ORTHOPEDIC & PROSTHETICAPPLIANCE The Journal of the Limb and Brace Profession



A Lady Has Lots to Tell Her Orthotist! Debby is able to enjoy life because her handicap is overcome through the work of a certified facility (See note inside cover).

# DATES TO REMEMBER

# **1958** What • When • Where

# OCTOBER

6-10	American College of Surgeons-Clinical Congress	Conrad Hilton Hotel Chicago, Illinois
13-15	National Rehabilitation Association—1958 Na- tional Conference (OALMA Program presenta-	Asheville, N. C.

- tion October 14)
- 17-18 Certification Examination for Orthotists S and Prosthetists a

St. Louis, Mo. and Los Angeles, Cal.

- 24-25 CERTIFICATION EXAMINATION FOR ORTHOTISTS Miami Beach, Fla. AND PROSTHETISTS
- 26-30 OALMA NATIONAL ASSEMBLY

Eden Roc Hotel, Miami Beach, Fla

# NOVEMBER

16-20 National Society for Crippled Children & Adults —National Convention

Statler Hotel, Dallas, Texas

# COVER PHOTOGRAPH

Debby Watson, the pretty little girl on our cover, is shown on a visit to the R & G Orthopedic Appliance Co. in Washington, D. C., for a minor adjustment to her braces. Charles Ross, head of the firm, is the orthotist. Charles reports that Debby is a most cheerful and cooperative patient. She wears two long leg braces attached to a Knight Spinal brace. Debby had polio at the age of two years (she is now seven). The crutches she uses were also made by R & G. These are Army-type Canadian crutches made of aluminum and specially designed for children.

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L	ORTHOPEDIC & PROSTHETIC APPLIANCE JOURNAL PAGE 1	

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PAGE 2

# **Orthopedic and Prosthetic**

# **Appliance Journal**

(Title registered U. S. Patent Office)

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ORTHOPEDIC &	PROSTHETIC	APPLIANCE	JOURNAL
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torso is told in these two pictures. The foamed pad protects vital organs from accidental bumping. In this case, it also makes for easier breathing and greater stamina.

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SEPTEMBER, 1958

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# Body Corrections



A thorocoplasty two-plane restoration necessitated by an operation with extensive rib resection. All body correction prostheses are sculptored in clay to restore normal contour. Permanent molds are fabricated permitting easy re-



placement of the prosthesis, when necessary. The material is washable and permits the skin underneath to breathe. In addition to its cosmetic value, the restoration gives badly needed protection and support.



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An unusual breast shape or radical surgical result offers no problem in this type of restoration. The partplastic, part - rubber latex foam makes for the best possible material.

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# **Complete Suppliers To The Prosthetic Industry:**

PAGE 8

1

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# GENERAL ABDOMINAL

For half a century Camp has been recognized by doctors and their patients as leaders in manufacture of scientifically designed, high-quality abdominal supports. Designed for postoperative, postnatal and posture control, the Camp abdominal supports are groin (illustrated) or skirt length, feature rear, side or front adjustment lacings and are provided in a variety of attractive, long-lasting materials. Camp's low cost to you assures highest profits for your supports department.

SERVE YOUR MEDICAL MARKET WITH A WIDE VARIETY OF SUPPOR



PAGE 10

# ... FOR MEN

# LUMBOSACRAL

#### Triple Adjustment, illustrated

Camp lumbosacral supports for men satisfy a wide variety of needs among patients with low back injuries or other disorders. Designed with wearing strength and powerful, functional control as their main features, the garments are prescribed for patients in all walks of life and social stations. Shown here are two garments in a highly profitable line that offer side lacing adjustment, snap button closings, two stainless steel stays for added rigidity. Made of strong, cream canvas. Camp lumbosacral supports extend from the lower rib cage well down over the gluteus, providing partial-immobilization for the pelvis and the entire lumbar spine.

# GENERAL ABDOMINAL

Camp abdominal supports for men fill what many physicians consider an essential need for post-operative control and general support. The model illustrated here offers specific help in posture control for patients with pendulous abdomen. This garment and others in the line have also been prescribed for men who need extra back and abdominal support to help them withstand the strain of work in business, industry and sports.

#### DORSOLUMBAR

There are many conditions for which orthopedic surgeons wish to support a portion or all of the dorsolumber vertebrae, and Camp dorsolumbar supports are made in a variety of heights to satisfy doctor and patient requirements. Camp's method of manufacturing . . tough fabric which may be reinforced with strong, pliable steels (model illustrated has two shaped steels) . . . puts the profitable dorsolumbar garments in heavy demand.

# ND APPLIANCES FROM CAMP







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PAGE 12

# NEW, HIGH-PROFIT ITEM FOR YOUR HEALTH SUPPORTS DEPARTMENT

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ORTHOPEDIC & PROSTHETIC APPLIANCE JOURNAL

PAGE 13

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man Sacro-Lumbar Back Support for my inspection [].	Address	
Men's Women's Size	City	State
PAGE 14		SEPTEMBER, 1958



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Certainly no one type of foot appliance is fitted for all foot conditions, that is the reason why we offer you a great variety of appliances.

Cork—Rubber—Celastic Supports and Inlays. Levy Mould and Forefoot Balancer—Artificial Toes and Forefoot Amputees and short Limp Extension. Orthopedic work is our specialty.

All Inlays are made with Oak sole leather base—and in many types blue tempered steel springs are added. Also every type of stainless steel brace all hand hammered to your cast.





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The common law of business balance prohibits paying a little and getting a lot—it can't be done.

- John Ruskin



Three pull straps control traction in Model 430-EHS lumbo-sacral support pictured . . . two rigid steels.

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# OALMA ANNOUNCES ASSEMBLY PROGRAM

Limb and Brace Profession to Meet in Miami Beach and Havana

The 1958 National Assembly of the Limb and Brace Profession will be held at the Eden Roc Hotel in Miami Beach, Florida, October 26-30, 1958. At its conclusion delegates will adjourn to Havana, Cuba the afternoon of October 30, for a two-day technical demonstration, to be held in the Havana Riviera Hotel.

Advance reservation forms and program details may be obtained by writing to OALMA National Headquarters, 411 Associations Bldg., Washington 6, D. C.

The Annual Meetings of the Orthopedic Appliance and Limb Manufacturers Association and the American Board for Certification will be held as part of the Assembly. John A. McCann, President of OALMA, will preside at the election of officers and Business Session of the Association. Dr. Roy M. Hoover, President of the American Board, will preside at the Certification session.



TED SMITH, Exhibits Chairman



**RALPH STORRS, Program Chairman** 

# Thirty-five Booths Have Been Reserved by Suppliers to Display the Latest in Prosthetic and Orthopedic Appliances and Materials at the National Assembly in Miami Beach

These leading manufacturers in the limb and brace field will set up their displays in the Imperial Room of the Eden Roc Hotel the afternoon of October 25. Formal opening of the myriad of products, equipment and necessities for orthopedic appliance practice is scheduled for Sunday, October 26. The displays will remain on view from 9:00 A.M. to 4:00 P.M. October 27, 28 and 29. Formal closing of the exhibits is scheduled for 11:00 A.M. on Thursday, October 30.

Ted W. Smith of Kansas City, Missouri, who is serving as Chairman of the Exhibits Committee, reports that trained technicians and representatives will be at each booth to answer questions.

The exhibitors will be guests of honor at the OALMA Reception to be held in the Eden Roc Hotel Sunday evening October 26.

FOR DETAILS ABOUT THESE EXHIBITORS SEE PAGES 30, 127-130

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The Preliminary Program as announced by Program Chairman Ralph Storrs, follows (the final printed Program available at Miami Beach should be consulted for room assignments and last minute changes in program):

# Your Invitation to The 1958 Assembly

The National Assembly of the Limb and Brace Profession convenes at the Eden Roc Hotel in Miami Beach, October 26. After adjournment at noon, October 30, you are invited to attend a Pan-American Technical Session at Havana, Cuba, October 30 to November 2.

The program has been carefully planned: You will have an opportunity to confer with noted specialists in rehabilitation—*Technical and Scientific exhibits* will bring you up-to-date on supplies, research, and services to make easier your task of serving the handicapped. Mornings you will take part in technical sessions—the afternoons will be available for consultation on individual problems and for attendance at instructional courses.

Both in Miami Beach and Havana you will have an opportunity to visit rehabilitation facilities, to talk with colleagues and to take advantage of the unique recreational features. Members of your family have not been forgotten—they will share in some unusual Assembly features.

This is your opportunity to combine a vacation with attendance at your annual professional session. For the best in accommodations, mail the reservations card direct to the Eden Roc Hotel. To enable us to serve you effectively, please fill out the registration card and mail it to OALMA Headquarters. This will assure your name being listed on the Preliminary Roster of the Assembly. And we can then have your Admission Badge waiting for you at the Registration Desk.

Our special rates at the Eden Roc Hotel begin as early as October 23, giving you time to inspect Florida's recreational establishments and resources, entertainment and to visit rehabilitation facilities. As a Godbey is planning an Early Bird Fishing Trip for Saturday, October 25. Certification Examinations will be held October 24-25. And the exhibitors will be busy setting up their displays the afternoon of October 25, to be ready for you on Sunday. Come early!—Enjoy yourselves; we'll be looking for you —

Ralph Stons

Program Chairman

Preliminary Program Notes

# REGISTRATION

The Registration Desk will be open from 10:00 A.M. until 5:00 P.M. October 24, 25, and 26. Tickets for the Assembly Breakfast Monday, the Luncheon Tuesday and the Reception and Dinner on Wednesday will be available.

It is important that everyone register before entering the meeting areas. Those not wearing the Official Badge will be refused admission. This meeting is not open to the general public.



Havana Riviera Hotel and Cabana Club, scene of OALMA Technical Conference in Havana Cuba, October 30 - November 1.

A Registration Fee will be charged: \$5.00 per person. In addition there is a special charge of \$12.50 to cover instructional materials and expenses in connection with the course on Accounting, Taxes and Law. A \$5.00 fee will be charged for other seminars.

#### **BUSINESS SESSIONS**

The annual Business Meetings of the Orthopedic Appliance and Limb Manufacturers Association will be held on Monday October 27, and on Thursday October 30. Only members of the Association in good standing, whose dues are paid for the current year will be admitted.

#### **EXHIBITS**

Supply, technical and scientific exhibits will be on display in the Imperial Room of the Eden Roc Hotel and should prove of great interest to all in attendance. The program has been arranged to allow time for visits and inspections of these exhibits. Since these have been given considerable thought and effort, we urge every visitor to set aside sufficient time for a complete tour of all exhibits.

#### HAVANA SESSION

Members desiring to attend the Havana session should plan to fly from Miami Airport the afternoon of October 30. Service is available on National Airlines and Pan American Airlines. Fare is \$36.00 roundtrip and flight time approximately one hour. Consult registration desk for details.

Special Session in Cuba

#### October 30 - November 2

Registration fee for Miami Beach also covers registration for the Havana session. Hotel rates at the Havana Riviera Hotel are \$13.00 per day, room with twin beds (either single or double occupancy). If you buy your ticket to Havana from your hometown with stopover privileges at Miami Beach, you have the benefit of the larger baggage allowance for foreign travel. And there is in some cities a saving on the round trip flight rate from Miami to Havana. Check with your Airlines or travel agencies. Note: Passports are not required of American citizens.

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Assembly Program Outline

# SUNDAY, OCTOBER 26

9:00 a.m. Registration—and Exhibits open—An OALMA Registration to Badge is required for admission to all meetings and to 5:00 P.M. the Exhibits display. Sessions will not be open to the general public.

6:00 p.m. OALMA Reception

# MONDAY, OCTOBER 27-Morning

# President's Breakfast-setting the keynote for the Assembly.

# THE FUTURE AND OALMA

What is Your Future as a Member of the Limb and Brace Profession? OALMA unites individual members for the best interests of all. What does it do? Hear your officers and staff report on its resources, its publications, its public relations program, and financial operations. Learn how you can make use of OALMA in planning a better future for yourself, your firm, and your partners. In 1958 OALMA held conferences on such topics as "The Future of the Profession", "Education, Training and the New Research Program in Orthopedic Appliances". Hear about this and let others hear your views.

*Note:* OALMA will hold two business sessions open to members only. The first, on Monday, October 27, will receive nominations for officers. Resolutions for action by the Assembly will be presented at this meeting. They will then be referred to the *Special Committee on Resolutions* for study and analysis. The report of this Committee on the resolutions submitted will be acted on at the final Business Session of OALMA, Thursday morning, October 30.

Orthopedic and Orthotic Management of Certain Paralytic Foot Deformities

Presentation from Pennsylvania State Hospital for Crippled Children

DANIEL DE MEO, M.D. and

ALFONS GLAUBITZ, C.O. & P.

Presented by: Alfons R. Glaubitz, C. O. & P., Elizabethtown, Pa., and Joseph C. Flynn, M.D., Orlando, Florida.

# Afternoon

This afternoon has been left unscheduled, so that visitors to the Assembly may have time to visit exhibits, consult with "resource persons" on individual problems, and inspect Rehabilitation facilities in the Miami area.

Evening

Above Knee Fitting Techniques; An Analysis of the Techniques Currently Being Used in the Various Prosthetic Courses.

# **DENISON'S** CEREBRAL PALSY BRACES

# MADE TO ORDER

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rigid pelvic band and hip sections for positive abduction and adduction control

sealed radial and lateral thrust ball bearing joints used throughout

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PAGE 22



George Robinson to Give Functional Arm Bracing Course with Dr. Miles Anderson and LeRoy Snelson.

# **TUESDAY, OCTOBER 28**

Morning

#### Concurrent sessions:

Visit Exhibitors.

# Functional Arm Bracing

Hear GEORGE ROBINSON, pioneer in this field with DR. MILES ANDER-SON and LEROY SNELSON.

#### Bio-Mechanical Problems in B/K Prosthetics

CHARLES W. RADCLIFFE, Associate Professor of Engineering Design-University of California at Berkeley.

# Comprehensive Management of the Older Amputee

ALLEN S. RUSSEK, M.D., Associate Professor of Clinical Physical

Medicine and Rehabilitation, New York University FRED ESCHEN, C. P., New York City WILLIAM TOSBERG, C., O., AND P., Institute of Physical Medicine and Rehabilitation, New York City, New York University.

#### Surgical Appliances—Helpful Hints as to Fitting—and Their Place in the Successful Limb and Brace Establishment.

RUSSELL JOHNSON, Truform Anatomical Supports. "Russ" Johnson is a recognized authority on this-he has helped countless members of OALMA make a success of the surgical appliance department. Skilled technicians will assist him in this demonstration.

#### Luncheon American Board for Certification. **Business Session**. Afternoon

This has been reserved for individual consultations with "resource persons", interviews with suppliers, and committee meetings. OALMA visit to the Viscaya Palace and Art Museum.

# **TUESDAY, OCTOBER 28**

#### 8:00 p.m.

# Special Seminar in Accounting, Taxes and Law for the Facility.

MARTIN SOSIN, attorney and accountant, will conduct this special instructional course for managers of limb and brace facilities. Material offered will include helpful hints in accounting methods and systems, business management (quality control, pricing and methods), legal aspects applicable to the limb and brace profession, tax planning and preparation. A special fee of \$12.50 will be charged for this instructional course and *attendance is limited*. Register early!

# VISIT OUR COMPLETE DISPLAY AT THE 1958 OALMA NATIONAL ASSEMBLY MIAMI BEACH

Jerry Leavy, Noel and Lloyd Brown will be present to discuss problems or explain new components and techniques with you—

¥

You will be pleased with this opportunity to see the latest DORRANCE-HOSMER developments.

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# A. J. HOSMER CORP.

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Martin Sosin, to give course on Legal and Financial Aids.

Prof. Charles W. Radcliffe to speak.

# WEDNESDAY, OCTOBER 29

# 9:00 a.m. Exhibits open

#### to 4:00 p.m.

Juvenile Amputee Film—Don't miss this unusual production describing results achieved by the prosthetics team at Tulane University.

Developments in Lower Extremity Bracing and the Future

The first report of the important New York University-OALMA Seminar on Orthotics.

# **Reinforcing Materials for Wooden Prostheses**

Special Seminar. \$5.00 fee charged; Registration limited. This session will be presented by ANTHONY STAROS, Chief of the Veterans Administration Prosthetics Research Center, and THOMAS PIRRELLO, Certified Prosthetist.

# **New Developments in Plastics for Prosthetics**

Useful technical data presented by DR. FRED LEONARD, Army Prosthetics Research Laboratory, Washington, D. C.

#### Afternoon

Special Event-Report to Physicians and Other Members of the Rehabilitation Team. OALMA Committee on Advances in Prosthetics. "What's New in Prosthetics"-Clinic Team Procedures, Prescription of the Appliance; Certification and its Role in Improved Appliance Service.

# Special Event: OALMA Reports to Physicians and Other Members of the Rehabilitation Team —

October 29

Delegates to the Assembly will be hosts to the physicians and to visiting colleagues in the rehabilitation field at a special meeting Wednesday afternoon October 29 at the Eden Roc Hotel.

They will hear:

(1) What's New in Prosthetics—The first report of the OALMA Committee on Advances in Prosthetics. JACK STEWART, inventor of the Hydra-Cadence Leg will take part in the Report.

(2) Clinic Team Procedures, comments by DR. EUGENE RECORD, M.D., V.A. Prosthetics Consultant at Boston, Massachusetts;

(3) Improved Procedures in the Prescription of Appliances, by Charles O. Bechtol, M.D., Professor of Orthopedic Surgery, University of California — Los Angeles;

(4) The Role of Certification in Improved Prosthetic and Orthopedic Appliance Care—by Roy M. Hoover, M.D., President of the Certification Board.

You will hear important news about the new "Feedback" procedure. This is being developed so that your experience in the use of new appliances may be presented to the Prosthetics Research Program as a guideline in developing other appliances. The thorny problem of multiple prosthetic clinics or "I can't be in three places at the same time" will also be considered.

# To Serve Your Supply Needs

# Exhibitors who have reserved display booths at the National Assembly:

Accurate Knitting Mills, Inc. American Rawhide Mfg. Co. Apex Foot Health Products Co. Bennington Stump Sock Corp. Otto Bock Orthopedic Industries S. H. Camp and Company C. H. Davies Co. D. W. Dorrance Florida Brace Corporation Everest & Jennings, Inc. Fillauer Surgical Supplies, Inc. The Hawkes Company Hersco Arch Products Corporation A. J. Hosmer Corporation Hydra-Cadence, Inc. K & K Prosthetic Supplies, Inc. Kingsley Mfg. Company The Knit-Rite Company Levy & Rappel, Inc. The John J. McCann Co. Markell Shoe Co. Minneapolis Artificial Limb Co. The Ohio Willow Wood Co. The Ohio Willow Wood Co. The Pope Brace Division Prosthetic Services of San Francisco R & G Orthopedic Appliances Sierra Engineering Co. Southern Prosthetic Supply Truform Anatomical Supports United States Mfg. Co.



To discuss Procurement Policies — A. A. Towne, Supervisor of Medical Services, Rehab. Division of Wisconsin.



Anthony Staros to give course on Reinforcing Materials for Prostheses.

#### WEDNESDAY, OCTOBER 29-(Continued)

#### Evening

# **OALMA** Reception and Banquet

Surprise Features make this an evening long to be remembered. The Eden Roc Hotel is famous for its cuisine and entertainment features.

# THURSDAY, OCTOBER 30-Morning

"1104 Sutton Road"—This is the story of Jim Hathaway, and he turns out to be a lot like you! This new movie, just released, has much to offer in entertainment—but it has more than that: We all have to get along with people. This film gives you some useful procedures to follow, whether you're boss, foreman, or at the other end of the totem pole.

# Exhibits Open 9:00 a.m. to 11:00 a.m. State Rehabilitation Purchasing Procedures and the Certified Facility —

An interview discussion by ADRIAN A. TOWNE and OALMA Director GLENN JACKSON. ADRIAN TOWNE has spent 21 years with the Wisconsin Rehabilitation Department and is now Supervisor of Medical Services. The Wisconsin Department has worked out some procedures worthy of your attention. You will want to hear this, and so will your rehabilitation counselors. Some noted "resource persons" will take part in this program.

#### **ORTHOPEDIC & PROSTHETIC APPLIANCE JOURNAL**

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Compressor spring housing.
 Compressor spring.
 Compressor spring.
 Compressor block.
 Rubber ring.
 Inside-Knee-Bolt Bushing with swing tever and swing bolt of Plastic material.
 Knee Bolt with friction brake.
 Round Nut M4x10 for forward bolt.
 Forward Bolt without nut.
 Shock Absorber of Plastic Material.
 Braker Strew with nut.
 Brake Distance Regulator Platform.
 Braking Segment of Plastic Material.
 Guiding Tube of Steel with wooden thread.
 Stoward Bolt wooden thread.
 Stoward Bow of plastic material with container for stop rubber.
 Guiding Balt of Steel coverad with Plastic Material.
 Nut Mó.

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PAGE 28

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# AT NO INCREASE IN COST!

In swing phase provides controlled heel rise . . . gives smooth, automatic forward shin action . . . and eliminates terminal jar as shin reaches full extension.

In stance phase locks as weight is applied at heel contact . . . remains locked during midstance . . . unlocks immediately after push-off.

The Otto Bock Safety Knee permits the amputee to walk with a natural gait , , , with less effort . . . and with assurance of maximum stability,





Dr. Fred Leonard to Lecture on Plastics.

Dr. Harriet Gillette

# THURSDAY, OCTOBER 30, Cont'd.

Cerebral Palsy—A Medical Review and Analysis of the Principal Bracing Systems

HARRIET GILLETTE, M.D. Dr. Gillette is Chief of the Division of Physical Medicine, The Health Center, The University of Florida. Joining her for this presentation will be these experienced orthotists: W. FRANK HARMON, JOSEF ROSENBERGER, ASA GODBEY and ERICH HANICKE.

A Better Future for You and What OALMA Can Do About It.

The second and final OALMA Business Session. Officers who were nominated at the Monday session will be voted upon and installed. The resolutions presented at the Monday session will be debated.

Noon Adjournment of the Miami Beach Sessions and Preparation To Leave for Havana.

3:00 p.m. Airplane flights to Havana from Miami Beach run about and later every hour.

. . .

# OALMA SCIENTIFIC AND TECHNICAL CONFERENCE AT HAVANA, CUBA

Note—All sessions will be held at the Havana Riviera Hotel in-Havana, Cuba.

- 7:00 p.m. Official Reception for OALMA Delegates They will be guests at the reception of the management of the Havana Riviera Hotel.
- **ORTHOPEDIC & PROSTHETIC APPLIANCE JOURNAL**

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#### FRIDAY, OCTOBER 31

# Morning Visits to Havana's rehabilitation facilities—check OALMA Registration Desk.

#### 1:00 p.m. OALMA Presents a Demonstration on American Progress in Prosthetic Appliances

JERRY LEAVY will demonstrate Upper Extremity Appliances; CHARLES A. HENNESSY will comment in Spanish on the demonstration for the benefit of visitors. Other participants to be announced; OALMA members wishing to take part in the demonstrations are urged to communicate with OALMA Headquarters promptly.

# Evening Official Greetings to Our Cuban Colleagues in Rehabilitation

# SATURDAY, NOVEMBER 1

Morning American Progress in Orthopedic Appliances A demonstration with interviews and comments by OALMA members.

Afternoon Visit to the University of Havana and Other Rehabilitation Features in Havana.

### SUNDAY, NOVEMBER 2

#### Adjournment and return to the Miami Airport.

For details of the program, room assignments, consult the final printed program, which will be available at the Registration Desk, Eden Roc Hotel, Miami Beach, Florida, October 26.

# EXHIBITORS TO DISPLAY LATEST AND BEST IN SUPPLIES

The following "thumb-nail" sketches of the displays is intended to serve a double purpose, first, as a pre-view of what Assembly delegates will be able to see and second, to inform those persons who will not be able to be present. Booth locations assigned as of the day the *Journal* goes to press include:

# Booth No. 1 • Southern Prosthetic Supply Company and the Minneapolis Artificial Limb Company

"Everything for the prosthetic manufacturer"—that's their motto and these two supply firms do just that. Stop at their booth, the first one as you leave the Registration Desk, to see the latest type socket blocks, the machine-shaped SACH Feet, knee-shin set-ups and foot shin set-ups.

# Booth No. 2 • OALMA Insurance Display

This exhibit will describe the life, hospital and surgical benefits available to members of the Association.

