

GUEST EDITOR'S INTRODUCTION

Sixteen years ago, with the encouragement of the leadership of The Johns Hopkins University and the support of the Department of Defense, the Applied Physics Laboratory joined with the University's School of Medicine in a collaborative program whose objective was to bring the technologic and scientific expertise of the Laboratory to bear on significant unsolved problems in biomedical science and health care delivery. The greatest testimony to the vision of the founders of this venture is the fact that, 16 years later, the collaboration continues to be both productive and exciting. The theme of this issue of the *Johns Hopkins APL Technical Digest* is "Science and Technology in Biomedicine," and the Theme Articles that follow are a sampling of current or recently completed projects begun under the aegis of the Collaborative Biomedical Program.

In my view, the outstanding feature of the collaboration that now exists between APL and the Johns Hopkins Medical Institutions is its scope. The program is a large one; in 1977, it was said to be the most extensive of its kind,¹ and it has nearly doubled in size since then. But by "scope" is meant more than size alone, for what is unique about the program is the variety of projects that have been undertaken.

This variety can be measured in different ways: the number of different technologies employed, the number of departments at the various collaborating institutions that have been involved, and the number of sponsors from whom support has been won. Several of these measures are given in the first Theme Article (Massey and Johns), which reviews the early history of the biomedical collaboration and suggests some requirements for its continued success. The succeeding articles have been selected to give an impression of the scope of the program.

There is some method to the organization of the Theme Articles. The work of APL extends from research through development to systems design and engineering, and this is mirrored in its biomedical effort. The next three articles (Flower; Kim and Bohandy; Meyer and Campbell) review three research efforts, each in a different discipline, each supported by a different Institute of the National Institutes of Health. These are followed by examples of the developmental application of state-of-the-art technology to important problems in medical image analysis (Garrison and Jenkins) and the provision of mobility

to the handicapped (Seamone and Schmeisser). Finally, a comprehensive review of the systems engineering needed to improve the monitoring of patients in intensive care is presented (Amsler).

Thus, the articles that follow are more or less representative of the Laboratory's biomedical work. At last count, 45 such projects were active at APL; clearly, most of these could not be included. Those readers whose appetites have been whetted by the material in this issue, and who wish to learn more about our current (or past) activities, are referred to a series of annual reports entitled "Biomedical Research, Development, and Engineering at The Johns Hopkins University Applied Physics Laboratory," the most recent of which covers the 12-month period ending September 30, 1980. Typically, each report summarizes past-year progress on about two-thirds of the active projects.

One aspect of the collaboration between APL and the School of Medicine that is not evident from the following articles is teaching. The Laboratory's teaching role in the School of Medicine is centered in the Department of Biomedical Engineering, and it includes the delivery of courses in clinical engineering and clinical information systems at the graduate level. In addition, courses and lectures on biomedically related subjects are presented by the APL staff to undergraduates and graduate students in the Whiting School of Engineering on the University's Homewood campus.

The first sentence in the first editorial in the first issue of this expanded *Digest* claimed that it "will report regularly on activities of staff members of the Applied Physics Laboratory *and of their collaborators elsewhere*" (italics added). The appropriateness of that sentence in its entirety is nowhere greater than in this issue. Half of the Theme Articles are co-authored by our colleagues at the School of Medicine, and the extent of the collaboration in the other projects is evident in the text and in the acknowledgments. Simply put, APL could not have done this alone; what pride can be drawn from the articles that follow, we share with the physicians and biological scientists of our sister division.

REFERENCE

- ¹D. Lampe, "Physicians + Physicists = Far-Out Medicine," *Family Health* 9, (9), 48-50 (1977).