



## **PROSTHETIC SERVICES IN KOREA**

**By**

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### *Editor's Note:*

Mr. Chun was assisted in the preparation of this manuscript by Mr. Eugene J. Taylor, New York University-Bellevue Medical Center. Mr. Taylor is a member of the Board of Directors of the American-Korean Foundation and has served since its inception as volunteer Director of Program, and is now Program Consultant.

In forwarding his manuscript to the Journal, Mr. Chun wrote, "My tour of training abroad has served me in good stead and has endowed me with a confidence which proves an invaluable asset to me in my work here in Korea. To the many friends who were instrumental in giving me their kind assistance, advice and support during my period of training, I wish to convey my most grateful thanks."

There are no reliable statistics in Korea on the number of physically handicapped persons in various categories, including amputees. The Korean Ministry of Defense has estimated the number of veteran amputees at 20,000. This figure seems to be fairly accurate. Over and above this number, however, are probably an even greater number of civilian amputees who became disabled while assisting in the war effort as members of the Korean Service Corps, a "labor force" which was attached to various units of the United Nations Command during the war, and of civilian amputees who were not directly or indirectly a part of the Korean and United Nations military war effort.

A conservative estimate is that a minimum of 50,000 Koreans suffered amputations as a result of the war. Added to them are a sizeable but unknown number of persons who have suffered congenital absence of extremities and amputations as a result of non-wartime accidents and disease.



**The Korean National Rehabilitation Centre, Tongnae, has a children's ward for 34 inpatients equipped through funds contributed by the volunteers of the United Nations Women's Guild.**

In the early stages of the Korean conflict, the United Nations Command through the United States Army Medical Service established a prosthetic program and amputee rehabilitation program for disabled Republic of Korea military personnel. The unit was operated by U. S. Army prosthetic personnel.

Parallel with this program, the United Nations Korean Reconstruction Agency in 1953 began the development of a modern comprehensive rehabilitation center utilizing a former veterans' institution at Tongnae, Kyongsang, Namdo, near Pusan in southern Korea. In addition to providing funds for construction of facilities, the UNKRA project included equipment and the long-term services of international experts in physical medicine, remedial gymnastics, prosthetics and vocational training.

In early 1953 when the Korean National Rehabilitation Centre, as this project came to be known, was just starting, an American-Korean

Foundation mission headed by Dr. Howard A. Rusk visited Korea. The purpose of the visit of this mission, which included such familiar names in rehabilitation as Mrs. Howard A. Rusk, Mrs. Bernard F. Gimbel, Mr. Leonard Mayo and Mr. Eugene J. Taylor, was to ascertain the immediate technical assistance needs in the Republic of Korea to which American voluntary funds could be put to immediate use by the then newly founded American-Korean Foundation. It was not surprising in view of the membership of this mission that the American-Korean Foundation gave high priority to cooperating with UNKRA in the development of the Korean National Rehabilitation Centre. Included in the assistance provided by the American-Korean Foundation were the services of expert international consultants in physical therapy, occupational therapy and nursing.

The Korean National Rehabilitation Centre, to which UNKRA contributed \$647,000, has been in full operation since 1957. It now provides services for 300 adult trainees (in-patient and out-patient) through three main units: medical, which includes physical therapy and occupational therapy; prosthetics, which includes the manufacturing, fitting and training in the use of artificial limbs and braces; and vocational rehabilitation which includes training in printing and stamp-making, commercial art, radio repair, electro-mechanics, tailoring and dressmaking, welding, masonry, machine shop, sheetmetal work and a number of other trades. The administrative director of the center, Mr. Cha-Hun Koo; the medical director, Dr. Chung Hi-Oh; a medical consultant, Dr. Pil Soo Shin, and the writer all had advanced training in their respective fields at the Institute of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center, on fellowships provided by the American-Korean Foundation. Four other physicians have or are now undertaking advanced training in physical medicine and rehabilitation at the New York University-Bellevue Medical Center, and a Korean is currently completing a full course of training in occupational therapy under the sponsorship of the American-Korean Foundation at San Jose State College in California. The author's fellowship was given as a result of the recommendations of Mr. William Tosberg, Chief Prosthetist, Institute of Physical Medicine and Rehabilitation, who visited the Korean National Rehabilitation Centre in Tongnae in 1956.

### **Prosthetic Program**

At the present time the prosthetics program is conducted through five independent workshops, but plans have been made to start construction in 1959 on new physical facilities which permit combining all of the prosthetic workshops. In order to avoid delay in production, the new building is being built around the present workshops which are located in independent barracks-type corrugated iron huts.