#### Booths Nos. 4, 5, 6 • D. W. Dorrance Company, Inc. and A. J. Hosmer Corp.

This is the largest single exhibit at the Assembly and you will have an excellent opportunity to see the latest Dorrance-Hosmer developments. Jerry Leavy, Noel and Lloyd Brown will be present for the Assembly and will be glad to discuss your prosthetic problems or explain new components and techniques.

# Booth No. 3 Accurate Knitting Mills

Jerry Shearer will again display the varied types of stump socks for which this firm is noted. These stump socks are hand fashioned and are anti-shrink treated. They stay soft and have lasting resiliency.

Continued on pages 127-129.

# ISCHIAL WEIGHT BEARING BRACE WITH QUADRILATERAL WOOD TOP----PRELIMINARY REPORT

# By ALLEN S. RUSSEK, M.D. and FRED ESCHEN, C.P. & O.

The development of the quadrilateral socket for the above-knee amputee and the extensive use of this socket have led to improved understanding of the principles of weight distribution on the artificial limb. Although there are many problems which must be solved with regard to the adaptability of the quadrilateral socket for the above-knee amputee, there is universal agreement on the advantages of ischial weight bearing.



Figure 1. The quadrilateral, wood top ischial weight bearing brace is cosmetically acceptable, comfortable and light in weight. (Figures 1 to 8 in this article are from photographs by Stanley Simmons of the N.Y.U. Bellevue Medical Center.)



Figure 2. The socket of the brace is easily opened and closed. The opening is wide enough to allow the thigh to fit into from the front.

The principles of ischial weight bearing have been applied in disabilities of the lower extremities in patients other than amputees. Braces have long been made incorporating the high thigh cuff and the Thomas ring or some modification of it. Most physicians have become doubtful of the efficiency





Figure 3. When the socket is closed, the ischial seat is held reliably in place without rotation.

Figure 4. The accurate.y fitted and a igned brace will transfer weight to the ischium at heel contact, with the knee locked.

of the ring type gluteal or ischial support where it is desired to relieve a lower extremity of weight bearing through the long bones. The principle of the quadrilateral socket in our experience, applied to bracing of the lower extremity, has made it possible to control the degree to which the weight bearing responsibility of the long bones can be relieved.

In cases of instability of the hip joint, failure of union of a fracture of the femur, particularly the neck of the femur and in cases where there is massive loss of the bones comprising the hip joint, the long leg brace with an ischial ring has been seriously disappointing. The gait of patients wearing such braces is altered by the leverage forces placed upon the femur which cannot withstand the physical stresses. Such patients have uniformly been using crutches in addition to the brace.

When weight is transferred directly from the ground to the pelvis the pelvic lever is much shorter so that the muscular effort of maintaining balance is considerably reduced. It is through the use of the quadrilateral socket that weight can be transferred to the pelvis in the lower extremity brace.



Figure 5. The closed socket is completely smooth inside even when the lateral edges are not in contact. Initial fit should allow about 1/2 inch space laterally.



Figure 6. The leather tongues are glued to the posterior portion of the socket. The edges are tapered.



Figure 7. The open socket demonstrating the higher anterior and lateral walls. These are modified for this patient and are lower than the UCLA specifications.

The socket is made with an open end in the same way as it is for an amputee. The anterior wall of the socket is then cut out and hinged medially with straps and buckles laterally for closure. This makes it unnecessary for the patient to put the foot and the knee through the socket opening. The patient's leg enters the brace through the front. The cut margins of the anterior wall are protected by carefully shaped leather tongues so that when the socket is closed the interior is smooth and continuous. The shrinkage problem and loss of fit is not encountered with the use of the brace since this can be adjusted through the tension in the straps. The brace is made with double drop locks at the knee for most patients. When partial weight bearing can be permitted the knee center can be set far back by curving the side bars and the knee allowed to swing when the brace is off the ground. The length of the side bars should be carefully calculated so that the patient's heel within the shoe is not bearing weight when he is standing in the brace. Most patients do not require any type of suspension for this brace if the lateral and anterior walls do not have to be modified from the UCL A socket design.



Figure 8. The brace is simple. The wood top eliminates the need for metal bands to stabilize the bars. The four buckles are easily adjusted by any patient. Accurate shaping and fitting of the bars is facilitated by the simplicity.

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Suspension in the form of hip joint and pelvic band or Silesian type belt can be used when necessary for additional stability and prevention of rotation within the brace.

Twenty such braces have been made within the last five years without a failure in terms of function. This may be attributed to the fact that the cases were carefully selected. A number of these patients had failed to function in a conventional type lower extremity brace with a full thigh cuff and padded ring type weight bearing support. By utilizing the existing brace and adjusting the length of the side bars they were able to walk without assistance with a quadrilateral wood socket on the brace. We are convinced by the control comparison of these patients having used both types of weight relieving mechanisms of the efficiency of ischial weight bearing and the superiority of the quadrilateral wood socket. Such a brace has been successfully used for a 93-year old veteran with a completely disrupted hip joint due to failure of several surgical procedures to correct non-union of a fracture of the neck of the femur. It has been used in cases of tumor of the femur with loss of bone, completely flail lower extremity in cases of polio, markedly unstable painful knee joints, and in postoperative failures following hip arthroplasty.

It is necessary that physicians and orthetists seriously consider the adaptation of the quadrilateral wood socket to the long leg brace for purposes of eliminating weight bearing through the long bones of the lower extremity where it is imperative that the brace be efficient.

## CIVIL SERVICE EXAMINATION

### **OFFERED FOR PROSTHETISTS**

The U. S. Civil Service Commission announces that applications are desired for persons trained for positions paying from \$4,980 to \$12,770 a year.

Applicants may offer experience in several different fields, one of which is for a technologist with knowledge of prosthetic devices or medical supplies and equipment.

The positions are located in various Federal agencies in Washington, D. C., and throughout the United States. Positions in overseas areas may also be filled.

Persons appointed to these positions will perform or direct the performance of responsible professional work of an applied scientific or technological nature. To qualify, applicants must have had appropriate experience in one or more of the following specialized fields: Adhesives, bituminous products, ceramics, drugs and chemicals, food preparation equipment and food logistics, glass, leather, *medical supplies and equipment and prosthetic devices*, military apparel and equipage, paints and other protective coatings, paper and pulp, petroleum fuels and lubricants, photographic processes and supplies, solid fuels, textiles and textile fibers, aviation survival equipment, industrial radiography, packaging and preservation, photographic equipment, rubber and plastics.

Applications for these positions will be accepted until further notice and must be filed with the U. S. Civil Service Commission, Washington 25, D. C.

Further information and application forms may be obtained from many post offices throughout the country or from the Commission's Washington office.

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# ADVANCED ADAPTATION OF QUADRILATERAL SOCKET

#### By J. W. LYONS, M.D. and J. L. SCHILLINGER, P & O

During the past year, excellent results have been achieved with 20 carefully selected cases using the illustrated apparatus — an adaptation of the quadrilateral socket in severe lower extremity involvement with flail legs, and also where gluteals and abdominals are involved. Eighteen of these cases were polio victims and two were spinal bifidas.

"Wearer reaction" has been gratifying since each of the cases previously found other types of appliances unsatisfactory. Cases where there was marked waddling and unsteady gait have benefited immeasurably. Wearers report that they do not fatigue so quickly as formerly. They are not bothered by chafing and they welcome the elimination of knee cap pads and pelvic bands. They have found that this appliance is much more sanitary than the types they discarded.

The ages of the patients range from 9 to 40 years of age. A typical case was that of a 35-year-old polio victim with flail right leg who is required to stand for long hours since he is employed as an X-ray technician. His gait was poor. He leaned to the left with each step he took in order to swing his right leg forward. Equipped with the illustrated quadrilateral socket, he has much better control of the flail right leg and doesn't have to lean to the left at an extreme degree. He reports that the socket is fitted more comfortably than his previous braces. Observation of these twenty cases suggests that anyone requiring ischial seats or rings will do much better with the quadrilateral socket.

The illustrated appliances were used in our initial cases. Since these pictures were taken, the new modified Silesian bandage—described on Page 74 of the 1957 issue of *Artificial Limbs* — has been a very helpful addition in some cases.

Careful fitting of the illustrated belt has aided pick-up of appliance; it holds it more securely when the wearer is sitting and corrects rotational problems. While the fitting procedure and fabrication are relatively simple, we believe a Prosthetist and Orthotist team is the ultimate approach to its success.

Measurements for a quadrilateral socket are taken and also tracing such as is used for a long double upright. The socket and the double upright are roughed out and the patient is called in for a fitting and walking test. The socket is fitted first, being cut carefully to allow the foot to slide through the opening freely, stressing medial rather than lateral pressure at the lowest point of the socket just above the knee.

The double upright is then aligned to the socket—patient in a sitting position — and attached temporarily with wooden screws. The patient stands and pelvic level is checked. The Silesian bandage is applied and walking and sitting phases are again checked. Now the appliance is ready for finishing. Two tapped metal adjustment straps are recessed in lateral and medial sides of the socket. The socket is finished with plastic or rawhide covering.

J. W. Lyons, M.D., FACS Diplomate, American Board Orthopedic Surgeons. J. L. Schillinger, P & O, The J. L. Schillinger Company, Marquette, Michigan.

ORTHOPEDIC & PROSTHETIC APPLIANCE JOURNAL

Extreme care must be exercised in locating anatomical and mechanical knee centers and alignment of socket. The rough fitting of the appliance without installing the knee disc may cause alignment trouble when attempting to add the disc to a finished appliance. In the bifida cases, with the usual swelling, it is wise to hinge the anterior side of the socket, enabling easier insertion and withdrawal of the limb.

Gait training is advocated as the wearers are taught to overcome many undesirable habits acquired with appliances which allowed them to plunge forward and down into ischial ring or cuff. During the first few days, the wearer may complain of back strain inasmuch as he is now walking without the pelvic tilt. In two or three cases, it was necessary to level pelvis with two-or three-length adjustments at spaced intervals. Each lengthening in these cases brought about an improved gait.



An 11-year-old post-polio case who previously wore pelvic band and hip joint.

#### **REVIEWS**----

#### FRACTURES AND OTHER INJURIES

By the members of the Fracture Clinic of the Massachusetts General Hospital and of the faculty of the Harvard Medical School. Edited by Edwin F. Cave, M.D. Published by The Year Book Publishers, Inc., Chicago, Illinois, 1958. 863 pages, \$28.00. Twenty-eight dollars is a lot of money for a book, but then this is a lot of book! Its 863 pages and numerous illustrations, some in color, reflect credit on the authors and on the publishers. The orthotist will be especially interested in the chapters on the healing of fractures, and on fractures of the forearm, the knee joint and the femoral shaft.

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tures. Permits free ant. flexion of the lumbar spine but prevents extension and lateral flexions."

#### Measurements:

- 1. Chest (about 4" below nipple line)
- 2. Waist (at navel line)
- 3. Pelvic (1/2 distance between greater trochanter and crest of ilium)
- 4. Seventh cervical spinous process to the prominence of Coccyx.

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## MAINTENANCE AND CARE OF THE PROSTHESIS

#### Compiled by Charles A. Hennessy, C.O. & P.

Prosthetics Education, University of California, Los Angeles

- I. The Socket
  - A. Cleaning the Socket
    - 1. Wash daily with mild soap and water. Rinse thoroughly with a cloth wet in warm water. Dry thoroughly and allow to air overnight.
    - 2. At night remove the valve and allow air to circulate freely within the socket. Do not drape clothing over the socket.
  - B. Care of the Finish
    - 1. When the protective coating on the socket wears off, the wood will absorb moisture. This should not be allowed to happen.
    - 2. Notify the prosthetist if the finish within the socket becomes rough or dark areas appear in the wood.
  - C. Maintenance and Use of the Valve
    - 1. If powder is used for applying the prosthesis, do not allow it to accumulate in the valve. All foreign material such as powder, lint, dust, etc. can be removed with a small soft brush. Be sure to take special care of the valve threading in the socket.
    - 2. Keep the spring in the valve tight by screwing it down.
    - 3. Replace the rubber gasket frequently.
    - 4. If the valve continues to leak or will not seat properly in spite of proper care and cleaning, it is probably defective. The prosthetist should be notified.
    - 5. Never use tools to tighten or loosen the valve.
    - 6. The valve is tightened by turning it clockwise with the fingers and it is loosened by turning counter-clockwise.
- II. The Knee Friction Mechanism
  - A. Adjustment of the friction mechanism is needed when the shin swings through too rapidly or too slowly.
  - B. Adjustment of friction in the conventional knee can be done by inserting an Allen wrench or a screw driver into each screw hole in the front of the knee. A quarter turn clockwise will increase the friction.
  - C. The amount of friction can be noted by grasping the leg in both hands and holding it suspended by the socket. Allow the foot to drop down toward the floor. Swing the shin back and forth. The amount of friction in the knee joint will determine how freely the shin will swing. Each amputee will determine with his prosthetist how much friction in the knee joint is adequate for his needs.
  - D. If the knee begins to extend backwards (hyperextended) and noise comes from the knee joint, the extension stop probably needs replacement. To inspect the extension stop for wear, bend the prosthetic knee and observe the bumper material at the top of the cut-out. The extension stop bumper will need to be replaced at frequent intervals.

III. The Shin

- A. If a cosmetic shin covering is used, guard against contact with sharp objects. If it is damaged, have it repaired immediately.
- B. If leg make-up is used on the covering, remove the make-up weekly with mild soap and water. Allow the shin to dry overnight before applying new make-up and recovering with a stocking.
- IV. Care of the Ankle and Foot
  - A. Inspect the covering of the foot frequently by removing the shoe. If the covering is torn, have it repaired immediately.
  - B. If the foot gets wet at any time, remove the shoe and dry the foot as soon as possible. Always dry any other parts of the leg that become wet.
  - C. If sand and dirt accumulate in the shoe, remove it and clean the foot. If dirt and sand get into the ankle joint, take the limb to the prosthetist.
  - D. If the flexibility or resiliency of the rubber bumpers in the ankle and foot decreases, have them replaced. It is very important to have this done at regular intervals.
  - E. Shoes should be kept in good repair, particularly the heels. If soles and heels become badly worn and uneven, it will cause uncomfortable change in gait and excessive energy consumption.
  - F. The amputee should be sure that all of his shoes have heels that are of the same height in order to maintain the proper alignment of the prosthesis.
  - G. Shoes are most easily changed when not wearing the leg. To remove the shoe, grasp it at the back and push the heel off the foot. Then shift the hand to the toe and pull the shoe upward and off the foot.
  - H. Replacement of the shoe is done by completely loosening all lacing. Place the shoe over the toe of the prosthetic foot and push it down. When the foot is pushed down as far as possible, grasp the shoe at the heel and, with a shoe horn, work the shoe on the foot.
- V. Care of the Leather
  - A. Keep all leather parts clean and dry. Use saddle soap for cleansing.
  - B. If leather becomes stained and smelly, return limb to the prosthetist for replacement of the leather.
- VI. Caution
  - A. Return the limb to the prosthetist at regular intervals to check on wear and breakdown of parts. In this way costly repairs or adjustments can usually be avoided.
  - B. Do not use sandpaper, files, knives, rasps, saws or make any repairs on the prosthesis. Correction of your adjustments or alterations may result in costly repairs and/or replacement of components.

Reprints of this article may be obtained from The Orthopedic Appliance and Limb Mfrs. Association, 411 Associations Bldg., Wash. 6, D. C.



Shown above is a typical interview, which is one of the requirements leading to Certification of qualified individuals. Left to right: the examiners, Orthotist Erich Hanicke, Dr. A. W. Spittler and Orthotist Frank Harmon are interviewing a candidate who holds in his hand the brace which he has submitted as a part of his testing. The article below describes the written test.

# "WHAT KIND OF EXAMINATION IS GIVEN TO APPLICANTS FOR CERTIFICATION?"

The American Board for Certification has approved the following statement for the information of persons who are applying for Certification and who want to know about the written examinations.

Following is a general description of the nature and contents of the written examination given to applicants for Certification.

To become Certified the candidate prosthetist or orthotist must secure a passing grade in a series of written achievement examinations. These examinations are designed to evaluate proficiency in the basic areas of prosthetics and orthotics that have been studied and practiced by the candidate. In addition, the candidate will be evaluated through the use of several standardized instruments to obtain information about intelligence, personality and mechanical aptitude.

The Certification Examinations are prepared by a consulting psychologist of the University of California, Los Angeles, in cooperation with the Committee on Examinations of the American Board for Certification of the Prosthetic and Orthopedic Appliance Industry, Inc.

The achievement examination for prosthetists will generally evaluate the candidate's knowledge of:

- I. Anatomy and kinesiology of the upper and lower extremities as related to prosthesis fit and use.
- II. Principles and practices of upper extremity prosthetics.
- III. Principles and practices of lower extremity prosthetics.

The achievement examination for orthotists will generally evaluate the candidate's knowledge of:

- I. Anatomy and kinesiology of the human body as related to the application of orthotic appliances.
- II. Principles and practices of bracing the lower extremities.
- III. Principles and practices of body bracing.

The following sources are recommended as references for the Certification Examination to be given in 1958:

- a. The Orthopaedic Appliance Atlas. Ann Arbor, Michigan: J. W. Edwards, 1952.
- b. The Proceedings of the First Annual Symposium on Orthopedic Appliances. Washington, D. C.: Orthopedic Appliance and Limb Manufacturers Association, 1950.
- c. Bowen, W. and Stone, H. Applied Anatomy and Kinesiology. Philadelphia: Lea and Febiger, 1953.
- d. Wells, Katherine F. Kinesiology. Philadelphia: W. B. Saunders, 1950.
- e. Grant, J. C. An Atlas of Anatomy. Baltimore: Williams and Wilkins, 1956.
- f. Klöpsteg, P. E., Wilson, P. D., et al. Human Limbs and Their Substitutes. New York: McGraw-Hill, 1954.
- g. Manual of Upper Extremity Prosthetics. Los Angeles: U.C.L.A., Department of Engineering, 1952.
- h. Anderson, M. H. and Sollars, R. E. Manual of Above-Knee Prosthetics. Los Angeles: U.C.L.A. School of Medicine, 1957.
- i. Artificial Limbs. Washington, D. C.: Prosthetics Research Board, National Academy of Sciences-National Research Council (Periodical).
- j. Orthopedic and Prosthetic Appliance Journal. Washington, D. C.: Orthopedic Appliance and Limb Manufacturers Association. (Selected Articles.)

### NATIONAL ADVISORY COUNCIL

The 1,100 Certified Orthotists and Prosthetists of America and Canada have chosen 70 of their number as a National Advisory Council to the Certification Board. These 70 persons, who will serve a term of three years, will have a number of important functions, including the nomination of one of the seven-man Certification Board.

A session of the newly elected Council is on the program for the National Assembly at Miami Beach this coming October.

Several members of the Council have held national office in OALMA and the Certification Movement. Their number includes Paul Leimkuehler, currently Second Vice President of OALMA, who represents the Seventeenth District; Herbert J. Hart, OALMA Regional Director for Northern California; and J. D. Snell of Shreveport, former Vice President of OALMA.

The Official Roster of the Advisory Council and the districts they represent are:

- 1. Maine, Massachusetts, New Hampshire and Vermont: Joseph Martino, Boston, Mass.; Joseph Aveni, Melrose, Mass.
- 2. Connecticut and Rhode Island: Joseph Rosenberger, Hartford, Conn.; Oke Lundin, Providence, R. I.
- 3. New York City Metropolitan Area and Long Island: Henry Gardner and Fred J. Eschen.

### ADVISORY COUNCIL ROSTER (Continued)

- 4. New York State (excluding Metropolitan New York and Long Island) : Eric Balke, Buffalo, N. Y.; Benedict Pecorella, Buffalo, N. Y.
- 5. New Jersey: Cosmo L. Invidiato, Paterson, N. J.; Arthur Beitman, Newark, N. J.
- 6. Pennsylvania East of 79° Longitude but excluding Philadelphia: A. R. Glaubitz, Elizabethtown, Pa.; Gerard R. Zielke, Florin, Pa.
- 7. Philadelphia Metropolitan Area: George S. Anderssen, Claymont, Del.; Frank Malone, Philadelphia, Pa.
- 8. Pennsylvania West of 79° Longitude: Kurt B. Nelson, Pittsburgh, Pa.; Karl Barghausen, Pittsburgh, Pa.
- 9. Delaware, Maryland and District of Columbia: Charles Dankmeyer and Martin Massey, Baltimore, Md.
- 10. Virginia and West Virginia: John G. Cranford, Richmond, Va.; Richard W. Rosenberger, Charlottesville, Va.
- 11. North and South Carolina, Georgia: Bert R. Titus, Durham, N. C.; Wilbur L. Floyd, Charleston, S. C.
- Florida North of 27° Latitude: D. Wilmore Bremer, Jacksonville, Fla.; William L. Wright, Jr., St. Petersburg, Fla.
- 13. Florida South of 27° Latitude: Asa L. Godbey and Alvin D. Laubender, Miami, Fla.
- 14. Mississippi, Alabama and Louisiana lying east of Mississippi River (includes Baton Rouge): George H. Lambert, Baton Rouge, La.; Lloyd C. Jones, Baton Rouge, La.
- 15. Tennessee and Kentucky: Carlton Fillauer, Chattanooga, Tenn.; Donald O. Lee, Memphis, Tenn.
- Ohio South of 41° Latitude (includes Cincinnati, Columbus, Dayton and Zanesville): Vernon Murka, Dayton, Ohio; L. B. Barghausen, Gahanna, Ohio
- 17. Ohio North of 41° Latitude (includes Akron, Cleveland, Toledo and Youngstown): Paul Leimkuehler, Fairview Park, Ohio; Arthur Guilford, Sr., Cleveland, Ohio
- 18. Indiana: Stanley Hedges and Theron M. Davidson, Indianapolis, Ind.
- 19. Michigan: D. R. Coon, Detroit, Mich.; Otto Becker, Birmingham, Mich.
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- 26. Iowa and Nebraska: Don Sullivan, Iowa City, Iowa; Everett F. Haines, Des Moines, Iowa
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# OALMA TO HAVE AN IMPORTANT ROLE IN PROSTHETICS RESEARCH

The orthopedic appliance and limb profession through OALMA, its professional organization, will henceforth take over an important role in the research program on prosthetics.

President John A. McCann with the approval of the Executive Committee, has established a new *Committee on Advances in Prosthetics*. It will coordinate activities of the Association having to do with the Research Program in Artificial Limbs.

As the Journal goes to press, arrangements are being made for the Committee to meet with the Washington Staff for the Orthopedic Appliance and Limb Manufacturers Association on September 24 and 25.

The OALMA Almanac for August 1958, announces the formation of the Committee to members of OALMA.

The new Committee has as its general purpose the advancement of all approved developments, devices and techniques related to prosthetics services to amputees.

To carry out this aim, the Committee will engage in such specific activities as:

(1) It will receive information about the products of research conducted by the Prosthetics Research Board, and try to devise ways and means for the use of these devices, so that amputees will benefit to the greatest extent.

(2) The Committee will conduct surveys and studies in order to get information to the Prosthetics Research Board which would assist it in its program.

President McCann emphasized that in naming the new Committee he had endeavored to provide a group which would be well rounded in experience and activities. *Carlton Fillauer* of Chattanooga, Tennessee was picked to be Chairman of the Committee on Advances in Prosthetics. He has been a member and Past President of the American Board for Certification, and was Program Chairman of the 1954 National Assembly in Atlantic City. He has taught at New York University and has a broad experience both in prosthetics and orthotics.

Howard Thranhardt of Atlanta, Georgia, is another member from the South. For several years he has been a member of Subcommittee II, of the Committee on Prosthetics Research and Development, PRB, and is the former Chairman of this group. (This Phase II Subcommittee advises on the making of experimental models or "prototypes" for trial purposes).

Fred Eschen, Certified Prosthetist in New York City, is a Past President of the Metropolitan Orthopedic Appliance and Limb Manufacturers Association.

Charles Hennessy of Los Angeles is a Past President of OALMA and is currently a member of the American Board for Certification. He has long been active in the educational program, and is a member of the faculty of the University of California, Los Angeles.

M. P. Cestaro, Treasurer of OALMA, is President of the J. E. Hanger Co. He has had unusual experience in the business aspects of prosthetic service.

