DECEMBER, 1954

The journal of the Limb and Brace profession

Orthopedic and Prosthetic Appliance Journal

Trends of 1954

The A. B. C. — Views of a Surgeon

Academic Training

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

DATES TO REMEMBER — 1955

What • When • Where

JANUARY

29	AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS—Annual Meeting (adjourns February 3. Certification Exhibit in Booth No. 107)	*Los Angeles, Calif. Statler Hotel*

MARCH

12-14	REGION IX, OALMA—SOCIETY OF ORTHOTISTS AND PROSTHETISTS—Scientific Assembly	*Los Angeles, Calif.*
18-19	REGION IV, OALMA (SOUTHEAST)—Meeting	*Memphis, Tenn. Peabody Hotel*
26-27	REGION VIII, OALMA (SOUTHWEST)—Meeting	*Dallas, Texas*

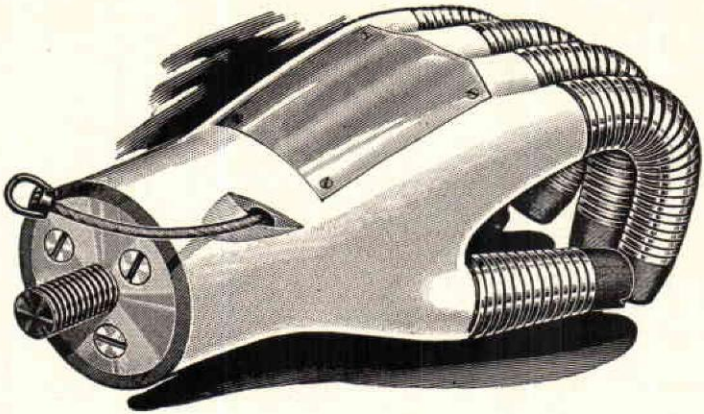
APRIL

29-30	TECHNICAL SEMINAR—Sponsored by MOALMA	*New York City Roosevelt Hotel*

OCTOBER

14-15	EXAMINATION FOR PROSTHETISTS AND ORTHOTISTS—Conducted by the American Board for Certification. Deadline for applications: August 14, 1955.	*New Orleans, La.*
16-19	NATIONAL ASSEMBLY OF THE LIMB AND BRACE PROFESSION	*New Orleans, La. Jung Hotel*

SEE THE NEW LOCKGRIP HANDS



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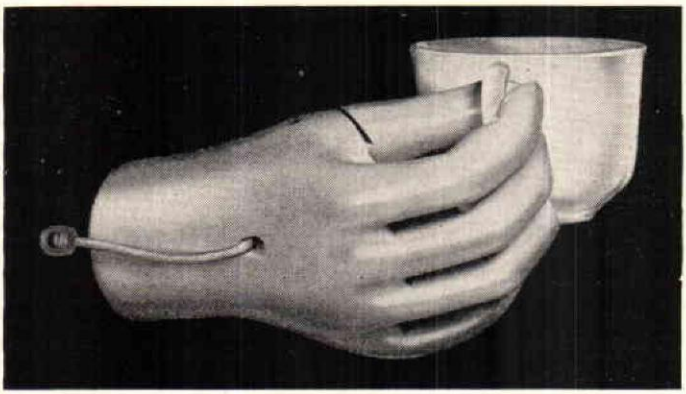

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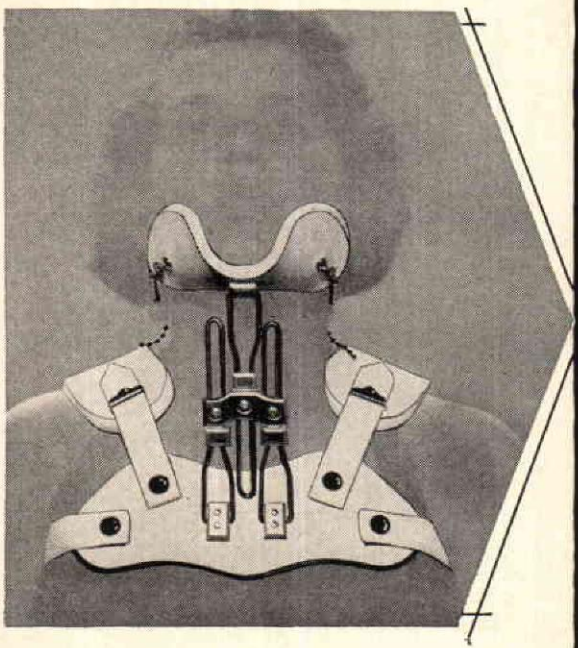

