MARCH, 1954

The journal of the Limb and Brace profession

Orthopedic and Prosthetic Appliance Journal

C. H. Hittenberger, Pioneer

New York Seminar

Arch Supports

published jointly by
Orthopedic Appliance & Limb Mfrs. Association
American Board for Certification

DATES TO REMEMBER — 1954

What • When • Where

APRIL

12	UCLA PROSTHETICS SCHOOL—9th Section Opens (Concludes May 21, 1954)	*Los Angeles, Calif.*
17	REGION VII, OALMA CONFERENCE	*St. Paul, Minn.*
19-24	SUCTION SOCKET SCHOOL	*Minneapolis, Minn.*
21-22	CHICAGO METROPOLITAN AREA — OALMA CONFERENCE	*Chicago, Ill.*
30	MOALMA TWO DAY ASSEMBLY OPENS	*New York City Roosevelt Hotel*

MAY

1	MOALMA ASSEMBLY—Closing Day	*New York City*
3-8	SUCTION SOCKET SCHOOL	*New York City*
8-9	REGION V, OALMA CONFERENCE	*Toledo, Ohio Commodore Perry Hotel*
16-17	REGION III, OALMA CONFERENCE	*Philadelphia, Penna. Drake Hotel*
24	UCLA PROSTHETICS SCHOOL—10th Section Opens (Concludes July 2, 1954)	*Los Angeles, Calif.*

SEPTEMBER

13-17	SIXTH WORLD CONGRESS, INTERNATIONAL SOCIETY FOR THE WELFARE OF CRIPPLES	*The Hague, Netherlands*
25	EXAMINATION FOR PROSTHETISTS AND ORTHOTISTS — Conducted by the American Board for Certification	*Philadelphia, Penna.*
26-30	NATIONAL ASSEMBLY OF THE LIMB AND BRACE PROFESSION	*Atlantic City, N. J. Chalfonte-Haddon Hall.*

Orthopedic and Prosthetic Appliance Journal

(Title registered U. S. Patent Office)

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Executive Director

LESTER A. SMITH
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The first of a series-sketches of leaders in the profession.

Professional profile of C. H. Hittenberger

By CHESTER C. HADDAN

Consultant to and Past President of The American Board for Certification; Past President of OALMA.

Reno, Nevada, is famous for many things. The lives of many people have been changed by events that happened there. In the "roaring eighties" a lusty young fellow was born there who was destined to change the lives of many. This youngster was christened Carl Herman Hittenberger. Through his efforts, skills and knowledge, the lives of thousands of persons have been changed from hopelessness and despair to happiness and contentment, from crippled helplessness to usefulness.

It is well known that the comfort and function a handicapped person realizes from the device which aids him are largely governed by the construction and fitting of that appliance. Perhaps no single person in our profession has done so much to give that fundamental premise meaning than this San Francisco Prosthetist and Orthotist, C. H. Hittenberger.

In his hands and mind are embodied the artist craftsman's skill in superb and rare degree. This ability has originated myriads of aids for the physically impaired — devices proven sound, used over the civilized world, and widely copied.

Not only have the results of this eminent skill found their way into the lives of hundreds of thousands of patients through the five Hittenberger outlets in California, but of equal importance is the attitude of seeking for perfection "C.H." has instilled in the hundreds of Prosthetists and Orthotists who have received their training under the careful guidance of this always exacting but fair and understanding taskmaster. Training under the supervision of "C.H." could be considered to be our profession's equivalent of surgical training at one of three "peerage" orthopedic centers — New York's Ruptured and Crippled Hospital, Massachusetts General at Boston, or Baltimore's Johns Hopkins.

This is the accomplishment of a lifetime of applications by an unpretentious, wiry little man who, at 69 years, is still active in this profession.

Early Training

While "C.H." was still an infant, the family moved to Oakland, California and in 1902 his father, Herman H. Hittenberger, started his business of making surgical appliances and braces. Upon completion of grammar school. "C.H." worked full time in his father's shop and attended school at night. When he was 17 he went to New York and worked there in a Brooklyn surgical appliance firm. From there he went to Germany to visit and work in various orthopedic clinics. Upon his return to the States he spent the next three years working for his father. He then went to Rochester, New York, for further apprenticeship and managerial experience with the now non-existent George R. Fuller Co. He was soon transferred from Rochester to Philadelphia as manager of the branch there where he remained until the spring of 1912.

A True Help-Mate

He returned to Oakland to resume working for his father and in November of that year married Marie Drewes of Hanover, Germany, whom he had met on board ship when he was returning from Europe. In December of 1912 "C.H." and his bride opened the first "C.H. Hittenberger Co." in San Francisco. They worked diligently together to build a solid foundation for their firm. Many times Mrs. Hittenberger was left in complete charge while "C.H." took a train to some neighboring town and hired a horse and buggy to "call on the trade."

They were blessed with two children, Martha, and a son, Herman, and both youngsters, like their father, had an early start in their dad's business. At the age of twelve they spent a part of each school vacation helping their parents and learning the many phases of the profession. They are both associated with the Hittenberger Company today.

Service Rewarded

The genius "C. H." had for creating with his own hands whatever aid a patient required, from the most fastidious corset to forged steel braces of the most complicated design, brought its reward in demand for his services. Hittenberger branches are operated in Fresno, San Jose and San Mateo as well as San Francisco and Oakland, the original family firm. These employ 105 people.

Administration of this, one of the profession's largest concerns, has never kept "C. H." from spending the major portion of his time in the department he loves best — the shop. By staying close to the production operation he has made the fullest use of his uncanny instinct for spotting the slightest fault in an appliance even before it is fitted to the patient — one of the secrets of his outstanding ability. His vast experience, his precision and "know how" have won him more success, in this writer's opinion, in the fitting of bi-lateral, above-knee amputees, than anyone else in this nation.

For relaxation, "C. H." turns to his garden which he has made into a panorama of floral beauty, or to one of California's many trout streams, or a favorite retreat — his cabin on the Klamath River. His dexterity and accuracy with a fly rod have brought him championship honors in casting competitions.

Despite his many achievements, "C. H." has avoided acclaim, preferring to sit back proudly while his proteges expound the knowledge he has imparted to them. He has dedicated his life to fine craftsmanship and ascended the pinnacle in the process. The callouses on his hands are the proud badge of his service to the handicapped.

To You—from our Presidents

OALMA

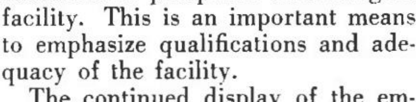
This column is being written in the beautiful surroundings of Duke Hospital at Durham, North Carolina, where Bert Titus is playing host to the Southeastern OALMA meeting.

Lee J. Fawver

I wish every member of OALMA could be here with us for these two days. The interesting program and the fellowship with other people in this field sends you away refreshed and inspired.

A fellow doesn't really know an organization until he has spent a good deal of time with it and has travelled throughout the country seeing members in their own environment. Being with about a dozen groups of OALMA members from New York to California and from Florida to Michigan during the past year has benefitted me far more than I could have benefitted them. You can't meet with a fellow limb and brace man without picking up a new idea, a new thought or a new solution to an old problem. In addition, there is a more important personal dividend — new friendships which will carry on long after the meeting.

Because this has meant so much to me I hope every OALMA member will go over the list of meetings carried on the inside front cover of this *Journal* and make it a point to attend at least two of them this year: your Regional Meeting and our big event of the year, the National Assembly. Carlton Fillauer is Program Chairman for this year's Assembly. The place is Atlantic City, New Jersey and the dates are September 25-30. Make your plans now to bring your family and combine this trip with a vacation.



AMERICAN BOARD FOR CERTIFICATION

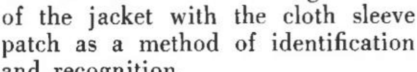
This month I want to commend to you the use of our emblem of Certification. First, because it's a badge of distinction for you and your facility, and second, because it emphasizes to others the importance of Certification.

D. A. McKeever

The certified individual can wear with pride the lapel pin. It identifies him to the others in our profession and to those with whom he comes in contact. We urge the use of the jacket with the cloth sleeve patch as a method of identification and recognition.

A certified facility is authorized to use the Certification Emblem on its letterhead, its business cards and any brochures or pamphlets describing its facility. This is an important means to emphasize qualifications and adequacy of the facility.

The continued display of the emblem and the use of this symbol will help to familiarize the medical profession and handicapped persons and to assure them that it stands for the finest in our profession. Wear and display the emblem with pride and as you do so, help to make it even more important.



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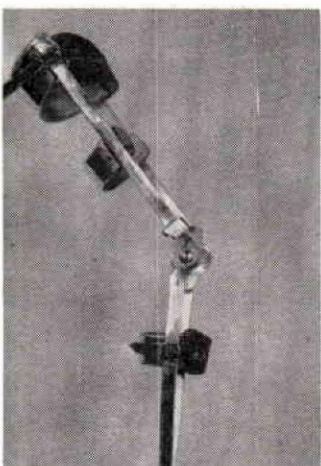

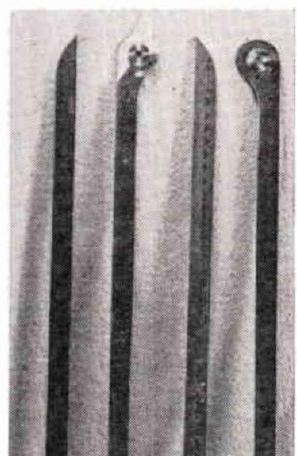

New York Seminar To Feature Latest Developments

BY WILLIAM SPIRO

SEMINAR COMMITTEE: Standing, John A. McCann, Director OALMA Region II; Fred Eschen, President MOALMA; A. A. Margoe. Seated: Mrs. Mary Dorsch, Herbert B. Hanger, William Spiro. Member Leo Waller was away on Seminar business when the picture was taken.

New York City will be host to the limb and brace profession when the Third Annual Seminar on Orthopedic and Prosthetic Appliances is held this Spring, April 30 and May 1. Region II of OALMA and the Metropolitan Association are joint hosts for this Seminar, which is becoming national in scope and interest.

All sessions of the Seminar including the annual banquet will be held in the Roosevelt Hotel, 45th Street and Madison Avenue, which is the new headquarters of the Metropolitan Association.

In planning the sessions, our aim has been to make this Seminar the most noteworthy one yet held in this country. Our ideal has been to display the services and abilities of our profession, to show what is being done for the handicapped and to establish the value of the concerted action on the part of the medical profession and our own.