No committee can function very effectively for long without a staff, and for this the Committee has been fortunate in securing temporarily on a two day a week basis the services of A. Bennett Wilson, Jr. Mr. Wilson recently resigned his position as Staff Engineer of the Prosthetics Research Board, in order to assist in the preparation of Volume II of the "Orthopaedic Appliances Atlas, which will require his services the other three days of the week.

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## REPORT ON N.Y.U.-OALMA ORTHOTIC SEMINAR

#### By NORMAN BERGER\* and CHARLES FRYER\*\*

In recent years, many orthotists have begun to ask questions about the possibility of research programs and University courses in the field of orthotics comparable to those which exist in prosthetics. In an attempt to meet these needs and establish a sound orthotic research and education program, New York University, which has been active for many years in prosthetics research and education, and OALMA, which has been a leader in the growing tendency for trade organizations to promote educational efforts, jointly decided to sponsor a Seminar on Lower Extremity Orthotics. The purposes of this seminar were (a) the definition of an agreed-upon body of knowledge incorporating the thinking and practices of leading orthotists, and (b) the formulation of problems in orthotics which might be amenable to research.

In preparation for this seminar, which was held at the New York University-Bellevue Medical Center during the week of August 11th, each member of OALMA was asked to nominate one or more persons who would, by virtue of experience and standing in the field, be best able to contribute to the deliberations. By these means, orthotists from all sections of the country were nominated and attended the meeting. The group which is shown around the conference table in the accompanying photograph consisted of:

Mr. Milburn J. Benjamin, M. J. Benjamin Company, Los Angeles, Calif. Mr. John F. Buckley, Orthopedic Services of Rhode Island, Providence, R. I.

Mr. Karl W. Buschenfeldt, Buschenfeldt Orthopedic Appliances, Stoughton, Mass.

Mr. Carlton E. Fillauer, Fillauer Surgical Supplies, Chattanooga, Tenn.

Mr. Alfons R. Glaubitz, State Hospital for Crippled Children, Elizabethtown, Pa.

Mr. Charles Goldstine, Institute for the Crippled and Disabled, New York City

Mr. Erich Hanicke, P. W. Hanicke Manufacturing Company, Inc., Kansas City, Mo.

Mr. W. F. Harmon, Atlanta Brace Shop, Atlanta, Ga.

Mr. William J. McIllmurray, Veterans Administration Prosthetics Center, New York City

Mr. Clyde E. Peach, Pope Brace Division, Kankakee, Ill.

Mr. Basil Peters, B. Peters Company, Philadelphia, Pa.

In addition to the above participants, it was felt advisable to have certain resource people in attendance, who might contribute valuable information from their fields of specialization. Included among the resource people were Dr. Eugene Murphy and Mr. Anthony Staros of the Veterans Administration; Dr. R. T. Bunshah and Mr. Joseph Winter, Metallurgy specialists from the College of Engineering, New York University; Dr. Rudolph Drillis and Messrs. Robert Burtch, Edward Ford, Hector Kay and Gerald Stone of the Prosthetic Devices Studies staff; and Messrs. Norman Berger, Charles Fryer and Warren Springer of the Prosthetics Education staff. Finally, the Chairman of the meeting was Dr. Sidney Fishman, Director, Prosthetics Education Program.

<sup>\*</sup> Associate Director, Prosthetics Education, New York University. \*\* Instructor, Prosthetics Education, New York University.

This group of people, representing the leading orthotists in the entire country, as well as a number of experienced specialists in the fields of engineering, materials, biomechanics, research and education, met on Monday morning, August 11th, and were welcomed by such outstanding men as Drs. Howard Rusk and Donald Covalt, Director and Associate Director, respectively, of the Institute of Physical Medicine and Rehabilitation; Mr. John McCann, President of OALMA, and Mr. Glenn Jackson, Executive Director of OALMA. The group then turned to consideration of an agenda, which was quickly agreed to as follows:

#### AGENDA

LOWER EXTREMITY ORTHOTIC SEMINAR August 11 - 16, 1958

Date Monday AM August 11 Subject Greetings and Introductions Purpose of Seminar and Plan of Approach

Monday PM Tuesday AM and PM August 12 Lower Extremity Orthotic Components and Materials

#### I. Bands

- a. Types
  - 1. Calf, mid-thigh, upper thigh, pelvic bands
- b. Dimensional Characteristics
- c. Materials
- II. Uprights
  - a. Design Characteristics 1. Solid, tubular
  - b. Materials
- **III.** Shoe Attachments
  - a. Types
    - 1. Stirrup, caliper, foot plate
  - b. Characteristics of Each Design
  - c. Materials
- IV. Ankle Joints
  - a. Basic Designs
  - b. Functional Characteristics
  - c. Stops
  - d. Materials
- V. Knee Joints
  - a. Basic Designs
  - b. Functional Characteristics
  - 1. Lock types
  - c. Stops
  - d. Materials
- VI. Hip Joints
  - a. Basic Designs
  - b. Functional Characteristics
    - 1. Lock types
  - c. Stops
  - d. Materials

Wednesday AM and PM Alignment and Fitting Considerations

August 13 Thursday AM August 14

Thursday PM August 14 Friday AM August 15

- I. Criteria and Methods of Determining Joint Placement
  - a. Anatomical axes of ankle, knee and hip
  - b. Effects of varying joint location
- II. Placement and Alignment of Upright Bars a. Anatomical landmarks
  - b. Length and contour
- III. Positioning of Shoe Attachments a. Effect of variation
- VI. Shaping and Positioning Bands, Cuffs and Lacers

# Bracing As Applied to Various Lower Extremity Disabilities

- I. Disorders Affecting Muscles
  - a. Materials, components, alignment and fitting of devices for other unilateral and bilateral spastic and flaccid conditions with and without contractures and other complications.
- II. Disorders Affecting Bones and Joints
  - a. Materials, components, alignment and fitting of devices for various deformities, fractures, dislocations and other skeletal conditions.

Friday PM August 15

Saturday AM August 16 Fabrication Techniques

Summary and Conclusion

So as to clarify matters as much as possible, the deliberations of the first three days of the conference were based on the assumption that the physical disabilities to be considered were such as to cause a loss of motor power without accompanying contractures or deformities that might influence the skeletal alignment of the affected limb. This limitation on the discussion made it possible to explore the practices in lower extremity orthotics that might be considered "standard," or "average," without going into the myriad possible variations that a particular situation might require. The succeeding two days, however, were devoted to some of these variations. In this section of the conference, discussion revolved around bracing practice for various patterns of paralysis with accompanying spasticity, contractures and malalignment. The plan, therefore, envisioned the establishment of a foundation of standard practice which could then be modified to meet the needs of particular bracing conditions. Finally, the last half day of the conference was reserved for a more or less philosophical discussion of the need for orthotic courses, the type of curriculum that might be offered, and the requirements of students with varying levels of experience.

It would be futile to attempt to present in any detail the discussions and conclusions of the conference. It will perhaps be of interest, however, to choose a single topic as a sample of the kind of thinking that went into this entire Seminar. For this purpose, we have selected the subject of the place-

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"SHIRTSLEEVES" SESSION AT NEW YORK UNIVERSITY—These are the OALMA members and the educators who made up the Orthotic Seminar held at New York University under the sponsorship of the University and the Orthopedic Appliance and Limb Manufacturers Assn., the week of August 11.

Left to right, around the table clockwise: Dr. Sidney Fishman, W. Frank Harmon, Karl Buschenfeldt, M. J. Benjamin, William J. McIllmurray, Basil Peters, Carlton Fillauer, Alfons Glaubitz, Clyde Peach, Erich Hanicke, Warren Springer and Charles Fryer. In the rear of the room seated are Hecter Kay, Gerald Stone and Norman Berger of New York University. At the time the picture was taken Charles Goldstine and John Buckley were absent from the seminar session.

ment and alignment of mechanical ankle joints, which has been the center of considerable interest in the past ten years. Where is the anatomical axis of the ankle joint located? What is its position in relation to the line of progression? Is it important that the mechanical and anatomical axes fall in the same plane? What is the significance of "toe out" in orthotics? These are just a few of the issues related to the subject of ankle joint placement and alignment that were discussed by the group.

The participants indicated that the height of the mechanical ankle joint is an important consideration only in those situations where the device allows freedom of dorsiflexion and/or plantar flexion. With limited motion stops or appliances which completely restrict ankle motion, it makes little difference how high or low the mechanical joint is placed. However, in free-motion joints and those equipped with either a posterior or anterior stop, there are some definite mechanical advantages to be gained from accurate vertical positioning of the mechanical joint.

The caliper type shoe attachment permits rotation to occur at the heel of the shoe, considerably below the anatomical ankle axis. This creates some mechanical problems that are not common to those attachments which provide for closer approximation of the mechanical and anatomical axes. First, since the axes do not lie in the same plane, it is clear that the arcs described around these pivots will not be similar but will tend to be divergent. Since the shoe is rotating around the lower axis, and the foot around the higher pivot (and, if we assume that the calf band and cuff are not allowed to move in any direction), dorsiflexion will cause the calcaneus to be forced backward toward

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the heel, and plantar flexion will see the toes being cramped in the forward part of the shoe. Fortunately, however, the calf band and cuff are not so intimately fitted as to prevent slight motion, thereby allowing the incongruity of the axes to result in slight vertical displacement of the calf band and cuff during the various phases of gait, with relatively little motion occurring between the shoe and the foot.

Another apparent disadvantage of not having coincidental axes of mechanical and anatomical motion at the ankle pertains to the transmission of the forces which act on the device utilized as a "stop." These forces are transmitted to the caliper plate, upright bars, and ultimately to the calf band. At the point of "heel strike," a posterior 90 degree stop is called upon to resist a torque force of approximately 300 pound-inches—assuming the wearer to weigh about 150 pounds—regardless of the vertical position of the mechanical pivot. However, the greater the distance of the stop from the pivot, the more advantageous its position to resist the forces acting upon it. Consequently, all other things being equal, the devices which allow the stop to be located as far from the center of rotation as possible are less apt to require frequent readjustment of the stops to maintain the desired degree of dorsiflexion and/or plantar flexion.

Still another, and even more obvious factor for consideration in the controversy of where mechanical joint motion should occur, lies in the fact that, to date, the only type of joint design that has been utilized for the caliper attachment is the overlapping variety. The participants were in almost unanimous agreement that the clevis or box type of construction was mechanically superior.

The participants, then, were generally agreed that the underlying principle which dictates the vertical placement of the mechanical joint reflects an attempt to approximate as closely as possible the anatomical axis of the ankle joint. Since the anatomical axis is felt to lie at the apex of the fibular malleolus, and since the tibia does not extend as far distally as does the fibula, the medial location of the mechanical joint should be about  $\frac{1}{2}$ " to  $\frac{5}{8}$ " below the tip of the tibial malleolus. The vertical position of the mechanical joint, therefore, appears to be rather clear-cut and defined. Unfortunately, the same cannot be said for the antero-posterior placement of the mechanical joints.

Recognizing that the anatomical axis of the ankle is parallel to the ground but not perpendicular to the line of progression, the conferees spent time discussing the significance of this fact and what influence, if any, it should have on deciding the optimal antero-posterior positioning of the medial and lateral mechanical joints.

It was agreed that the average normal external rotation of the shaft of the tibia is about 20 degrees (external tibial torsion) but that the measurable "toe out" during gait is less than 10 degrees. In accounting for this, it was felt that the internal rotation of the entire extremity that occurs from the point of toe off until the time when mid stance phase is reached, repositions the foot and leg so that the line of progression and the horizontal axis of the ankle are much more nearly perpendicular.

Pursuing the subject in greater detail, a number of the participants had noticed that long leg brace wearers frequently tended to go into various degrees of ankle varus when they were in the neutral standing position. After some very stimulating discussion, it was postulated that perhaps one of the causative agents was the restraint of the motion that normally occurs in the sub-talar joint by malpositioning of the mechanical ankle joints. Several of the members of the group stated quite positively that placing the medial

mechanical joint anterior to the lateral mechanical joint and thereby accommodating the obliquity of the ankle axis resulted in the foot assuming a more comfortable and functional attitude. Whatever the reasons for the improvement, there remained the distinct impression that further study and investigation are required to clarify the antero-posterior placement of ankle joints in orthotics.

The above discussion, limited to the single topic of the ankle joint, is only one of many similar debates and analyses that took place during the week-long meeting. To get a true impression of the entire seminar, the reader must visualize literally dozens of topics being subjected to the same kind of treatment with points of view being stated, disagreed with, modified, thrashed through and, in most cases, eventual agreement being reached. The conference thus amounted to a statement of bracing practice from the leading orthotists in the United States. As such, we can confidently expect the results to provide a foundation for the future establishment of both education and research programs in orthotics. All concerned in this venture can share a feeling of pride in the knowledge that their work will assuredly shape the future of orthotics.

# N. Y. U. COURSES FOR PROSTHETISTS AND ORTHOTISTS, 1958-1959

New York University is again this year offering a series of courses in Prosthetics. These are being given by the Post-Graduate Medical School with the cooperation of the College of Engineering and are intended for prosthetists, therapists, physicians and rehabilitation counselors.

Oct. 6-10. 741A. Above-Knee Prosthetics. For physicians and surgeons.

Oct. 27-Nov. 7. 745A. Upper-Extremity Prosthetics. For therapists.

Nov. 3-7. 744A. Upper-Extremity Prosthetics. For physicians and surgeons.

Nov. 10-21. 7410A. Prosthetics and Orthetics. For rehabilitation counselors.

Dec. 8-19. 7410B. Prosthetics and Orthetics. For rehabilitation counselors.

#### 1959

Jan. 5-23. 743B. Above-Knee Prosthetics. For prosthetists.

Jan. 12-23. 742B. Above-Knee Prosthetics. For therapists.

Jan. 19-23. 741B. Above-Knee Prosthetics. For physicians and surgeons. Spring Semester 1959

Feb. 2-13. 7410C. Prosthetics and Orthetics. For rehabilitation counselors.

Feb. 23—Mar. 13. 743C. Above-Knee Prosthetics. For prosthetists.

Mar. 2-13. 742C. Above-Knee Prosthetics. For therapists.

Mar. 9-13. 741C. Above-Knee Prosthetics. For physicians and surgeons.

Mar. 30—April 3. 7412A. Syme's Prosthesis. For prosthetists.

April 6-10. 7412B. Syme's Prosthesis. For prosthetists.

April 13-24. 7410D. Prosthetics and Orthetics. For rehabilitation counselors.

April 27—May 29. 746B. Upper-Extremity Prosthetics. For prosthetists.

May 18-29. 745B. Upper-Extremity Prosthetics. For therapists.

May 25-29. 744B. Upper-Extremity Prosthetics. For physicians and surgeons.

Further Information

Requests for further information should be addressed to Prosthetics Education, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, N. Y.

SEPTEMBER, 1958

### AN IMPROVED PROSTHESIS FOR HEMIPELVECTOMY

#### By SHYH-JONG YUE, M.D. and CHARLES R. GOLDSTINE, C.O. & P.\*

*Editor's Note:* This article is reprinted by permission from the December 1957 issue of the "Archives of Physical Medicine and Rehabilitation." This is the official publication of the American Congress of Physical Medicine and Rehabilitation. The article was read at the Thirty-fifth Annual Session of the Congress in Los Angeles, September 12, 1957.

Hemipelvectomy, or interinnomino-abdominal amputation, is an extensive surgical operation, usually for malignancy involving the upper femur, hip joint, pelvis, and the surrounding soft tissue. This operation was first performed by Billroth in 1891;<sup>1</sup> the patient survived only a few hours. Gordon-Taylor,<sup>2</sup> in a review of 50 cases of hemipelvectomy performed at the Middlesex Hospital in England between the years 1922 and 1950, found the operative mortality before 1940 was 36 per cent and after 1940 was 18 per cent. Pack<sup>3</sup> reported 8 cases of hemipelvectomy in 1947; there was no immediate operative mortality. King and Steelquist<sup>4</sup> reported 6 cases in 1943;



Fig. 1—Hemipelvectomy prosthesis with large leather bucket and abdominal belt front and back view.

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<sup>\*</sup>Instructor, Department of Physical Medicine and Rehabilitation, College of Physicians and Surgeons, Columbia University; Visiting Fellow, Presbyterian Hospital; Training Fellow, Institute for the Crippled and Disabled. Director, Prosthetic and Orthopedic Appliance Laboratories, Institute for the Crippled and Disabled.

there was one operative death. Thus the high operative mortality has been markedly reduced and the operation is being performed more frequently, with the result that the problem today is one of rehabilitation, particularly the development of a suitable, comfortable and functional prosthesis. Morton<sup>5</sup> in 1942 wrote: "No prosthesis can be fitted early in this stump. The patients quickly learn to use crutches, and get around well by this means. They learn to adapt themselves to sitting on the involved side. The younger patients, according to reports, adjust themselves more quickly and successfully." Even as recently as 1947, reports in the literature complain of the lack of a good prosthesis.

The early prosthesis consisted of a large leather bucket to support the lower abdominal tissue.<sup>6</sup> Figure 1 shows this type of prosthesis. A wide abdominal belt was used to fasten the bucket, and a shoulder strap was installed in some for additional support. The difficulty with this prosthesis was excessive telescoping of the soft tissue into the bucket, in some cases, allowing an excursion of four inches or more. Due to lack of support, excessive pressure was exerted in the groin and perineum.



Fig. 2—Hemipelvectomy prosthesis with molded plastic bucket and bridge extending to the other side.

Our experience in the use of molded plastic in prosthetic devices led to the exploration of the use of this material in a hemipelvectomy prosthesis. Attempts were made to combat the disadvantages of the early leather prostheses. Plastic molded buckets were made to fit the stump, which consists essentially of soft tissue. In addition, a bridge extending from the lower part of the bucket across the midline to engage the remaining ischial tuberosity, or heavy muscle groups, took over a portion of the weight bearing. The bucket extended above the costal margin, and a wide pelvic belt was well fitted over the crest of the remaining ilium. Repeated adjustment was often necessary to relieve pressure of the bucket upon the ribs and the remaining sacrum. A regular prosthesis was attached to the bucket by a regular hip joint: roller castings were added to the upper portion of the thigh piece to give additional stability to hip attachment. Patients wearing this type of prosthesis felt considerable increase in their sense of balance, thus improving gait pattern. The telescopic movements were largely eliminated. Figures 2 and 3 show this type of prosthesis.

When the prosthesis was completed, the patient was given a course in gait training. During the first week, the patient was instructed in putting on and removing the prosthesis, in standing-balancing exercises, gait training with parallel bars, crutch walking, and in walking with a cane. In the second week, the patient was allowed to take the prosthesis home and continue to practice at home, but still came in regularly for training. An average patient required approximately two to three weeks to complete the training.



Fig. 3—Internal lateral view of the molded plastic bucket showing the bridge extending across the midline to the other side.

Ten patients with hemipelvectomy were fitted with this type of prosthesis. Nine patients had been operated upon for malignancies and one patient had a congenital hemipelvectomy. Five patients were male; five were female. The longest followup has been two and one-half years. Among these ten patients, three learned, and continue to use the prosthesis all day. They found the plastic bucket was comfortable and they were able to carry on their daily activities. Two patients, both young adult males, were able to use the prosthesis all day, but they had to discontinue because of recurrence of the disease. One patient, a woman of 24, was able to use the prosthesis for 10 hours each day, but she complained of discomfort from the plastic bucket, especially when she was sitting down. One patient, a man of 48, was given a plastic bucket without the additional ischial rest; he complained of insecurity because, when he was standing or walking, the prosthesis had a tendency to give way laterally in spite of a strong abdominal belt and shoulder strap. He was able to use the prosthesis only a few hours each day, and crutches were used for additional support. Three female patients were unable to use the prosthesis at all. Among these three patients, the first, a woman of 68, complained of constant pain in the scar while she was wearing the prosthesis. A neuroma was removed later, but the patient retained her wheelchair existence, mainly because of her age. The second patient, a woman of 53, had trouble with control of her bladder. Each time she wore the prosthesis, she developed some urinary incontinence; she also found the plastic bucket uncomfortable, especially when she was sitting in a low chair or in a car. Therefore, she chose not to use the prosthesis. The third patient, a woman of 42 who had had rather extensive pelvic surgery, found the prosthesis to be uncomfortable and refused to use it. All three patients were inactive and leading sedentary lives.

#### **Summary and Conclusions**

Hemipelvectomy prostheses with plastic molded buckets were made for ten patients. Five patients were able to use the prosthesis fully. Two patients were able to use the prosthesis for a few hours each day; one complained of discomfort, and the other of insecurity. Three patients were unable to use the prosthesis because of discomfort and other complications, such as neuroma and urinary incontinence.

The advantage of this improved prosthesis was the elimination of the telescopic movements, more adequate support, relief of pressure in the groin and the perineum, and an additional sense of security. Some problems of comfort and utility still remain unsolved; for example: in toilet activities, the prosthesis has to be removed. Young and active male patients seem to accept the prosthesis well; however, female patients over middle age who lead a sedentary type of life do not do well with this type of prosthesis.

#### References

- 1. Selig, S.: Interinnomino-Abdominal (Hindquarter) Amputation. J. Bone & Joint Surg. 23:929, 1941.
- 2. Gordon-Taylor, G.; Patey, D. H., and Warwick, W. T.: The Interinnomino-Abdominal Operation. J. Bone & Joint Surg. 34-B:14, 1952.
- 3. Pack, G. T.; Ehrlich, H. E., and Gentil, F. C.: Radical Amputation of the Extremities in the Treatment of Cancer. Surg., Gynec & Obst. 84:1105, 1947.

PAGE 58

- King, D., and Steelquist, J.: Transiliac Amputation. J. Bone & Joint Surg. 25:351, 1943.
- 5. Morton, J. J.: Interinnomino-Abdominal (Hindquarter) Amputation. Ann. Surg. 115:628, 1942.
- 6. Cooper, J. F., and Taylor, G. W.: Prosthesis Following Hemipelvectomy. New England J. Med. 241:1047, 1949.

### FITTING TECHNIQUE OUTLINE FOR HEMI-PELVECTOMY SOCKET JOHN MITCHELL, C.P. ROBERT MITCHELL, C.P.

The following series of pictures clarify the socket fitting techniques which have been developed in Orthopedic and Prosthetic Laboratories of the Institute for the Crippled and Disabled. The technique is for the Hemi-Pelvectomy amputation as described by Dr. Shyh-Jong Yue and Mr. Charles Goldstine in the preceding article, "An Improved Prosthesis for Hemipelvectomy." The explanation of the procedure requires considerably more detail than space allows us to present at this time. The technician's time required is exceedingly high but results justify the extensive labors.

It is obvious that we are not attempting to explain the entire mechanical setup; however, the same procedures in socket fitting can be applied to the conventional or Canadian type prosthesis.

It is further assumed that the reader is totally familiar with the fabrication procedure to successfully laminate the plastic socket. It cannot be emphasized enough as to the importance of obtaining a perfect plaster check socket so as to assure a totally satisfactory final plastic socket.

Figure 1 indicates the severity of the amputation. In addition, it shows the frequent distortion of anatomy in the stump area. This must be considered by the prosthetist in the design of the socket.



Figure 1, Fitting Technique Outline for Hemi-Pelvectomy Socket.



Figure 2, Fitting Technique Outline for Hemi-Pelvectomy Socket.

The loops around the axilla are support for the patient so that the cast may be taken in the standing position. This position is advantageous because the stump and opposite gluteal fold will have the normal contours of weight bearing.

Figure 2 shows the lateral anterior view of the plaster wrap being applied to the stump. Stockinette is first put on the stump and pulled tightly so as to confine loose tissue. A section of 6" stockinette approximately 30" long has been used in the illustration. Prior to removal of the cast, the plaster bandage will be carried over to include the gluteal fold on the sound side. A minimum of 4 layers of plaster bandage are used on this cast.



Figure 3. Fitting Technique Outline for Hemi-Pelvectomy Socket.



Figure 4. Fitting Techn.que Outline for Hemi-Pelvectomy Socket.

Figure 3 shows the male mold which has been taken from the first plaster wrap and has been corrected in the following manner:

- 1. The height of the mold is above the level of the distal ribs.
- 2. The proximal border has been flared to give comfort.
- 3. The plaster has been sculptured from the anterior portion of the mold to assure firm fit of the socket. This is determined by the prosthetist's initial examination.
- 4. To accommodate any remaining protuberance of the coccyx, plaster has been added to this area of the mold to relieve pressure.

Figures 4 and 5 show the posterior and anterior fitting of a plaster bandage check socket. This socket is approximately  $\frac{1}{4}$ " thick. The bridge to the opposite gluteal fold is approximately  $\frac{3}{8}$ " thick. All adjustments must be made in the plaster check socket. Material may be cut away with a rasp or other tools or built up by adding Plaster of Paris.





