (J. C. Rhode)
1976	A. Haug	Earth and Planetary Science (O. M. Phillips)
1979	R. L. McCally	Physics (J. C. Walker)
1980	T. W. Eagles	Geography and Environmental Engineering (C. ReVelle and J. Cohon)
1981	R. C. Beal	Earth and Planetary Science (O. M. Phillips)
1981	G. E. Mitzel	Electrical Engineering (W. J. Rugh)
1983	A. Brandt	Earth and Planetary Science (O. M. Phillips)
1984	E. P. Gray	Earth and Planetary Science (O. M. Phillips)
1988	B. W. Hamill	Psychology (H. Egeth)
	Merle A. Tuve Fellowship	
1982	W. E. Buchanan	John F. Kennedy Institute and Division of Education (M. Bender, G. B. Schiffman, and M. E. Lewis)
1983	D. P. Vasholz	Earth and Planetary Science (O. M. Phillips)
1984	L. G. Knowles	Radiology (H. Wagner)
1985	G. D. Tyler, Jr.	Mathematical Science (R. J. Serfling)
1986	S. B. Cooper	Electrical Engineering and Computer Science (B. Hughes)
1987	R. F. Cohn	Materials Science and Engineering (J. Wagner)
1988	J. A. Giannini	Electrical and Computer Engineering (R. I. Joseph)
	Lawrence Hafstad Fellowship	
1985	C. C. Sarabun	Biology (D. A. Powers)
1987	K. Peacock	Center for Astrophysical Studies (A. Davidsen)
1988	W. R. Powell	Cognitive Sciences Center (A. Caramazza)

Table 2—Professorship program appointees.

Year	*Appointee*	*Department Appointment (sponsor)*
	William S. Parsons Professorship	
1966	C. K. Jen	Chemistry/Physics (W. Koski)
1968	E. P. Gray	Physics (Kimball)
1972	T. O. Poehler	Electrical Engineering (G. Benton)
1975	L. Monchick	Chemistry (B. Murr)
1976	D. Fox	Mathematical Science (R. Horn)
1977	K. Moorjani	Physics (J. Walker)
1978	V. G. Sigillito	Mathematical Sciences (R. Horn)
1978	J. T. Massey	Physiology (V. Mountcastle)
1980	R. A. Makofski	Geography and Environmental Engineering (M. G. Wolman)
1982	L. Monchick	Chemical Engineering (J. L. Katz)
	J. H. Fitzgerald Dunning Professorship	
1983	J. C. Murphy	Materials Science and Engineering (R. E. Green)
1984	R. E. Jenkins	Electrical Engineering and Computer Science (C. R. Westgate)
1985	M. L. Edwards	Electrical Engineering and Computer Science (F. Davidson)
1986	R. McDonough	Earth and Planetary Science (O. Phillips)
1987	K. Allen	Electrical and Computer Engineering (R. I. Joseph)
1988	A. Michelsen	Oncology Center, Johns Hopkins Medical Institution (J. B. Williams)

lowships available each academic year; as many as two of the appointments may be visiting professorships. These other appointments, which also honor important University and Laboratory staff, include the J. H. Fitzgerald Dunning Professorship, the Merle A. Tuve Fellowship, and the Lawrence Hafstad Fellowship. Together with the William S. Parsons Fellowship and Professorship, these programs have led to 43 fellowships and 16 professorships during the time in which they have been in operation (Tables 1 and 2). Current appointees to the fellowship and professorship program include Arve Michelsen (Dunning Professorship), William R. Powell (Hafstad Fellowship), Judith A. Giannini (Tuve Fellowship), and Bruce W. Hamill (Parsons Fellowship).

The program was expanded again in 1974 with the creation of the Frank T. McClure Fellowship in Cardiology, established to honor Frank T. McClure, former Chairman of the Milton S. Eisenhower Research Center and Deputy Director of APL. The fellowship supports a postdoctoral research scientist for full-time research in the broad area of cardiology, with emphasis on the prediction of potential heart attack victims and the evaluation of preventive therapeutic measures. Typically, fellows are appointed for one to two years (Table 3). James L. Weiss of the Cardiovascular Division of The Johns Hopkins University School of Medicine was the first of seven McClure Fellows appointed thus far; his appointment lasted from 1975 to 1977.

Table 3—Frank T. McClure Fellowship appointees.

