electrotherapy. It is addressed to the widely varied interests of technicians, medical students and physicians. It meets the several requirements of these groups by providing sound physical and physiologic rationale for electrotherapeutic measures in terms which are neither too profound for the less experienced nor too elementary for the more experienced groups. This difficult matter has been accomplished in part by a division of text. For students who are well grounded in science and who desire comprehensive information regarding fundamentals of electrotherapy, some physical and mathematical data are presented in footnotes. For the students who are less well grounded in science and who desire more streamlined information, the general text, illustrated with a minimum of mathematical formula, is fully satisfactory.

Although bound in one volume, the material has been so arranged that it actually provides four books in one. Major divisions are devoted to the effects and technical application of direct current, electrical muscle stimulation and radiation and high frequency current. Each of these sections is developed with a fixed pattern and with sufficient detail to stand alone. Each division includes a description of theoretical as well as instrumental aspects of electrical phenomena. In many instances, illustrative experiments are described. The influence of each type of electrical energy on man is also indicated by detailed experiments. Comprehensive pictorial and textual descriptions of apparatus currently used in practice are presented. Descriptions of clinical conditions amenable to electrotherapeutic measures are presented in terms of physiological effects induced.

The book is profusely illustrated with diagrams and photographs. The diagrams are well chosen and informative. In contrast, some of the illustrations of apparatus have not been so critically selected and reproduced. These apparent faults are partly due to the use of plates borrowed from previous publications and to failure in eliminating material that is repetitive or unnecessary. In these respects, the book suffers from the minor faults which are common in first editions. None of these detracts from the inherent worth of the book as a whole. There is some lack of uniformity in the style of illustrations, but this may be justified at present as a measure of economy.

The presentation of precise data on the changes in physiology induced by physical agents fills a long-felt need in physical medicine. The summaries of such data appearing in this book set a standard which might well be followed in other branches of physical medicine.

"The Technic of Electrotherapy" can be commended to all groups of students of physical medicine, including technicians and physicians. That technicians should be familiar with the principles of the underlying procedures which they apply is widely appreciated. It is equally evident that the results of prescriptions for electrotherapeutic measures are more successful when written by physicians who are familiar with the physical nature and physiologic influence in the procedures recommended. It is therefore to be hoped that the book will find its way into the hands of the general practitioner as well as into the hands of the specialist in physical medicine. This contribution to the literature of physical medicine provides a significant step toward the establishment of physical medicine in its proper place among medical specialties.

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REPORTS

PROGRAM OF THE INSTITUTE OF RADIO ENGINEERS

THE Institute of Radio Engineers, representing the leading radio engineers, is fostering an extensive program for aiding postwar activities. SCIENCE has received the following report in regard to the plans of the institute:

The most remarkable aspects of the growth of the radio industry have been not only its impact upon activities in many other fields, but on the great number of new industries that have been created from the developments of its engineers. The scope of some of these have been so far afield from that which is usually considered to be "radio" that a general term has become popular to describe these miscellaneous applications of radio principles—"electronics." It is interesting to note the scope of this work, as set forth on the cover of the *Proceedings* of the Institute of Radio Engineers: "Radio communication, sound broadcasting, television, marine and aerial guidance, engineering education, power and manufacturing, applications of radio-and-electronic technique, industrial electronic control and processes, tubes, electron optics, medical electrical research and applications, radio-frequency measurements, sound and picture electrical recording and reproduction."

Many of these fields became prominent before the war. However, the trend to electronic methods utilizing war-born developments will revolutionize many other industries and start new ones previously unknown.

The factor which will have a great influence in get-

ting these projects under way as readily as possible will be the dissemination of the information relative to all phases of electronic development to radio engineers. The fact that the art is highly specialized together with the security rules that have been in force have narrowed down the activities in each individual's field to but a few specialists. But the number of these projects is large and a far-reaching guided program of cooperation is needed to make such developments of greatest utility to a world-wide public. This matter has concerned the industry itself to no small degree.

The promotion of engineering standards will provide all engineers with a common set of terms and test methods. The work of arranging the preparation and publishing of the details of hundreds of application principles (many of them now classified as military secrets) is another phase of this work. Giving greater service to engineers in more remote sections through enlarged and more numerous branch sections is a third. Providing information service to those engineers of the required quality in such a highly technical and widely diversified field requires not only additions to the staff of men having the specific qualities in training and experience to handle the jobs, but also adequate equipment facilities so that their help can be most effectively utilized. All in all, the plans include the following activities: publication of important papers with less delay, post-war publication of a large amount of material now held secret, more adequate publication coverage of the subdivisions of radio-and-electronic interest, publication of a handbook, annual publication of a Year Book, better correspondence service with the sections, program aid to sections, section aid by traveling lectureships, formation and professional direction of semi-autonomous specialist groups in the larger sections, integration of a conference program reaching all parts of the country, proper organization of college activities and other educational work, full-time supervision of standardization activity, creation and housing of a technical library, establishment of employment and placement bureau, activity in legislative matters, additional liaison work with other societies, Government and engineering bodies.

The nucleus of this program will be the concentration of all activities undertaken by the enlarged institute, in a new headquarters building, which will become a center for the promotion of all related activities. In view of the most remarkable strides that have been made by the engineers of this organization in giving to this war the most scientific devices ever developed by any country, this building will have international importance, because the peace-time products of the same group will have world-wide value.

Already the impact of this project has been shown by the nationwide response of both the members and the industrial organizations who foresee the significance of the work, in providing the financial backing of such a headquarters building to insure adequate handling of the needed activities. The response is also remarkable as to the number of new applications for membership from the engineers and research workers in this profession who see in this program the most practical way of getting "educated" as to all the advances made by others during the past five years.

In this expansion, the institute will have the same democratic status as it has had during more than thirty years of its existence. It is the broad-minded cooperation by the members themselves that has heretofore made the publication of all important developments possible, and the work of administering the affairs has always been done by officers who have been elected from those practicing the profession and knowing its problems.

The enthusiasm evident from the response to the call for help on this building project has been such that assurance can be given that it will go through, and work is progressing to the next steps in the plan, that of the procurement and outfitting a suitable structure. The directors are reserving the right to join with other engineering and scientific societies in a common building program if that seems advantageous.

SPECIAL ARTICLES

THE PRECIPITATION OF PURIFIED CONCENTRATED INFLUENZA VIRUS AND VACCINE ON CALCIUM PHOSPHATE[1]

DURING a study[2] of methods useful in the concentration and purification of influenza virus, data on a method involving the precipitation of virus on calcium phosphate[3] were not presented because in preliminary experiments effective purification and concentration of virus were not achieved and because the method appeared impractical for the preparation of virus on a large scale. However in view of the finding by Salk[4] that the precipitation on calcium phos-

[1] The work described in this paper was done under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and The Rockefeller Institute for Medical Research.

[2] W. M. Stanley, *Jour. Exp. Med.*, 79: 255, 1944.

[3] J. E. Salk, *Proc. Soc. Exp. Biol. and Med.*, 46: 709, 1941.