Figure 5. Fitting Technique Outline for Hemi-Pelvectomy Socket.

Figure 6. Fitting Technique Outline for Hemi-Pelvectomy Socket.

Figure 6 illustrates a trial leather pelvic belt which is fitted to the check socket for the purpose of determining fit when patient is sitting. This belt will ultimately be finished and used on the permanent prosthesis.

Figures 7 and 8 show the posterior and anterior view of the final socket fitting procedure. It is sometimes advisable to allow the patient to wear this socket for a limited period of time. During this time, he will evaluate the fit and become accustomed to wearing the socket. At this fitting, the



Figure 7. Fitting Technique Outline for Hemi-Pelvectomy Socket.



Figure 8. Fitting Technique Outline for Hemi-Pelvectomy Socket.

prosthetist establishes the contours for the outer shell. This outer shell incorporates the lateral aspects of the socket. In this manner a good cosmetic appearance is established and the attachment point for the completion of the prosthesis is provided.



Figure 9. Fitting Technique Outline for Hemi-Pelvectomy Socket.

Figure 9 shows the first step in the actual fabrication of the plastic laminated socket. A second male mold has been taken from the final check socket. The mold is covered with a coat of petroleum jelly which serves as a moisture barrier. A PVA sheet has been drawn over the mold as a separative for the plastic and is easily drawn into the concavities by use of a vacuum pump. The plastic to be used is the Bakelite C-8 Resin (A ERL-2795 and B ERL-2793). It is necessary to use 8 layers of treated glass cloth in all areas except for a required addition of 4 extra layers to reinforce the gluteal bridge. The finished socket wall is only approximately threesixteenth inch thick. This construction has been found to be totally adequate for patients weighing in excess of 200 pounds.

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# HANDICAPPED WORKERS AND THE FEDERAL WAGE-HOUR LAW

#### By ARTHUR H. KORN

#### Chief, Handicapped Worker Problems Branch, Wage and Hour and Public Contracts Division, U. S. Department of Labor

Handicapped people make good workers. A manufacturer of precision instruments thinks they're so good that his policy is to hire half his workers from among the handicapped. A railroad rehired, as an engineer, a man who had lost his leg when a road engine crashed into the cab of his locomotive. A double-amputee, now a repairman and auto body worker, finished his apprentice training. There was an official presentation of the completion certificate. Not only was the worker praised for his determination, but the owner of the shop where the apprentice received his training was lauded for giving him the chance to prove his ability.

The Federal Government has lent its support to efforts to give the handicapped a better chance to earn their living. Take, for instance, the special provisions of the Fair Labor Standards Act which were framed to encourage job opportunities for these workers.

The Act—which is commonly known as the Federal Wage and Hour Law —was intended to promote the health, efficiency and general welfare of workers without substantially curtailing employment or earning power. These ends were to be achieved by means of three basic provisions—on minimum wages, overtime pay and child labor—applying to employees engaged in or producing goods for interstate commerce.

#### **Special Minimum Rates for Handicapped**

When providing the minimum wage requirements, the Congress recognized that there would be some persons who, because of their handicaps, would not be able to compete with the able-bodied in the labor market. Therefore a section was enacted permitting the issuance of special certificates authorizing the employment of handicapped workers below the statutory minimum, to the extent necessary to prevent the curtailment of employment opportunities.

While most disabled persons are earning pay at or above the Act's present minimum of \$1.00 an hour, the special provisions for handicapped workers continue to further the employment of many who might otherwise be vulnerable in the search for work. Last year, the U. S. Department of Labor's Wage and Hour and Public Contracts Divisions, the agency which administers the Act, issued certificates authorizing the employment of over 4,250 workers at special rates in industry generally.

Any firm which is considering the hiring of handicapped workers at special minimum rates should first take into account the meaning of "handicapped," as used in the Divisions' regulations, Part 524, which govern the issuance of handicapped worker certificates. A "handicapped" person is one whose earning capacity is impaired by age or physical or mental deficiency or injury for the work which he is to perform. The fact that the potential employee may have a serious handicap does not in itself assure that the Divisions will grant the special certificate. For instance, a person with badly crippled legs could be efficient in a job requiring little or no standing, and the Divisions would not be justified in issuing a certificate for his employment at special rates in such work.

The employer who wants to obtain a handicapped worker certificate should accordingly keep in mind that he will be required to present evidence that the worker is handicapped, that the handicap is disabling for the position at which he is to be employed, and that because of the handicap the worker is unable to earn the statutory minimum of \$1.00 an hour.

To work in manufacturing or processing jobs, or in work rooms or places in which goods are manufactured or processed, the handicapped worker must be at least 16 years old—the minimum age for general employment under the Act.

#### How to Obtain a Certificate

The employer's first step in obtaining a special certificate is to contact the Divisions' Regional Director for the region in which the firm is located, asking for an application form for a handicapped worker certificate. An application form is needed for each handicapped person to be hired.

The application will require information among other things, on the nature of the worker's disability, a description of the occupation at which he is to be employed, the earnings of the establishment's non-handicapped workers doing the same type of work, and the wage per hour the firm proposes to guarantee the handicapped worker.

It is important that specific details be supplied when describing the worker's disability. Such vague statements as "nervous condition," "incapacitated" or "slow" will not suffice. The Divisions may require a medical examination report on the worker's condition if the nature of the handicap is not made clear.

Both the employer and the worker must sign the application. The employer should then return it to the Regional Director.

If the application and other available information indicate that the regulations' requirements are met, the Regional Director will issue the special certificate. Otherwise, it will be denied.

#### **Terms of Certificate**

The special certificate specifies, among other matters, the occupation at which the worker may be employed at special minimum wage rates, the wage rate inself, and the period of time during which the rate may be paid, usually one year. The wage rate is set to reflect the worker's actual earning capacity, and except for unusual justifiable circumstances, will not be less than 75 cents an hour.

Employers should take care to note that the worker may be paid the special minimum rate only during the effective period of the certificate. Thus, if the worker was employed before the certificate went into effect, he would be due minimum wage pay at a rate of \$1.00 an hour for all hours worked before the effective date. Similarly, work done after the expiration of the certificate is compensable at a minimum rat of \$1.00 an hour. However, certificates are renewable if it can be shown that the need for the certificate still exists.

#### **Certificates for Handicapped Trainees**

The certification procedure differs for handicapped persons being given on-the-job training under the sponsorship of a State Rehabilitation Agency or the Veterans Administration. In order to facilitate the training of the disabled for productive employment under these programs, the Divisions have made special arrangements for the certification of trainees. In most States, the sponsoring rehabilitation agency has been authorized to issue, if

warranted, temporary handicapped worker certificates valid for no more than 90 days. It is the responsibility of the rehabilitation agency subsequently to take steps to obtain a special certificate from the Divisions' Regional Director, if one is needed beyond the initial 90-day period. The employer himself need not apply.

On submission of required documentation by the rehabilitation agency, the Regional Director may then issue a special certificate to replace the temporary certificate or to take effect on the expiration of the temporary certificate, or he may terminate the temporary certificate prior to its expiration date, with or without issuing the special certificate. If a special certificate is issued or the temporary certificate is terminated prior to its expiration date, the Regional Director will give written notice to the employer, the disabled trainee, and the rehabilitation agency.

The employer must pay the trainee at least the rate specified in the certificate. Any money paid to the handicapped trainee by the vocational rehabilitation agency for maintenance or other expenses is not to be considered as offsetting any part of the wage due the trainee by the employer.

#### Notes About Pay

While the wage rate specified in the certificate is an hourly rate, this does not mean that the worker must be paid by an hourly rate. Many handicapped workers are paid by the piece, for instance. If the establishment also employs non-handicapped piece-rate workers in the same occupation in which the certificated worker is employed, the handicapped worker must be paid at least the same piece rates as those paid the other workers. In any establishment, the handicapped worker must be paid his full piece-rate earnings or the hourly rate specified in the certificate, whichever yields him the greater pay.

The handicapped worker certificate does not relax the statutory overtime pay provisions which require payment of time and one-half the employee's regular rate for all hours worked over 40 a week. His regular rate must be at least the rate specified in the certificate. If the worker has earned more than the specified rate—as, for example, through piece-rate earnings his regular rate will be figured on the basis of the higher earnings. When the handicapped worker works more than 40 hours in the week, he, too, is owed overtime compensation.

#### More Information Available

Any firm that wants more information about handicapped worker certificates or provisions of the Act in general should contact the Divisions' nearest regional office. They are located in the following cities: Boston, New York, Chambersburg (Pa.), Birmingham, Cleveland, Chicago, Kansas City (Mo.), Dallas, San Francisco and Nashville. Copies of Regulations, Part 524, on Employment of Handicapped Persons, are also available free of charge.





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SEPTEMBER, 1958

# A STUDENT'S VIEW OF FUNCTIONAL ARM BRACING By STEPHEN HALL,, C.O.

#### Institute for the Crippled and Disabled, New York City

Editor's Note: Stephen Hall was one of the skilled orthotists selected for the first course in Functional Arm Bracing given at the University of California at Los Angeles. His comments on the subject matter will be of interest to other orthotists who wish to apply for admission to one of the four classes now scheduled.

After the usual greetings and orientation by the staff of UCLA, we started with *Functional Anatomy of the Hand* given by Dr. J. Perry of Rancho Los Amigos. The anatomical functions of the parts of the hand, including the wrist, forearm, fingers and thumb were discussed in detail with the necessary muscles used by joints and their action produced in function. Such actions as flexion, extension, abduction and adduction of the fingers were discussed. *Uses of the Hand* 

A. Percussion--when used as a club to pound the desk with the wrist and forearm acting as a lever.

B. Prehension or grasp-the act of picking up objects.

Types of Prehension.

a. Three Point palmar

b. Two Point palmar

c. Side Pinch

d. Nail Tip Grasp

e. Hook grasp for carrying only

f. Cylindrical as large round handle

g. Spherical as ball

Dr. Perry explained how the three point palmar or chuck type grasp was the most generally used type of prehension. We use this type about 50%of the time for picking up objects and about 88% of the time for holding objects. We next went into types of bracing such as:

1. Polio. The chief problems are atrophy of muscles and the hyperextension of joints.

2. Injuries from Trauma. The need usually is for progressive bracing over a long period of time.

3. Nerve Injuries.

1. Median nerve controls flexor side of hand Palmar.

2. Ulnar nerve.

3. Radial nerve controls the extensor side of hand—Dorsal wrist and thumb.

4. Rhumatoid Arthritis-Two problems:

 Bad position of hands. 2. Deformities—typical swans neck fingers.

5. Spastic Hemiplegia—Two problems: 1. Limitation of extension. 2. Coordination Loss.

*First Splint* made was the Basic hand splint which is used to maintain the thumb in functional position and support palmar arch. This splint is the foundation for a great number of other types of splint by using attachments.

Second Attachment made was the swivel thumb-spreader bar and spring types. Function of this spring swivel thumb was to dynamically hold thumb in abduction. Spring tension can be overcome to allow grasping of smaller objects. To use this splint the patient must have thumb flexion to operate the swivel. Hand should be free of deformity and fairly flexible.

ORTHOPEDIC & PROSTHETIC APPLIANCE JOURNAL

Third Attachment made was the First Dorsal Interrosseus Assist. The function of this attachment is to abduct first finger to assist prehension. The spring on the attachment can also be adjusted to assist flexion to the first finger.

Fourth attachment made was the lumbrical bar. The function of the lumbrical bar is to prevent hyperextension of proximal phalanges, allowing the extensor digitorum communis to extend distal phalanges. The lumbrical bar is usually used to hold the fingers in 15 degrees flexion so that full extension can be obtained at the distal phalanges.

Second Splint made was the Dynamic finger flexion assist, used to assist finger flexion. To use this splint the patient must have fair to good finger extensors.

Third Splint. After adding the long forearm piece to a new Basic hand splint to form the Long Opponens hand splint we added a C Bar to the splint. The function of the "C" Bar is to hold the thumb in opposition and Abduction. The "C" Bar is used on all splints except when the Swivel thumb is used. Also used with the "C" Bar is the Thumb IP Extension Assist. It is a spring and stop added to an oppones hand splint to dynamically extend the thumb at the IP Joint providing better grasp position.

Fourth Splint made was the Action Wrist with Dorsiflexion Assist. Hinge joint allows free volar and dorsiflexion and partially prevents radial or ulnar deviation with the Dorsiflexion assist added it assists wrist dorsiflexion. The splint is used when wrist extensors are in the poor to fair range. May be used with a stop to prevent too much dorsiflexion or prevent volar flexion.

Fifth Attachment made was the hand splint prop, used at night or period of rest for the patient so that the weight of the splint and hand are not put onto the patient's hand. This has been found to help prevent bed sores on the hands.

Fifth Splint made was the flexor hinge splint which can be with finger, wrist or shoulder harness drive to give prehensive grasp to the patient. It can also be harnessed to the artificial muscle to provide power. An interesting addition to the flexor hinge splint when used with the shoulder harness is the pressure relief control. The fact that the fingers are under constant pressure from the spring to close the fingers a patient would have serious difficulties unless he could relax his grasp once in a while. The relief control allows him to relax his fingers until he wants to use them for grasp.

At this point in the program we left hand splinting and went to the Rehabilitation Center at Rancho Los Amigos to see patients. These, we fitted with splints which we had made in class from measurements given to us by our instructors. The results were quite good and we next went into *Ball Bearing Feeders* that attach to the patients' wheelchairs.

The feeders tied in with the lecture on Biomechanics of Functional Hand splints and arm Bracing. The apparent good that the feeders accomplished for the severely handicapped wheelchair patients was clearly shown. We also viewed the Flying saucer feeder, the suspension-type feeder and the quadriplegic feeder that is automatic. At the same time that the Feeder lecture was in progress we went into the special assistive devices that can be made for the Polio and Paralyzed patient. Most of these devices have been made by all the people in the Orthopedic business at one time or another but it was a good chance to exchange ideas from many parts of the country on the different types of aids that are available.

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#### Second Half of the Course

Principles of Operations and Application of Functional Arm Braces. Basic Anatomy of the Arm and Shoulder was discussed by Mr. John Bray of the UCLA Staff. Muscles discussed were: Trapezius, Levator, Rhomboid, Serratus Anterior, Pectoralis Minor and Subclavius, which are all Fixator Muscles. The Prime Mover muscles discussed were, Pectoralis Major, Latissimus Dorsi, and Deltoid. The need for this anatomy was soon apparent when we started to harness some of the polio patients' hands, arms and shoulders.

Handi Hook was the first type of assistive devise discussed and made in the laboratory. The basic indication for the use of the hook is that the patient would have no sensation in the hand. Quadriplegics are the most likely users. The hook is made of Stainless Steel handpiece. It has a position of function friction lock built into the wrist unit. The Hook may be activated by 1. Scapular elevation, 2. Humeral flexion, 3. Shoulder elevation, 4. Leg loop or perineal strap on either side of patient, 5. By attachment to wheelchair if patient uses one. Position of Hook is according to patient's needs and type of activity to the patient can best be trained for.

If patient has immobility of the finger joint and lack of sensitivity of the fingers, and also paralysis of the muscles of the wrist the patient would be fitted with the Handi-Hook plus the addition of the Dorsal or Volar wrist splint. The wrist splint holds the hand in a functional position. The hook is available in three sizes with either the left hand or right hand position. With cable controlled hook the cable can be attached to either foot by a simple shoe and brace arrangement to provide additional opening power if needed.

Straight Shoulder Suspension Hoop: The shoulder suspension Hoop provides a stable foundation for the attachment of various combinations of rubber bands, cables, levers and joints designed to assist the patient to obtain useful function of his shoulder and elbow joint. The Hoop consists of a well padded waist band shaped to fit the body contour over the crest of the illium. It is held in place by chest straps and waist straps.

A "U" shaped hoop of stainless steel wire goes over the shoulder and inserts into tubing attached to the waist band and locked with set screws. No weight is borne on the shoulders but all the weight of the arm is carried through the attachment to the waist band resting on the illium.

The hoop and waist band can be shaped to the contour of the body by bending irons or by hand. The straight shoulder hoop is usually used with a forearm cuff to give the patient elbow flexion assist. The patient should have elbow extensors and the hoop will help flexion. Without extensors some other source of power such as a leg reciprocator should be used. This type of brace is theraputic and with it a weak triceps muscle can be built up in strength. The balancing of the arm with the rubber band tension and the position of the hooks on the cuff are the most critical concern of the fitter when using all of the suspension apparatus in the course.

The axillary shoulder suspension hoop may be used instead of the straight hoop and offers certain advantages to the patient. The axillary hoop is worn under the clothing and usually does not include a shoulder saddle. It would not be used if there was a presence of sensitivity in the axillary region or the chest wall.

The By-Pass shoulder Hoop is used most generally for the attachment of the various types of shoulder and forearm flexion units. The hoop is shaped around the top of the shoulder at the point of the acromium and the first

Stephen Hall checks out the bilateral functional arm brace fitting he did for Mrs. Betty Wickstrom, one of the patients who served as teaching aides in the Pilot Class.

She is wearing a By-Pass Shoulder Suspension Hoops with Fore Arm and Elbow Flexion Assists. On each side of the braces is a manually operated locking device activated by a lanyard. The units also include internal and external rotation and pronation Assists Springs, which help the patient to pronate the hands.

The braces allowed the patient the use of her hands at table top level in a functional position, and the ability to reach out and grasp objects.



assistive device added was the shoulder flexion assist. This consists of the lever arm which is activated by a series of rubber bands running from the front of the hoop to the distal end of the arm cuff. To this shoulder assist can easily be added the forearm cuff and the necessary rubber bands to give forearm flexion. The By-Pass hoop is also fitted with the shoulder stabilizer and elbow locking joint which is activated by a lanyard and the use of the other hand to attain the locked position. The bar that contains the locking device can be placed either on the lateral or medial side of the arm. A pronator or supinator spring can be incorporated into this unit to give either pronation or supination. If a leg reciprocator is used with the By-Pass hoop the elbow unit should be a free unit because the cable hand and foot could be locked in a flexed position if the elbow was not free.

Leg Reciprocators are used where the patient has weak shoulder and elbow muscles as in the flail arm. If finger function exists at all a reciprocator will bring the forearm into a functional position. The cable rewind mechanism is attached to the shoe and is activated by a bale across the instep of the shoe coming in contact with the calf of the other leg. This action shortens the cable and when the foot is again placed on the floor the cable lifts the forearm cuff of the patient. The cable is anchored to the waist band with cable housing retainer. To allow the arm to extend the bale is released by downward pressure on the instep of the foot using the heel of the opposite leg.

The final brace shown and assembled was the *shoulder supported functional arm brace*. This brace has no waist band and is hung from the shoulder girdle. The patient would necessarily need good shoulder muscle tone to allow the fitting of the upper arm support. The elbow locking unit is activated by the opposite hand and has seven locking positions. The unit may also include a pronation and supination assist. The most critical concern of the technician in the fitting of this brace is the shaping and contouring of the metal shoulder saddle to the arm and chest wall surfaces. The placing of bands will allow the brace to be positioned with the mechanical joint in line with the anatomical joint.

All the functional arm brace parts are now being manufactured by the Hosmer Corporation of California.

## **Orthopedic-Prosthetic Idea Exchange**

Contributing Committee: Everett J. Gordon, M.D., Chairman; Joseph Ardizzone, P.T.; Raymond Beales, C.P.; Edwin M. Brown, Prosthetic Representative; Victor L. Caron, C.P.; Charles Ross, C.O.&P.

Now that summer is drawing to an early close, we anticipate the usual quickening of the prosthetic pulse and a renewed interest in our ever recurring problems of braces and prostheses. Your summer repose is over and now we shall expect your most welcome communications and helpful hints to pass on to our widespread host of readers (we hope!).

Perspiration continued to be a top priority problem in our area, but frequent use of Phisohex appears to be reducing the associated cutaneous problems. In addition we have experimented with a nylon bag (actually an eviscerated nylon powder puff!) filled with Silica-gel, fastened in a prefashioned depression in the knee seal by gripper snaps. The amputee merely snaps out a soaked bag and snaps in a fresh one as needed; in the evening he dries them in a moderate oven and is ready with a fresh supply the next day. We have encountered a slight difficulty in placing the bags in position but hope to facilitate this by adjusting the position of the snaps. We feel this will supplant the paper bag containers of Silica-gel, now supplied as Protect-Sorb. However, these containers have been quite useful, as evidenced by a comment recently received from *Joseph Martino of Boston:* "It has been our experience with the Silica-Gel in suction sockets that it seems to work well with normal perspiration. However, when an amputee perspires a great deal, the paper container almost dissolves. As the cost of these bags is inexpensive, we recommend that the patient insert a new one rather than go to the trouble to 'cook it dry.'"

#### Weight of Amputees

In our Washington Clinic we have been giving increasing attention to the weight of our amputees. Fluctuating weight has been a nagging source of fitting difficulty, frequently causing expensive replacement of otherwise satisfactory sockets. The dietician now attached to our prosthetic team keeps a record of body weight at each amputee's clinic visit, and disseminates general dietary information to all potential "avoirdupois candidates." We hope this will prove to be a valuable step in preventive medical care of amputees.

One of the most critical problems to face the orthopaedist concerns special orthopaedic shoes. Sagacity and perspicacity must supplement a thorough basic orthopaedic knowledge to solve the majority of these vexing situations. Mental and emotional factors, prominent as they are in the amputee, constantly harass the orthopaedic technician and examining physician, and confuse the basic issues to an even greater degree, in achieving a satisfactory fit of specially fabricated orthopaedic shoes. The desire for perfect foot comfort and ability to walk as well with his deformity as he did before predisposes to a recurrent preoccupation and fixation, finding expression and outlet at frequent clinic visits. Temporary satisfaction is usually quickly supplanted by focusing attention to another area with which to seek another pair of shoes, etc. In the Veterans Administration Shoe Program, so ably set up by Dr. C. F. Mueller and Joseph Ufheil of the Prosthetics and Sensory Aids Office (also

attached to our clinic and of invaluable aid), the use of a central last depository and repair of all special shoes over these individual lasts has resulted in prolonged wear and satisfaction with subsequent economical savings of substantial magnitude. Incidentally, we have been trying to revive interest in the lowly and ancient shoehorn for routine use to prolong the life of the heel counter. It's surprising that such a useful item, usually distributed gratis, finds so little actual use. When did *you* last use one?

How are your Canadian hip disarticulation prostheses functioning? Comments on this still relatively rare prosthesis are very much desired by all members of our profession. At the New York Veterans Center a hip-lock type of catch to stabilize the hip in place of the lateral stride-limiting strap has been reported to be of considerable success in special situations. We have two veterans now being fitted, after long and successful use of a tilting table prosthesis—more about their progress in our next issue. Experience is obviously required for successful fitting and minimizing of difficulties; this is still to be obtained.

Those of you who were fortunate enough to attend the one-day seminar of July 15th at the Veterans Administration New York Regional Office were treated to a very intensive review of the latest developments in limb research. It was a well planned and organized program with forum discussion which everyone thoroughly enjoyed. Don't miss the next one if you are eligible to attend!

The Vickers Hydro-cadence hydraulic limb is now under limited manufacture in five experimental stations throughout the country. The preview releases have been most stimulating and everyone is anticipating more information on its performance. If anyone in contact with these limbs would forward your comments, we would be most happy to spread the news, good or bad.

Has anyone seen any bizarre types of amputations lately? We recently examined a 27-year-old Spanish girl with a Symes amputation performed in Spain at age 14 for a flaccid foot resulting from poliomyelitis incurred at age 3. Severe atrophy of the entire involved lower extremity resulted in the usual shortening plus a fixed, pelvic obliquity. Growth of the normal leg after age 14 has now given her a BK stump with Symes type of end-bearing, and with the pelvic tilt, the Symes stump is now  $4\frac{1}{2}$  inches above the ankle center of the normal leg! She is being fitted with a BK wood socket with partial endbearing, short thigh corset, and Sach foot.

#### SACH FOOT NOTES

All of which brings us to our current favorite prosthetic topic, the SACH foot. We are prescribing them routinely now, unless the veteran objects; females who want to wear pump type of shoes also cannot be fitted with such a foot, which will bulge laterally with weight bearing and will not retain the shoe on the foot unless it be a strap type of shoe.