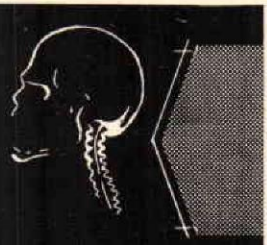

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Orthopedic and Prosthetic Appliance Journal

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LESTER A. SMITH
Editor

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CONTENTS

DEPARTMENTS

A Report from The President of OALMA

It was deeply gratifying to see such a large number of our members attending the Atlantic City Assembly. This was still another evidence of our continuing growth and constantly increasing interest in the problems of the handicapped. The social aspects of the meeting should not be ignored; we all enjoyed seeing old friends and making new ones.

In the next month I hope to see a large number of Apprentice Prosthetists and Orthotists enrolled in the new National Apprenticeship Program. Already OALMA members, as well as other firms in the industry, are writing our headquarters for the necessary forms and information. I urge everyone who has or expects to have in his employ an apprentice fitter, to cooperate in this program.

Our new Education Committee consists of Charles A. Hennessy, Chairman, Carlton E. Fillauer and Herman C. Hittenberger. Under "Chuck's" direction, work is going forward already on the educational needs of our industry. Carlton is in charge of enrolling apprentices and evaluating their past experience. Herman is OALMA representative on a Joint Planning Committee to develop a program of regional schools.

Your new officers pay tribute to the steady progress achieved under previous administrations, and are anxious that we make continued progress for the benefit of the handicapped and for our industry. We would most certainly welcome from everyone in the Industry, and particularly from our OALMA members, any new ideas or suggestions which would contribute to that goal.

We will look forward to hearing from you.

Sincerely,

Wilberth Hanger, Jr.

A Report from The President of the Certification Board

As I write this first article as President of the American Board for Certification, I pray that the limb and brace profession which has worked so hard in the past years to help the handicapped, will continue strong in the faith which has given us the Certification Movement.

Certification has reached its high standard and recognition largely because of the two great Past Presidents, Chester C. Haddan of Denver and Daniel A. McKeever of Atlanta. It is with great humility that I try to fill the position of Board President, which they honored.

Committee Appointed

I am proud at this time to announce the following appointments for the year 1955:

1) *Committee on Facilities*—Karl W. Buschenfeldt, chairman; Charles O. Bechtol, M.D.; Clinton L. Compere, M.D.; Daniel A. McKeever.

2) *Committee on Applicants*—M. J. Benjamin, chairman; Lee J. Fawver; Chester C. Haddan, Edward Chas. Holscher, M.D.

3) *Committee on Examination*—Robert Mazet, Jr., M.D., chairman; Carlton E. Fillauer, asst. chairman; Rufus Alldredge, M.D.; M. J. Benjamin.

4) *Judiciary Committee*—T. Campbell Thompson, M.D., chairman; Chester C. Haddan; David E. Stolpe; Atha Thomas, M.D.

Over a thousand men and women have now met the standards set by the Certification Movement. I am sure that each and every one of these certifees has some idea or thought which would help improve our Movement. I know this because in talking to a few of them personally in various parts of the country, they have all expressed themselves to me at various times. I am asking my readers to take time now to put on paper and send me any ideas or suggestions they may have. These ideas can then be compiled and presented to our Board meeting in the Spring.

