

Transition

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WITH this issue, *Artificial Limbs* embarks upon a new pattern of activity, changing from monographs covering major aspects to issues with articles on more diversified topics related to artificial limbs. A brief review of the philosophy and contents of prior publications may illuminate the logic of this transition.

In nearly every issue, stress has been laid upon the management of the amputee through a clinic team. This noble idea, arising from the follow-up of the cases fitted immediately after the suction-socket schools in 1947, was destined to have a profound impact not only upon prosthetics but also, through this program and many parallel developments, upon the management of other disabilities as well.

Early issues, many of them now out of print, were devoted to explanations of the total program of research, development, and evaluation in the fields of upper- and lower-extremity prosthetics. In a series of monographs, with copious references, *Artificial Limbs* has considered nearly every important level of amputation and has discussed the medical and psychological management of amputees, whether typical cases or those with special problems. Other related journals and reference books have become available to the clinician and to the research scholar.

With the establishment of this solid base of reference literature, both in previous issues of this journal and elsewhere, it now seems appropriate to deviate from the classic monograph style so as to permit relatively more rapid publication and greater freedom in pursuing timely yet widely varied topics. In the past, one of the major causes for frustrating delay in the publication of this journal has been the necessity to wait upon the last manuscript needed to round out a comprehensive monograph. Those concerned with the policy of the journal, of course, have long recognized that more rapid publication of a reasonably useful document could be obtained with far less effort and suspense. A series of manuscripts, each individually worthy yet not necessarily directly related to the others, could simply be accumulated until the bundle "weighed enough to print."

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The articles in this transitional issue, however, are related to the background of past issues and to other publications of the Committee on Prosthetics Research and Development. In the traditional role of the editorial or lead article, this is an attempt to correlate the articles in this issue, to comment on them, and to stimulate each reader to apply them to his problems.

Dr. Glattly's preliminary report on a survey of amputees, conducted with the cooperation of the prosthetics profession of this country, discloses a number of fascinating facts yet leads to interesting speculations. Obviously, the information in the article is related to the important considerations of methods of treatment for each level of amputation covered in past monographs and in the "case studies" issue of Spring 1957. Improved prostheses are available for every level of amputation; but perhaps more important are the principles of management valid for all levels which have evolved since World War II. The great preponderance of geriatric amputees in civilian practice points up the value of the report arising from a conference sponsored by CPRD in 1961—*The Geriatric Amputee*. At the other extreme, the number of child or juvenile amputees emphasizes the importance of the work of CPRD's Subcommittee on Child Prosthetics Problems and of the slowly growing number of special children's clinics engaged in a cooperative program. Fortunately, high-level and bilateral upper-extremity amputees are relatively limited in number, but they especially emphasize the need for auxiliary power, as discussed in the record of a conference held at Lake Arrowhead, California, in 1960 under the auspices of CPRD—*The Application of External Power in Prosthetics and Orthotics*.

Indeed, the entire problem of amputation emphasizes the role of the Committee on Prosthetics Education and Information in widely disseminating information to the medical and paramedical professions through their professional schools, and local and national meetings, and by exhibits, publications, films, and slides. In fulfilling its important role, CPEI will join CPRD in sponsoring *Artificial Limbs*, beginning with the next issue. Dr. William J. Erdman, II, a member of CPEI, will join the Editorial Board.

Mr. Colin A. McLaurin's article on independent-control harnessing for upper-extremity prostheses is clearly related to previous issues on the upper-extremity problem as a whole, harnessing for artificial arms, and discussions of problem cases. Elbow flexion independent of operation of the terminal device has long been sought, as shown by the patent literature in this country and by the German literature of World War I. Immediately after World War II, many of the amputees working with Northrop Aircraft in the relatively warm climate and casual atmosphere of Los Angeles preferred to sacrifice independent control in favor of simplicity of harnessing. However, the amputees fitted in the relatively cooler German climate by Professor Hepp after his return from his 1951 trip to the United States laboratories were more willing to accept his expert judgment that some form of "triple control" was important for function. Thus they were more willing to tolerate the more restrictive type of harness. As a

result of experience with problem cases seen at the Rehabilitation Institute of Chicago and at the Michigan Area Child Amputee Center at Grand Rapids, Mr. McLaurin and Mr. Sammons have decided that independent control is important for selected amputees. Their suggestions, presented in one of the major articles of this issue, deserve careful consideration.

The article on porous laminates in this issue, by Mr. Hill and Dr. Leonard of the Army Prosthetics Research Laboratory, is closely related to the discussion of perspiration and its consequences in a past issue on dermatological problems of amputation stumps. Readers of that classic will no doubt remember the cartoons of gremlins representing perspiration and bacteria attacking the stump within the typical air-tight socket. Porous sockets in the past have been only imperfectly approximated with porous, wicklike stump socks worn within wooden or metal shells, sometimes with numerous drilled holes, or in sockets molded of leather, which is slightly porous but undesirable from so many other hygienic aspects. The typical above-knee suction sockets of lacquered solid wood or of molded plastic laminate, both completely impermeable, have been worn without a stump sock. An early goal of the Sarah Mellon Scaife Foundation Fellowship on Orthopedic Appliances at Mellon Institute, in 1947 and following, was the development of a porous-plastic material. Though techniques of the time for attaining porosity were not satisfactory, the project made an important indirect step—the introduction to the orthotics and prosthetics field of epoxy laminate which later proved to be a key feature in the early development of porous laminates. After many years of effort, techniques only recently have been developed for the production of porous laminates of polyester resins as well as epoxy.

The adjustable coupling for alignment of lower-extremity prostheses, developed by Messrs. Staros and Gardner of the Veterans Administration Prosthetics Center, is obviously related to the early issue of May 1954 in which tools to aid in achieving alignment based upon biomechanical principles were discussed by Professor Radcliffe. The adjustable coupling is particularly useful in aligning prostheses containing special knee joints intended for better control of the limb, though it is also applicable in alignment of the patellar-tendon-bearing below-knee prosthesis. The present coupling, useful though it is, seems only a step toward a light, expendable coupling which may be left in the prosthesis, thus obviating the need for transfer of alignment.

Though amputees represent a relatively small fraction of the disabled of the country, the serious physical and psychological aspects of their problems demand special attention. Neglect of these severely disabled persons has sometimes, as at the end of World War II, been the cause of public criticism and emotional or even unjust reactions. It is gratifying that, since then, the systematic and steady work of many devoted individuals and organizations has led to the body of knowledge outlined in the literature now available and to many thousands of persons being trained through intensive short courses in

the field, and thus to the present happier state when this highly specialized publication may move from a series of monographs to the greater freedom enjoyed by other journals.

Eventually, it is hoped to cover such other problems as fluid mechanisms and children's prosthetics, to provide a review of clinical experience, and to enter the much broader and more complex field of bracing, or orthotics. Also, it will be a pleasure to consider for publication voluntary contributions, without placing continual pressure upon a few devoted contributors. In the meantime comments will be appreciated from our readers throughout the world.