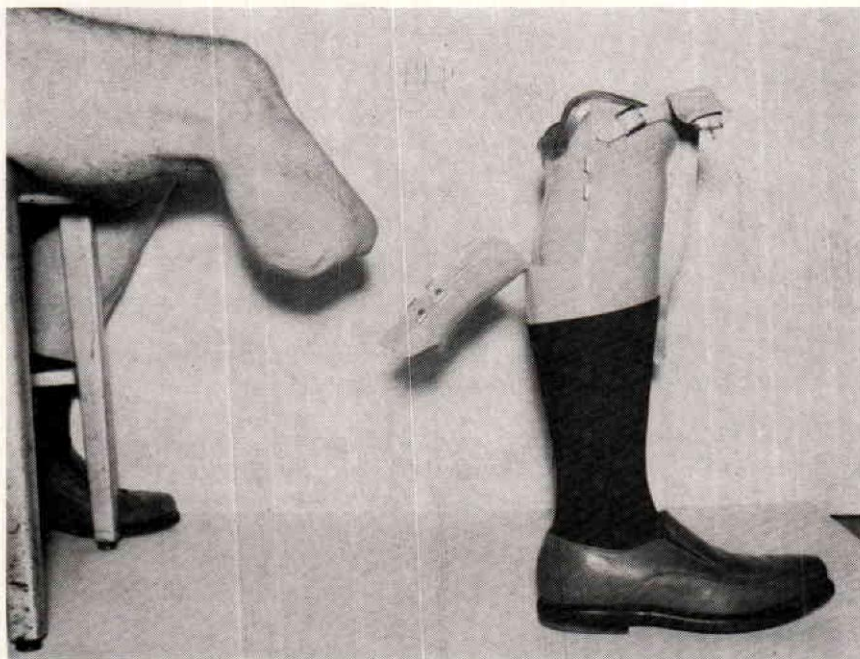


## Modification of the PTB Prosthesis to Accommodate Bell-Shaped Stumps

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Minor modification of a standard type PTB limb has made possible the successful fitting of an unusually shaped stump. This individual was of an extremely muscular build and amputation of the right leg through the largest part of the calf left a "bell-shaped" stump which has retained this same conformation and firmness in spite of the usual shrinkage over a period of four years. The patient wore a standard PTB limb during this time. With this appliance it was impossible to fully utilize the proper weight bearing surfaces about the knee since the proximal portion of the socket had to be made large enough to permit entry of the substantially larger distal end of the stump into the prosthesis. Because of this situation the stump could not be supported in its proper position and the distal end of the tibia bore heavily against the closed end of the socket, thus producing traumatization of the bone and constantly abrading the skin at this point.

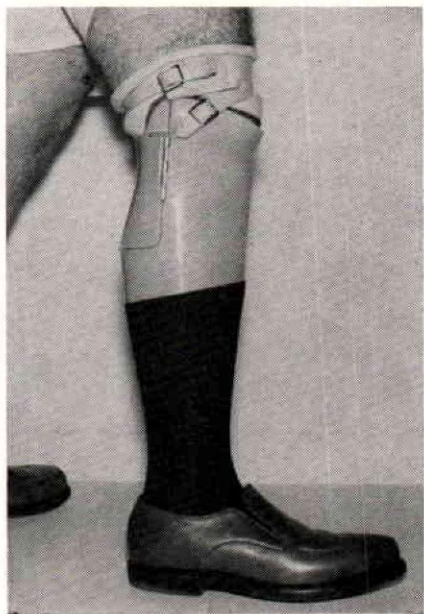


1. Necessity for special modified PTB socket can be plainly seen in this profile view of amputee's stump. Circumference of distal end is approximately  $1\frac{1}{4}$ " larger than stump at level of patellar tendon and muscle tissues are very firm.

The possibility of using a thigh lacer and knee joints on either a PTB or conventional BK was considered but it was felt that snug lacing of the corset would not overcome lack of weight bearing at the knee and would probably impede circulation of the distal portion of the stump.