However, experience to date has shown that there is still a maintenance factor with these feet, albeit less than with the wood foot. The rubber heel cushion occasionally pulls loose or softens with constant use. Replacement of the rubber inserts is easily accomplished, usually inserting a wedge of firmer durometer.

Minor repairs can easily be done by the amputee, using a small tube of Barge rubber cement whenever the neoprene heel inserts spread apart or tear. Issue of this inexpensive item to the amputee when the limb is approved will facilitate the early repair of such small tears and separations and prevent major repairs and replacement.

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#### HONORS FOR DR. STEWART



Dr. Stewart Honored,

The Veterans Administration has given a special commendation to Dr. Robert E. Stewart, director of the Prosthetic and Sensory Aids Service for his contributions to the VA prosthetics program.

Dr. Stewart was cited by Dr. William S. Middleton, VA Chief Medical Director, for efficiency, leadership, and coordination of interagency efforts in behalf of disabled veterans and citizens.

The Prosthetic and Sensory Aids Service provides artificial limbs, orthopedic shoes, hearing aids, and other prosthetic devices to disabled veterans, and also conducts extensive research and development and training in prosthetics.

Dr. Stewart has been with the Service since January 1946 and has been director since July 1955.

#### **IDEA EXCHANGE (Continued)**

Several amputees have complained of rolling the SACH foot over to the outer border of the heel and causing excessive wear of shoes, resulting in a toeing-in type of gait. Use of firmer durometer neoprene inserts in the heel cushion appears to be the answer.

Our experience has shown that it is imperative to inspect the SACH foot directly rather than to question the veteran about his reaction to the foot. In all cases the shoes should be removed, even though more time is consumed, so that the foot can be directly inspected. It was noted on one case that the SACH foot had become rotated at the ankle, which the patient had not noted and had not thought to be of consequence but which obviously had interfered with his gait and caused a rotation stress on his stump, plus delamination of the heel.

Our experience with SACH feet now includes a "fracture" of the stud bolt at the ankle, from merely stepping off a curb. However, the bolt appeared to be of defective manufacture and replacement has resulted in satisfactory wear now for three months without "re-injury." Incidentally, a suggestion by *Charles H. Dankmeycr*, of Baltimore, one of our prosthetists, to x-ray a defective SACH foot proved to be quite interesting, as well as confusing to the x-ray technician receiving the routine request! Actually on the lateral projection one could perceive separation of the keel from the rubber element and also fracture of the anterior tip of the keel, with fragmentation. We believe this may prove to be a valuable tool in diagnosing early difficulties with SACH feet, rather than removal of the foot and "dissecting" it.

Thanks to all of you who have so kindly forwarded your comments and suggestions. And say, don't YOU have something to contribute? ?



Pictured are the Aluminum Canadian type crutches that have become increasingly popular particularly among polio patients and have been proven satisfactory for many other persons handicapped by a lower extremity involvement.

## ATLANTA BRACE SHOP

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## Laboratory and Shop Notes

A Column of Practical Ideas

Contributing Editors, Alvin L. Muilenburg, Chairman; G. E. Snell, C. O. Anderson, Erich Hanicke, Joseph Martino.

We are sorry to report that Mr. Al Muilenburg, the capable conductor of this column, has been in the hospital. He is recovering from an attack of hepatitis. The Journal's best wishes for a prompt recovery go out to him.

R. N. Witt, Head Orthotist at Gonzales Warm Springs, in the heart of Texas, sends along this tip for those who are using Plastisol: "Preheat your metal to 550 or 600 degrees, and you will have a much better job."



Our good friend, Erich Hanicke of Kansas City has a lot of good ideas. This is one of them:

The photograph is a simple article that we find quite useful for several purposes. I have no particular name for it but it is a rotary platform designed to indicate various degrees of rotation of the human leg.

It consists of a platform on which is mounted a box type elevation of about 4". This is covered with rubber floor matting to prevent patient from sliding or shifting from a desired position. The smaller rectangular platform is mounted on a large bevel roller bearing which permits a very smooth articulating medium especially under body weight. Its height or thickness corresponds with the large box mentioned above. The patient stands on both the large and small platform. It is necessary, of course, to be certain that the patient's body is square to the platform by watching the region of the anterior superior spines which is usually sufficiently accurate.

It is very interesting to note the various movements a leg will undergo in its longitudinal axis. This instrument is used to ascertain quite accurately the degree of inversion or eversion of the entire leg caused by the relaxation or ordinary motion of the hip joint. It is also used to indicate the amount of eversion and inversion of the lower leg due to tibial torsion with or in rotation to the positioning of the axis of the knee joint. This is accomplished by recording the degree registered on the protractor during the stance phase or static position of the leg and also while patient is flexing his hip and knees in act of sitting.

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By recording both findings, one can calculate the proper angle of rotation of the lower leg and foot. It is advisable to exert various counter tensions or resistances to these movements as it is necessary quite often to prevent too much or too free rotary movement. Positioning of ankle axis to knee axis in below knee legs can be greatly simplified and achieved with this particular instrument. It has been a great help to us in solving a number of problems, particularly in congenital deformity cases to augment current standard procedures.

#### C. O. Anderson of Prosthetic Services of San Francisco Comments About Plasticized Vinyl:

Increasingly popular with both prosthetists and orthotists is plasticized vinyl, used as a dip coating.

This wonderful material is the basis for most cosmetic gloves and leg covers. Used differently, however, it can give a handsome and protective finish to a brace, a comfortable soft socket liner for a limb, or any number of other uses.

No particular equipment is needed as it is possible to "gel" the material over a gas flame and cure in a medium heat oven. A near approximation of flesh color is possible although, naturally, not the "skin" appearance of cosmetic gloves.

The Army Prosthetic Research Laboratory has worked out a non-toxic formulation which is the standard for the industry.

#### DIFFERENCE BETWEEN STUMP PERIMETER AND SOCKET PERIMETER



Ed Snell of Little Rock describes the chart shown above which is used in graphing progress in the carving of a quadrilateral socket: "I have reproduced this chart on a sheet of steel  $16'' \ge 18''$  and have it mounted on the wall by my bench and use magnetic markers. This makes it very casy to see where it is necessary to remove more wood without the bother of recording on a paper chart."



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#### METHOD OF CASTING AN ABOVE KNEE STUMP FOR FITTING WITH A PLASTIC LAMINATE QUADRILATERAL SOCKET

Louis Iuliucci, C.P., describes a method of casting an above knee stump for fitting with a plastic laminate quadrilateral socket. (He is an orthopedic technologist in the VA Prosthetics Center in New York City.)

The Veterans Administration Prosthetics Center has developed a method of casting an above knee stump by pre-shaping the proximal thigh contours using a pre-fabricated socket form. This cast is then used to fabricate a quadrilateral ready-to-fit all plastic-laminate socket. The plastic-laminate pre-fabricated socket forms are shaped based on the concepts outlined by UC-Berkely and shown in the basic quadrilateral socket templates. These forms range in circumference from 14" to 21" in 1" increments. The forms are split to permit simple disassembly by removing four screws.



#### Figure 1

Figure 2

The first step in the procedure is to select the proper size of socket form. It has been found advisable to select a form approximately 2" less in circumference than the top circumferential measurement of the stump, for a suction socket and 1" less, for a conventional socket. This results in a snug fitting socket and permits modification when necessary. After determination of the proper size, the socket form is secured in a fixture as in Figure 1. The amputee is supported on the form during cast taking. The fixture is designed to permit movement of the socket in all planes and thereby allows the amputee to stand in a comfortable position. The fixture is also adjustable for height.

A length of cotton stockinette is pulled over the amputee's stump and over the rim of the socket form. The distal end of the stump is wrapped with plaster of Paris bandage high enough to incorporate the base of the socket form. During setting of the plaster the prosthetist applies pressure to the distal lateral aspect of the cast to stabilize the femur. During the setting period comments are elicited from the amputee as to possible areas of discomfort or excessive pressure and so forth. These comments are noted for later modification of the master model. After the plaster wrap has set, the amputee removes his stump from the cast. The cast (including the socket form) is then

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## KNIT-RITE

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filled with plaster of Paris to form a positive model. After setting of the plaster of Paris model, the bandage wrap and the socket form are removed and the plaster model is then modified according to previously taken measurements and any comments of the amputee which were previously recorded. A PVA bag is pulled over the cast and air is evacuated to insure firm contact of the bag to the plaster model during the lamination procedure. A  $\frac{3}{4}$ " thick wood sealing plate of proper shape is placed on the distal end of the cast. Three layers of Dacron felt are wrapped around the model and tied at both ends. To keep the felt in position, a layer of nylon stockinette is pulled over the felt and tied off in a similar manner. The socket is then laminated in the usual manner using polyester resin. After proper cure the socket (figure 2) is ready to be fitted to the amputee using the adjustable leg.

This plastic laminate socket can be as easily rectified as the conventional wood socket. Even build-ups on the socket wall can be performed. It has a further advantage in that it requires no internal finish. Experience to date has shown it to be a structurally sound socket. The VA Prosthetics Center is preparing a manual which will describe the casting and laminating procedures in full detail. The manual is scheduled for publication in October.

#### U.C.L.A. CLASS SCHEDULE

Eight courses for prosthetists and orthotists will be offered by the University of California at Los Angeles in the next nine months. The class schedule is given below:

#### 1958

Oct. 6-17-Above-Knee Prosthetics (\$100)

Nov. 5-21—Functional Bracing of the Upper Extremities (\$150)

Dec. 10-13—Advanced Above-Knee Prosthetics (\$35)

#### 1959

Feb. 4-20-Functional Bracing of the Upper Extremities (\$150)

Mar. 9-20—Above-Knee Prosthetics (\$100)

Mar. 25-28-Advanced Above-Knee Prosthetics (\$35)

Apr. 8-24—Functional Bracing of the Upper Extremities (\$150)

May 18-June 5-Upper Extremities Prosthetics (\$150)

For further information and enrollment forms write to: Dr. Miles H. Anderson, Prosthetics Education Program, Room B4-229, Medical Center, University of California, Los Angeles 24, California. Telephone, BRadshaw 2-8911, Ext. 448.

(A limited number of traineeships made available by the Office of Vocational Rehabilitation are available through the University of California for those who can demonstrate eligibility for such assistance. Applications are available upon request.)

The courses are given in the School of Medicine (Dept. of Surgery, Division of Orthopedics). They are sponsored by the U. S. Office of Vocational Rehabilitation and presented through U.C.L.A. Medical Extension. Similar courses are given for physicians and therapists and rehabilitation personnel.





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#### FIRST INTERNATIONAL CONGRESS OF THE ORTHOPEDIC APPLIANCES AND ARTIFICIAL LIMB MANUFACTURERS

#### A Report on the Brussels Meeting by the OALMA Representative George W. Fillauer, Sr., Chattanooga, Tennessee

The First International Congress of orthopedic appliance and artificial limb manufacturers association was held from May 24 to May 26, in Brussels Town Hall, Brussels, Belgium. The announcements of the Congress in French referred to it as "Union Professionelle Des Bandagistes et Orthopedistes. In German, it was referred to "Bandagisten und Orthopadiemechaniker Handwerks."

The idea for the International Organization and the sponsoring of it, is due the Union Professionelle des Bandagistes et Orthopedistes de Belgique of Brussels; hence, full credit for the fine arrangement and successful conduct of the meeting should be given to this organization. Associations of the various countries were invited to send delegates. The program was comprehensive with a number of addresses given by representatives from European Countries, and America. These talks covered the many facets and responsibilities of our profession.

Mr. Angerhausen presided at the first and special meeting of the delegates held on the evening of the Congress. He expressed the hope that this auspicious occasion might be the beginning, through co-ordinated efforts, of developing the Orthopedic Industry on an International Basis. Through this thinking came about the idea of planning this initial meeting during the World Fair in Brussels, Belgium. Next on the program was Mr. Pueschel from Berlin, who presented his points of view on the purpose and aim of an International Organization. These are the salient points of his address:

1. The promotion and idealization of the interests of the Orthopedic Industry and its members the world over.

2. The cultivation and promotion of exchanging thoughts on technical and professional questions by world organizations and their members.

3. To promote all measures suitable to serve the professional and technical interest in its official position.

4. The deliberation of its members on scientific and technical advances in the field of the orthopedic technique.

5. The promotion of requisite qualifications and training of personnel. 6. The promotion and cultivation of exchange of Orthopedic Technicians.

It is gratifying that Mr. Pueschel's program was enthusiastically received. Mr. George Fillauer spoke and moved for the adoption of the program. The French, English, and Dutch Representatives spoke on the motion, which was unanimously accepted.

On motion of a Belgian colleague, Mr. H. Stortz of Cologne was nominated as the First President of the New International Organization.

On the following morning the meeting was officially called to order in the beautiful, historical Town Hall of Brussels. The First Commissioner of the Town of Brussels welcomed the delegates and expressed his gratification that on this day in the City of Brussels the foundation for such an International organization should be laid. He was happy to note the representative numbers from many countries attending this valuable meeting.

Dr. Fassin, from Paris, spoke on the employment of bodily movements as models in Orthopedic Appliances and Prostheses.

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DELEGATES TO THE INTERNATIONAL CONGRESS—Some of the delegates to the International Congress of Trussmakers, Orthopedic Technicians and Prosthetists, pose for their picture outside of the own Hall of Schaerbeck in Brussels.

The following are identified by number in the picture: Mr. Hugo Stortz of Cologne, Germany, President of the International Committee of the Council for Prosthetists and Orthopaedists; Mr. A. Saermans of Brussels, President of the Professional Union of Trussmakers and Orthopaedists of Belgium; Mr. M. Dreesen of Brussels, Second Vice-President of the Professional Union; Mr. A. Daxhelet of Liege, First Vice-President of the Professional Union; Mr. M. Lejon of Antwerp, Commissioner of the Organization Board; Mr. R. Angerstein of Brussels, Manager of the Professional Union; Mr. H. Feierabend of Munich, First Vice-President of the Bundesinnungsverband in Germany; Mr. Heinz Pfau of Berlin; Mr. Fritz Pueschel of Berlin; and Mr. George W. Fillauer of Chattanooga, the OALMA delegate.

Next followed Mr. Pueschel, who spoke at length on the Orthopedic Industry and its international task, beginning with the development of the industry and bringing it up to the scientific, technical development of the present day. He suggested that a committee be formed for the pooling of scientific data for the benefit of the sick and handicapped.

Following this there was a reception given by the Burgomaster in his office.

Other speakers on the program were:

Dr. de Doncker, Brussels, spoke on "Flat Foot and Treatment."

Professor Murdoch, Aberdeen, read a paper on "Pes Valgus," and showed, by examples, how mild and severe cases were treated with appliances in Scotland.

Mr. H. Stortz gave a most interesting and informative talk on Direct, Indirect, and Ventral Hernias. He mentioned the co-operation he has received from Doctors and Insurance Companies.

Mr. Feierabend, Munich, chose as the subject of his talk, "The Artificial Leg," demonstrating through the use of photographs, the fundamentals of proper construction in assuring correct and comfortable prostheses. The two most important prerequisites are:

1. Thorough technical "know-how."

2. Knowledge in the field of Orthopedic Technique.

Mr. Tuck, London, spoke on the methods of providing appliances and prostheses in England.

Professor Murdoch, Aberdeen, spoke again, this time choosing the subject, "Good and Bad Stumps." He made some favorable comments on the Desoutter Aluminum Limb with pelvic band. He also mentioned a geared polycentric knee joint for BK Prostheses which affords nearlynormal movement.

Dr. Maes, Lier, spoke on "Varicose Veins."

Hans Pfau, Berlin, discussed the topic, "Artificial Arm, and Hook Arm." He demonstrated his subject with slides and models. Time did not permit doing justice to his studious subject.

Dr. Lucien Konings, Brussels, chose "Dorsal and Lumbodorsal Supports" as his subject of discussion. He made interesting comments on the difficulties encountered in providing proper balance of support and movement of the vertebral column.

George Fillauer, Chattanooga, spoke in detail on the application of plastics in prosthesis. He illustrated his talk with samples of material, and discussed the techniques employed in the United States. His address is printed in this issue of the *Journal*.

Dr. Med Kuhn, Munster, read an address on "New Material in Orthopedic Appliances." He said, "Once upon a time, a prosthetist had to be a forger . . . and leather worker . . . then a wood worker . . . now, a prosthetist has to have a good knowledge in Chemistry, also."

The last man to be on the program was Mr. A. Daxhelet, Liege, who spoke on the development of Orthopedic Industry in Belgium. He said Belgium was a small country with only eight and one-half million inhabitants. For this reason, the industry has met with greater difficulties than some other countries, due to the lack of necessary schools and laboratories for the study of Orthopedic Technique and Medical Science. The industry uses mainly German, English, and American material and supplies. The Belgians study the various techniques of these countries, and then choose the best. Belgium is the meeting place for technical news. From Germany, they receive new theories in construction; from France, stimulation for light, nicely formed prostheses; from Austria, recommendations for good corsets, and England gives good council on mechanisms. The cosmetic prosthesis from America is very much desired, but too high priced for Belgium economic conditions. Most of the country's prosthetic needs are purchased by Federal Agencies and Insurance groups. Several comments were made that the prices set by these agencies were inadquate to provide the best in material and workmanship; that in many instances the patient has to pay the difference to insure a reasonably good appliance, corset, or prosthesis. This illustrates the difficulty with which the industry has to contend.

As was pointed out by Mr. Daxhelet, the interest of the government is not only that the patient "breathes again," but also that the patient "can work again."

The talks given in the various languages were relayed simultaneously to the delegates in French, German, English, and Dutch.

The closing feature of the Congress was a banquet in the great Hotel Central Bourse. We were the guests of the Belgian Minister of Public Health, Monsieur E. Leburton, and his family.

In his address, the Minister stressed the responsibility that the industry has in the care for the health of the land and its people. The Monsieur was proud in hearing that the meeting was crowned with success. The German, French, American, and other delegates responded by expressing their deep appreciation for the invitation and hearty welcome they received in Brussels, with sincere thanks for the efforts of the Belgian Government, the City of Brussels, and the Belgian Colleagues, responsible for this wonderful meeting. In conclusion, the Minister presented to each of the delegates a silver "Atomium," a remembrance of the World Fair in Brussels, 1958.

I have one lasting impression to carry back with me to America. It is a feeling of joy and appreciation in my heart, of being grateful for the privilege of having attended this, the first International Orthopedic Mechanics Congress. With all who have been there will go this same deep impression of the friendly reception in an atmosphere of peace and friendship. From the results of this meeting, we have all been made aware of the unlimited possibilities through international co-operation of industries and governments.

## TENENBAUMS PUBLISH BROCHURE ON COSMETIC PROSTHESIS

Tenenbaum Prosthetics of New York City have published and are distributing to medical specialists "PlastiSkin," a brochure on their services. It is illustrated with some of the cases served by this firm in its 18 years of activity. The photographs were taken by Milton Tenenbaum, making practical use of his chief hobby.

The following paragraphs are quoted from the text:

"The compelling need for prostheses which authentically restore normal appearance, and therefore, self-confidence to the amputee, has been the determining factor in the development of 'PLASTISKIN' prostheses.

"Our Research and Development Division has evolved prosthetic restorations wherein each prosthesis has been designed with sharply defined and sharply controlled properties which fit it to the performance demanded. Each gives the appearance or functional characteristic required by the individual amputee.

"Appearance is highly individual. To limit the range of cosmetic hand prostheses to a few standard complexions and sizes denies the amputee the opportunity to duplicate the appearance of the normal hand as closely as possible. 'PLASTISKIN' offers versatility in a vast variety of models, sizes and complexions. With 'PLASTISKIN,' a closely matching prosthesis is assured.

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#### PLASTICS IN AMERICAN PROSTHETICS By Carlton Fillauer, C.O. & P.

*Editor's Note:* This paper was delivered by Mr. George W. Fillauer, Sr. before the International Congress of Orthopedic Technicians, Trussmakers and Prosthetists, held at Brussels, Belgium, May 25, and 26, 1958. The Senior Fillauer was official representative of the Orthopedic Appliance and Limb Manufacturers Association at the Congress.

#### Introduction

Prior to World War II, the use of plastic materials in our American industry was so small that it was hardly noticeable. Perhaps the most universal application was in the making of cellulose nitrate and cellulose acetate body jackets. Since cellulose nitrate (celluloid) is always a source of danger to the patient by the nature of its inflammability, it was succeeded by the less flammable but not so flexible, cellulose acetate. All of you probably are aware of this technique which is pursued as much today as then. The low cost of equipment and supplies and the simplicity of building the appliance by coating successive layers of cotton stockinette with a solution of cellulose acetate in acetone probably is the reason for its continued use. The plastic material in this technique has one basic short-coming which no doubt prevented its greater application into other braces. This and other deficiencies of some plastics should be understood to fully appreciate the new developments which began during the war and has now blossomed throughout the prosthetic world.

#### Two Types of Plastics

When thinking of plastics and to comprehend them, we must first know and understand why and how all plastic materials fall into one of two groups. These two groups have chemical and physical characteristics which identify them. While some physical properties are common to both, the determining factor lies in the molecular structure of the material. In one group, we find materials that cover a wide range of strength, yet they all are more or less subject to the phenomenon "cold flow" and to distortion under relatively low loads at moderately elevated temperatures. This is the thermoplastic group. They are the "re-useable" materials that can be broken down into solution or softened by heating and reformed repeatedly without altering the material chemically. Their molecular structure is not fixed or fully stabilized by cross linkage. Examples of these are cellulose acetate and cellulose nitrate used world wide for photographic film, the acrylics, sparkling transparent products trade-marked "Plexiglas" and "Lu-cite" as well as the blends of acrylic and nylon in "Nyloplex" or "Plexidur" and the vinyls and polyvinyls used in dolls and cosmetic restorations. These and many more plastics that can be readily dissolved by the organic solvents and/or softened or melted at elevated temperatures for casting or reforming are in the same family. Typically, they exhibit one or more of the following properties: low strength, dimensional instability, "cold flow" and are subject to attack by organic solvents such as acetone. These offer advantages to low cost forming operations, low pressure molding and to many fabrication techniques.

In contradistinction, the second group, the "thermosetting plastics", prior to World War II, had many drawbacks to *low cost, small run* production. They required, for manufacturing, expensive high pressure dies and machinery suited only for mass production. Perhaps the most popular thermosetting plastic was a phenolic trade-named "Bakelite". It typifies

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the physical properties of the thermosetting group, namely good dimensional stability and resistance to distortion at elevated temperatures. It cannot be broken down by heat or solvents for re-use. Once the end product is obtained, the chemical structure cannot be altered just as with an egg when once fried, it cannot be reverted to its former state. Herein lies the ideal feature for prosthetics. We need components that will hold their shape under weight bearing in warm ambient temperatures and provide a pleasing durable exterior as well as interior finish. Since thermosetting resins are stable chemically and practically inert in their polymerized (cured) state, they are in fact no causitive factor for a dermatitis. In spite of these known facts, the use of thermosetting plastics was handicapped by the expensive manufacturing costs involved.

#### Introduction of Polyester Resins

The turning point came in 1942 when the Bakelite Corporation developed the first thermosetting low contact pressure resin, the unsaturated polyester. Early in 1943, Northrup Air Craft Corporation, who had only recently begun to tackle the prosthetic problem, began experimenting with plastics for a new arm socket material. It seemed logical to them that the type of material best suited for this was one that could be cured in its permanent shape or form on a model of the stump. This was the ideal, if expensive dies or equipment were not required. It is history that their experience with this new resin proved successful. Truly, the unsaturated polyester resin was the answer to the plastic problem in prosthetics. With the stump model as the inner mold and with a sleeve of clear stretchy plastic film pulled over the fabric, serving as the outer mold to impart a low contact pressure and as well as a beautiful finished surface the objectionable high cost features of thermosetting resins was a thing of the past. When the resin is cured, the inner plaster model is broken out and the outer film removed, leaving a beautiful, durable "shape retaining" socket.

For quite a few years cotton stockinette, usually in combination with fibreglas mat or cloth for reinforcement, was the major laminating material. Four layers of cotton stockinette with fibreglas reinforcement or four nylon without the glass is adequate for the average arm socket. Light or heavy duty requirements may dictate changes in this. Leg shanks of six nylon layers are of sufficient strength for the average adult.

One of the U. S. Army Amputation Centers during the War provided hundreds of Veteran amputees with below knee prostheses containing sockets of polyester resin, with gauze and felt as the filler material. Many of these were worn for ten years or more. Impervious to perspiration, these sockets remained clean and intact while the remainder of the prosthesis wore out.