The reservations already received include the names of prominent orthopedic surgeons, neuro-surgeons, physiatrists, physio-therapists, general practitioners, rehabilitation and compensation counselors, and colleagues from allied fields.

The First Day

Psychological factors relating to patients with orthopedic and prosthetic problems will be discussed by Dr. Lawrence E. Abt. Dr. Abt is a national authority in this field. He serves as a consultant to the VA and is Attending Psychologist in the rehabilitation service of Beth Israel Hospital, New York.

Miss Signe Brunnstrom will discuss aspects of bio-mechanics of the standing position in relation to artificial legs. Miss Brunnstrom is on the staff of the Institute for Physical Medicine and Rehabilitation of New York University.

The afternoon session devotes special attention to brace problems of paraplegics. This discussion will be presented by Dr. Arthur S. Abramson, Clinical Professor of Physical Medicine and Rehabilitation of the New York Medical College.

Friday afternoon session concludes with two important papers:

1. Dr. T. Campbell Thompson discusses the Turn-Up Plasty Amputation. He is one of the pioneers in this development. Dr. Thompson is President of the Academy of Orthopaedic Surgeons and is a member of the Certification Board.

2. Relationships between the prosthetist and the medical profession are analyzed by Dr. Allan Russek, Director of Prosthetic Service, New York University-Bellevue Rehabilitation Institute.

The closing session on Friday will witness a demonstration of new devices and techniques. David E. Stolpe, former Director of Region II, will serve as Chairman for this demonstration.

New developments in plastics and bracing will be reviewed by Dr. John L. Young of Mellon Institute. This is the curtain-raiser for Saturday's program. Following Dr. Young's report additional devices and techniques will be exhibited.

Dr. Eugene Murphy of the Veterans Administration will give a critical analysis of the new book "Human Limbs and Their Substitutes."

Compensation and its relationship to amputee beneficiaries is to be considered by a panel of experts headed by Nathan M. Slater as moderator. Mr. Slater is Senior Rehabilitation Counselor for the New York State Division of Vocational Rehabilitation. He has selected the following for his panel members: Abraham Leiberman, Publications Editor of the New York State Workmen's Compensation Board; Dr. John P. Stump, Consulting Orthopedic Surgeon to the American Rehabilitation Committee; Mrs. Phyllis Malatier, Rehabilitation Representative of the American Mutual Liability Insurance Company; Albert Agran, Senior Compensation Claim Examiner for the State Insurance Fund; Louis Salzman, Rehabilitation Counselor for the State Division of Vocational Rehabilitation, and Herbert B. Hanger, Manager of the firm of J. E. Hanger, Inc., New York.

Reception and Banquet

A cocktail party and banquet Saturday evening conclude the two-day sessions. OALMA Director Glenn Jackson will speak on "What's Doing? — Impressions from the National Tour and Some Predictions."

The Committee is again publishing a *Journal* in connection with the Seminar and wishes here to acknowledge the cooperation of the retailers and manufacturers represented in its pages. Their help has made possible this useful reference book and given assistance to the educational program of the New York group.

The past several years have brought significant changes in the relationship between the medical profession and the orthotist-prosthetist. Assemblies and seminars such as this one which your New York colleagues planned for you are an important part of this development. In 1954 as in the past your New York City colleagues are happy to have a part in this movement. They have had *your interest* in mind in preparing the 1954 Seminar.

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WORKING FOR YOU IN OUR NATIONAL OFFICE

To advance the interests of the Limb and Brace Profession, OALMA and the Certification Board maintain permanent headquarters in Washington. These are the people who staff that headquarters — and carry out the policies determined by you at the National Assemblies and through your elected officers—

GLENN E. JACKSON

The chief operating executive of OALMA and the Certification Board is the Executive Director, Glenn E. Jackson. He has held that position since the Washington offices were opened in 1946. Previously he was connected with the Rockfeller Foundation, and served also as Director of Public Assistance of New York State. Mr. Jackson is an authority on trade associations and their special activities such as group insurance, discussion methods and government relations. A graduate of Coe College, he took advanced training at Columbia University. Mrs. Jackson has attended many Assemblies and is widely known throughout OALMA circles. She has been a member of the Ladies' Auxiliary since 1946.

LESTER A. SMITH

"Les" Smith joined the Headquarters staff in 1952 as Assistant Executive Director of OALMA and the Certification Board. His background includes promotion work for hospitals, teaching and organizational work for his university alumni association. A native of Missouri, he holds the Master's Degree in Library Science and was formerly on the staff of the Army Medical Library.

Miss Gwen Rhys came to the office in 1948 with a background of experience in hospital, credit and legal offices. She was formerly secretary to the Publicity Director of the Republican National Committee. A member of the OALMA Ladies' Auxiliary, she attended the '52 and '53 Assemblies.

Miss Betty Yudkowsky, our capable stenographer, has had considerable experience in government and association offices. She was educated in the public schools of Washington and George Washington University.

Training the Unilateral Amputee—Upper Extremity

By LEONARD P. MADISON
Madison Artificial Arm Co., Columbus, Ohio

Begin with "Unilateral Thinking." Concentration on *Terminal Device* only is important. Among the first exercises are: 1. Opening and closing of the terminal device; 2. Picking up small nails or tacks from table top; 3. Picking up blocks and a ball from table top.

Next allow the patient to help choose interesting objects on the training board (see illustration) which will exercise his opening and grasping ability. The following are examples: 1. Pulling light switch; 2. Turning light button; 3. Unfastening snaps; 4. Tug of war with string.

Next have the patient practice on operating latches. He already has the idea of opening and closing the hook. Now he learns to position the hook. Also, in operating latches which need finger compression and pulling action, he will learn tension arm action. (1. Kitchen Cupboard Latch, 2. Window Casement Latch, 3. Hook and Eye.)

A little trick training should now be used to teach the amputee to think of different methods of attacking a problem when his first try does not work. This stresses positioning of the hook and use of the hook with the fingers closed. Exercises include: 1. Opening drawers; 2. Operating suitcase latches; 3. Operating push type light switches; 4. Operating water faucet.

During all this training with the terminal device alone, the prosthetist has an opportunity to check the harness setup which he has designed for the patient. He can observe whether the harness is permitting the patient to operate the terminal device smoothly. If there is need for adjustment it will show up while the patient is doing these procedures. It is for this reason that it is wise to do this much of the procedure of training when the patient is in for rough fitting and is wearing the arm in "rough fitting" condition.

Continue with "Bilateral Thinking." Emphasize coordination of the appliance and the normal arm. It is suggested that this phase of the training be done in a second lesson perhaps at time of the final fitting.

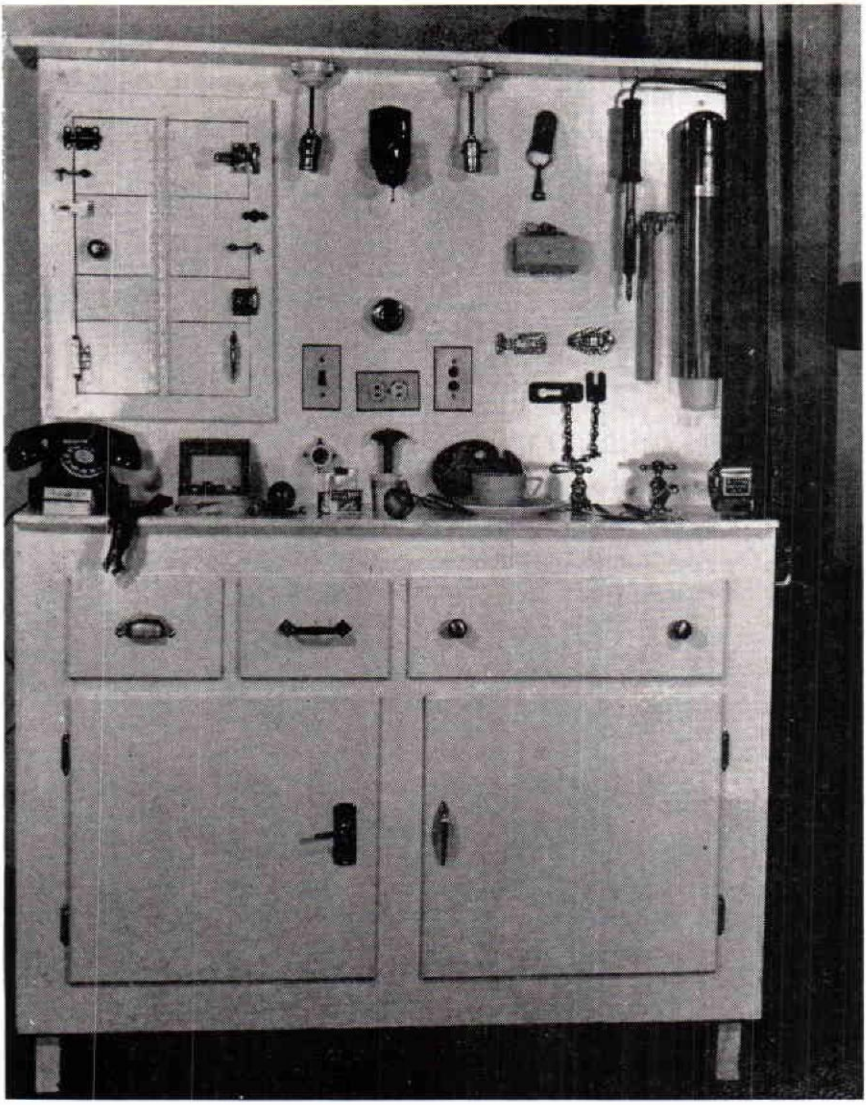
Have the patient do the following to learn simple coordination first: 1. Operate loose zipper; 2. Pick up box and remove marbles; 3. Remove matches from penny match box; 4. Open box and work padlock; 5. Put blades in injector razor; 6. Pencil sharpening.

The following operations teach the patient to make use of additional articles to aid himself: 1. Dialing telephone (use aid of pencil in terminal device); 2. Using button hook; 3. Filling lighter; 4. Opening jar and measuring coffee; 5. Using knife, fork; 6. Opening cans or bottles.

Give the patient a list of things to work out at home. When he comes in to your office, check on his progress and help him further with problems which proved most difficult. In turn, ask him to pass on to you any new uses for his terminal device which he has discovered so that you may pass on this benefit to other beginners.