In conclusion, I want to make this pledge: to do the best job I can for all of you—to have as my ultimate aim in any decision—*Is this the best for the patient?*

Louis Trautman

Trends and Highlights During 1954 in the Prosthetic and Orthopedic Fields

By WILLIAM M. BERNSTOCK

Chief, Prosthetics Education Section, Research and Development Division, Prosthetic and Sensory Aids Service, Veterans Administration

The writer has been privileged for the past two years to have published in the December issues of the *Orthopedic and Prosthetic Appliance Journal* summaries of the important trends and activities in the field. Included in such summaries were listings of the newly available devices and techniques as well as descriptions of other devices and techniques in various stages of research and development. It is proposed to limit this current article to a review of trends, activities, and highlights, exclusive of devices and techniques, with the thought that appropriate coverage will be given the latter as the need arises.

Perhaps the most significant activity during 1954 was the continuation of the upper extremity prosthetics training and field follow-up program. Four additional sections of the course were held at UCLA during the first six months of the year, making a total of ten sections conducted since the inception of the program in January, 1953. Interest in the program was so great that it was necessary to hold another course during October and November of 1954 and to schedule one or possibly two courses for next year. By the time all of the courses will have been held, the personnel from all the Veterans Administration Orthopedic and Prosthetic Appliance Clinic Teams throughout the country and from more than 50 private and military clinic teams will have received training in upper extremity prosthetics at UCLA. Some 120 prosthetists will have attended the course, thus assuring effective teamwork at the local level.

Another significant feature of this upper extremity prosthetics program has been the field follow-up project administered by the staff of New York University Prosthetic Devices Study. Field representatives, especially trained in upper extremity prosthetics, have been working closely with the clinic teams that have returned from UCLA. Reports of their activities have generally been to the effect that the field representatives have been helpful in aiding the clinic team personnel to put into practice what they learned at UCLA. Moreover, the field representatives have been collecting data which will be useful in further research in the area of upper extremity prosthetics.

In order to provide assistance to the personnel in the field concerned with upper extremity amputees, *armamentarium boards* were developed and sent to all of the clinic teams in the Veterans Administration. The prosthetic components and harnessing displayed on these boards are illustrative of the devices and techniques evaluated through the Artificial Limb Program. The items were fabricated by the Orthopedic Shop of the Veterans Administration Regional Office in New York in accordance with a joint undertaking of the Advisory Committee on Artificial Limbs, New York University Prosthetic Devices Study, and Prosthetic and Sen-

Reviewed by the Veterans Administration and published with the approval of the Chief Medical Director. The statements made and the conclusions drawn by the author represent individual opinion and do not necessarily reflect the opinion or policy of the Veterans Administration.

sory Aids Service of the Veterans Administration. It is intended that these boards be considered available on a short-term loan basis to local interested organizations.

This training and follow-up program is probably the most comprehensive ever conducted in the history of prosthetics in this country. Undoubtedly, it will result, as has already been evident in a number of areas, in a great improvement in upper extremity prosthetic services, with higher standards and better techniques. Further, it will contribute greatly to the acceptance and furtherance of team-work philosophy and practice so essential in any rehabilitation undertaking.

The success of the upper extremity program has been responsible, in great measure, for current plans to develop other prosthetic training courses throughout the country. A Regional Schools Steering Committee, consisting of representatives from the Orthopedic Appliance and Limb Manufacturers Association, University of California in Los Angeles, New York University, American Board for Certification, and Veterans Administration, has had several meetings to determine the most effective methods of holding regional schools. Present thinking is to conduct short-term courses in cooperation with selected and interested universities. It has been agreed that the first schools will cover the principles and practices of above-knee fit and alignment. Tentatively, it is believed that such a course will be of two weeks duration for the prosthetists. It is planned to develop a group of instructors from industry, primarily, who will teach at the regional schools as they are developed. It is hoped that the first round of schools will be initiated in 1955.

A number of other significant educational developments took place during the year. In May, 1954 a meeting was held at New York University to discuss the desirability of developing formal education courses at the college or university level for prosthetists and orthotists. Some twenty-five representatives from sixteen interested organizations, including spokesmen from OALMA, participated in this conference. Additional meetings are contemplated to explore the most appropriate type of training for the development of prosthetists and orthotists.