#### Use of a Promotor

In this early stage of development, the resin was cured by the addition of small amounts of a peroxide catalyst and the application of heat,  $115^{\circ}$  C.  $(240^{\circ}$  F.) for one to two hours. Because the heating phase would produce steam from a wet plaster model, the models had to be thoroughly dried before hand. This was not a severe problem, but did require heating the plaster form in an oven for about twenty-four hours.

The inconvenience associated with oven drying or dehydrating a plaster model was obviated when the use of a promoter was introduced. Now, the gel-time and curing time may be controlled at will by the judicious addition of a promoter. This chemical suppliments the internal heat creating action of the catalyst by intensifying the heat, thus producing a cure without external heat.

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#### Flaxible Resin

The first polyester resins available were of the rigid type. But soon flexible varieties were introduced which can be mixed in various proportions with the rigid to produce a wide range of flexibility in the finished socket. Blends of around forty to sixty percent flexible with the rigid were the common practice in use with cotton stockinette and fibreglas.

The rigid resin lacks the ability to absorb shocks to any great degree, but it has good strength. The flexible resin is much more pliable than the rigid, but lacks the strength. Tests show that within the range mentioned (40-60 to 60-40) a cured plastic with a cotton fabric would be produced which had ample strength, coupled with a reasonable resistance to shock. It has been observed that nylon produces a more flexible laminate than does cotton and hence can be used with a higher percentage of rigid.

#### **Color Pigments**

The combination of cotton or nylon stockinette and resin produced an amber color which, though not matching any human skin shade, was not unpleasant. As you may know, now various color pigments have been developed which when added in amount of 1 to 4%, depending on the shade, produce an excellent cosmetic effect. Arm component manufacturers and the universities that were teaching upper extremity prosthetics agreed to accept the standards developed by the U. S. Army Prosthetic Research Laboratory for color pigments. This has resulted in a rather uniform usage throughout America, which permits the use of stock arm set-ups (forearms and elbows for above elbow arms) from one source with the socket made at another. This practice is so common today that probably less than 10% of the plastic forearms used are made by the prosthetist.

#### Plastics in Leg Prostheses

The first large scale use of plastics in legs was at the U. S. Army Bushnell General Hospital where hundreds of below knee sockets of cotton reinforced polyester resin were fitted. These sockets were inserted in fibre shanks in such a way that they were removable. Since many of the army amputees were measured and even fitted five to six weeks after definitive surgery, a large number of seconds sockets were required for reason of early stump shrinkage. A new socket was routinely made in two days, an unheard of schedule for a large volume, prior to the use of plastics. Today, it is not uncommon to see flesh colored or white plastic sockets in wood, fibre, or metal legs. They can be sanded or relieved and quickly recoated to a beautiful finish and it is reasonable to expect them to out-wear the remainder of the prosthesis.

#### **Plastic BK**

Many prosthetic facilities now provide all plastic below knee shanks and sockets for their best prosthesis. Combine this type with the new American SACH (Solid Ankle Cushion Heel) Foot and you have a light weight, trouble-free prosthesis. Here are the usual steps followed: First the socket is fabricated and fitted. Since it is rather difficult to alter the alignment or height (length) in a finished *plastic* limb more precaution is taken initially to avoid the necessity of a major alteration later. The use of a walking alignment device is highly desirable before the shank model is formed. When the stump is tapered, the finished shank, in order to have reasonable cosmesis should be huilt up as a double wall arm socket using a build up model of bees wax. This second step is the only difficult and time consuming part, for once the model is made with a jig of some sort incorporated to hold the knee joints true, the plastic part is routine, and comparable to that in arm

work. Of course, the knee joints and ankle block would be laminated into the shank free of rivets or bulges.

#### Plastic Laminate Substitute for Rawhide

About five years ago, we began to substitute for rawhide on wood prosthesis, a laminate finish consisting of one layer of nylon stockinette over a layer of fibreglas cloth. The primary objective was to develop a protective finish which would cut down the delay experienced with rawhide in soaking, drying and lacquering. Also, the outer surface coating on the rawhide has never been ideal in resisting abrasion and once the coating was worn, there was no waterproof protection to the wood. Typical of this condition was the ankle section near the joint line and the medial proximal border of thigh sockets. So as a secondary advantage, we felt that the plastic finish would correct these problems.

Once the laminating technique has been mastered for arm sockets or for any component there is little problem in adapting it to covering wood. The usual preparatory shaping and sanding operations for rawhide apply to the new method. Then all holes and slots must be filled or covered with an impervious material such as Celastic, a reinforcing material used in shoe construction. Since all pin holes or cracks which might permit air or the resin to pass through the wood must be sealed, it is our practice to coat the inner surface of the shank or socket with a seal-others apply the sealing coat to the outer surface. Both shank and thigh pieces are mounted inverted on padded mandrels-holding sticks in a vise and kept vertical until the resin has gelled. This is to prevent the resin that runs beyond the wood components from getting inside the socket or shank. Usually the resin mixture, made up of 80% rigid and 20% flexible, is promoted to set in 10 to 15 minutes. Trimming can be accomplished after the parts have been heated for 10-15 minutes at 93°C. The heating speeds up final cure and softens the resin sufficiently to permit easy cutting around holes and socket margins. If a means of heating the parts is not available, the trimming can be done cold, but with more difficulty. To facilitate cutting a neat opening around the joint hole in the knee block, we insert hardened, steel bushings into the knee joints prior to the "lay-up" of the fabric. Then after the resin hardens, the contour of this steel bushing can be seen so that a hole cutter with a small pilot drill can be used to make a neat cut out for the joint strap on the shank.

During the past year, the Veterans Administration made numerous comparative tests of the nylon-polyester finish against the usual rawhide and found that it had many advantages. Now the University courses on A. K. Prostheses include this method in their instructions. It is safe to assume that in a few more years, the use of rawhide will drop significantly if not into complete disuse.

#### Soft Sockets

We have mentioned that a plastic laminate can serve as a potentially durable and easily formed below knee socket. There is also a modification of this that involves another special plastic which holds good promise. This is a combination unit of a soft rubber-like liner of plastisol over which a rigid supporting shell is built of nylon and plastic resin similar to a plastic socket. For years a soft socket material has been sought for this purpose. The ideal degree of resilience and permanence without packing down after prolonged wear has not been found in a material easily formed, that is non-toxic and resistant to perspiration. However, we have found a new plastisol formulation that comes close to the ideal. It is a rather viscose liquid which will convert to a rubber-like material when heated to 177°C. for a few minutes.

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Using a dehydrated plaster stone model of the stump that has been preheated to 149°C., a liner of any thickness can be built up by repeating the process of coating the model by dripping or application with a spatula and curing it in an oven for 15 minutes then recoating while hot. Once the desired thickness, 5-10 millimeters is reached, there remains only the removal of the liner for trimming before encasing it in a plastic laminate over the same stump model. We find that the soft liner needs to extend only three and one half inches down into the socket to cover the weight bearing area of the stump. We have patients who received a plastisol socket three years ago and are still satisfied wearers of this type of soft socket.

#### Epoxy Resin

Not to mention, in passing, the existence and use of another similar but unrelated plastic resin would leave this paper incomplete. This reference is to the postwar family of epoxy resins which were developed through the Mellon Institute in Pittsburgh, Penn. in their efforts to develop a new plastic for orthopedic appliances. The first name used was the designation C-8 but now that several companies are manufacturing expoxies, we find various trade names like Epon. The epoxy resin is a phenolic like Bakelite but there the similarity ends. In many characteristics it resembles and can be used in laminations as the rigid polyesters. It is a room temperature cure resin usually sold commercially in two liquid parts. Cure time cannot be controlled as readily as with the polyesters, but it can be speeded up by the application of moderate heat. Until very recently flexible epoxy resins were not available. Also the curing agents were highly toxic and many cases of dermatitis developed on those handling the raw resin. Last but not the least of the deterant factors in its wide spread use has been its relative high cost which is more than double that of the polyesters.

The chief asset of the epoxy is its excellent adhesive ability which makes it especially valuable in making strong fibreglas laminates and repairs to prostheses of all materials.

#### **Three Recent Innovations**

1. Several improvements in the use of polyester resins are just being anounced. One is an additive to prevent discoloration of the laminate resulting from exposure to sunlight (ultra violet). Arm prosthesis wearers who often work in the open notice a distinct yellowing of the plastic in only a few months exposure. Now by adding 2 to 4% Ultra Violet absorber to the resin this can be prevented.

2. It is our practice to coat all wood inner socket walls with the rigid "air cure" resin used in our plastic sockets. Within a very short time a heavy coat is tack free and ready for wear. To obtain a similar thickness with a lacquer would take several hours. We add a silica power (it can be used with any resin mixture) which increases the viscosity appreciably while not affecting its wetting ability. This permits application of thick coatings that will not run. When "filling-in" a socket is necessitated by stump shrinkage, a  $\frac{1}{4}$  to  $\frac{1}{2}$  inch thick buildup can be made by adding a 5-6 percent silica to a resin mixture containing cork, wood dust or suitable filler like Bentone. This thixotropic mixture can be contoured to the socket interior and the material will not run to the lowest level. When the resin is cured, it can be sanded smooth and coated to blend into the socket without an offset.

3. Current research work is being directed toward the development of an easily fabricated porous socket with equivalent strength and durability of the present laminae. Such a socket has been made with microscopic

porosity sufficient to carry off moisture equal to the rate that it is produced by the skin. The end result will be a cooler appliance with diminished perspiration around the stump.

#### Summary

It is no longer problematic whether or not leather, wood and other materials used as the basic structure of prostheses will be supplanted by plastics. Real advances have been made on all fronts and they are continuing at a rapid pace. Tangible advantages in the methods of construction as well as in comfort to the patient are self evident to even the casual observer.

Without a doubt the trend to plastics began with the development of low contact pressure polyester resins in 1942 and advanced with the war effort. The subsequent research program in prosthetics assured the full exploitation of its potential and the dissemination of its uses through publications and the postwar university prosthetic courses.

Just about overnight, all upper extremity prostheses were converted to plastic by the appeal of the new found qualities of the new resins. All new components, wrist units and elbow mechanisms, have been designed exclusively for bonding to plastics almost to the exclusion of leather, wood, metal and fibre.

The now conventional technique of laminating nylon and other fabrics with a contact pressure resin enables the prosthetist to fabricate a wide range of end products. He can readily control size, shape, color, weight, strength and shock resistance and incorporate into his laminated prosthesis a whole new armamentarium of components. The amputee patient benefits by these new materials with a more durable appliance that can be made from (*prefitted*) test sockets. Interior and exterior finishes are excellent from the points of view of skin contact and cosmesis.

Though research has developed many techniques and procedures as a guide, the ultimate success of the "masterpiece" depends upon the knowledge and skill of the prosthetist in his handling of materials and in fitting the patient. Plastics, we believe, now provide the versatility and mechanical properties necessary to better accomplish the goal of biomechanical rehabilitation.

#### PLAN TO ATTEND

The National Assembly of the Limb and Brace Profession October 26 to 30, 1958. Eden Roc Hotel, Miami Beach, Florida. Post Assembly Scientific Session at Havana, October 31 and November 1.

#### NEW CONSTANT FRICTION WRIST UNIT

#### F. A. Ritterrath and Robert E. Jones, Sierra Engineering Company Sierra Madre, California

The introduction of the Northrop Model C manual friction wrist unit over 10 years ago was a significant forward step in the development of functional upper extremity prostheses. This unit permitted the amputee to adjust the position of rotation of his terminal device to suit the particular task at hand. Frictional resistance to rotation of the terminal device, thus aiding in holding the set position of rotation, was provided by means of the compression of a rubber washer. The rubber washer was compressed or squeezed, in effect, between the back of the terminal device and the face of the wrist unit. The amount of squeezing or resulting friction was a function of the amount the terminal device was threaded into the wrist unit, or in a finer sense, was a function of the amount that the terminal device was rotated. Thus, the pitch of the thread on the terminal device stud had a marked effect on the rate of increase in the amount of friction available for resistance to rotation of the terminal device.

During the years of field experience with the manual friction wrist unit there has become prevalent a demand for a friction wrist unit of the manual type that would provide constant friction throughout the range of rotation of the terminal device. Constant friction providing resistance to rotation would make the prosthesis much more useful to the wearer, provided that the level of friction could be adjusted to suit each individual wearer. Also, the friction level should be capable of adjustment to a sufficient degree to resist rotation of the terminal device under the action of moments introduced by the control cable system or by the task being performed with the terminal device. Any manual constant friction wrist unit would of necessity be required to function with the standard  $\frac{1}{2}$ -20 terminal device thread.

Sierra Engineering Co. becoming aware of the need of a constant friction wrist unit, assigned the project of developing a suitable unit to its prosthetics engineering group. Many factors must be considered in the design of a prosthetic component, particularly a component to operate at the distal end of an upper extremity prosthesis. Maximum strength with minimum weight; thoroughly reliable performance with the least complicated mechanical design: and the capability of performing consistently for many thousands of cycles, are fundamental goals of good mechanical design. They served as foundations for evaluating various ideas in the thinking stage of the constant friction design project. Many ideas were considered. One of the earliest, for example, was to use the approach of finding material for a mechanism which would provide a flatter spring rate than the rubber washer used in the current manual friction wrist units. This suggested a system of mechanical springs of some sort. Stacks of Belleville springs were one method considered. It soon became apparent that within the space available, mechanical springs or rubber springs would not provide the necessary constant friction due to the axial travel of the terminal device stud caused by the rotation of the threaded portions.

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As the idea of providing friction to resist rotation is, in a sense, the idea of a brake, it seemed logical that the full length of the terminal device stud itself could be considered as a brake drum. Thus, if a brake shoe were applied to the external threaded surfaces of the terminal device stud, perhaps suitable constant frictional resistance could be developed within the allowable design spaces. This concept showed promise and resulted in the testing of various brake shoe materials against the threaded surfaces of the terminal device stud. Of the various materials tested, nylon showed the most suitable characteristics because of its toughness, resistance to wear, machinability and reasonably constant performance with respect to changes in ambient temperature.

Laboratory prototypes of a constant friction wrist unit employing a nylon plug bearing against the threaded surfaces of the terminal device were constructed and tested in Sierra's engineering laboratory. The tests showed promising results. Further refinements were made to the units with respect to the area of nylon in contact with the terminal device stud and the manner in which pressure was applied to the nylon to maintain or adjust the level of friction, all of which contributed to an even smoother action and a more lightwight unit.

Subsequently, several units were fabricated and placed on amputees used in Sierra's test program. The results and reaction from this phase of the development were most encouraging. Production units were fabricated and submitted to the Prosthetic Research Board Transition Program. The child size unit was selected for the first production because of the greater need for constancy of friction by young children who are limited in strength and because the Sierra No. 280 quick disconnect constant friction unit is capable of serving most adult cases.

The results of the PRB tests and evaluations indicated the child size constant friction wrist unit would perform in a satisfactory manner as a component of the prosthetic system. Many valuable suggestions were received from the testing agencies resulting in improvements in the performance of the unit.

The photograph accompanying this article shows the unit alongside a 25cent piece to give a rough comparison of size. The general physical specifications of the unit are as follows:

- 1. Outside diameter: 11/4".
- 2. Laminating distance: 3/4".
- 3. Body material: new high strength aluminum alloy.
- 4. Insert material: nylon-mechanical grade (extensively used for bearings).
- 5. Finish: bright anodize.
- 6. Torque adjustment: by means of a 3/8-32 slotted head set screw.
- 7. Weight: .6 of an ounce.
- 8. Essentially constant torque through at least 180° of rotation.

From these basic specifications, it can be seen that a shorter laminating allowance is required than that required in most other wrist units, thus resulting in more effective and useful prosthetic proportions where cases involving long BE stumps are involved. The constant friction design permits full engagement of all the terminal device threads, as compared with only partial engagement in the present manual friction wrist units. The nylon insert will last, in most cases, for the life of the prosthesis and will require very little adjustment. An initial adjustment after some use, or "run-in," will be required. After this, the torque or constant friction setting will remain essentially constant for the life of the unit.



New Wrist Unit.

The small outside diameter of  $1\frac{1}{4}$ " was designed for use with the No. 1 size child hand, thus preventing crimping of the cable housing exit and bulging at the wrist. Thus, the unit will be very compatible for larger sized hands and other hook-type terminal devices incorporating operating levers or "thumbs." The unit is light in weight in keeping with modern light weight upper extremity prostheses. The friction adjustment is such that the terminal device may be screwed in and out without changing the original torque setting. The constancy of torque through a complete revolution of the terminal device is a great asset to the young child, particularly when low torque settings are required. The friction level can be set so that no accidental revolving occurs when the terminal device is opened.

Although the nylon insert is extremely tough and will wear indefinitely, should replacement be required for some reasons, this can be done in the field. All that is required is a  $\frac{1}{2}$ -20 bolt and a bench vise. The nylon cannot harm the threads of any terminal device and thus contributes greatly to the life of the terminal device stud.

Laminating instructions for installing the Sierra constant friction wrist unit in a plastic prosthesis are essentially the same as those used in applying the conventional manual friction wrist unit to the lay-up. There are some steps that should be followed carefully in order to make the installation successful with a minimum of effort. The following laminating instructions should be followed:

- 1. Remove set screw and apply silicone grease to the threads liberally.
- 2. Screw the set screw to lightly contact bottom.
- 3. Fill slot in screw with wax to keep out resin.
- 4. Place unit on end of build-up of forearm with the set screw on the radial-volar side to make it easy for adjustment by the amputee and to keep dirt out during use.
- 5. Tie off stockinet and laminate in normal manner.\*

<sup>\*</sup> After room temperature cure (if promoter is used), using a sharp pointed knife, cut out the laminate immediately above the set screw position. Trim neatly and remove the wax from the slot in the head of the set screw so it will not discolor the area during melt-out.

- 6. Caution: Do not heat cure above 240° F. as the nylon insert softens and may lose its pressure against the walls of the casing. Remember that nylon, although extremely tough and strong at normal temperature, is thermoplastic, that is, it will melt at elevated temperature.
- 7. After the wax has melted out and the laminate cooled, a ½-20 tap may be carefully run through to clear the threads of wax. Lubrication may be applied but the residual wax provides some lubrication of its own. Screw in the terminal device and adjust the torque, completing the installation.

The Sierra constant friction child size wrist unit is now available for shipment from factory stock. Production units of the adult size are being prepared for submission to the PRB testing agencies. Availability of the larger sizes will be announced following completion of testing and evaluation.

#### OALMA MEMBERS PICK NEW DIRECTORS New OALMA Board to be Installed at Miami Beach

Each year members of OALMA by written ballot, choose eleven of their number to serve as Regional Directors of the Orthopedic Appliance and Limb Manufacturers Association. The eleven Regional Directors with the National President, First and Second Vice Presidents and Secretary-Treasurer, constitute the official governing body of the Association.

This year in the balloting for the term 1958-1959, these eleven were chosen and will be installed at the OALMA session in Miami Beach October 27:

Region I: Karl W. Buschenfeldt of Stoughton, Massachusetts, to represent the New England States.

Region II: Fred Eschen of New York City to represent New York and New Jersey.

Region III: Basil Peters of Philadelphia, representing Pennsylvania, Delaware, Maryland, the District of Columbia and Virginia.

Region IV: George H. Lambert of Snell's, Baton Rouge, Louisiana, representing the area roughly of the old Confederacy (North and South Carolina, Tennessee, Kentucky, Mississippi, Alabama, Georgia, Florida and that part of Louisiana east of the Mississippi River, including Baton Rouge and New Orleans.)

Region V: Charles W. Rosenquist of Columbus, Ohio, to serve the states of Ohio, Michigan and West Virginia.

Region VI: Richard G. Bidwell of Milwaukee, representing the states of Wisconsin, Illinois, Indiana and Eastern Missouri.

Region VII: Ted W. Smith of the Isle Company and Knit-Rite Company, Kansas City, Missouri, representing the great Middle West Region (Minnesota, Iowa, Western Missouri, North and South Dakota, Nebraska, Kansas, Wyoming and Colorado).

Region VIII: David C. McGraw, of Snell's, Shreveport, Louisiana, representing Texas, Oklahoma, Western Louisiana, Arkansas and New Mexico.

Region IX: Fred Quisenberry of Alpha Orthopedic Appliance Company, Los Angeles, reelected to represent Southern California and Arizona.

Region X: Herbert J. Hart, of Hittenberger's, Oakland, reelected to represent Northern California, Nevada, Utah and Hawaii.

Region XI: William E. Brownfield of Boise, Idaho, representing Washington, Oregon, Idaho and Montana.

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L. to R.: Dr. P. A. Walford, Deputy Chief Medical Director; Dr. L. A. Zink, Assistant Chief Medical D.rector for Operations; Mrs. Stearn; Mr. J. D. Johnson, Chief Purchase and Contracts Division; Mr. R. E. Adkins, Excutive Officer in the Chief Medical Directors Office. The above photograph was made at the reception honoring Mrs. Stearn on her retirement after more than forty years of service with the Veterans Administration.

#### MRS. STEARN RETIRES

Mrs. Adenia Stearn, Chief of Service Contracts Section of the Veterans Administration, is retiring at the end of August after more than forty years of service. Members of her staff, friends and colleagues joined in a reception in her honor held at the Veterans Administration headquarters building in Washington August 8.

In a message of greetings Mrs. Stearn wrote as follows:

"To My Friends in OALMA:

After forty years in the Government service I am retiring at the end of August, 1958. During the years of my service I have had the privilege of working with so many of you. Through research, study, trial and error we have strived to procure for the veteran the very best, the most improved artificial limbs or their accessories obtainable. This we have done with your help at prices which we believe to be fair and equitable to the government and at a profit which we hope has been fair and equitable to you. And so as I say goodbye, I want to extend to each and everyone of you my sincere thanks for your patience and forbearance, your assistance and co-operation in our joint effort to continually strive to improve the Prosthetics Program for the benefit of the veteran and the ultimate benefit to us all.

I wish you the best of luck in the future and if ever I can be of any assistance to you it would be a privilege and a pleasure to serve you. Very sincerely yours, Adenia Stearn."

Dr. Robert E. Stewart, Director of the Prosthetic and Sensory Aids Service, paid tribute to Mrs. Stearn in these words:

"The Prosthetic and Sensory Aids Service will miss Mrs. Adenia Stearn. Her devotion to the principles of good contractual management will always be remembered by all of us here. Her loyalty to the Prosthetic and Sensory Aids Service and her untiring efforts to assist us in providing the best prosthetic devices for veterans have been instrumental in enabling us to function successfully over the years. We





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\*Different settings

\*All sizes — 6" to 30"

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wish her much happiness and success in all of her future activities."

Service Contracts Section The headed by Mrs. Stearn, has one of the most difficult procurement responsibilities in the Federal Government. With a staff of only 23 employees, it is responsible for the procurement of services and supplies of many and varied types. In addition to the procurement of artificial limbs and the staff supervision of local purchases of braces and supports, it includes such varied items as optical lenses, plastic eves, hearing aids and guide dogs for blinded veterans. The work of her unit was described by Mrs. Stearn in an article, "We buy hope for Veterans," which appeared in the June 1955 issue of the Orthopedic and Prosthetic Appliance Journal.

As she takes up the challenge of retirement years, Mrs. Stearn takes with her the best wishes of the members of OALMA, who have worked with her in providing prosthetic service to the veterans.

#### **REVIEW**

A PRIMER OF CEREBRAL PALSY By Joseph D. Russ, M.D. and Hyman R. Soboloff, M.D. Published at Springfield, Illinois by Charles C. Thomas, 1958. 77 pages. Illustrations. \$4.00.

This helpful booklet is one of the American Lecture Series in Pediatrics. The authors are both faculty members of Tulane University School of Medicine, and have had an unusually wide experience in the Cerebral Palsy field. The orthotist who reads this book will be oriented in all aspects of the cerebral palsy problem, and will thereby be better equipped to work with the patient, the therapist, and physician.



Mr. Louis C. Weld, President, G. W. Chesbrough Co., with three new Chesbrough Pre-Walkers. Club foot, Open toe and Closed toe Surgicals.

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Big promise? Maybe. But here's why I think it's safe to say this new line of high-grade but *moderately* priced corrective pre-walkers offers you an opportunity.

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**Two New Forms From** 

#### RANCHO LOS AMIGOS HOSPITAL

Comments by Roy Snelson, Manager of Orthetic Dept.