Upon completion of the outer walls and glass roof of the new building, the huts will be dismantled, leaving the machines and equipment in their present position but in a modern one-floor workshop. Very little re-arranging will be required, and there will be no interruption in production.

#### **Workshop No. 1**

Workshop No. 1 is equipped with a modern automatic copying lathe for producing wooden feet, shin pieces, knee blocks and high sockets, all of which are roughly assembled to close approximate measurements with the knee joint and ankle joint ready for the final assembly and fitting stages. Other equipment includes a bandsaw, electric routing machine and drilling machine.

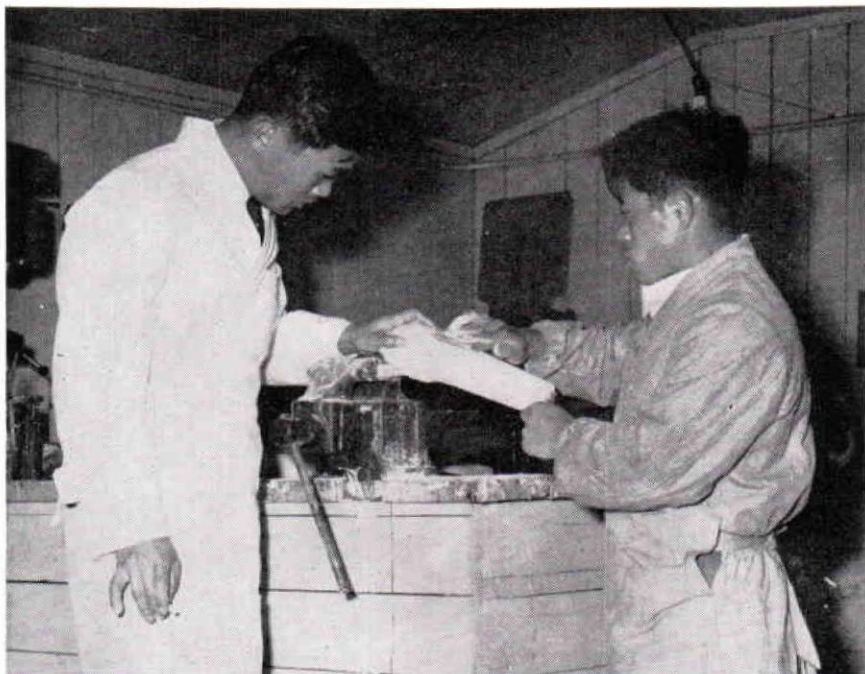
Imported willow wood has been used for these wooden parts, but a transition is being made gradually to the use of a locally grown wood known as "Pinamoo." This wood, pinamoo, is slightly heavier than willow but otherwise possesses similar characteristics. It is tough and durable and is proving quite serviceable, providing ample seasoning time is allowed. For this a small kiln drier is needed. Pinamoo is purchased in log form and stored. After initial seasoning the bark is removed and the log is stocked out to lengths which are trimmed roughly to size, bored through the center; the ends are waxed to prevent cracking, and the lengths are stored in an airy drying shed for continued seasoning.

### **Workshop No. 2**

Workshop No. 2 produces all of the leatherwork for artificial limbs and braces and a sub-section is responsible for the making of plaster casts and leather blocking. Efforts are being made to use laminated plastics for arm sockets and other needs, but due to the inavailability of recognized suitable plastics, a celluloid acetate is being used with success. This is secured by rendering down celluloid scrap such as motion picture or X-ray film and applying it layer by layer over a stockinette. Another sub-section produces boots and shoes for uses with braces and other leather sub-assemblies for surgical supports.

### **Workshop No. 3**

Workshop No. 3 is a self-contained unit for the fabrication of braces and other surgical supports. Equipment includes a turning lathe, blower forge, welding apparatus, grinders, a small milling machine and two small power presses for stamping out sheet metal components.



Trimming Arm Cast—Finishing Shop No. 4

#### **Workshop No. 4**

Workshop No. 4 is used for the final assembly and fitting phases of the program. It is equipped with fixed and portable internal sanders, drilling machines, drying ovens, rawhide facilities and compressor-type paint spray equipment.