During the year plans were also being developed at the University of Buffalo to establish a school in Prosthetics extending over a four year period.

The decision by the American Board for Certification that applicants for certification after January 1, 1955 must be trained in accordance with formal apprenticeship standards or the equivalent represents a significant advance in industry's educational program. This policy will undoubtedly result in the establishment of additional educational programs throughout the country with more uniform curricula.

These activities reflect a constantly growing awareness on the part of industry and other organizations interested in prosthetic services to provide opportunities for the development of prosthetists and orthotists. The introduction of college or university level programs should serve to round out the diversified courses that are being sponsored by Orthopedic Appliance and Limb Manufacturers Association, Veterans Administration, and Advisory Committee on Artificial Limbs.

The Lower Extremity Prosthetics Clinical Study begun by University of California at Berkeley in 1953 was carried on throughout the year. Excellent physical facilities have been provided by the United States Naval Hospital in Oakland, California for this study. Generally speaking, the objectives of this Clinical Study are to determine the best prosthetic practices, devices, and techniques of fit-

ting and alignment. The Clinical Study will afford an excellent opportunity for the study of relevant medical and locomotion problems.

The Child Amputee Research Program, started in 1953, was continued during 1954. This has involved the University of California, Los Angeles group with the Marion Davies Clinic, and the staff of the New York University Prosthetic Devices Study with the Michigan Crippled Children Commission. Studies of rate of growth on the amputated side as compared to the normal side are indicated as is the development of prostheses that can be made larger as the child grows. It is hoped that the coordinated efforts of the University of California in Los Angeles, New York University, Army Prosthetic Research Laboratory, Michigan Crippled Children's Commission, Marion Davies Clinic, industry and other interested agencies will bring about improved prosthetic services for children.

A new and welcome publication reached the field during the year. "Artificial Limbs—A Review of Current Developments" is being published three times a year by the Advisory Committee on Artificial Limbs and is being widely distributed. This journal is meeting a real need.

The long awaited book, "Human Limbs and Their Substitutes" by Klopsteg, Wilson et al was published in November by McGraw Hill. It is the considered opinion of the writer that this book will become the outstanding text in the field of prosthetics. Prepared under the sponsorship of the Advisory Committee on Artificial Limbs of the National Research Council, the book summarizes and correlates the artificial limb research program supported by the Department of Medicine and Surgery of the Veterans Administration and the Office of the Surgeon General of the Department of the Army. The contributions of some thirty experts from the several professions concerned with amputation surgery, design and development of artificial limbs and their components, fabrication, fit, and evaluation of prostheses, and care and training of amputees have made for a comprehensive coverage of the various facets of prosthetics. The material is presented in a manner which will be of much value not only to the doctor, therapist, engineer, prosthetist, psychologist, and other interested specialists, but to the amputee himself. "Human Limbs and Their Substitutes" is an outstanding contribution in the field of artificial limbs.

WILLIAM M. BERNSTOCK

Mr. Bernstock has been Chief of the Prosthetics Education Section of the Veterans Administration's Prosthetic and Sensory Aids Service since October 1951. For five years prior to this assignment he served as Chairman of the Rehabilitation Board of the New York Regional Office and was also in charge of the advisement and guidance of seriously disabled veterans. His activities over the past 17 years have been closely identified with problems of the disabled and have included selective placement, testing, counseling, training, and manpoyer utilization.

He is currently serving as Representative from New York to Region II of the National Rehabilitation Association. Mr. Bernstock has been pursuing a Ph.D. at Teachers College, Columbia University the hard way—evenings and week-ends—and is on the last lap.

Another formidable undertaking has been initiated by the Advisory Committee on Artificial Limbs in the compliation of a comprehensive, fully annotated prosthetics bibliography. It is planned to include in this bibliography all the books, manuals, pamphlets, reports, articles, patents, etc. that are related to the various aspects of prosthetics. A bibliography of this type would be a tremendous contribution to the field.