MUSCLE CHECK, FORCE, AND MOTION CHART

ross		Martin		Left			Right							
irade	Segment	Motion	Range	Force	Grade	Range	Force	Grade						
	Scapular	Elevation	10.2					-						
		Abduction												
		Adduction												
	Humeral	Flexion												
		Extension			-									
		Abduction												
		Adduction												
		Internal Rotation												
		External Rotation												
	Forearm	Flexion												
		Extension						1						
		Pronation												
		Supination	-											
	Wrist	Dorsi Flexion												
		Volar Flexion												
		Ulnar Flexion												
		Radial Flexion												
	Thumb	Opposition	1											
		Flexion												
		Extension												
		Abduction												
		Adduction												

Course		Motion	Joint		Left										Right											
Grade	Segment			Range				Force				Grade			Rang			e	Force			e	Grade			e
				T	1 2	3	4	1	2	3	4	1	2	34	1	2	3	4	1	2	3	4	1	2	3	3 1
	Fingers*		M.P. Joint																							
		Flexion	Prox. I.P.								_	_					1	1	1	1						e
		neers	Distal I.P.																	L						
+			M.P. Joint																		L					
		Extension	Prox. I.P.																	L						Ц
			Distal L.P.								1															
		the second s	*	-		12 1				1.1			-													

"Index finger = #1; Middle = #2; Ring = #3; Little = #4

O - FLAIL; P - POOR (Full range of motion, but not against gravity); F - FAIR (Full range of motion against gravity); G - GOOD (Full range of motion against resistance); N - NORMAL SUGGESTION PRESCRIPTION:

This muscle check, and force motion chart was designed here at Rancho. After looking over the conventional muscle check charts that physical therapists use, we felt a need for one in Orthetics that actually told us what function a patient had. We divided the different segments into their individual motions. For example the scapula is capable of elevation, adduction and abduction. We measure the range of motion, the force, and give it a grade. We then group these grades into a gross grade for the segment.

As yet we haven't developed a formula for arriving at a gross grade, but rather use a rule of thumb. For instance in the forearm, we have flexion, extension, pronation and supination. In terms of function, flexion is by far

the most important action. Extension will be provided by gravity if the patient is standing upright, and as long as no contractions are present the patient can get along without pronation and supination. Therefore we might have a patient with a forearm flexion grade of good, an extension grade of 0, a pronation grade of 0, and a supination grade of 0, and arrive at a gross function grade of good. However to reverse the situation, if the patient had 0 flexion, good extension, good pronation and good supination he wouldn't have nearly as functional a forearm as the patient with good flexion, which would mean some type of bracing would be indicated. We use the same system with the rest of the segments.

After the patient has been given a complete muscle and force motion check, and the gross grades given, this chart presents a complete picture of the patient's function at a moment's glance. We have also provided a place on the bottom for suggested prescriptions. This gives the Orthotist a complete picture of the patient, and his suggestion for a device to the clinic team.

The Functional Assistive Hand Measurement Form is self explanatory. It contains the basic measurements required for the different type hand splints, and their attachments. We found it more satisfactory to have a form to fill out when measuring hand splints rather than writing measurements on a piece of paper. When a chart is used there is less chance of leaving out an important measurement.

#### ORTHOTIC INFORMATION—FUNCTIONAL ASSISTIVE HAND SPLINTS MEASUREMENTS FORM

Patient's Name	Date	
Measurement 1. Width of hand across metacarpophalangeal joints at widest point	Left Hand	Right Hand
2. Distance between palmar aspect of index finger metacarpophalangeal joint and distal interphalangeal joint of thumb		
3. Thumb circumference proximal to distal interphalangeal joint (Use ring gauge)		
4. Finger circumference at middle phalanx: (Use ring gauge) Index		****
Long		
Ring		
Little		
5. Finger circumference at distal phalanx:		
(Use ring gauge) Index		
Long		
Ring		
Little		
6. Index finger circumference at proximal phalanx		
7. Distance from ulnar styloid to metacarpo-		
8. Circumference of wrist proximal to ulnar		
		****
9. Circumference of forearm at midpoint		
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#### [Printed on back of form]

#### ORTHOTIC INFORMATION-FUNCTIONAL ASSISTIVE HAND SPLINTS

#### TABLE OF RING GAUGE DATA

		Metal Length	
Ring Size	Circumference	0.036" Stock	0.125" Stock
0	1-15/32"	1-19/32"	1-27/32"
$0.1/_{2}$	1-17/32"	1-5/8″	1.29/32"
1	1-9/16"	1-11/16"	1.15/16"
$1-\frac{1}{2}$	1.5/8″	1-23/32"	2"
2	1-21/32"	1-25/32"	2-1/32"
$2 \cdot \frac{1}{2}$	1-23/32"	1-13/16"	2-1/8"
3	1.3/4″	1-7/8″	2-5/32"
$3.1/_{2}$	1-13/16"	1.29/32"	2-3/16"
4	1-27/32"	1-31/32"	2-7/32"
4-1/2	1-29/32"	2"	2-9/32"
5	1-15/16"	2-1/16"	2-5/16"
$5.1/_{2}$	2"	2-3/32"	2-3/8"
6	2-1/32"	2-5/32"	2-13/32"
$6 - \frac{1}{2}$	2-3/32"	2-3/16"	2-15/32"
7	2-1/8"	2-1/4"	2-1/2"
7-1/2	2-3/16"	2-9/32"	2-9/16"
8	2-7/32"	2.11/32"	2-19/32"
$8.1/_{2}$	2-9/32"	2-3/8"	2-21/32"
9	2-5/16"	2-7/16"	2-11/16"
9-1/2	2-3/8"	2-15/32"	2-3/4"
10	2-13/32"	2-17/32"	2-25/32"
$10-1/_{2}$	2-15/32"	2-9/16"	2-27/32"
11	2-1/2"	2-5/8"	2-7/8"
$11-\frac{1}{2}$	2-9/16"	2-21/32"	2-15/16"
12	2-19/32"	2-23/32"	2-31/32"
$12-1/_{2}$	2-21/32"	2.3/4''	3-1/32"
13	2-11/16"	2-13/16"	3-1/16"
$13-\frac{1}{2}$	2-3/4"	2-27/32"	3-1/8″
14	2-25/32"	2-29/32"	3-5/32"

ORTHOPEDIC & PROSTHETIC APPLIANCE JOURNAL

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#### "OUR THIRTIETH YEAR"



Flexible Type Support, Combination Longitudinal and Metatarsal with Concealed Metal Spring, Made in Women's, Men's and Children's Sizes,



Style 800

Stainless Steel Support with High Inner Flange, Women's, Men's and Children's Sizes. The Above Style also Available in Specially Treated Dural.



Style 903 (Leather Whitman) A Combination Support with Both Inner and Outer Flange, Made with One or More Springs, Women's, Men's and Children's Sizes.



Style 900 Most Popular Metal Whitman, Made of High Grade Stainless Steel. Women's, Men's and Children's Sizes.



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#### **Rehabilitation Leaders**

Judge Vincent J. Dalton



(This is the first of a series of notes on the men and women who are giving effective leadership to rehabilitation activities in this country and abroad.)

Vincent J. Dalton is now in the second decade of service as Judge of the Court of Common Pleas of Schuylkill County, Pennsylvania.

Judge Dalton has reason for his interest in prosthetics and for his activities as President of The Fraternity of the Wooden Leg, Inc. At the age of twelve he lost both arms in a railroad accident. For most people this would have been lifelong catastrophe. His parents were poor, and he could expect very little in the way of additional aid, because the earnings of his father were required for a family of nine children. But while still in the hospital, Vincent Dalton determined that he was going to be a lawyer.

Vincent resumed his studies in school after returning from the hospital and wrote by using a pencil fastened to a leather band on what remained of his right arm. He later obtained other modern appliances. 1914 found him graduating as valedictorian of his high school class. He supported himself as a salesman, earning enough to buy himself a pair of mechanical arms and entered Villanova College. Success crowned his studies of the law and February 21, 1921, the young lawyer was admitted to practice before the Supreme Court of the State of Pennsylvania. Before his election to the bench, he earned an outstanding reputation as a trial lawyer.

Success did not make him forget the cause of the handicapped. His efforts through the years have earned him a certificate of merit from the Disabled American Veterans, and a certificate of appreciation from the American Federation of the Physically Handicapped. June 1, 1953, Villanova University, His alma mater, conferred on him the Honorary Degree Doctor of Laws, and he is now a Director of the University Alumni Foundation.

Judge Dalton has attended a number of OALMA Assemblies. Col. Bob Allen, a friend of the Judge, has well characterized him as an example to the American people for his ability, courage and charity, and for his work during both World Wars with the thousands of wounded servicemen who were in need of the inspiration, cheer and hope that he gives.

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Judge Dalton was named by the Veterans Administration as "Official Visitor" to all seven Amputation Centers during World War II. His demonstrating the use of arm prosthetics was of great morale-building value to arm amputees.

The Fraternity of the Wooden Leg is the name of a unique non-profit and benevolent organization, which is one of Judge Dalton's chief interests. It was founded in June of 1940, and, today, Judge Vincent J. Dalton serves as President of this organization. The purposes are:

1. The restoration of morale and the rebuilding of ambition in the field of amputation cases.

2. Extending constructive aid to the members of the Fraternity and to those who will become eligible for membership in the years ahead, whether by accident, illness or as the result of military or naval services.

"Courage" is the official publication of the Fraternity of the Wooden Leg, and its principal Vehicle for carrying out the work of the Fraternity. This little publication, which is edited by Miss Augusta B. Weaver, Co-Founder of F.W.L., Inc., has brought a message of cheer and comfort to countless amputees in the U.S.A. and 24 foreign countries. Miss Weaver travels extensively in connection with her duties as "Good-Will" Ambassador of F.W.L., Inc. The reports of her visit to service hospitals, to rehabilitation centers are carried regularly in the magazine, "Courage." A special feature of "Courage" are the excellent cartoons relating to amputees by Edward J. Barczuck, of Chicago, an arthritic who is completely immobile, but whose spirit is undimmed and his courage unwavering. He draws the incredible cartoons with his hand *braced* in a *sling*.



Reprint, Literature, Measuring Charts and Instructions upon request

## The Jewett Brace ...

is specifically indicated for compression fractures of the spine and other cases requiring positive hypertension of the spine, or the correction of a kyphosis; it is fully accepted by Orthopedic Surgeons generally and is custom made to the existing standards demanded by good brace making technique.

#### FLORIDA BRACE CORPORATION

Box 1366

Winter Park, Florida



#### **OALMA REPORT**

by

#### President

JOHN A. McCANN

There is so much happening in the limb and brace field that it is difficult to choose the most important subjects for this column. There are two, however, which at this time deserve your serious consideration:

1. OALMA has just moved to take on important responsibilities in the Prosthetics Research program (and our friends, the orthotists, should remember that the research program now includes braces as well as artificial limbs). This is the new *Committee on Advances in Prosthetics*, which will take over many of the activities and responsibilities of introducing new devices and techniques to our member firms.

This Committee, headed by Carlton Fillauer and composed of experienced and skilled prosthetists, will also look into such items as the problem of attendance at amputee clinics, the "feedback" to research headquarters of your comments on these new devices and services—how they are working out, etc. And the encouragement of the marketing and manufacture of the desirable new devices which come out of the research program (not all of these, of course, however desirable, will find a marked response from the amputee and his prescribing physician).

2. Brace Seminar—As I write this, the Brace Orthotic Seminar is getting underway in New York City. This is sponsored by New York University and by OALMA. Thirteen members of OALMA, all experienced orthotists, are engaging in a week of "skull practice." Their object: to come up with the basic essentials of a university course in Lower Extremity Bracing. This will mean much for the advancement of the orthotic profession and for the future status it holds. Those of our members who have sons coming along in this field, will benefit from the work of this project.

I've touched on my two subjects, and I haven't said a word yet about the wonderful program being planned for the *National Assembly*. Ralph Storrs and Ted Smith, who head up the Program Committee, have outdone themselves. They have prepared a program of unusual merit and significance. And they haven't forgotten for a minute that you'll be meeting in *Florida*, the Playground of the Nation. They'll work you hard during the technical sessions, but you'll have fun with your family in the afternoon and evening. Many of you, I know, are now making plans for this session. The National Assembly and its post-Assembly session at Havana, are going to be the experiences of a lifetime. Don't miss them!

-John A. McCann

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#### Code of Ethics for the Artificial Limb and Brace Profession

The Federal Trade Commission has approved fair trade practices for the field of artificial limbs and for orthopedic appliances. Both codes have been adopted by the American Board for Certification as a guide for the Certified Prosthetist and Orthotist. The full text of the Codes may be obtained from the Board's Headquarters. The following digest is printed for ready reference.

It is an unfair trade practice:

- (1) To deceive purchasers or prospective purchasers as to any of the qualities of a prosthetic or orthopedic appliance, or to mislead purchasers or prospective pur-chasers in respect to the service of such appliances.
- (2) To infer an artificial limb is equivalent or nearly equivalent to the human limb, complies with any government specifications, or has the approval of a government agency unless such be wholly true or non-deceptive.
- (3) To fail to disclose to a purchaser, prior to his purchase of a prosthetic appliance, that the degree of usefulness and benefit will be substantially dependent upon many factors, such as the character of the amputation, condition of the stump, state of health, and diligence in accustoming oneself to its use.
- (4) To promise that any product will be made to fit unless such promise is made in good faith and industry member is possessed of the ability to fulfill such guarantee. A prosthetic device or an orthopedic appliance is not to be considered as fitting unless properly shaped for the body member to which it is applied, and in proper alignment and conformity with the physique of the person to wear such a
- product, and affords the optimum of comfort and use on the part of the wearer. (5) To deceive anyone as to his authority to represent and make commitments in behalf of a member unless such be fully true.
- (6) To use any testimonial or use any picture which is misleading or deceptive in any respect.
- (7) To demonstrate any appliance in a manner having the tendency or effect of creating a false impression as to the actual benefits that may be reasonably expected from it.
- (8) To use any guarantee which is false or misleading.
- (9) To represent that any appliance conforms to a standard when such is not the fact.
- (10) To publish any false statements as to financial conditions relative to contracts for purchase of appliances.
- (11) To engage in any defamation of competitors or in any way to disparage com-
- petitors' products, prices, or services. (12) To use the term "free" to describe or refer to any product which is not actually given to the purchaser without cost. (13) To wil/ully entice away employees of competitors, with the purpose of injuring,
- destroying or preventing competition.
- (14) To take part in any concerted action with other members to wilfully fix prices.
- (15) To promote the sale of any appliance to any person who can not be expected to obtain reasonable benefit from such appliance,
- (16) To refrain from giving every assistance to doctors before and after amputation or crippling condition, or to fail to do everything possible to promote mutual trust and confidence between members and the medical profession.
- (17) To undertake to supply an artificial limb by mail-order specifications without personal fitting thereof unless conditions are such which make an exception desirable, and in any case, no misrepresentation shall be made as to fit.
- (18) To unduly exploit features of appliances less important than proper fit and alignment.
- (19) To fail to recognize that the interest of the amputee and the handicapped is the first concern and therefore any failure to make available to all of its members and the general public any improved technique that may be used as to making, fitting, aligning or servicing products shall be an unfair trade practice.
- (20) To pay anything of value to any doctor for the purpose of obtaining a referral of a patient by the doctor.

Further, the limb and brace profession desires to be an active and cooperative factor in all progressive developments of improved techniques that will contribute to the welfare and comfort of all who use its services.

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## To All Certified Orthotists and Prothetists

Greetings from Roy M. Hoover, M.D. President of the American Board for Certification

This year there has been at least a certain amount of advance toward the possibilities of more complete training and more satisfactory training for the orthotists. In the past I have emphasized several times that we should have more opportunities for advanced study for orthotists and following the pilot school this summer at the University of California, Los Angeles, a series of training courses are being given there in functional bracing of the upper extremity. This work has many very fascinating possibilities, not only for the orthopaedic surgeon but for the ingenious and careful orthotist. I am hoping that it will work out to be of great help to those having severe upper extremity problems.

There has also been a good start toward additional brace construction training at New York University and it is very strongly hoped that this is only a beginning in more complete and even more advanced training for the bracemakers.

It is now only a very short time until the certification examinations will be given on the West Coast, in the Midwest, and at the Miami meeting. The present prospects are for the greatest number of applicants ever presenting themselves for the examinations and we feel that this is an indication of the importance which certification has attained in the industry. The Board sincerely hopes that we will have a large number of men taking the examinations and they make an excellent showing. The meeting of OALMA immediately follows the examinations which is an excellent opportunity for the members to get together, renew former frindships and get new ideas for a more satisfactory year's work ahead.

RaymHoour

#### THE NEW SABOLICH BUILDING IN OKLAHOMA CITY



Lester J. Sabolich

The Certification Emblem shown on the front left of the building exterior was especially made for the Sabolich Company. (Duplicate copies are obtainable for other Certified establishments—at approximately \$200 each. Certified facilities which are interested should write Mr. Sabolich for the name and address of the designer.)

The building was designed by Dow Gummerson, architect, and built by Paul Thrash, and financed by the Northwest National Bank in Oklahoma City.

Mr. Sabolich is a graduate of the UCLA Course in Prosthetics. The facility which he established in 1946 is certified for both prosthetic and orthopedic appliances and operates under the name of the Lester J. Sabolich Artificial Limb and Orthopedic Appliance Company. A branch is operated in Enid, Oklahoma, at 617 South Quincy St.



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These are interior scenes of the new Sabolich facility in Oklahoma City. The building is 38 by 75 feet and is located at 1017 N.W. 10th Street, Oklahoma City, Oklahoma. In the shop, left to right, are: Lloyd T. Keller and Charles Foster, orthotists; Ray Buddin, prosthetist and orthotist, and Raymond Crawford, finisher and upholstery man (those with sharp eyes will see the hand and arm of Lester J. Sabolich, owner and manager, on the extreme right).

## Turn to

Medic

You never have to hesitate about where to turn to supply the doctor's shoe prescription needs for children. You'll always turn in the right direction when you turn to Medic. For in Junior Arch Preservers, Medic makes a shoe to fill every doctor's shoe prescription needs.

Built on lasts designed with the greatest possible care to meet the special needs of children, made of only the very finest leathers obtainable, constructed by master craftsmen to the most exacting standards, Junior Arch Preservers by Medic are unquestionably the finest shoes made for children.

Thomas

Heel

Inc.





For Mild

Supination









The complete line of feature shoes for children that doctors recommend

**PAGE 116** 

For Extreme

Pronation

Wedge

Construction

#### MOBILE REHABILITATION CENTER



Sandra Campbeli of Troy, A.abama, was a patient at the Mobile Rehabilitation Center when this picture was taken with Richard Locke (J. E. Hanger, of Birmingham) at the right and R. W. Goldsby of Mobile. Moody Smitherman was absent when the picture was made.

OALMA members in Alabama are cooperating in the work of the Mobile Rehabilitation Center. This was opened in the spring of 1958, and is operating as a Rotary Foundation Diagnostic Clinic and Rehabilitation Center at 1874 Pleasant Avenue, Mobile, Alabama.

E. B. Bowman, Executive Director, reports that in the four months since opening, over 300 patients have registered. Eighteen diagnostic clinics are held each month, there is a shop class in gait training, and between 70 and 80 report daily for therapy. At each of the orthopedic and amputee clinics prosthetists and orthotists are present and a part of the team.

In the picture above, the young lady is wearing an arm fitted and made by Moody Smitherman, of the Birmingham Artificial Limb Company.

#### WHAT'S NEW(S)

Norman Bodenstein, C. O., is co-author of an article, "Mechanical Substitutes for Hand Function in the Tetraplegic," which appeared in the "American Journal of Physical Medicine," April 1958. The other authors are Doctors Arthur S. Abramson, Alfred Ebel and Andor A. Weiss.



patients vary—varicosities vary . . . prescribe for BOTH from the complete

# Kendrick Line of 3 Basically Different Elastic Stockings

Kendrick Elastic Stockings are individualized for specific varicosities and for your patient's type. There are different types of construction — different kinds of knitting — different degrees of pressure. For the proper support elastic stockings are supposed to give, you can depend on Kendrick. Check these basically different models:

KENNIT: two-way stretch, full-fashioned elastic hosiery reinforced with fine cotton or nylon . . . for all except the most severe varicosities.

KENLITE: a "fashion-wise" two-way stretch, sheer full-fashioned stocking knitted entirely of fine, nylon-wrapped rubber yarn . . . for mild support and general use . . . practically unnoticeable. KENLASTIC ACCORDION-STITCH: one-way stretch elastic stockings available in varied degrees of support — light to heavy. Patented construction eliminates wrinkling and binding over instep and behind knee. The ultimate of fine craftsmanship.

If you cannot get genuine Kendrick Elastic Stockings at your local surgical supply dealer, write us and we will tell you where you can get them.

JAMES R. KENDRICK COMPANY, INC. Philadelphia 44, Pa. — New York 16, N.Y.



OVER A CENTURY OF EXPERIENCE IN KNITTED ELASTIC FABRICS

#### UCLA OFFERS EVENING COURSES

Three evening courses in prosthetics and orthotics are being given at the University of California, at Los Angeles, during the 1958-1959 school year. The courses are a part of the Prosthetics Education Program of the U.C.L.A. School of Medicine and the Department of Continuing Education in Medicine and Health Sciences.

#### X 466 Principles and Practices of Above Knee Prosthesis Fitting and Alignment

A course for prosthetists and trainees including: anatomy and kinesiology of the hip, thigh and leg; measurement techniques; analyses of flexion and adduction; socket plan and shape; socket fit; biomechanics of above-knee prosthetics; the adjustable leg; static and dynamic alignment; the alignment duplication jig; and checkout. Above-knee prostheses will be fitted to amputee subjects as part of the course of study.

Course X 466 meets in the Prosthetic Education facilities at the UCLA Medical Center from 7:00 P.M. to 10:00 P.M. each Tuesday evening beginning September 16, 1958. Two eight-hour Saturday laboratory sessions will be held each semester. Tuition, \$45.00 per semester.

Instructors: John Bray, CP & O and Charles Hennessy, CP & O.

#### X 475 Basic Principles of Upper Extremity Bracing—Part II

The continuation of a course for orthotists and trainees including: analysis of functional loss in the shoulder girdle, shoulder and elbow caused by paralysis; biomechanics of functional arm bracing; application of braces for various combinations of deficiencies; power sources for replacement of lost function, selection of components; and checkout. Braces will be fitted to clinical subjects as part of the course of study.

Course X 475 meets in the Orthotics Department at Rancho Los Amigos Hospital from 7:00 P.M. to 10:00 P.M. each Thursday evening beginning September 18, 1958. Four six-hour Saturday laboratory sessions will be held each semester. Tuition, \$45.00 per semester.

Instructors: Roy Snelson, CO and Jack Conry, CO.

#### X 479 Professional Aspects of Prosthetics and Orthotics

A one-year course for facility owners and managers including: prosthetic and orthotic practices from ancient times to the present; the paramedical professions of prosthetics and orthotics as they have evolved; the position of prosthetics and orthotics in the community; systems and procedures of accounting; business and industrial management; the legal aspects of doing business; tax implications and psychology of the physically handicapped.

Course X 479 meets in the Prosthetic Education facilities at the UCLA Medical Center from 7:30 P.M. to 9:30 P.M. each Wednesday evening beginning September 17, 1958. Tuition, \$60.00 for the entire year.

Instructors: Martin Sosin, BS, LLB, and Le Roy Nattress, AB, MA.

Information about enrollment may be obtained by writing or calling LeRoy Wm. Nattress, Jr., Prosthetics Education Program, Room B 4-229, Medical Center, University of California, Los Angeles 24, California. Telephone: BRadshaw 2-8911.



## CONVERTIBLE BRACE SHOE

Sabel introduces a newer, cleaner, simpler brace and shoe combination that simplifies the prescribing of corrective footwear by the doctor, for all time. The shoe features the Roto-Lok insert, a built-in serrated disc that is attached to the sturdy steel shank . . . no abrasive or scratching action. It's the perfect night . . . and day shoe . . . with or without the brace. Saves an extra pair of shoes.



# ....with a Im Im Section BUILT-IN ROTO-LOK INSERT

The setting of the splint on the shoe is made easy by a protractor that is stamped on the sole of each shoe.

#### EMBOSSED PROTRACTOR STAMPED ON SOLES

The brace has a matching serrated disc and smooth knurled nut that screws into the disc in the sole of the shoe, holding it firmly in the position the doctor desires.

This smoother brace has no protruding arms or edges to cut or tear bed clothing.