The following exercises are suggested for training the woman amputee: 1. Use of a dishmop; 2. Ironing; 3. Peeling potatoes.

In training children they should be encouraged to work with construction toys and building blocks. A favorite exercise is eating candy from which they must first remove the paper wrapping.



The Madison Training Board.

Training Helps Using Two Hands

(this list of "home practice" work is given to the patient after he has completed the basic training)

Open Box.
Open & close zipper.
Measure with tape.
Unlock padlock.
Sharpen pencil.
File nails.
Unwrap candy.
Open can or bottle.
Remove money from purse or wallet.
Remove cork or cap from bottle.
Remove top from tube of tooth paste.
Thread needle.
Start nail into board.
Tie bow, necktie or shoelaces.
Remove and wind wristwatch.
Work bent-nail puzzle.
Peel potatoes.
Tie millers knot.
Iron clothes.
Use bottle with medicine dropper.
Place new blades in Injector razor.
Repair extension cord.
Eat grapefruit or melon.
Remove lid from jar.
Measure instant coffee into cup.
Fill fountain pen.
Use book matches.
Use hand bottle opener.
Unwrap articles (cigarettes).
Wrap packages.

An Improved Type of Back Check for Artificial Legs

By FRANCIS L. SMITH, Fellow
with JOHN L. YOUNG, Ph.D., Senior Fellow

The Sarah Mellon Scaife Foundation's Multiple Fellowship
on Orthopedic Appliances
Mellon Institute

Generally speaking, back checks for the knee joint on an above knee artificial leg are satisfactory and on most people give many years of service without failure. However there are some cases where a powerful man, who attempts to make the artificial leg do as heavy work as the natural leg, will break back checks quite regularly.

Mr. McKnight of National Artificial Limb and Brace Company, Pittsburgh, Pennsylvania, and Mr. A. L. Godbey of Hanger Company, Miami, Florida, sent samples of broken back checks to the Fellowship which were breaking in severe service and requested advice as to how they could be corrected.

One of these back checks was tested with a static load and required 300 pounds to fail. It is difficult to understand how a 200 pound man can break a back check that can withstand 300 pounds.

Anyone who has ever used a pinch bar to pry open a box or to lift a heavy box knows that the longer the bar the heavier the box that can be lifted by any particular man. A child's seesaw acts in a similar manner. If a heavy child wants to seesaw with a light child, the heavy child must move in toward the center of the seesaw until the seesaw balances.

The forces on a back check act the same way as a seesaw, with the knee bolt acting as the pivot point. On one side is the man's weight acting a certain distance in front of the knee bolt, and on the other side is the force applied on the back check by the bumper, approximately 2¼ inches from the knee bolt.

A man's body weight shifts in relation to the knee bolt when he walks, so the distance his weight acts from the knee bolt may be anywhere from ½ inch to 4 inches in front of the knee bolt, depending upon the individual.

Because the particular back check tested can withstand 300 pounds before yielding, and this force acts 2¼ inches from the knee bolt, the back check can withstand 675 inch-pounds. A 200 pound man would have to walk in such a fashion that his body weight acted 3⅜ inches in front of the knee bolt to cause the back check to yield.

There are many possible ways that the back check could be occasionally overloaded. If a man carries a weight in his arms he puts additional load on the back check and also shifts his total weight forward. Stepping down from streetcars and going up and down stairs undoubtedly put additional load on the back check.

On an average, a man will probably put his weight on an artificial leg about one million times a year. This repeated loading probably causes some tiny spot in the back check to be continually overloaded and eventually a small, unseen crack forms. The crack gets larger until not enough metal is left to support the weight of the body and the back check fails. This is somewhat like bending a bar of metal back and forth until it breaks. The less the bar is bent, the longer it takes to break. If the bending of the bar is small enough, it can be bent back and forth forever and will never break. Back checks should be designed so that the repeated loading will cause so small a bending that they will never fail.

Figure 1 shows a back check designed by the Fellowship to take care of unusually active patients. It should be able to withstand at least five times as much load as the one previously mentioned. This back check was made of 24ST4 aluminum, and is lighter than the one tested. The design is simple enough that it can be made in any shop that has a drill press, a band saw, a grinding wheel and a buffing wheel. A shop that does not have a band saw can grind the back check to shape from a $\frac{5}{8}'' \times 1\frac{1}{4}'' \times 5\frac{7}{8}''$ piece of aluminum with an A30-N3E Norton Alundum grinding wheel. The general shape of the back check is cut from five-eighths inch thick aluminum, the two holes are drilled and then the rough edges left by the saw are removed by first grinding and then polishing with a buffing wheel. It is very important that the rough surfaces be removed. If they are not removed, the life of the back check will be shortened. The front surface of the back check that strikes the bumper must be rounded slightly to keep the noise level down to a minimum.

The critical section of the back check is where the bumper strikes.

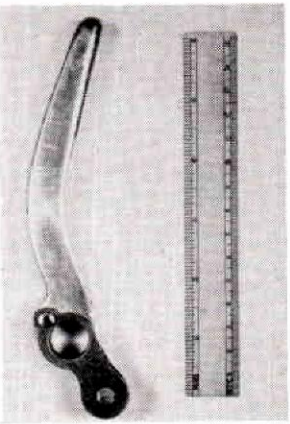


Fig. 1. Back Check designed by the Fellowship.

This should be five-eighths of an inch thick and five-eighths of an inch wide. Measured from the front to the back of the leg, a variation of one thirty-second of an inch will change the load carrying capacity by ten per cent.

This type of back check is currently being tested by patients weighing as much as 250 pounds. One 200 pound patient has carried as much as 100 pounds while working. He has been testing the back check for seven months.

The side plates, rollers, and pins necessary to complete the back check were purchased from the John J. McCann Company, Burlington, New Jersey.

The German Orthopedic Firm; Notes on Employee Training and Cost System

By GEORGE W. FILLAUER

President, Fillauer Surgical Supplies, Inc.,
Chattanooga, Tenn.

On my recent trip to Germany I made it a point to gather some information on the training and qualifications of Orthopedic Mechanics, and on the German method of pricing, which I think is of special interest to us.

Germany has 500,000 amputees in round figures. 70,000 of these were the result of World War I. 250,000 of them were the result of World War II.

There are 1700 orthopedic firms or shops in Germany — 1300 in the West Zone, 100 in West Berlin and 300 in the East Zone. With the exception of 30 to 40 firms, they are all small, with three to five employees, more often the members of the family. I know of just one firm—perhaps the largest in Germany—which employs thirty, including office personnel, apprentices and sales personnel.

The technical staff may be divided into three groups: A. Apprentices. B. Orthopedic Mechanics. C. Orthopedic Master Mechanics.

The apprentices serve a $3\frac{1}{2}$ year apprenticeship and take a course in one of the established trade schools. Therein they are taught the various branches related to Surgical Supports, Braces, and Prostheses.

Following the apprenticeship, one is required to pass an oral and practical examination before an Examining Board. Members of the Board are appointed by the Trade Chamber. The applicant is required to make one or more appliances. The oral examination covers general professional knowledge, including anatomy. If he passes the Board, he is awarded a certificate of Orthopedic Mechanic (Journeyman).

The prerequisite for a Master Mechanic is five years of work as a journeyman. He is then admitted to take an oral and practical examination before the Examining Board. He is required to build a long leg brace and an artificial limb. This includes taking of measurements, plaster casts, making the model, complete fabrication and fitting of the finished product. All of this is done in the presence of the Board.

The certificate of the Master Mechanic entitles him to open up a shop of his own and teach apprentices. Opening of a shop may not be allowed if the Commission deems that adequate facilities are in the trading area.

A few words about the costing and pricing situation: The Board of Trade appoints a Pricing Commission which, with approval of a federal agency, sets all prices on all appliances, parts and repair work—with no loop holes to "up" or "down" prices. Strange as it may seem, the Commission condones neither increases nor reductions in prices. All pricing is uniform and exact even in the neighboring towns. In the absence of price appeal the customer goes where he thinks he gets the best in quality and workmanship.

It is the responsibility of the Commission to calculate cost of material and add a certain percentage for overhead expenses. The information as to how the Commission arrives at these figures is not available to the shops; but it is said that it is done on a scientfic and equitable basis. One contributing factor is that more than 75% of all the work in German shops is Federal and State insurance business.

Like any other business, all large shops in the East Zone in Germany have been taken over by the Communists, and no longer enjoy fundamental human rights.

I was in Germany during the Adenauer election. He is, in my opinion, one of the greatest living statemen. Under his leadership Germany is doing an outstanding job in the fight against Communism, but she is hindered by a lack of cooperation from other Western European nations.

Encouraged by the United States, Germany is full of energy — seeking to cooperate in building a united front against the Kremlin. There is little hope over there for a lasting peace — little confidence in any peace treaty Russia may enter into. We have learned the hard way that the Communists justify any means—deceit or brutality—to gain their end. Would that it were possible for every American to be afforded an opportunity to listen to any refugee from behind the Iron Curtain!

CARLTON FILLAUER TO PLAN PROGRAM FOR '54 ASSEMBLY

Carlton Fillauer of Chattanooga, Tennessee, has been named Program Chairman for this year's Assembly, according to an announcement by OALMA President, Lee Fawver.

Mr. Fillauer is already at work on plans for the four-day session which opens September 26 at Chalfonte-Haddon Hall in Atlantic City.

The professional and technical sessions will be arranged so that members and their families may take full advantage of the features which have made Atlantic City the Entertainment Capital of the World.

The American Board for Certification meeting will again hold a prominent place in the Assembly sessions. The Board will hold a Certification examination in Philadelphia on September 25. This has been arranged so that persons taking that examination may combine with it attendance at the Assembly which follows immediately.

*Prosthesis For Korean Soldier Amputees

by

CAPTAIN JAMES N. CALWAY, MSC, Osaka Army Hospital

On the outskirts of Tong-nae On-Chon, South Korea, situated in a little valley, is an Orthopedic-Prosthetic Laboratory. The mission of this laboratory is two-fold. First, to train Korean Army enlisted men as technicians in fabricating and fitting upper and lower extremity prostheses, and second, to fit with prostheses as many Korean soldier amputees as possible.

The laboratory structure consists of a group of prefabricated buildings. This specialized organization is a United States Army Unit (1st Orthopedic Prosthetic Detachments) but it is actually located within the confines of the 31st Republic of Korea Army Convalescent Center.