An arm bracing project was started recently involving the Prosthetic Testing and Development Laboratory, other staff members of the Prosthetic and Sensory Aids Service, and the New York Regional Office of the Veterans Administration. It was felt that a large body of knowledge about artificial arms had been developed, much of which could be transferred to arm bracing. The number of people who do not have the use of an upper extremity, because of trauma or disease, is held to be much larger than the number of arm amputees. For various reasons less emphasis has been placed on the development of prostheses for this larger group of disabled people. It is hoped that this new arm bracing project will focus attention on this need and perhaps stimulate other research and development activities by interested organizations.

A new movie, "Upper Extremity Prosthetic Principles" is being produced by the Prosthetic and Sensory Aids Service. It is anticipated that this film will be available for showing in February, 1955. This new film will deal with rationale underlying research and development efforts in the area of upper extremity prosthetics. It is a 16 millimeter, color and sound film and will run for approximately 25 minutes. When completed, the film will be available on loan from the Central Office Film Library, Veterans Administration, Washington, D. C.

Space limitations of this article do not permit adequate coverage of the many other significant activities which took place during the year — the National Assembly of the Limb and Brace Profession, the Regional OALMA Assemblies and Seminars, the working conferences involving all the agencies participating in the Artificial Limb Program, the exhibits and demonstrations conducted by the Prosthetic and Sensory Aids Service and the Advisory Committee on Artificial Limbs, the visits abroad by prosthetists and researchers, and a host of other important activities. Suffice it to say this past year was highly eventful and forward-looking, portending even greater advances in our efforts to serve the disabled.

JERRY LEAVY PROMOTED

The many friends of *Jerry Leavy* will be happy to learn that he has just purchased partial ownership in the *A. J. Hosmer Corp.* In joining Noel J. Brown, Lloyd W. Brown and A. A. Tilton, the present owners, Jerry will continue to work in the same capacity as in the past except that he has been made Vice-President of the company and will therefore serve on the board of directors.

Mr. Leavy works in the experimental end of the Hosmer business while at the plant. He also handles much of the public relations work as well as the problems of Hosmer customers. During 1954 Jerry traveled over 40,000 miles in visiting limb shops throughout the United States.

With his wife and two children Jerry has just moved into a new home within ten minutes drive of the plant. With the children approaching school age his wife reports her happiness in their choice of settling down in the Santa Clara Valley, considered by many to be the perfect living spot of the United States.

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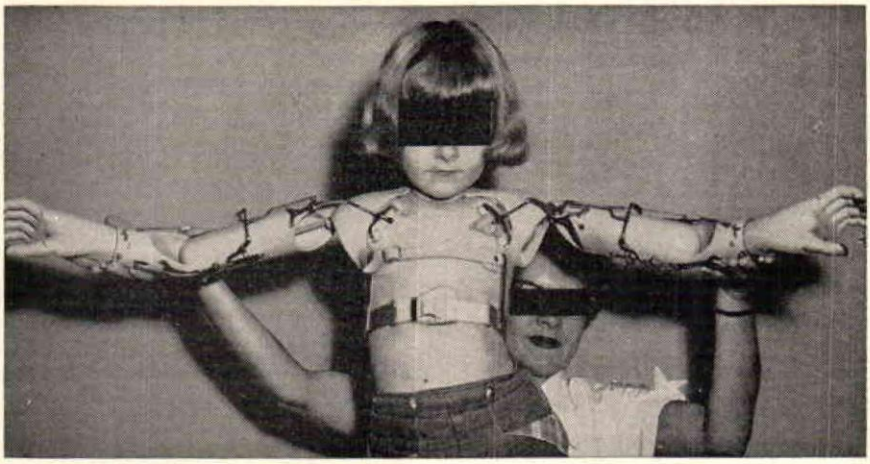

