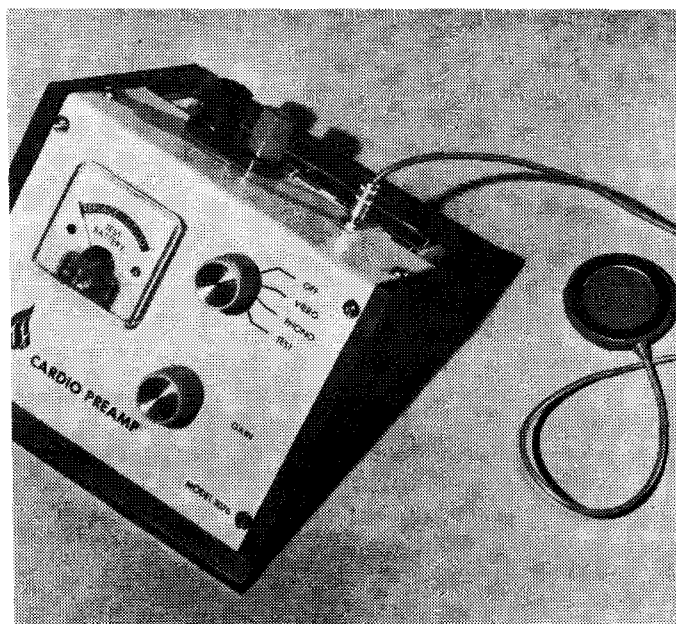
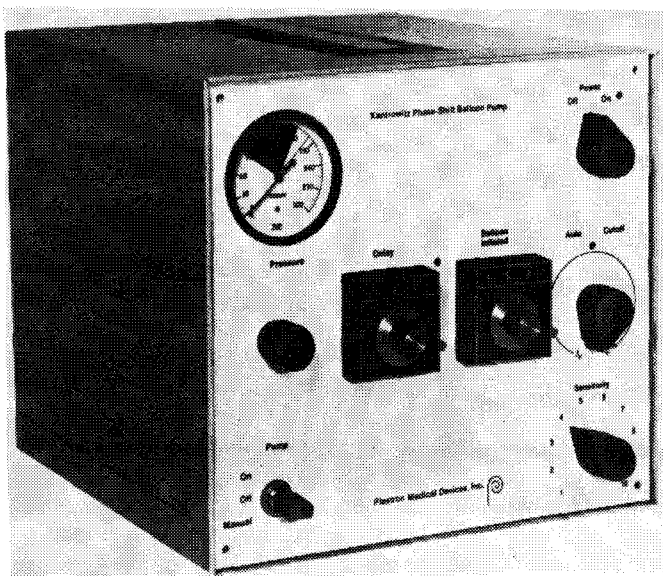




Plastron Medical Devices, Inc., of Brooklyn, New York, a Milton Roy company, is manufacturing and distributing the Kantrowitz Phase-Shift Balloon Pump. The balloon pump is positioned intra-aortically via a femoral arteriotomy and is connected to a pressurized helium source through the driving unit. The driving unit is synchronized to the ECG and operates synchronously and out-of-phase with the mechanical contraction of the heart. A brochure outlining the operation, characteristics, and references concerning this equipment is available via Number 43 on the Reader Service Card.

Electronic safety has finally received the attention it deserves from medical personnel. To assist in maintaining safe electrical standards, monitoring and testing equipment, like Shock Alert by Bio-Optronics, Inc., has become available. Shock Alert is a battery-operated leakage current meter sensitive to currents as minute as 5 micro-amperes. It is small, simple to operate, easy to read and understand, and moderately priced. For a complete dossier, circle Number 44 on the Reader Service Card.

To obtain phono- and vibrocardiographs, a new Cardio-Microphone and Cardio-Preamplifier has been developed by Industrial Scientific Research Corporation of Anaheim, California. The "heart" of the set is the miniature microphone, only 35 millimeters across and 6 millimeters thick, which has a frequency response of 1 to 1000 cps. Imbedded in the front surface of the silastic encapsulated microphone is a stainless steel disc, a double-faced adhesive disc attaches it to the patient eliminating straps. For information, circle Number 46 on the Reader Service Card.

Editorial Comment

COLLABORATION OF ENGINEERING AND MEDICINE

The need for more and better cooperation and collaboration between the medical and engineering professions has in recent years received much attention. Universities are expanding programs in Bioengineering and Biophysics. The medical instrumentation industry is rapidly growing and expanding. It has been said by some that in a few years the production of artificial organs will be among the nation's leading industries.

The growing collaboration between the engineering profession and the medical profession poses some difficulties that will take some solving.

Problems of Equality

"Few of us, if any, can say we have never messed up a project because we forgot the people involved . . . The trouble is that we rarely realize how often or when our thoughtlessness violates the fundamentals of good human relations. We need to work constantly at the problem of inter-personal relations since it transcends all our activities."¹

"Engineers who work with physicians are likely to have little opportunity to participate in the selection of objectives, to formulate questions, to structure and re-structure problems, and to devise alternatives for their solutions.

"Authority in the medical field, both culturally and legally, resides solely in the physician. This dearth of opportunity for shared responsibility inhibits a commitment to problem-solving by a truly inter-disciplinary group, functioning as peers. The physician retains to himself the role of problem definition. Thus, in many instances, where there has been an effort to incorporate various engineering specialists into a medical team, the physician has expected the engineers to assist *him* to carry out *his* task as *he* sees it, an attitude similar to that which he has always taken toward the nursing profession."²

In order to realize the contributions which engineering can offer to better medical care, collaboration must be maintained on the basis of mutual understanding and respect between the professions as *equals*. Maintaining the attitude of equality between the medical and engineering profession prevents feelings of inequality, unfairness, haughtiness or condescension to arise.

Communication

Problems caused by misunderstandings, personality conflicts, etc. usually stem from poor communication of ideas and intentions. Many people master the art of speaking but few master the art of listening. Communication involves both. In order for the medical profession and the engineering profession to effectively communicate with each other, engineers must learn to understand the nature and complexity of medical problems and doctors must learn to appreciate the nature and scope of the solutions offered by engineers. Then by working together meaningful solutions will be found.

At the University of Utah a high degree of collaboration exists between the Division of Artificial Organs and the College of Engineering. Joint appointments in the College of Engineering and the College of Medicine have been made for physicians as well as engineers and scientists to encourage this cooperation. In the area of Home Dialysis treatment alone several accomplishments have resulted from this close cooperation. A do-it-yourself four coil kidney system was developed which reduced per dialysis costs to \$15.33.³ A bubble detector has been developed to protect patients against the dangers of air embolism. An inexpensive, semi-automated control system for the artificial kidney has been developed to provide the highest degree of safety at the least possible cost. Membrane research and analysis is being performed in cooperation with the Dialysis Training Center in the Division of Artificial Organs.^{4,5,6} Research is presently going on to develop more reliable and less expensive blood leak detectors and conductivity meters.

Future Opportunity

The opportunity for future collaboration between medicine and engineering is as broad as medicine itself and multiplies with the rapid technological advances being made in engineering. What must be remembered is that the solutions and progress resulting from this collaboration are concerned with people, especially people who are sick and who react individually to disease, not as statistics nor mathematical models. Working together as equals, defining and solving problems through effective communication, engineering and medicine will perhaps in the not too distant future be able, to a large extent, eradicate human disease and suffering.

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