The need for this type of orthopedic rehabilitation for Korean amputees came to the attention of Major General George E. Armstrong, Surgeon General, and Colonel Oral B. Bolibaugh, Orthopedic Consultant, Army Forces, Far East, during a routine inspection of United States and Republic of Korea Army medical units in the latter part of 1951.

Following a conference with President Rhee, it became more apparent that some form of rehabilitation program was urgently needed to provide prostheses for the ever increasing number of amputees. The outcome of this conference was a plan to activate this prosthetic unit.

** Reprinted by permission from the Medical Bulletin of the U. S. Army, Far East, Sept. 1953. The author, a certified prosthetist, was formerly Commanding Officer, 1st Orthopedic-Prosthetic Detachment.*

At the time, there were no adequate facilities in Korea to provide artificial limbs. Colonel Bolibaugh assumed the responsibility for the activation of the 1st Orthopedic Prosthetic Detachment, first of its kind in Korea. Then followed months of planning and working on administrative details to procure proper buildings, personnel, equipment, materials and supplies. Finally, in May 1952, the laboratory was ready.

Although it was designated a United States Army Provisional Detachment, in effect the unit was the result of the cooperative effort of both the United States Army Medical Service and the Republic of Korea Army Medical Department. This cooperation between the Korean and American Army Medical Services resulted in the high success that the unit has attained after more than a year of operation. The Korean Army Medical Department provided the site for the buildings, 30 Republic of Korea Army enlisted men for training as technicians, one orthopedic surgeon as consultant on amputations, two interpreters, one supply and one administrative officer with the necessary enlisted men to assist.

The United States Army Medical Service supplied the prefabricated buildings, machinery, tools, materials to make prostheses, and a teaching staff consisting of one experienced Medical Service Corps officer who was appointed Commanding Officer of the laboratory, and four enlisted technicians.

PROGRAM OF INSTRUCTION

The following program of instruction was set up to include both classroom and on-the-job training:

Basic Anatomy: Osteology, Myology, Neurology and Arthrology — Emphasis of instruction on upper and lower extremities in relation to fitting of prostheses. Study of regional anatomy stressing the skeletal, muscular and nervous system of the body. The study of the inter relationships in the musculoskeletal system as it pertains to body activity and locomotion.

Medical Terminology: To familiarize the student with medical terms commonly used in relationship to amputations and prostheses, and medical terms technicians will find on prescriptions for prosthetic appliances.

Amputations: Lower and upper extremities described, including various reasons for amputations. Types and sites of amputations also discussed. Various stump complications are explained. Clinical training and experience is given on the rehabilitation of the amputee before and following the fitting of the prosthesis.

Plaster of Paris Technique: Instruction on principles and techniques in the use of plaster of paris. Various types of casts and their uses. Lectures and demonstrations in obtaining negative and positive plaster molds in relationship to the prosthesis. Clinical training n use of plaster of paris in the fabrication of prostheses.

Prosthetics (Lectures and Demonstrations): Lectures and demonstration in measuring aligning and fitting of all types of upper and lower extremity prosthesis.

Prosthetics (On Job Training): On-the-job training and practical experience in the measurement, fabrication, alignment and fitting of upper and lower extremity prostheses.

Procurement: Maintenance and placement of equipment and supplies. Instruction in supply requirements of a prosthetic unit. Its initial set-up and its method of drawing, storing and maintaining of supplies and equipment.

The classroom instruction consisting of lectures, demonstrations and conferences, was initiated at the opening of the laboratory and was continued for a period of sixteen weeks. At the end of this time the students had attained a sufficient degree of proficiency so that full time could be devoted to on-the-job training and production of prostheses.

FABRICATION OF PROSTHESES

The laboratory is divided into three sections, one for arm prostheses, one for above knee, and one for below knee prostheses. This is necessary as the various types of prostheses require different principles of construction according to the type and location of the amputation. Each section operates on an assembly line basis and greater production is obtained from this system.

Amputees entering the laboratory for the first time are measured and casted, then the cast and the drawing are routed through the appropriate section. Each technician performs a certain phase of work contributing to the final fabrication of the prosthesis.

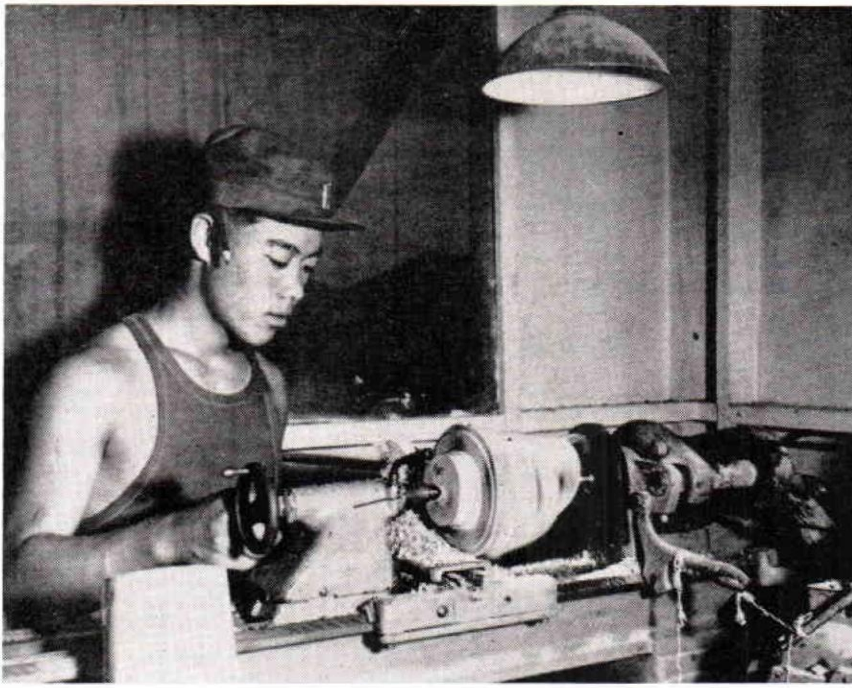
However, the technicians are rotated through each section so that they learn all phases of the work.

When the prosthesis is completed, the chief technician of each section makes the final fitting of the prosthesis to the amputee, in the presence of the commander of the laboratory or one of his representatives and the Korean orthopedic surgeon. If the prosthesis is satisfactory in every detail, the laboratory commander gives his approval.

The amputee is then given a period of instruction in the use of his artificial limb. When the set standard of proficiency is met, he is discharged from the military service to one of the Korea Veterans National Rehabilitation Centers. Here the veteran amputee is further rehabilitated and taught a useful trade or occupation.

The two basic materials used at the laboratory in the fabrication of prostheses are: (1) Polyester thermo setting resin commonly known as plastic and (2) Cotton stockinette (used as the laminated base).

The plastic material is simple and easy to use. No machinery is needed and only a few hand tools and a hot air oven are necessary in the laminating process. Following lamination, the plastic and stockinette combination in its finished form is durable, strong and light in weight. Simplicity in design, and in the fabrication of the prosthesis were recognized as one of the keynote policies to be followed early in the planning stages of the laboratory. Plastic, having the above mentioned qualities and requirements, was selected as one of the best basic materials to use. Instruction was also given in the use of

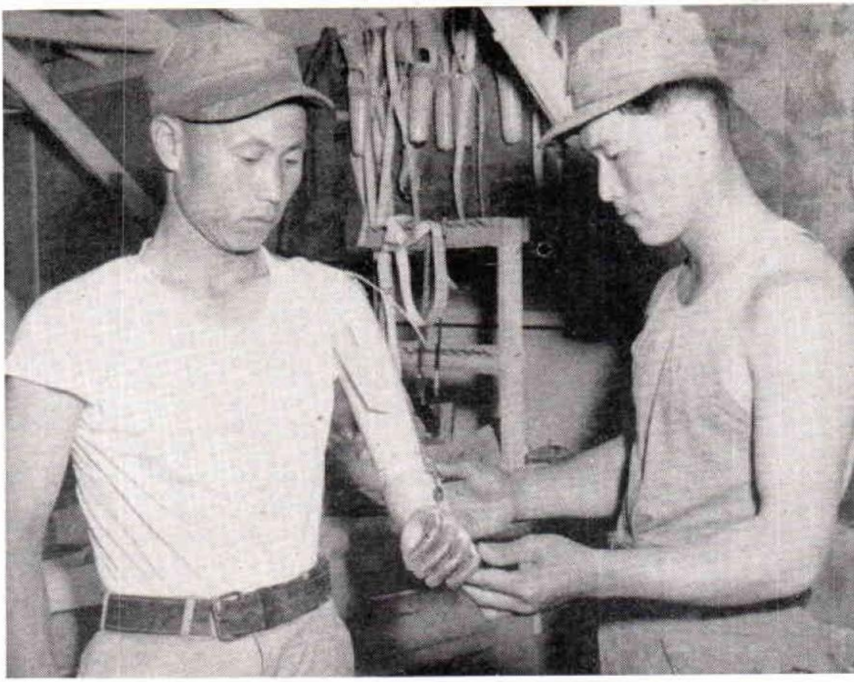


Korean Army Prosthesis Specialist Turns a Wooden Knee Block on a Lathe.

other materials in fabricating prosthesis as follows: (1) Celastic and leather combination for upper and lower extremity prostheses. (2) A thermoplastic resin using fiber glass as the laminated base for both upper and lower extremity prostheses. (3) Willow wood for above knee sockets.

Except for the Syme and Chopart amputations, the foot, ankle and skin pieces of the prosthesis for the lower extremities are constructed in the same manner for both above knee and below knee amputation. The foot is a prefabricated type consisting of rubber and wood combination available in sizes 6 through 8. The rubber portion extends from the distal portion of the toe to the site of the metatarsal-phalangeal joint giving the required joint motion at that point. The remainder of the foot is of wood construction.

The ankle is of the straight bolt steel functional type, with standard type anterior and posterior rubber bumpers set in the foot and ankle base. The bumpers are adjustable to give the required 30 degree plantar flexion to the foot. The shin piece is made from a positive plaster mold by covering the mold longitudinally with six layers of cotton stockinette and wrapping gauze bandage between the 3rd and 4th layer of stockinette to give lateral strength. A polyvinyl alcohol bag that resembles cellophane in appearance is then stretched around the stockinette covered mold. The bag is sealed against leaks and an opening made in the top. The proper mixture of plastic is poured through the top opening and allowed to impregnate the stockinette. The air bubbles are then worked out of the polyvinyl bag. Fol-



Prosthesis Specialist Fits Limb to Korean Amputee.

lowing this the entire assembly is placed in a hot air oven to cure. When taken from the oven the shin piece is ready for use following minor procedures in the finishing-up process.