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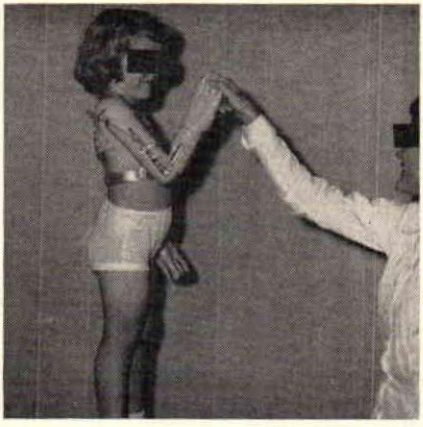

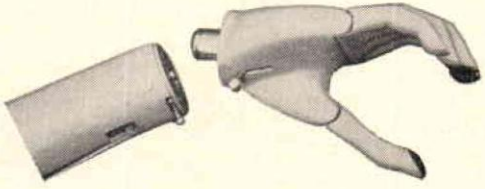

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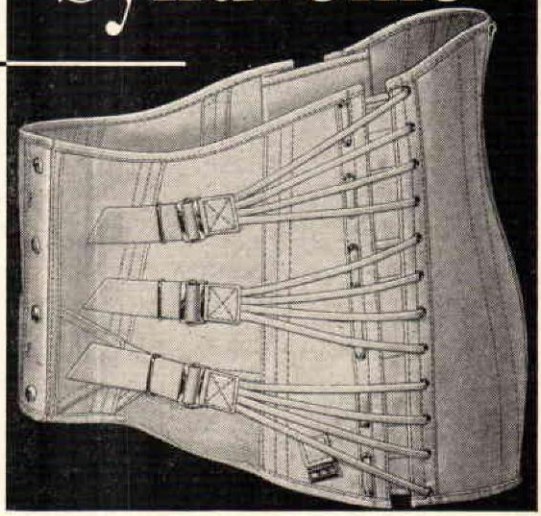

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McCarthy Hanger Elected OALMA President

Atlantic City Assembly Sets Record Attendance

Choosing McCarthy Hanger, Jr., of St. Louis as President of OALMA for the year ahead, the National Assembly of the Limb and Brace Profession concluded the 1954 sessions at Atlantic City September 30.

Mac Hanger's promotion to the presidency climaxed a long period of service to the limb and brace field, during which he did pioneer work on the Educational Program and brought to completion the long-awaited *Apprenticeship Standards.*

Now President of the J. E. Hanger Co., of Missouri, Mr. Hanger has had 16 years experience in the artificial limb field. After graduating from Duke University and taking a Master's degree in Business Administration from the University of Pennsylvania, he began work with J. E. Hanger, Inc., at Philadelphia in 1938. During World War II, Mr. Hanger was an officer in the U. S. Naval Reserve. After the war, he moved to St. Louis to become Vice President of J. E. Hanger of Missouri, Inc. He was elected president of the company following the death of his father, McCarthy Hanger, Sr., in September, 1949.

The other officers of the Association for the coming year include W. Frank Harmon of Atlanta, as First Vice President, Charles Hennessy of Los Angeles as Second Vice President, and M. P. Cestaro re-elected for his fourth term as Secretary-Treasurer.

Registration of 278 members and guests was an all-time high—evidence of the widespread approval of a resort area as convention headquarters. Encouraged by this approval OALMA officers have picked glamorous New Orleans as the site of the 1955 Assembly. The Jung Hotel, one of New Orleans' largest establishments, will be the scene of the sessions opening October 16.

Many important discussions of the Assembly are to be published in future issues of the Journal. The following highlights are set down here for the benefit of those who could not attend:

(1) *Senator Estes Kefauver* of Tennessee was the featured speaker at the OALMA banquet, reporting on his recent conversations with the foreign ministers of European countries. The banquet was preceded by the annual reception in honor of new members (the wandering photographer was much in evidence at this reception and some of his snapshots are shown on page 21).