After careful appraisal of the problems involved it was decided that the PTB socket offered the best possibility of success providing that a method of construction could be devised that would allow weight bearing according to the basic principles of that type of limb. A hinged posterior section satisfied these conditions and proved relatively easy to construct. The soft insert was fabricated in the usual manner and the plastic shell was laminated approximately fifty per cent thicker than normal to provide more rigidity. It was felt that a positive aligning and rigid type of fastener would be required in order to maintain precise shape and dimensions of the socket during weight bearing. Straps with buckles and other flexible fasteners such as Velcro tape were ruled out on this account. Medium sized butt hinges proved adequate for this purpose after the original pins were discarded and new ones of polished steel were fitted so as to slide into place easily. The hinges themselves were set into place with plastic paste and then riveted securely before final finishing of the prosthesis. Beveling the edges of the top hole made insertion of the pins much easier.

In donning the limb, the amputee has the choice of either pulling the insert upon the stump and then inserting both into the plastic shell together or by first positioning the insert in the shell and then pushing the stump into place. In either case the posterior flap is not closed and fastened until the stump is fully in place. An extra accessory which makes it much easier for the amputee to close this flap and hold it up snugly while the pin is



II. L-shaped pins lie flat, can be easily inserted and removed. Metal hinges lock posterior flap rigidly in place and hold entire socket in shape during weight bearing.



III. Note that pivoting hinge is placed above end of stump at point of largest stump circumference. Also that insert does not have hinged section but is solid like standard PTB.

inserted can be fabricated with a 1" leather strap and a lever type fastener such as is ordinarily used on fisherman's ice chests. It might be possible in some cases to eliminate the cuff suspension strap but here it was necessary in order to avoid excessive piston motion.

In concluding it should be emphasized again that there is no departure from the accepted techniques of PTB fitting. While the particular circumstances of this case will seldom occur, a more frequent occasion for the use of this modification might be found in early fittings of BK amputations, allowing post-operative ambulation before atrophy of muscle tissue reduces the distal portion of the stump enough to permit use of the regular type socket.

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## Book Reviews

**ORTHOPEDIC BRACES: Rationale Classification and Prescription.** By Maxwell H. Bloomberg, M.D., Chief of the Brace Clinic, Veterans Administration Hospital, Newington, Connecticut. Published by the J. B. Lippincott Company, Philadelphia and Montreal, 1964. 207 pages, illustrations.

This is the latest book on orthopedic appliances and should be useful to any reader of the *Journal*. In his preface, the author among other acknowledgements thanks AOPA members K. B. Nelson, Ralph Storrs, John Retzler, Sr., and Alfred Schnell.

A comprehensive review of the book will appear in the next issue of the *Journal*.

**REHABILITATION MEDICINE: A textbook on physical medicine and rehabilitation.** Second edition by Howard A. Rusk, M.D. and collaborators, with the editorial assistance of Eugene J. Taylor. C. V. Mosby Company, St. Louis, Missouri, 1964. 668 pages, \$15.50.

This is a useful volume for the orthotic and prosthetic facility. The

professional personnel of these facilities will find it a useful reference tool. The chapters on the management of psychiatric problems and on crutches and wheel chairs, for example, give information that is hard to find in print.

**SCIENCE AND CANCER: By Michael B. Shimkin, M.D.** Published by the National Cancer Institute of the U.S. Public Health Service, 1964. 137 pages. May be purchased from the U.S. Government Printing Office at sixty cents each.

Dr. Shimkin spent twenty-five years in the Public Health Service. He is now engaged in cancer research and teaching at Temple University School of Medicine in Philadelphia.

This is a booklet for the layman. It is clearly written (unusually so for a government document). The report has two purposes: (1) to give the medical aspects of cancer as a practical problem facing all of us today, (2) to tell about some of the efforts now being made by science to protect us against cancer. The report is entirely successful. We urge you to get a copy of this and read it.