

## FRONTIERS WITHOUT BORDERS

*... an editorial*

Anthony Staros

Director, VA Prosthetics Center, New York, N. Y. 10001

To us who are involved in prosthetic and sensory aids research and development, there are no boundaries on what needs to be done, only on what we are permitted to do. The technological and biological limits imposed by complete duplication or restoration of human function are still surely beyond our scope. However, our present capabilities in the prosthetics, orthotics, and sensory aids technologies are reasonably good, considering the resources which have been made available only recently and on a relatively small scale. But more, indeed much more, should be done; our atlases and research reports clearly show the frontiers requiring exploration to produce further advancement.

Fortunately, closely associated national and international professional families have developed because of common concern for the problems of the disabled. A broad array of needs has been evolved from study of these complex problems which nevertheless are somewhat standard in that they have no political, social, or national identities. When a sincere desire to satisfy basic human need prevails in the minds of men, these borders now dividing humans are placed in proper perspective as artificial limits on communications and therefore on progress.

Advances in technology have in great part paralleled improvements in the effectiveness of people-to-people contacts. For lack of progress we can no longer fault an unavailability of communications channels but only the lack of the wherewithal to use them. The rapidity of modern transport, the speedy contacts by wire, mail, or telephone have produced significant forward surges in technical capability. From the invention of the printing press to the present era of jet-powered travel and the Early Bird satellites, we have seen major advances in civilization made primarily as a function of the effectiveness of information transfer. The thrust of a country's development has not been produced by an omniscient few or by any number of workers operating in a vacuum, in isolation from each other or from colleagues beyond the borders of their projects, companies, institutions, or nations. Research and development productivity which necessarily thrives on cross-fertilization, stimulation, constructive criticism, and

feedback requires close contact among the many without regard to organization, geography, and politics. Technical advances are best fostered by those people-to-people contacts in which a give-and-take can result and the required stimulation and cross-fertilization are enhanced. Though often we must rely on the mails or at best the telephone, the most effective communication still comes from the face-to-face contact in which a smile, a nod, or even a frown speeds and enriches the transfer of information.

And so it is in advancing the technologies in prosthetics, orthotics, and sensory aids. We know these benefits in our own American Program, primarily the results of the efforts of the National Academy of Sciences — National Research Council's Committee on Prosthetics Research and Development. In this issue we are pleased to publish the Committee's Annual Summary Report. Noteworthy is the vast array of diverse projects which the Committee has been able to correlate primarily through its subcommittees and panels. In these, the close personal contacts among our research and development people have yielded not only the coordination required to prevent unnecessary and wasteful duplication but also cross stimulation and the very beneficial mutual assistance between many of the projects. Of the CPRD program and its accomplishments over the years, we Americans are particularly proud.

The report of the St. Dunstan's International Conference on Sensory Aids for the Blind highlights a multinational attack on the problems of blindness. Conferees from eleven nations discussed in great technical detail the efforts required to meet the complex needs of this group of disabled people.

In 1951, the Council of the International Society for the Welfare of Cripples (now the International Society for the Rehabilitation of the Disabled) established a committee to advise on international prosthetics and orthotics problems. Through the years this committee, now known as the International Committee on Prosthetics and Orthotics, has grown in numbers of members, in capability, and in stature. It has established very close relationships with national and regional programs. Recently, several regional subcommittees were formed to strengthen the Committee's base by spreading its constituency to a larger number of workers. It developed appropriate relationships with international agencies involved in worldwide health programs. Most of all, it has been a mechanism through which key people from all over the world may be brought together for close personal consideration of international prosthetics and orthotics problems. And since these problems are common to us all, each member has gained as has each member's national or regional program advanced when these contacts have been permitted.

The Committee has organized seminars and international prosthetics and orthotics courses. Through the seminars, researchers from various parts

of the world have been able to tell each other about what they are doing and why and how, producing benefits for all. Similarly, these same experts have taught physicians, surgeons, therapists, and technicians in courses offered by the Committee. Clinicians from all parts of the world have gathered all-too-infrequently in Copenhagen, Denmark, the headquarters of the Committee, to hear lectures on modern methods and principles. But, from these courses with students from all societies, some even competing ones, there has been established a brotherhood born of concern with problems which know no boundary except those created for political or economic purposes, boundaries outside the purview or cognizance of dedicated workers for the disabled.