#### **Workshop No. 5**

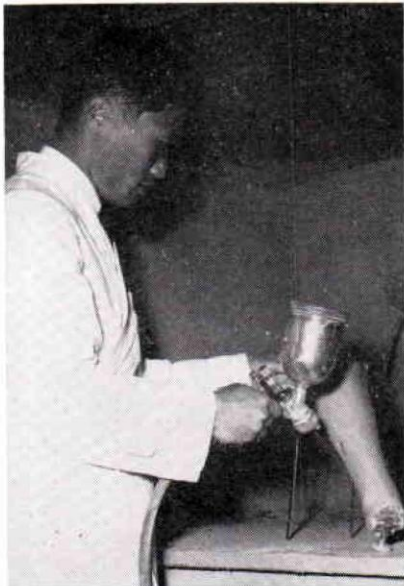
Workshop No. 5 is a completely equipped machine shop which serves the dual purpose of production work plus providing vocational training in metal work for the disabled trainees in the center's vocational training division. In this workshop two prosthetic technicians are permanently assigned for the making of components.

#### **Production Progress**

Production was slow during the initial stages of development of the program because of the necessity for training technicians in skills almost totally foreign to Korea. The volume of production, however, has increased steadily as additional trained technicians have become available. During 1958 production averaged 65 completed limbs and braces per month, but early in 1959 an average of 115 finished products had been achieved.

#### **Staff Training**

A staff training program has been initiated to which independent limb makers and other rehabilitation personnel are invited. Prosthetic manuals from other countries are being translated for distribution not only to the center's staff and trainees, but to independent limb makers in an attempt to aid them in increasing their skills and to promote the use of standardized prosthetic terminology and technical knowledge throughout the nation. One objective of this effort is, hopefully, to develop standardization of prosthetic components through encouraging private prosthetic organizations to order components from the Korean National Rehabilitation Centre. Currently the center is supplying components to the Church World Service Amputee Rehabilitation Projects at Severance Hospital, Yonsei University, Seoul, and at Taejon. These projects have been aided by American consultants. The Chief Prosthetists at Severance Hospital Project and



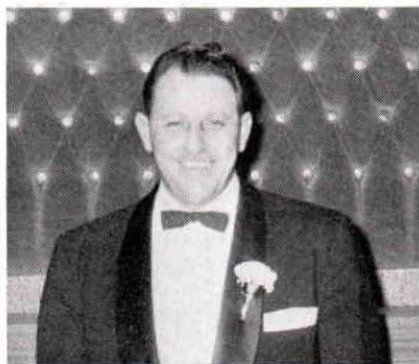
**Spray Painting—  
Finishing Shop No. 4**

Taejon Project, Mr. Ray Song and Mr. Kan Mo Chung, both had advanced training in the United States under fellowships from the American-Korean Foundation. Mr. Song's training was at the Institute of Physical Medicine and Rehabilitation and Mr. Chung's training at the Woodrow Wilson Rehabilitation Center, Fishersville, Virginia. Mr. Chung has just returned to Korea after spending a year as a consultant in organizing an amputee rehabilitation project at the Cameroons in Africa.

### Local Problem

While every effort is being made to make maximum use of Korean raw materials, it is almost certain for some considerable time that the Korean National Rehabilitation Centre must depend on imports of certain items, such as certain metals of good quality and plastics which are not obtainable in Korea. Ankle and knee joints using local metals have been successfully produced, but experimentation over a two-year period shows the local metals will not stand up to the exhaustive wear and tear demanded of them. Progress has not as yet reached the stage where the very intricate mechanisms for upper extremity elbow units or advanced types of terminal devices requiring specialized machinery can be produced satisfactorily. Efforts in this direction have been confined to simple devices, which although crude, have proved serviceable.

The Korean National Rehabilitation Centre at Tongnae is building a reputation of which all members of its staff and the author are very proud. The words of commendation and praise which we receive from visitors from other countries who have had wide experience in rehabilitation and prosthetics are encouraging to us. Even more satisfying, however, is the increasing number of applications for admission which the center is receiving from all parts of the Republic of Korea upon the recommendation of former patients who are now using our limbs and braces.



### WAR MEDALS FOR JOHN GALLO

John Gallo, C.P., Manager of J. E. Hanger, Inc. of New York City, was awarded the Bronze Star, February 20, 1959, by the U. S. Government. This medal was awarded for exemplary conduct in ground combat against armed enemy forces during World War II. Mr. Gallo is the recipient of the Purple Heart with oak leaf cluster (twice wounded), the Presidential Citation with cluster, European-African Middle East medal with silver star and 4 bronze stars and Invasion arrowhead, combat infantry badge, the French Fourragere and Victory medal.