Until recently, the integral parts of the prosthesis such as ankle joints, knee joints, elbow joints, pelvic bands, and wrist disconnects have been procured by the U. S. Army Medical Service from the United States. Now, however, the Korean Army Medical Department has its own blacksmith and machine-shop adjacent to the laboratory. Korean Army technicians are being trained to make these parts and it soon will no longer be necessary to purchase them from the United States or elsewhere. This will make the Koerans independent of United States purchases and products. The same is also true of terminal devices (hooks and artificial hands) for artificial arms. The Korean mechanics already have made a number of artificial hands that will undoubtedly prove satisfactory for their needs.

Monthly production from the opening of the laboratory in May 1952 rose from 28 cases to 198 in June 1953. During this period, 1,528 amputees have been fitted with artificial limbs. These victims of war, who otherwise would have been helpless cripples, now have the oportunity of continuing a fairly normal civilian life. This has been made possible through the efforts of the orthopedic laboratory, which has been one of the few great humane projects to come out of the Korean conflict.

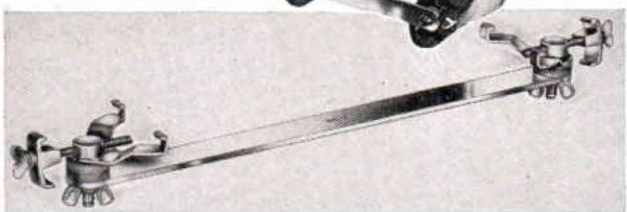
Reprints of articles are available. Inquire of OALMA, 336 Washington Bldg., Washington 5, D. C.

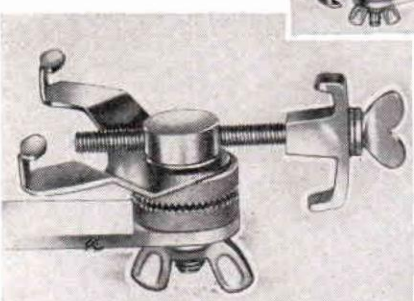
Fillauer DETACHABLE NIGHT SPLINT

NOW UNIVERSALLY ACCEPTED

Orthopedic surgeons are enthusiastic about this versatile splint. It affords decided advancements for treating club feet, positional deformities, tibial torsions, flat feet, congenital hip dislocations. Use of the Fillauer Splint minimizes the necessity of manipulations, plaster, tenotomies and anesthetics. Satisfactory results are confined to children under 3 to 4 years of age.

WRITE FOR DESCRIPTIVE FOLDER





Stainless bronze serrated discs permit 50 different rigid settings. Fits any shoe —double-post swivel clamp adjust easily to any shoe up to 4-yr. old sizes. Special flange for club foot or wedged shoes. Splint lengths: 6″, 7″, 8″, 9″, 10″, 12″, 14″, 16″, and 18″.

ANNOUNCING

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It's New—Revolutionary

Read article on Nyloplex in this issue

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Manufacturers of Orthopedic Appliances ESTABLISHED 1914

Anatomy for Prosthetists and Orthotists
A Report on the New York City Class

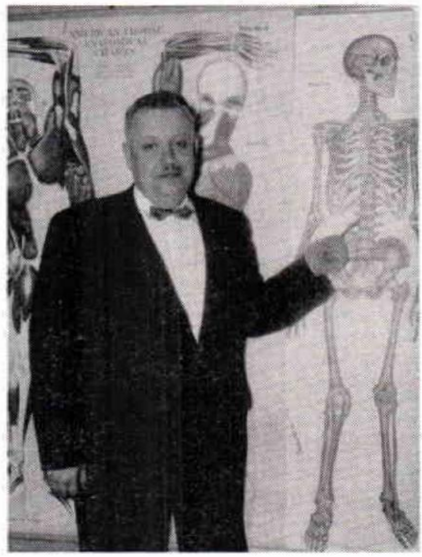
By A. A. MARGOE

Chairman, Educational Committee, MOALMA

It has long been the desire of the members of the Metropolitan New York (Region 2) of the O.A.L.M.A. to develop a training program for apprentices and to provide refresher courses for members and their employees. Such a training program, it was felt, should include a practical understanding of basic anatomy, physiology and pathology, in addition to familiarity with methods and procedures used in the manufacture of orthopedic and prosthetic appliances. Accordingly, with this idea in mind, Chairman Adolph Margoe, in behalf of the Educational Committee, presented the plan to Mr. William A. Kraengel, the Co-ordinator of the N. Y. C. Evening Trade Schools. Mr. Kraengel and Mr. Margoe agreed that such a course in anatomy could and should be presented and decided upon the Straubenmuller High School, 351 West 18th Street, New York City, as the classroom site for the course.

Although the N. Y. C. Board of Education is providing the classroom and some financial aid for this course, Region 2 is meeting the bulk of the expenses by means of a fund raised for this purpose. It was agreed that to present adequate material in basic anatomy and normal and abnormal physiology, a two-year program would be required. It was decided that each class period would be of two hours duration, once a week, preferably on Thursday evenings from 7:00 to 9:00 P.M. The material to be discussed was left to the discretion of the teacher of the course.

Ralph G. Rohner, M.D., A.A.O.S., a practicing Orthopedic Surgeon, of New York City, was engaged as the instructor. Dr. Rohner was formerly an instructor in anatomy at the University of Wisconsin and the Medical College of Virginia. He carried on research in functional anatomy at the University of Wisconsin and New York University. Dr. Rohner subscribes to the functional approach to anatomy and does not discuss it as an inert mass of separate materials. In the course of lectures the structure of the body, its physiology and pathology are discussed and explained in such a way as to be of value to the individuals engaged in the rehabilitation of the physically handicapped through the manufacture and fitting of orthopedic and prosthetic appliances.



Dr. Rohner illustrates a point in Anatomy Class.

Dr. Rohner has been very successful in giving practical interest to this course in anatomy. Through the helpful cooperation of Dr. E. O. Butcher of the New York University Medical

School, some of the class sessions have been held in the dissecting laboratories of the University. In order to take advantage of the University's material on the functioning of the human skeleton and muscles the students have had actual dissecting of the extremities on the cadaver.

Dr. Butcher has aided other class sessions by loaning slides and dry bones for demonstration purposes. The attachment of muscles and the function of joints has been demonstrated on the fore and hind quarters of beef.

In addition to the regular attendance of our registered students who are studying towards certification, the course attracts certified fitters who are using this as a refresher course.

The anatomy course had its inaugural in mid-November, 1953, and has continued through the present with the expected termination date to be June, 1954 for the first section of the course. After a recess for the summer, the class will be resumed in early Autumn.

It is the hope of the Education Committee to enlarge this program to include other courses deemed necessary for certification and for maintaining professional standards.

Costs and Time Studies for the Brace Facility

During the past year, the Prosthetic Testing and Development Laboratory of the Veterans Administration, concluded three special reports which are of interest to Orthotists.

Special Report 18-3, Analysis of Orthopedic Leg Brace Fabrication, describes in great detail over two hundred individual steps required in the manufacture of the brace parts and in their assembly into a full length ischial weight-bearing leg brace with knee lock. The time consumed in each step is tabulated and summarized. The various breakdowns were made to show, notably, the percentages of time spent on parts fabrication, assembly and fitting.

Special Report 18-31, Time Required to Fabricate a Leg Brace Using Prefabricated, Mass-Produced Parts, is a sequel to report 18-3 in that to confirm the figures on time required for parts fabrication, a time analysis was made of an identical-type long leg brace being assembled and completed using prefabricated brace parts. The estimations made in report 18-3, concerning this phase were very close to the actual time recorded. Roughly 40% of a brace maker's time which would be spent in making his own parts and assembling them brace by brace, could be saved for other work if stock parts were employed.

Special Report 18-32, Cost Analysis of Leg Brace Fabrication, the latter of the three, relates to the financial considerations involved in the two former reports. Actually, it translates into dollars and cents what the others show in time and in percentages.

Benefit in various catagories can be derived from the study of these reports: 1. To point out the need for a study of our costs of operations. 2. As a comparison to our operating procedure. 3. As a training guide.

With current plating charges so high, it is evident that the use of stainless steel prefabricated brace parts offers a substantial saving over shop craft-made carbon steel parts.

To my knowledge, this is the first time material of this sort has been accumulated and compiled in such detail. It is factual and accurate for the work concerned. Leather work and plating costs have been omitted as well as overhead, etc.

Reviewed by Carlton Fillauer.

ARCH SUPPORTS

Problems of Fittings and Materials with Special Reference to the Use of Nyloplex

By CARLTON FILLAUER

Manager, Orthopedic Dept., Fillauer Surgical Supplies, Inc.

Arch supports in many forms and types for the treatment of ailing, symptomatic feet are known and accepted universally. They provide surprising results in relieving foot complaints when properly prescribed as for type and material and then constructed and fitted by competent technicians.

This article will not attempt to set forth principles or recommendations governing the diagnosis of foot complaints or the prescribing of supports. Rather we will attempt to cover (1) causes for failure and unsuccessful use of supports (2) advantages and disadvantages of conventional materials (3) a solution to some of the problems.

FITTING PROBLEMS:

Granted that proper diagnosis and prescription have been made, successful use of the support is dependent primarily on its construction and fitting the patient's foot. Knowledge of basic foot anatomy is essential for this. Fitting properly embodies the length, breadth, and height of the support and without the correct relationship of each to the foot as well as to the shoe, no support will completely fulfill its task.

The heel of the removable support should fill the space in the heel of the shoe for the support to be comfortable and to stay in place. When too narrow, it will leave a mark on the foot and possibly cause discomfort where the heel overhangs. If too wide, it will slide forward or distort the shoe. The height, width and location of the longitudinal section must be adequately appraised to perform its intended function of restoring balance to the foot. If the apex of the longitudinal arch be too far posteriorly or anteriorly, comfortable and adequate correction of pronation can not be effected. Similar reasoning applies to the metatarsal support and to any other correction being attempted. Good judgement based on training and experience plays a big role in this determination and then, even with the experts, subsequent alterations may be necessary. The use of stock "ready made" supports in retail shoe stores and many orthopedic shops has satisfied a number of foot sufferers, but not near the number they are reputed to have relieved. Many patients who receive some degree of relief feel that they should be satisfied and resigned to their use, whereas more satisfactory results could be obtained if the supports were made to suit their requirements.