In 1963, the Committee under the sponsorship of the World Veterans Federation organized an international meeting of experts to consider worldwide problems in prosthetics and orthotics. These experts, rather than competing, joined to identify and clearly define the problems and then formulated very specific recommendations toward their solutions, many of which still cannot be achieved primarily because of fund shortages. Indeed, the personal contacts from the Committee meetings, from the seminars, from the courses, and from such special conferences have fostered a truly effective international program, limited still only by finances.

Many physicians, surgeons, engineers, therapists, and technicians have traveled to other countries to learn, bringing home with them new ideas to teach, offering from their own programs many beneficial aids for their fellow man. New York, our home and an international city, has seen many such persons; we have thrived on the stimulation from their presence for weeks, for months, and even for years at a time. Many researchers and clinicians from countries with more advanced technologies have traveled to other areas of the world in which technologies are still developing, to foster advances which help equate the indigenous prosthetic-orthotic capability with their own. We are sincerely happy to report that many Americans have been involved in such programs and that their effectiveness has been noted in several regions of the world. And from such contacts benefits have come back to America.

There is also the written word. The many journals published in the United States and abroad have offered other instruments for communication among this family with common problems. The International Committee has a journal which recently became quite effective in disseminating information on a worldwide basis because it is available in French, German, Spanish, and English. Funds are needed to make it available in even more languages. The U.S. National Academy of Sciences—National Research Council in the publication *Artificial Limbs*, the American Orthotics and Prosthetics Association in its Journal, and we in our own Veterans Administration *Bulletin of Prosthetics Research* have tried to tell thor-

oughly, across all borders, everything available about American technology. Often, these journals have also published contributions of colleagues from other countries.

We, of the Bulletin, have tried to improve the effectiveness of our communications in one part of this issue by including both the English system and the metric system of units. We sincerely feel that any small thing we might do to improve communications among the international family will facilitate general progress.

The results of effective technical communications on an international basis through personal contact and by means of publications and letters are many. Some, which have particularly helped us, are cited.

Most recently the work of Dr. Weiss in Warsaw, Poland, who built on the previous work of Dr. Berlemont of France, has altered significantly some of our American concepts of post-amputation rehabilitation. Dr. Burgess' project report contains a clear indication that we are moving toward using a technique which the Seattle group has developed on the basis of Weiss' work. Variations of the technique fostered by other groups in the United States may also be adopted. Education and training planning now underway will assure that an efficient transfer of information on the very critical details of these methods will be effected.

We can also offer the contributions made to us by other Europeans, by Australians, by South Americans, and by others. Special mention might be made of the advances which have been stimulated by the development of the Russian myoelectric hand and the report of evaluation of the French electric hand contained in this issue. Powering of prehension, perhaps unlike that of other upper-extremity functions, still requires much more research, especially more creative design work. Fortunately, only a small number of amputees now require powered terminal devices; perhaps if true man-machine control loops are developed, then these devices may become more than exercises in engineering design and will be clinically applicable to larger numbers of cases including even those unilateral below-elbow amputees now generally involved in fittings of powered prehension devices.

The German work in many areas, particularly at Heidelberg on pneumatic prostheses and at Münster on arm fitting, has been reflected in developments in the United States. In the past and in the present as shown in the report of VAPC Research, we have had the opportunity to examine a large number of products of European industry. All these have been accomplished on the basis of effective professional contacts.

We are indeed thankful that agencies of the United Nations and of member governments have financed international communications in our field. We can cite some of our United States agencies such as the State Department, the Vocational Rehabilitation Administration through its

Public Law 480 Program, and our own Veterans Administration. Privately endowed institutions such as the World Rehabilitation Fund have been most active in improving the effectiveness of worldwide contacts among the workers in the technology. But we think more needs to be done.

That United States citizenry particularly realizes the importance of international programs can be demonstrated by the White House Conference on International Cooperation held in Washington, D.C. in 1965. We should like to quote from the report of the National Citizens' Commission's Committee on Science and Technology:

"The opportunities for scientific and technological cooperation among nations in the future are thus enormous. Such cooperation can rest on a sound base, for it is already an accepted fact of international life. It has much room to expand, for the needs of mankind — particularly in the developing countries, but also in the more developed areas of the world — are great. It holds the promise of bringing together the intellectual fruits of basic research and the technical arts of development and engineering to produce rapid and positive improvement for all mankind. And most important of all, it holds the promise of providing one route, at least, through which the nations of the world may find lasting peace."

Can one find a better way to advance the frontiers of peace than through effective international communications to accrue progress in overcoming the limitations of disability — of all types and in all places? Our work embraces only physical disability. But we should seek continued advancement in our small portion of the whole technological frontier, and we can do this best by means of an international identity.