Term	*Appointee*	*Affiliation*
1975–77	J. L. Weiss	The Johns Hopkins University School of Medicine
1977–79	L. S. C. Griffith	Johns Hopkins Medical Institution
1979–80	G. C. Friesinger	Vanderbilt University
1979–81	F. C. P. Yin	The Johns Hopkins University School of Medicine
1982–84	W. H. Guier	APL
1985–87	L. C. Becker	The Johns Hopkins University School of Medicine
1987–89	E. Shapiro	Francis Scott Key Medical Center

APL FELLOWSHIP PROGRAM

All of the fellowships and professorships discussed above were established to permit APL staff members to spend time on the Hopkins academic campuses and interact with their academic colleagues. In 1962, a reciprocal program, the APL Fellowship Program, was established to encourage Hopkins graduate students with interests related to APL activities to conduct their research at APL under the joint supervision of a senior APL staff member and a member of the appropriate University department.

The APL Fellowship provides an annual stipend plus full tuition during the candidate's tenure. Thesis research areas have included aspects of atomic, molecular, and electron physics; quantum electronics; solid-state physics; chemical kinetics and combustion; space physics; atmospheric science; applied mathematics and computing; mechanics; electrical engineering; biomedical engineering; and environmental and transportation studies. Alvin G. Schulz was the first chairman of the APL Fellowship Program, and Theodore O. Poehler succeeded him in 1974.

Since the program's inception, 16 candidates have successfully completed their thesis research under the program in the Departments of Electrical and Computer Engineering, Chemistry, Physics, Mathematical Sciences, Materials Science and Engineering, and Biomedical Engineering. The first APL Fellow was M. Mallory Buchner, of the Department of Electrical Engineering, who

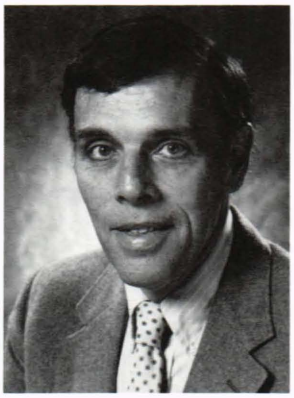
researched optimum linear single-error correcting codes under Edwin Shotland of APL and Willis Gore of the Department of Electrical Engineering. Two students are currently engaged in some aspect of their research at APL. Peter Thompson, Department of Physics, is studying computer modeling of complex physical systems, and Deborah Mechtel, Department of Electrical and Computer Engineering, is researching optical probing of semiconductor devices. Robert C. Hoffman, Department of Materials Science and Engineering, has just completed his work on optical phase transitions in organic materials.

INFORMAL PROGRAMS

As a result of the formally organized interactions between the graduate programs of the Hopkins academic divisions and APL, the number of informal interactions has increased in recent years. For example, in addition to the APL Fellows, other graduate students from the Departments of Electrical and Computer Engineering, Materials Science and Engineering, Chemistry, and Physics have engaged in research programs under the supervision of senior APL staff members. Currently, eight graduate students outside the APL Fellowship Program are in residence at APL, carrying out thesis research in a variety of areas. Further, a number of APL staff members participate in the teaching and research programs of the Hopkins academic divisions. In the current academic year, at least 20 APL staff members are participating in graduate research, either through teaching or in joint research with members of the academic departments; more than half are teaching.

These interdisciplinary research and development activities have grown in recent years; although the number of students and staff members involved is not extremely large relative to APL's total population, those who participate make important contributions to the academic departments while APL benefits through the stimuli provided.

THE AUTHOR



THEODORE O. POEHLER was born in Baltimore in 1935. He received his Ph.D. in electrical engineering from The Johns Hopkins University in 1961 and joined APL in 1963. He is now director of the Milton S. Eisenhower Research Center. Dr. Poehler previously served as supervisor of the Quantum Electronics Group; Director of the APL Evening College Center; and Director, Part-Time Graduate Programs, G.W.C. Whiting School of Engineering, The Johns Hopkins University. Dr. Poehler is an *ex officio* member and secretary of the APL Advisory Board. He is a specialist in solid-state physics, semiconductors, thin films, and optical lasers. He is Associate Director of the Center for Nondestructive Evaluation at Johns Hopkins and currently holds a joint appointment as Professor in the Departments of Electrical Engineering and Materials Science and Engineering.