MATERIAL PROBLEMS:

Often patients are fitted properly, but negative results may be due to the material used. Who has not heard one of the following complaints: arch supports are too heavy; too hard; too cold; too dirty and odorous; they make the shoes too tight for my foot; they flatten out; they have not done me any good.

Materials for supports may be classified into two groups: (1) rigid or semi-rigid materials molded or hammered to a model of the foot. (2) soft materials cut or ground to fit the foot. The former category includes, stainless steel, monel, leather and plastics such as celastic, cellulose acetate and thermosetting laminating materials. Supports made from these materials are not so dependent on the shoe for holding their shape as the latter catagory. These soft materials, such as felt, sponge rubber, lattery category. There soft macork and cork compositions are fabricated into pads as supports, and then cemented into shoes.

Rigid metal supports offer two formidable problems: (1) specialized skill and hard labor are required to properly form them to the desired anatomical conformation, making them more costly. (2) their rigidity "crutches" the foot to the extent that no exercise is permitted, and often this factor cannot be tolerated by the wearer. Weight, but not corrosion, is a factor with stainless steel and monel. Aluminum, on the other hand is light but subject to corrosin, to even with a leather covering.

The softer materials offer more flexibility and they are less expensive to the patient than the rigid types. Plaster impressions are seldom used in the fabrication process. Usually weight bearing ink prints or caliper measurements are all that is required. The pads are cemented into the shoes and with a number of shoes, this sometimes can exceed the cost of removable supports. The life and quality of these types are directly dependent on the quality of the shoe. Sometimes it is questionable with the soft shank, poorly constructed shoes women and children wear, whether or not the patient receives adequate support.

A NEW MATERIAL:

Generally speaking, arch supports ideally should have flexibility with durability, hold the correction, yet be elastic. They should be thin and light, corrosion proof and free from holding odors. In many cases, they must not be rough on delicate hosiery or noticeable in open counter shoes.

This "ideal" material must be suited for individual shaping with a simple molding process. Quick alterations and adjustments also must be possible. And, finally, these demands for the ideal support should be met with moderate cost to the patient.

Only through long and tedious research was it possible to develop a new plastic combination, nylon and methacrylate, which offers so much in the way of an ideal arch support material; one that had the characteristics and physical properties as outlined above. This new combination with the strength characteristics of nylon and the workabilty of plexiglas, is in a class by itself.

The prelude to this development began with the early experimentation with plexiglas. It molded beautifully but the supports broke after short use.

Compared to the methacrylate (plexiglas) material, Nyloplex* *has 100%* greater impact strength, and proportionately is more ductile yet more resistant to cold flow and deformation from weight bearing. It is able to withstand considerable weight without noticeable deformation. Even after having been subjected to deformation over a long period of time, it will return to its original shape. This makes it ideally suited for orthopedic use.

TECHNICAL DATA:

Nyloplex is a clear, transparent plastic with a light golden tint. It is a thermo-plastic which following heating, not to exceed 280°F, becomes soft, rubber-like and very easily shaped to a patient's foot or a model thereof. Heating the material may be accomplished by a number of methods but in any case, it is imperative that the temperature be controlled and not allowed to exceed the prescribed maximum limit. Only electric hot plates, sandwich type enclosed grills (see illustration) or ovens with automatic temperature controls are recommended. Heating time for the ma-

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*Registered Trade Mark Applied for

Use of Simple Heating Device.

terial varies with the type heater, but in any case, the heaters should be allowed to reach maximum heat, before inserting the material. Nyloplex should be left on heated plates for only 2 minutes, while in an oven 10 minutes is maximum time. It is advisable to turn over the blanks once or twice during the heating process. When using an oven, they should be placed on glass or smooth metal. The danger of overheating cannot be over emphasized as permanent damage takes place in the way of crystallization and brittleness in the material. Darkening of the material is indicative of this condition. Nyloplex that has been heated too long is considerably darker in contrast to normal Nyloplex and too brittle to be used for supports. For this reason the shaping process should not be repeated more than a few times. A well worked support can be recognized by its light, even coloring.

MOLDING PROCESS

When a positive plaster mold technique is used, certain suggestions are offered which would not apply in cases where metal supports are being made. The first is that a 5/16 or 3/8 round rod should be cast in the model so as to protrude 3″ to 5″ beyond the toes to provide a handle that can be clamped in a vise during the molding of the support. This enables the operator to easily place the heated Nyloplex blank over the model and wrap it with an Ace type bandage. The second is the necessity for building up on the model the lateral border and the heel margins so that the support will not have an excessively cupped heel or elevated lateral margin. This altering of the model is best and easiest accomplished with plaster just after the positive model is poured and stripped. If a metatarsal raise is desired, the corresponding area in the model should be excavated with slight exaggeration.

And last, to protect the glass-like surface during the forming procedure, it is advisable to cover the plaster model with a thin soft felt or, preferably with horsehide coated with nylon lacquer. If the covering is cemented to the model with rubber cement it can be easily removed later and re-used many times. The heated Nyloplex blank can be handled with cotton gloves while it is removed from the heater and positioned on the model. Quickly the blank can be hand shaped to the model and then wrapped in place with a bandage. A felt pad over the metatarsal and longitudinal areas will help form the support to the model.

An alternative method of forming the Nyloplex is to make or rework a shoe press so that it will have a thick, soft forming pad for a base. This is easily made of 1" foam rubber covered with felt. A section of hard felt placed in the longitudinal arch area will assist in forming the plastic to the model, especially when a pes cavus condition exists. As with the model, the final surface in contact with the plastic ideally is horsehide with a nylon coating.

In 10 to 15 minutes or as soon as the Nyloplex has cooled below 125°F, the supports can be removed from their models. If a proper size blank has been selected, it is possible that no alteration may be necessary. Occasionally, when it is deemed necessary to further raise the metatarsal area it can be accomplished with localized heat and thumb pressure.

As with other types it is proper that the supports fit the patient's shoe without crowding. Whatever method of trimming is used, whether sawing, grinding, or sanding, one precaution should be observed and that is to avoid over heating the margin or surface, with high speed tools or wheels. As warned previously, over heating causes brittleness and stresses in the material. There is one important safe-guard to assure long service life in the support. All scratches and tool marks should be carefully removed by buffing. This is equally as important as the caution to avoid over heating, as inferior work on the edges will result in premature breakage. The same buffing compounds recommended for Plexiglas is ideal for Nyloplex.

SUBSEQUENT MODIFICATION:

Later, the supports may require correction or alteration of an area e. g. the metatarsal raise. For this type of adjustment localized heating is necessary and may be accomplished in one of several ways. 1. By means of a hot air heat gun. 2. By means of a flame heat source as an alcohol lamp or bunsen burner. 3. With a suitably shaped heated metal rod.

When using a flame as a heat source, a distance of 4 to 8 inches should be maintained between the heat and the Nyloplex. The material is not a good conductor of heat so the heat must not be too great. It is recommended that a coating of oil be applied to the area before heating to dissipate the heat. The operator wearing cotton gloves can feel the Nyloplex become pliable and can easily and quickly make the alteration.

CLEANING:

A special advantage of Nyloplex will be found in its easy cleaning. Supports made of Nyloplex can be washed in lukewarm water or soapsuds and then rubbed clean with a soft rag, preferably of glove material. The use of brushes or similar cleaning agents such as sand or commercial abrasives is to be avoided, since Nyloplex would be scratched by them. If dirt cannot be removed with soapsuds, the supports may be rinsed in diluted soda.

Care has to be taken not to use very hot water for cleaning Nyloplex, since by thermic reaction, it would then revert to its original shape and would make reshaping necessary. It may be warped by excessive heat.

Experiences made with Nyloplex since 1948 are extremely encouraging. The experience gained from publications and wearing tests are here summed up. There is general agreement on the fact that the main advantage of Nyloplex is the ease with which it can be shaped. A considerably simpler, yet better, fitting than can be obtained with other kinds of supports can now be taken for granted. To this is added the ease with which it can be corrected. After local heating, the longitudinal or transversal arch can be changed at will. This adaptability makes it possible repeatedly to reshape long worn supports, so that replacement is unnecessary.

Even a complete reshaping of worn supports is possible. This remolding, however, cannot be repeated indefinitely. After Nyloplex has taken on a darker coloring by repeated heat-molding, it loses its elasticity and will break soon after. Another point which is emphasized again and again is this very elasticity. The supports do not in the least interfere with the elastic action of the foot. By using supports of suitable thickness the spring action has a wholesome effect in stimulating the foot muscles. Even after being subjected to a great weight, the supports revert to their shape. There is for instance a report on a beer-truck driver who would regularly crush or break the usual light metal supports within one week. He had already been better satisfied with Plexiglas, whose elasticity is far below that of Nyloplex. This shows that Nyloplex will come up to the highest expectations. It is also mentioned that the patients do not feel the hardness of Nyloplex on account of its elasticity, whereas they frequently complain about metallic supports.

Nyloplex as an arch support material possesses a total of characteristics not found in any other single material. These are lightness with strength, moldability with durability, elasticity, cleanliness and ease of adjustment.

(Nyloplex blanks available in all sizes 1 to 13 at:
Fillauer Surgical Supplies, Inc.
Box 1678
Chattanooga, Tenn.
Materials, heater and hot air gun data available from above.)

Welcome

Cordial greetings are extended to these new members of OALMA:

Bennington Stump Sock Corporation (Associate Member), Milton Katz, President, 2400 Merrick Road, Bellmore, New York.

Otto Bock Distributing Agency (Associate Member), H. D. Fahrenholtz, Representative, 375 West Fourth Street South, Salt Lake City, Utah.

C. N. Orthopedic Company, Charles Nagat, Partner, 329 W. Madison Street Baltimore, Maryland.

Pierre W. Delaby, Pierre W. Delaby, Owner, 127 Rowland Circle, Fayetteville, North Carolina.

Physician's Orthopedic Service, Harvey G. Lanham, Owner, 624 Robinson Avenue, San Diego, California.

Lyman Dickinson, Lyman Dickinson, Owner, 624 Third Avenue, Watervliet, New York.