R. J. POTVIN SHOE CO., BROCKTON, MASS.

WALKER

RIGHT

80

40 1111,40

SEPTEMBER, 1958

PRE-WALKER

20 0 20 40

LEFT

#### FACILITY USES TRAILER



FACILIT, TAKES TO THE ROAD—The equipped trailer used by the Binghampton Limb and Brace Company is shown outside the facility at 67 Glenwood Avenue, Binghampton, New York. The interior view shows how well-equipped the trailer is. (A similar unit is now being used in France).



Since 1954, the Binghamton Limb and Brace Company, Binghamton, N. Y., makes use of a well-equipped trailer to save the amputee's time and to make fittings and needed repairs with a minimum of inconvenience and a maximum of service. The pictures show the trailer as it is equipped.



S. W. Conrad, Secretary-Treasurer of the Company, writes the Journal that:

"We believe that the trailer is as well equipped as 85% of the stationary shops in the business. It is stocked with all types of leather used in the limb and brace business with parts for our own type units plus parts of some other companies. It carries stump socks, elastic hosiery, plaster of paris bandages for cast making, willow wood (shins, thighs and foot blocks). It is possible to make a foot, fit a socket (upper or lower extremities) on the spot.

"The general use of the trailer is for fittings (set-ups made at the factory) at a central place in the town or city. We stay one day only and many times we have gone direct to the patient's home and made the fitting or repairs in their driveway. The trailer has not been exploited as it should have been, for the reason of not being able to secure the proper salesman. We carry brace parts, too. You will notice by the pictures that the machinery and tools are there along with welding outfit that did not get into the picure. The fitting room is in the back with a lounge and is heated with electric heaters. Our large flexible shaft is under the work bench on a swivel; cupboards are full of stock. There is approximately 210 sq. ft. of floor space which really is plenty of room for the use required."



#### WELCOME TO A NEW MEMBER

Norman Shamp, a Certified Prosthetist is head of the Shamp Artificial Limb Company. He has had 16 years of experience in the field and holds a Suction Socket Fitter Certificate.

Norman and his wife, Bess, who is in charge of the office, make their home in Canton, Ohio, but commute to the facility location at 68 Springfield Road, Barberton, Ohio.

The shop, which was opened two years ago, now has a staff of 3 fulltime men and one part-time. It is operated in accordance with the Code of Ethics of the American Board for Certification. No salesmen are employed; patients are referred by physicians and through word-of-mouth recommendation of other satisfied amputees. Norman Shamp writes the *Journal* that he is grateful for the opportunity he had of learning the prosthetic work under one of the best men of the field, Joseph Spievak of Youngstown, Ohio, a Past President of OALMA. Mr. Shamp believes that the follow-up after delivery of the prosthesis is a very important part of the facility's responsibility. Wherever a training program is not available for the patient in a rehabilitation center, a program is instituted in the shop itself before the patient is finally discharged.

#### WELCOME TO OALMA—NEW MEMBERS

The Orthopedic Appliance and Limb Manufacturers Association announces the election to membership of the establishments listed below: Biographical sketches of the Heads of these establishments will appear from time to time in the Journal. The addresses and the names of the firms will be published in the 1958-1959 OALMA Roster.

1. Calgary Artificial Limb Factory, 605 First Street East, Calgary, Alberta, Canada. W. D. Roberts is head of this firm, which has been in operation for 45 years. Telephone number is A.M. 24070. Scope of firm: Limbs, braces, surgical supplies, canes, wheelchairs.

2. Progressive Artificial Limb Company, 3031 34th Street, Lubbock, Texas. Telephone Number—Sherwood 4-7394. Fred A. Lucas, Certified Prosthetist, is head of this firm, which has been in operation for three years. Its scope includes artificial limbs, canes, crutches and wheelchairs.

**3.** Shamp Artificial Limb Company of 68 Springfield Rd.; Barberton, Ohio. The telephone number is PLaza 3-8821. Norman E. Shamp, Certified Prosthetist, is head of this firm, which has been in operation for two years. Its scope includes artificial limbs, canes, crutches and wheelchairs.

4. Wayne Pharmacal Supply Company; Orthopedic Appliance Department; 347-9 West Wayne St.; Fort Wayne 1, Indiana. Telephone number is E-4626. Melvin Watts is President of this firm and Dwight E. Carr, Certified Orthotist, is in its employ. Its scope includes braces, surgical supplies, canes, crutches and wheelchairs.

5. Rhode Island Limb Co., 602 Elmwood Ave., Providence 7, R. I.; Telephone number is Williams 1-6230; Albert P. Teoli is President. The firm. which has been in operation 12 years, is in the field of artificial limbs.

6. Vancouver Orthopedic Service, 2012 "C" Street, Vancouver, Washington. Telephone: OXford 5-2722. Edward B. Greene is President. This firm handles artificial limbs, braces, surgical supplies, canes, crutches and wheelchairs. It has been in operation for seven years.

#### CAMP NAMES EDWARDS

William H. Edwards has been named Manager of Manufacturing of the S. H. Camp & Company plants in the United States, Canada and Great Britain. Mr. Edwards formerly owned and operated his own consulting service and was at one time Chief Development Engineer for the Singer Sewing Machine Company in New York City. He worked with many leading corset and brassiere companies while associated with Singer. Mr. Edwards has taught Engineering Systems procedures in several countries and is the author of a book on Needle Trades Engineering and Methods Time Management Technique. PAGE 124



Mrs. Virginia Hedges President



Mrs. Bobbye McGraw 1st Vice President



Mrs. Margaret Peters 2nd Vice President



Mrs. Gertrude Buschenfeldt, Secretary



Mrs. Pearl Leavy, Treasurer

#### **OALMA's Women's Auxiliary**

The "Fall Season" has arrived and just around the corner—"The Trip to Florida"—which we have all been awaiting with much anticipation.

To quote Miss Gwen Rhys, who also has had the pleasure of a vacation at The Eden Roc. . .

I have been counting the months, weeks, and now days, looking forward to the 1958 OALMA Assembly. And while this event usually means lots more work—this year I am looking forward to a vacation at EDEN ROC.

I spent my vacation there in June 1957 and loved it. It has the most relaxing atmosphere of any hotel I have ever had the pleasure of visiting. So I thought it would be nice to tell you what you can do and enjoy yourself.

The main lobby of the Eden Roc is quite formal and very impressively beautiful and when one is all dressed up for the evening affairs, is a delightful place to sit and watch the rest of the world go by. I know you don't do much sitting around waiting for things to happen, but you might have occasion to sit for a minute and this would be the ideal spot. What I choose to call the music corner is up a few steps from the main lobby and has piano, radio, television, comfy chairs in a Chinese decor—beautifully done.

However, I believe you are more interested in what you can do in the morning while father is busy going to seminars and business meetings. You can go from your rooms to the play areas in your swim suits, shorts, or what-have-you. You can go to breakfast in the coffee shop which is on the lower level—where all the shops are too—in any regalia you wish to wear. The only restriction is that you cannot or should not appear in the main lobby or the lobby dining rooms in bathing suits, or shorts. Otherwise it is completely informal.

During my two weeks there I lived in shorts every day up to five o'clock and then got dressed for dinner and whatever events were happening in the evening. So when you are thinking about packing, make it play clothes and your summer cottons for informal dressing. You all know how informal the OALMA affairs usually are and Eden Roc's staff are all very helpful—particularly their social director who will work with you planning things to keep you busy all day—and night too, if you wish.

SEE YOU AT EDEN ROC OCTOBER 26th and don't forget the sun tan lotion!

Recently Mr. Hedges and I were guests of Mr. and Mrs. Paul Leimkuehler of Cleveland, Ohio. Paul, the Second Vice-President of OALMA, and Kay, a Past-President of the Women's Auxiliary, were as usual the perfect host and hostess. We had a thoroughly enjoyable visit, swimming in their beautiful pool and dinner at a delightful spot in Akron, Ohio, where they served "Kish-ka bobs a la flaming sword."

Paul showed movies on Sunday and along with some excellent ski shots, taken on their winter vacation, numerous pictures of amputees and their rehabilitation. Actually they were so impressive that I felt I would like to add just a note to my column to express my thoughts, which I am sure are fully shared by all who are associated in the Prosthetic field.

To see the happy expression on the faces of those who have come so close to losing all courage should leave us with a deep feeling of satisfaction and make us all very proud to be a part of such a wonderful organization as "OALMA."

In closing I would like to extend my utmost appreciation for the confidence placed in me by having me serve as your President.

Thank you again, see you soon.

Virginia L. Hedges, President

#### **REVIEWS**

#### REHABILITATION: A COMMU-NITY CHALLENGE

#### By W. Scott Allan

#### Published by John Wiley & Sons, Inc., New York and London, 1958, 247 pgs., \$5.75.

Scott Allan is Supervisor of Medical Services for the Liberty Mutual Rehabilitation Insurance Company. The company is familiar to members of the limb and brace profession because of its excellent Rehabilitation Centers at Boston and Chicago, where Joseph Aveni and Michael Amrich are doing outstanding service as certified prosthetists.

Mr. Allan has produced a book which will be invaluable to all who must work closely with or in a rehabilitation center. One example, to show just how detailed and helpful his book is: on pages 60-61, he gives a typical rehabilitation center budget (of special interest will be the provision for the services of a certified prosthetist or orthotist as a consultant on a fee basis).

#### ORTHOPEDIC DISEASES; PHYSIOLOGY—PATHOLOGY RADIOLOGY

By Ernest Aegerter, M.D. and John A. Kirkpatrick, Jr., M.D. Published by W. B. Saunders of Philadelphia, 1958, 602 pages. Illustrated, \$12.50

The orthotist who wants to have some understanding of the complex problems faced by the orthopedic surgeon will find this book good background material. One author is a pathologist and the other is a radiologist. The book reflects the richness and variety of their experience at the University of Pennsylvania Graduate School of Medicine and at the Temple University Medical Center in Philadelphia.

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#### SUPPLY EXHIBITS AT NATIONAL ASSEMBLY (Cont.)

#### Booth No. 7 • American Rawhide Mfg. Company

Howard Emery is to be on hand for the display of quality and Supreme Rawhide for the artificial limb trade. Precut leather parts intended to save the prosthetist both time and money, will be on display.

#### Booth No. 8 • Hawkes Company representing L. Laufer & Co.

William C. Hawkes will display the full line of coutils, nylon lacings, buckles, moleskins and other supplies which are distributed by the firm of L. Laufer and Company. In addition, Mr. Hawkes will also exhibit other lines which he carries, including the American Wheelchair Division, and the Cameron Sales Company.

#### Booths Nos. 9 and 10 • Ohio Willow Wood Company

The display of the Ohio Willow Wood Company will include a complete line of their socket blocks, Sterling Stump Socks and other products. The Arbogast Brothers, Ed and John, and their father before them, are well known among artificial limb establishments for the reliability of their products and the promptness of their service.

#### Booth No. 11 • Kingsley Manufacturing Company

Ken Kingsley of the Kingsley Mfg. Co. of Costa Mesa, California, is looking forward to seeing you. In addition to the APRL gloves and SACH feet, etc., he will have some of their latest developments that are sure to be of interest to you. These new items will include appliances for children, being displayed for the first time.

#### Booths Nos. 12 and 14 • Sierra Engineering Company.

The exhibit will be staffed by Harry L. Daulton and Arthur Ritterrath, who will be prepared to show Sierra's newest developments. The child size constant friction wrist unit is the latest product released and offers many interesting features. Sierra will have a novel project at the booth for the entertainment of OALMA conventioners. We will look forward to pleasant visits with our many friends.

#### Booth No. 15 • C. H. Davies Company

C. H. Davies, the founder of this company, was one of the pioneer members of OALMA. The company continues the tradition of quality products which he established. The company is famous for its line of lightweight aluminum limbs. Stop by and see their beautiful display.

#### Booth No. 16 • R. & G. Orthopedic Appliances

Certified Orthotists and Prosthetists Charles Ross and Michael Stone have something to save you time and get your orders out quicker: Prefabricated leather parts for leg and back braces and for artificial limbs. All the parts are standardized and are uniformly cut. They are available in black and white, gray and brown. Included are coverings for back braces, fronts for Taylor and Knight Braces, B K Corsets, A K Control Straps, check lugs, etc.

#### Booth No. 17 • Fillauer Surgical Supplies, Inc.

Fillauer displays their specialty items which cover both the Orthopedic as well as Prosthetic field.

We have recently introduced Laminated Wood Quadrilateral Thigh Socket Blocks in the light wood, *Abachi*. These blocks are precision made with a smooth planned exterior finish. Top and bottom surfaces are machined square to the medial wall which eliminates waste.

#### SUPPLY EXHIBITS AT NATIONAL ASSEMBLY (Cont.)

Other new items include the Vari Gait Knee Shank Assemblies, Vari Gait Valves and Feet.

As the Kingsley Distributor, we will show the newest SACH Feet stock items as well as ankle block for use with these feet.

Streamline imported BK and KB joints, leather stampings and an entirely new AK Socket measuring device will be demonstrated.

Carlton Fillauer, Dick Lehneis and Jack Faatz will be on hand to greet you.

#### Booths 18 and 19 • Everest & Jennings, Inc.

The Everest & Jennings booth this year will have on display a variety of their units including a new Mono-Drive power chair and the Mono-Drive attachment. These are the latest power-driven chairs on the market. The new Hydraulic Elevating Seat will also be on display.

#### Booth No. 20 • Apex Foot Health Products Company

Charles Schwarz, one of the executives of the firm, will be on hand to show their line of products, including the new Hallux Valgus Bunion night bandage. Other products include arch shells, foam rubber, adhesive felt sponge rubber, etc.

#### Booth No. 21 • Pope Brace Division

The Pope Brace Division will feature a wide range of prefabricated orthopedic appliances including the new type Newington Cerebral Palsy Brace, special lower extension toe lift ankle joints, drop ring attachments and small tools designed to function specifically to the advantage of the orthotist. Your attention is invited.

#### Booth No. 22 • Bennington Stump Sock Corp.

This company will have a display of its trademark products, "Bessco," including stump socks, and orthopedic cotton stockinette. The stockinette is used in the manufacture of prostheses, under plaster casts (producing a firmer, smoother cast) for dressings, skin protection, etc.

#### Booth No. 23 • K & K Prosthetic Supplies, Inc.

A complete line of products for the limb dealer will be displayed. This will consist of knee locks, knee and shin set-ups, below knee joints, foot and ankle assemblies, and other items pertinent to the limb profession.

#### Booth No. 24 • S. H. Camp and Company.

CAMP, having completed fifty years of serving the surgical trade, looks forward to another half century of service to the Orthopedic Appliance and Limb Manufacturers Association.

See our new plastic covered aluminum brace with fashioned front elastic belt and zipper front opening.

Also, our complete Breast Prosthesis line made of fine white broadcloth and dacron with plastic inflatable breast form inserts.

New models have been added to our sacro-iliac line including supports with a "Continental Flair" for both men and women—A new idea by CAMP for a functional support.

#### Booth No. 25 and 26 • United States Manufacturing Company

Jay Greene, President, and Edward Strong, Field Representative, will be at the booth to display this company's complete line of orthopedic and prosthetic supplies. Prefabricated brace parts, and setups from their new plant at Glendale, California, will be shown.

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#### SUPPLY EXHIBITS AT NATIONAL ASSEMBLY (Cont.)

#### Booth No. 27 • Hydra-Cadence, Inc.

Eighteen years ago, in 1940, Mr. John Harold Freeman Stewart began development work on application of hydraulic principles to artificial legs. Since then he has become known to the workers in the field of prosthetics as "Jack" Stewart, and this year we rejoice with Jack as his labors bear fruit. Early in the year he concluded a patent-licensing agreement with Mr. J. Morgan Greene (of United States Manufacturing) and Mr. A. A. Tilton, who formed Hydra-Cadence Incorporated for the express purpose of manufacturing the hydraulic shin mechanism patented by Stewart.

Tilton and Greene are now busy on several fronts as they prepare to put the new "Hydra-Cadence" leg on the market. Specifications are being drawn up in detail for Veterans Administration purposes, a manual of instructions for installation, adjustment, and maintenance is being developed, and a sound-film is in production—and right along with all of this, the complex job of tooling up is moving forward.

Tilton and Greene forecast production of the Hydra-Cadence leg in the late summer or early fall, so look for the Hydra-Cadence exhibit at the October OALMA convention!

#### Booth No. 28 • Prosthetic Services of San Francisco

A variety of Realistic Prostheses for body correction will be shown by C. O. Anderson and his associates of this San Francisco firm. These include cosmetic gloves, breast restorations, and thoracoplasty restorations.

#### Booth No. 29 . M. J. Markell Shoe Co., Inc.

We offer a single source for children's prescription footwear, featuring authentic, medically accepted Tarso Supinator, Tarso Pronator and Tarso Medius Shoes. All orders are filled by return mail and mis-mates and matching shoes are available to copy with any fitting problem. All orders get personalized attention, and we are always glad to offer suggestions on ordering and fitting.

#### Booth No. 30 • Truform Anatomical Supports

## We concern ourselves in catering only to the requirements of the ethical surgical appliance dealer.

We always consider it a privilege and pleasure to show the latest developments in *Truform Anatomical Supports* to our OALMA friends. Our personnel, in attendance at the booth will be looking forward to a visit with you. Stop and say "Hello."

Stop at our booth and inspect all features of our merchandise. Scan closely design, material, workmanship and general applicability of Truform's well-rounded line. Each Truform support has been approved by our technical and medical staff before being offered to our customers. See "The Professional Line."

#### Booth No. 31 • Hersco Arch Products Corp.

Booth No. 31 will be occupied by Hersco Arch Products Corp. of New York. The latest developments of their laboratory will be featured for your inspection. On display will be many types of flexible Arch Supports, including Amputation Fillers, numerous Stainless Steel Supports, as well as Dural Foot Appliances specially treated against corrosion, Moulded Leather and Rubber Shells of all description, Rubber Scaphoids and

other Longitudinals, Metatarsal Pads, Air-foam, Foam on sheeting. Ortho-Cork. In fact the most complete line of Arch Supports and Orthopedic corrections that enabled Hersco to satisfactorily serve the Orthopedic and Prosthetic Profession for nearly three decades. Leo Waller will be on hand, and will demonstrate the Hersco Foamo-Cast.

#### Booth No. 32 • Florida Brace Corporation

Florida Brace Corporation, Winter Park, Florida, will exhibit The Jewett Brace for hyperextension of the spine in the treatment of spinal conditions requiring positive hyperextension such as simple compression fractures, Osteoporosis, Adolescent Epiphysitis, and Marie Struempell's Disease. They will also exhibit The Myo Cervical Collar, a rigid modification of the Thomas Collar with the unusual feature of adjustability of height and degree of hyperextension.

#### Booth No. 33 • John J. McCann Company

This world famous prosthetic supply house is now in its fifty-first year and is living up to its motto: "If we don't have it and it is available, we'll gladly try to get it for you." Among the items to be shown are Comfort Stump Socks, Simplex metal spun limbs, various wood setups, gloves, hooks and the Becker Hands.

#### Booth No. 36 • Knit-Rite Company

Lee Fawver and Ted Smith, two of the senior partners in the Knit-Rite Company, will be at the Assembly with a complete display of prosthetic and orthopedic supplies carried by this firm. This includes the Hallmark Cervical Braces and the Heger Cervical Collars in addition to the Knit-Rite Stump Socks, Webbing, buckles, felt and other items.

#### Booth No. 37 • Levy and Rappel

This "House of Foot Comfort" offers foot balancers of all descriptions, flexible, semi-flexible and stainless steel cork, rubber, celastic and all types of inlays with steel springs. The firm also will display artificial toe and forefoot amputation prostheses, as well as short limp extensions of all deformity of the foot. All Levy and Rappel appliances are made to prescription and all hand made.

#### Booths Nos. 38 and 39 • Otto Bock Orthopedic Industry, Inc.

The feature attraction of the Otto Bock Orthopedic Industry exhibit is a live demonstration of the Otto Bock method of aligning A. K. limbs. Both the portable balancing unit and the portable transfer jig will be exhibited and used in the demonstration. In addition, the Otto Bock line of conventional, safety and lock-knees, feet, B. K. joints, braces, artificial hands, and the like will be exhibited. Miscellaneous items including trouser protectors, leather scissors, etc., will also be displayed.

#### PUBLICATIONS RECEIVED

"Lower Extremity Prosthetic Devices for Children"—68 pages. Tables, illustrations. Copyright 1958 by the Michigan Crippled Children Commission.

This is another of the valuable reports presented by Dr. Carleton Dean, Director of the Michigan Crippled Children Commission. The case reports, the descriptions of the patients, the prosthetic devices provided, necessary repairs, cost, etc., make this interesting and helpful reading to the prosthetist.

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#### A GUIDE FOR PARENTS OF CHILD AMPUTEES

By John Steensma

Published by the Area Amputee Program, Michigan Crippled Children Commission, 1958, 30 pgs., illustrations and drawings.

- NOTE: A limited supply is available on application to OALMA Headquarters, 411 Associations Bldg., Washington 6, D. C.
- Reviewed by Charles Wright, C.P., Wright & Filippis, Detroit, Mich.

I am sure if the parents of child amputees or other handicapped children could have the privilege of reading this article by Mr. John Steensma, much could be accomplished. First by the child, which is most important, then by the parents who would have a better understanding, and then by the prosthetist or orthotist, who needs the respect and confidence of both child and parent, in order to do his job the best he knows how. I really believe an article like this, if given to the parents of child amputees, would be an advance introduction to the therapist and prosthetist of their choice.

This 30-page booklet offers the parent many helpful hints about the prosthesis which the child amputee wears, his walking habits and training. The photographs and drawings add materially to its value. The booklet ably carries forward the fine service which the Michigan Crippled Children Commission has provided amputees of the State of Michigan and elsewhere through its program.

Through my many years of working with child amputees, I find, the most important thing is, to get the confidence and friendship of the child. Often, a piece of gum or candy and a few extra minutes of attention to the child help to gain your point. Once this is done the work of making the prosthesis or appliance is much less trouble and by the child's action of confidence you gain the complete confidence of the parents. Once this has been accomplished, a friend is gained, often for life, by both amputee and parent.

There are many, many amputees I have cared for since childhood and even infancy, have grown to adulthood and middle years, scattered throughout the Continent. They still come to me as friends and patients and their parents make it their business to stop in and say "Hello" if they are in our neighborhood. They have never forgotten the care their child received, and never tire of showing their thanks in every action.

There are many of these amputees that not only respect my professional advice but come to me as they would their father, to ask advice on their private problems.

These things are the fruits of my years of labor and I am proud of them and the friendship I have made with the amputees and their parents.

1. Hemophilic Arthropathies by Henry H. Jordan, M.D.—Springfield, Illinois — Charles C. Thomas, Publisher — 1958. 255 pages — Illustrations — \$8.50.

The section on Bracing will be of particular interest. It incorporates much of the technical procedures worked out by Paul Schumacher, C. O., Manager of the Lenox Hill Hospital Brace Dept.

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## In Memoriam

**Powell Simonton**, former head of the Fort Wayne Orthopedic Company of Fort Wayne, Indiana, died July 6, 1958. Mr. Simonton had a major operation in June. He is survived by his widow, Mrs. Dolores Simonton and one son.

Operations of the Fort Wayne Orthopedic Co. are continuing under the direction of Mr. Samuel R. Statler, President.

SACH FOOT AND EXTERNAL ELBOW SPECIFICATIONS READY OALMA Headquarters has available a limited supply of these specifications for distribution to interested members: 1. Tentative Specification (dated January 24, 1958) for Foot, Solid Ankle, Keel Type, Elastomer Heel Cushion for Lower Extremity Prostheses (without production drawings). 2. Tentative Specifications (dated May 1, 1958) for Elbow. Artificial, External, Alternating for Above-Elbow Amputees. These tentative Specifications covering the design of SACH feet and external elbows were recently approved by the Committee on Prosthetics Research and Development, Prosthetics Research Board. These specifications, prepared by the U.S. Army Prosthetics Research Laboratory, the Veterans Administration Prosthetics Center, and representatives of other research groups in the Prosthetics Research Program, are particularly useful to large scale pur-

chasers of such prefabricated pros-

thetic items. U.S. Army Procurement and the Veterans Administration are

now employing these instruments in

providing devices for their benefici-

aries. The Testing and Development

Laboratory of the VA Prosthetics

Center is also running periodic speci-

fication checks on items purchased as

specified.

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