Lanham Applied Service Corporation, (Associate Member), Harvey G. Lanham, President, 1043 Pine Avenue, Long Beach 13, California.

Minneapolis Artificial Limb Company, William P. Fleming, 226 Highland Drive, Williamsville, New York.

Importance of Musculature of the Amputation Stump

By PROF. DR. FELIX MONDRY, Marburg/R.

Lecture at the Meeting of Master Technicians in Orthopedics at Marburg/L.

Orthopedic technicians of Germany, by developing the suction or grip prosthesis (with its exact static structure and by the fashioning of the socket rim with the so-called "tuber (ischial) seat," which requires great mechanical ability, anatomic knowledge, and a capacity for patient understanding and adjustment), have provided for those, who suffered amputation above the knee, a replacement of the lost member, which can justly be called an "artificial leg."

The modern thigh prosthesis makes great demands of the thigh stump, if it is to be as useful, as the amputee as well as the orthopedic technician, justly expect it to be. Many thigh stumps resulting from injuries in the two World Wars do not meet the requirement of the modern thigh above knee prosthesis. The reasons are known: the shortage of well-trained surgeons in the presence of an overwhelming number of severely wounded casualties; the winter campaigns; the retreats in Russia, the adversities of defeat and of the after-war period. These often made necessary the use of emergency prostheses, which seemed to make the "guillotine amputation" advisable and often led to premature discharge from the war hospital. The emergency operation, which had been thought to be provisional, and which was to be followed by a correction of the stump by well-trained specialists, remained the permanent treatment. There are still tens of thousands of amputees with poor, defective stumps. The prosthetic care of these stumps involves great efforts for the orthopedic technician. They demand of him time-consuming, and often repeated fittings, and they may even present him with problems, which are technically impossible to solve. The disappointment of the orthopedic technician with the the limitations of his ability is just as great as the disappointment of the amputee, who is incapable of wearing the artificial limb. The repeated attempts at altering the prosthesis cause accumulation of governmental expenditures, and the general public is burdened with a dissatisfied, discouraged, "disabled" war veteran.

When the prosthetic equipment of a thigh amputee causes difficulties for the orthopedic technician, confidential consultations between the craftsman and the surgeon are essential, and will be a help for the amputee. There are some amputation stumps which even a master craftsman in orthopedic mechanics will be unable to equip with a prosthesis, until a surgeon rectifies the defects of the stump. Every orthopedic technician knows from his own experience what poor stump conditions are. In such cases, the orthopedic technician should try to overcome the "operation-phobia" of the amputee, by calling his attention to the progress in surgery, and in the modern methods of anesthesia, and by impressing on him the necessity of improving his defect by a surgical intervention, and by urging him to consult a surgeon.

It is essential that the skin covers the stump snugly (closely) and smoothly. Deep retractions, flap-like

* *Reprinted by permission from Orthopadie-Technik, Feb. 1953.*

scar formations result in skin irritation and eczema formation, and, like protruding skin-tail formations, can be removed by simple corrective interventions. Scars adhering to the bone stump with a broad surface, have a tendency to ulcerate, always cause discomfort and should be removed in all cases. Highly sensitive amputation scars should be removed by scar correction, because the terminations of sensory nerves are baked into these cicatrices. Sensitive bone proliferations on the end of the bone stump are often connected with a vessel or nerve stump and require the resection of the bone projection and the shortening of the neurovascular stump. Osteomyelitic fistulas and chronic inflammatory foci in the bone can be eradicated by the use of antibiotics such as penicillin, streptomycin, terramycin, etc. Highly sensitive nerve ganglions and phantom-limb pain can be cured by the combined use of nerve resection, antibiotics and roentgen irradiation.

It is surprising that exact management of the stump musculature has so far received insufficient attention in amputation and stump correction. Strong and functioning muscles on the amputation stump are of vital importance for activating the prosthesis, and particularly for the circulation in the amputation stump. The stronger the stump musculature, the better also the blood perfusion of skin and subcutaneous tissue, and the warmer and healthier will be the amputation stump. An amputation stump with optimal circulation is warm to the touch, not subject to profuse sweating nor to irritation and discoloration of the skin and the customary stump disorders.

It is generally believed that the muscles which have been cut through during amputation, have lost their function permanently and will atrophy. Attempts have been made to accelerate this atrophy by "wrapping (bandaging)—out." We reject the

Fig. 1. During amputation a part of the adductor musculature is transversely divided and usually left without definitive care.

"wrapping-out" of the stump, and believe that by joining the flexor and extensor muscles, which act as counterbalancing forces, and by joining the divided adductor musculature of the thigh with the *Tractus iliotibialis* and the *Musculus vastus lateralis*, the divided muscles will also become amenable to exercise, and better blood perfusion of the amputation stump will result, and this in turn will produce a healthier amputation stump.

For the last several years we have carried out this principle of careful adjustment of the antagonistic stump musculature on a large case material. We regard it as a decided progress and believe that this method can be recommended.

In the management of thigh stumps, the divided part of the adductor musculature is generally left as such, and this implies a considerable loss of strength for the stump and causes the development of disturbances. The adductor muscles which draw downward in a wide wedge on the inside of the thigh, are muscles of the hip joint. Their great functional performance is exceeded only by that of the extensor muscula-

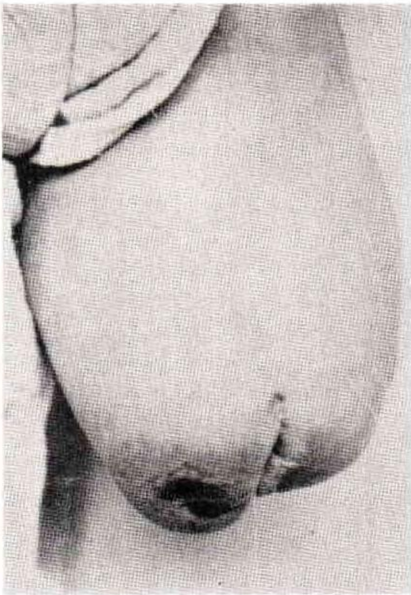

Fig. 2. Hardening and discoloration of skin at inner end of the stump, because the divided part of the adductor musculature received no definite repair.

ture of the hip joint. The adductor muscles are antagonists of the abductors of the hip joint (Fig. 1), and over and above that, depending on their origin and attachment, they strengthen flexors, extensors, and the internal-and external rotators of the hip joint. Together with the abductors of the hip joint they insure maintenance of the equilibrium during standing on one leg and in collaboration with the other hip muscles, they are of greatest importance for the functioning of the artificial leg. During walking and standing, the adductors hold the thigh, so that the abductors can elevate the opposite side of the pelvis. Every considerable weakening of the adductor muscles leads to disturbances in walking. If the abductor muscles gain dominance through a weakening of the adductor muscles, the stump end in the socket deviates laterally and to the front. The end of the stump is pressed against the lateral wall of the socket, the prosthesis is shifted toward the outside, so that a pocket is formed between trochanter and the lateral rim of the socket and a painful pressure area develops at the inner rim of the socket. In such cases, brownish-red skin discolorations are observed on the inner side of the thigh, which are the result of the pressure exerted by the internal rim of the socket.

Particularly in case of the suction prosthesis, the unattached portion of the adductor musculature, during walking, draws backwards like a roll and is pressed against the inner wall of the socket. These contusions and clampings of the retracting adductor musculature produce constantly repeated circulatory disturbances and blood effusions, which in turn cause the well-known indurations and dark brownish-red discolorations of the skin at the inner end of the stump (Fig. 2.) In all cases with this dark brown-red discoloration and induration of the tissue at the inner end of the stump, we found, that the part of the adductor musculature which had been cut through at the time of amputation, had not been properly taken care of.

If one examines the amputation stump, while the amputee is standing and the musculature is tensed, one can see how the divided part of the adductors retracts like a roll. During the correction of such stumps, the musculature is usually readily pulled forward and can then be united over the bone stump by means of a suture, a shortening of the bone stump being generally unnecessary. We join the stump musculature over the bony end of the stump in two separate layers (Fig. 3-4). We recommend that in the first deep, layer the divided part of the adductor musculature be joined to the *tractus iliotibialis* or to the *M. Vastus lateralis.* Over this, we join in a second layer, crossing over the first one, the flexor with the extensor muscles. Active muscle exercises are begun two weeks after the operation.

On stumps of below-the-knee amputations, the joining of the divided flexor and extensor musculature to a "muscle play" (muscular system) is possible only over a bone bridge between tibia and fibula, which Bier recommended as the osteoplastic amputation. Ertl greatly improved Bier's surgical technique of the osteoplastic below-the-knee (lower leg) amputation and made this method more widely known (Fig. 5-6).

The often repeated assertion that the osteoplastic stump of the lower leg is capable of weight-bearing (Gocht) implies a stump, which can support the entire body weight for a considerable time. The osteoplastic (Bier-Ertl) stump of the lower leg is not suitable for weight-bearing, but it is capable of bearing a greater load than the ordinary lower-leg stump and it gives a particularly good "ground feeling." In addition to this, the osteoplastic lower-leg stump has other essential advantages over the ordinary lower-leg stumps. The fact that tibia and fibula are rigidly joined by a bone-bridge corresponds to the natural fixation of both bones in the region of the ankle joint. Behind this bone bridge the stumps of vessels and nerves are protected against irritation and the musculature is protected against compression and the circulatory disturbances inherent therein. The otherwise poorly functioning flexor and extensor musculature is joined by suture over the bone-bridge and thus can be exercised again. The strengthening of the musculature, which has been joined into a "muscle play," produces better circulation of the entire lower-leg stump and prevents stump disorders. The advantages of the osteoplastic (Bier-Ertl) lower-leg stump, such as stabilization of the bony frame-work, capability of exercising the residual musculature, better blood perfusion, of

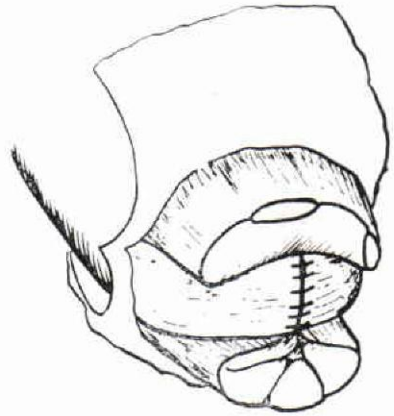

Fig. 3. Over the stump end of the bone the vastus lateralis.

Fig. 4. Over this, as a second layer, the flexor and extensor musculature is joined by suture.

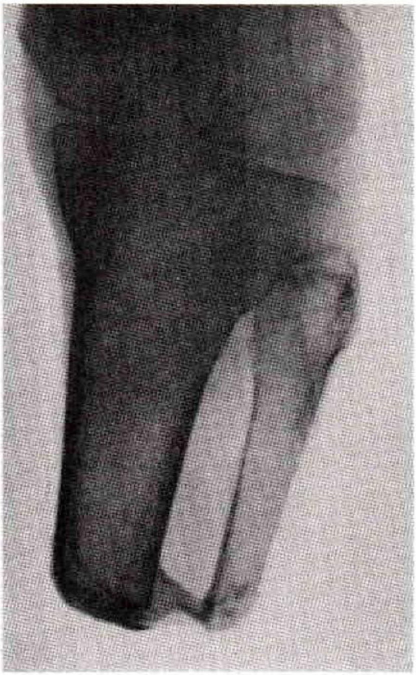

Fig. 5. Osteoplastic lower-leg amputation according to Bier-Ertl. Stabilization of fibula and tibia by a periosteal-bone bridge.

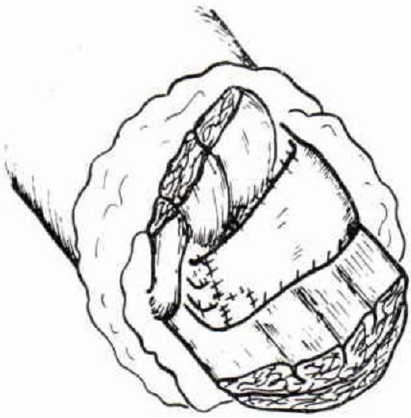

Fig. 6. Over the periosteal-bone bridge, between tibia and fibula, the flexor and extensor musculature is joined by suture.

the entire stump, and protection of the nerve and vessel stumps against irritations, are so great, that we recommend the osteoplastic, below-the-knee amputation as the method of choice, not only for first amputations but also for necessary stump corrections.

Lower-leg prostheses hitherto available are not suitable for the osteoplastic (Bier-Ertl) lower-leg stumps. Orthopedic technicians have the task to devise newer and better prostheses with a new socket shape to facilitate a better weight distribution, and with a multi-laterally movable foot joint, which will protect knee and hip-joints against hard impacts and so protect them against early wear-out.

"What's New(s)"

• TERRY MOORE is now the manager of the *Florida Brace Corporation* at Winter Park, Florida. This company features the Jewett Brace for hyperextension of the spine. Many bracemakers throughout the country find great satisfaction for their patients and considerable profit for themselves in handling this brace. The local brace firm makes the measurements, sends them to Florida and then makes the subsequent adjustments as required. Delivery is forty-eight to seventy-two hours to most places in the country by air-mail from the time the measurements are sent, since shipment is made within three hours after the order is received. This is very important since these cases demand three to four day service.

CROSS-COUNTRY REPORT

What the Regions are Doing

THE NEW ENGLAND STATES

Members of OALMA Region I held their annual meeting March 1 and elected the following officers: Karl Buschenfeldt, *President;* Joseph Martino, *Vice-president;* John Buckley, *Secretary;* and Herman Buschenfeldt, *Treasurer.*

Wilfred G. Holsburg, VA Regional Supervisor was the speaker at the January meeting. He discussed the operations of the Prosthetic and Sensory Aids Unit and outlined ways in which our members might be of greater service to the veteran.

WM. J. FERRIS,
Director, Region I.

REGION IV MEETS AT DUKE UNIVERSITY

The seventh meeting of the Southeast (Region No. IV of OALMA) was held March 12 and 13 at Duke University, Durham, North Carolina. The program for the two-day session included outstanding members of the University faculty and officials of OALMA.

In its business session Saturday the Region elected the following Board of Governors: Bob Blair, Ralph Snell, J. M. Bonds, Moody Smitherman and George Lambert.

We were honored to have President and Mrs. Fawver and the Glenn Jacksons among the 85 members registered.

—BERT TITUS,
Chairman.

REGION V—OHIO, WEST VIRGINIA AND MICHIGAN

Spring is just around the corner and so is our second annual meeting for Region V. Place: The Commodore-Perry Hotel, Toledo, Ohio. Date: Saturday & Sunday, May 8th and 9th. Time: Assemble 7:00 P.M. Saturday; Adjourn 3:00 P.M. Sunday.

We will start our Saturday session with registration and cocktails at 6:00 P.M. The banquet will start at 7:00 P.M. with our program following, which will cover both braces and limbs. Our Executive Director, Mr. Glenn Jackson, will highlite our program with a very interesting review of his recent national tour.

Mr. A. E. Kloene, of Toledo, has offered to be my assistant for this 1954 meeting. We hope to have the arrangements completed for our program within a few weeks, so that we can send you an advance copy.

The ladies are invited, so plan to bring your wife and spend an enjoyable as well as educational, weekend in Toledo.

Sincerely yours,
PAUL E. LEIMKUEHLER
Director, Region V.

REGION VII—THE NORTH CENTRAL STATES: (MINNESOTA, THE DAKOTAS, WYOMING, COLORADO, KANSAS, NEBRASKA, WESTERN MISSOURI AND IOWA)

All members of the limb and brace profession and others interested in rehabilation are cordially invited to the one-day reunion of Region VIII on April 17. This will be held at the Gillette State Hospital for Crippled Children, at St. Paul, Minnesota. The Chief of Staff and the Head Physical Therapist will conduct a tour of the Hospital and Brace Shop. This is to be followed by a panel discussion of the UCLA Upper Extremity School. The panel will include a prosthetist, a therapist and a physician. Glenn Jackson will be the featured speaker reporting impressions of his cross-country trip.

ROBERT C. GRUMAN
Chairman

MEXICO

REGION VIII—TEXAS, OKLAHOMA, ARKANSAS, WESTERN LOUISIANA AND NEW

The Southwest does things in a big way and its annual meeting March 20 and 21 lived up to that tradition with a registration of 69 members and guests. Meeting at the Hotel Biltmore in Oklahoma City, delegates were guests at dinner of the Oklahoma firms. In the session that followed, President Lee Fawver and Director Glenn Jackson outlined the new projects of OALMA and plans for future growth of the profession. Jerry Leavy lectured on new developments in the Upper Extremity field, and R. N. Witt demonstrated hand splints and assistive devices. Sunday morning was devoted to the Certification program, and to the group insurance service of OALMA.

The slate of officers for the new year includes Ed Latimer, *president;* J. A. Baker, *vice-president,* and R. N. Witt, re-elected *secretary-treasurer.* They will plan the 1955 meeting which is to be held in Dallas.

Members adjourned, full of praise for the fine meeting arranged by Lester Sabolich and A. L. Muilenberg.

R. N. Witt, Secy.-Treas.

REGION IX (SOUTHERN CALIFORNIA AND ARIZONA)

Region IX of OALMA joined with the Society of Orthotists and Prosthetists to hold a two-day Assembly in Los Angeles March 27 and 28. A unique feature of this Assembly was a live Closed Circuit Television Broadcast from the Orthopedic Hospital, Los Angeles direct to the Statler Hotel allowing the audience to see a Biceps Cineplastry for below elbow amputee performed, with subsequent training and rehabilitation technique. This will be reported in detail in the June issue of this *Journal.*

HARVEY G. LANHAM
Director, Region IX

SUPPLIERS SECTION

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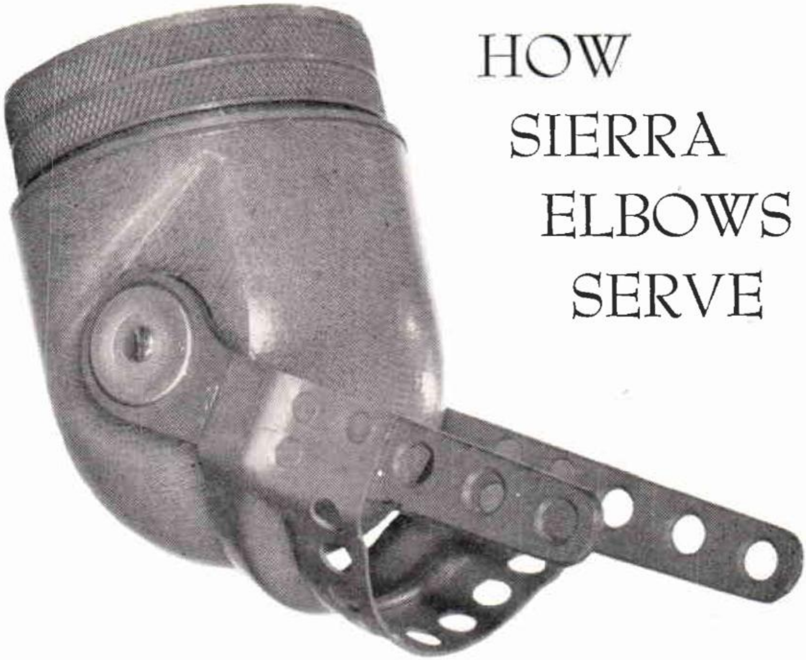

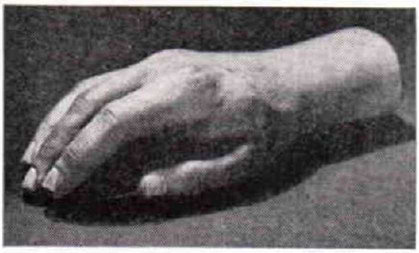

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Our Code of Fair Trade Practices

Below is a digest of the rules governing fair trade practices as promulgated by the Federal Trade Commission, April 1946 and adopted by the American Board for Certification in August 1948.

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 purchasers in respect to the service of such appliances.

(2) To infer that 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 industry product will be made to fit unless such promise is made in good faith and the industry member is possessed of the requisite competence to assure his ability to fulfill such guarantee. A prosthetic device 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 an industry 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 competitors' products, prices, or services.

(12) To use the term "free" to describe or refer to any industry product which is not actually given to the purchaser without cost.

(13) To wilfully entice away employees of competitors.

(14) To take part in any concerted action with other members of the industry 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 the industry and the members of 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 of this craft 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 of industry products shall be an unfair trade practice.

Further, the industry 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 wear its products.