RECEPTION SNAPSHOTS

No. 1. Mrs. Thomas E. Griffith; Mrs. Paul Leimkuehler; Blair Hanger; M. P. Cestaro; Mrs. H. Hoover Hanger, widow of the former President of the J. E. Hanger Company; and Mrs. William Kloman. No. 2. Mrs. Erich Hanicke of Kansas City chats with Miss Gwen Rhys of the headquarters staff. No. 3. Dr. Robert Mazet, Jr., of Los Angeles listens to Major C. A. Bell, Director of Prosthetic Services, Veteran's Affairs Department, Dominion of Canada. No. 4. Robert Bidwell of Madison, Wisconsin; Stanley Hedges of Indianapolis; and Dan Becker of St. Paul. No. 5. Past President Lee Fawver checks a point with Director Glenn Jackson. No. 6. Chester Nelson of Minneapolis; Vice President Charles Hennessy of Los Angeles; and A. L. Muilenburg of Houston, Texas. No. 7. Herbert Hart of Oakland; Al Amsterdam of Syracuse; and James D. Snell of Shreveport, La.

OALMA RECEPTION

The camera man snapped these reunions at the Assembly—how many can you identify?
(See list on opposite page)

No. 1

No. 2

No. 3

No. 4

No. 5

No. 6

No. 7

(2) *Technical Exhibits*—Many a supply problem was solved as member and manufacturer met around the display booths of America's leading suppliers to the brace and artificial limb field.

(3) *Seminars*—The classroom look was in evidence early in the Assembly with over 60 students registered for "refresher courses" in anatomy, plastics, and harnessing of appliances.

(4) *Leg Braces*—Anthony Staros of the VA's Prosthetic Laboratory in New York led the discussion on "How to Know What It Costs To Make a Leg Brace in Time, Materials and Wages." Herbert Hart, Wilmore Bremer and H. H. Maddox, and C. E. Medcalf served as a panel to discuss practical application in the brace shop. OALMA headquarters has available for loan copies of the three VA Studies which were the basis of this cost discussion.

(5) *Lower Extremities Clinical Study* — Dr. Verne Inman and Professor Howard D. Eberhart of the University of California, gave us the first report on the Clinical Study of Lower Extremity amputees. This includes significant data on phantom pain, hip complications following amputation, and other data of importance to those who render professional care to an amputee.

(6) *Lt. Charles A. Mead* of the United States Navy demonstrated "Gaits, Normal and Abnormal." Appearing through the courtesy of the Surgeon-General of the Navy. Dr. Mead brought new light to this difficult subject of gait analysis.

(7) *Management Problems* were given dramatic treatment in a series of skits starring Lucius Trautman as the Man with Problems. Among those portrayed in the skits were such puzzles as "The Problem Child in the Waiting Room" and "Bookkeeping in the Small Establishment."

(8) *"What Does Europe Have to Offer Us?"*—Carlton Fillauer, Dr. Eugene Murphy, and Dr. Miles Anderson joined in a discussion of new developments in artificial limbs and braces as seen in Europe.

HON. ESTES KEFAUVER
Assembly Speaker

(9) *The Testing of Appliances* — Dr. Sidney Fishman of New York University, Chester Nelson of Minneapolis, A. L. Muilenburg of Houston and Howard Thranhardt of Atlanta reviewed the Upper Extremity Program and described (a) the development of prosthetic clinics, (b) the educational program including the recruiting for the Arms School at Los Angeles and (c) the "follow-up" of arm cases fitted by graduates of the School.

(10) *Tibial Torsion*—Dr. Tom Outland, Chief Surgeon of the Pennsylvania Hospital for Crippled Children and A. R. Glaubitz discussed problems for the orthopedic surgeon and bracemaker which arise from any twist or rotation of the tibia which results in a change "in the alignment of the anatomical axes of the knee and ankle."

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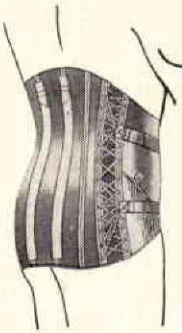
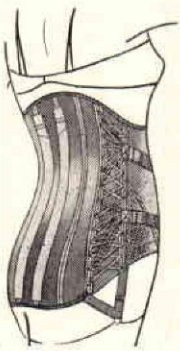


MODEL 422
Sacro-Lumbar Back Support for Men



MODEL 423
Sacro-Lumbar Back Support for Women

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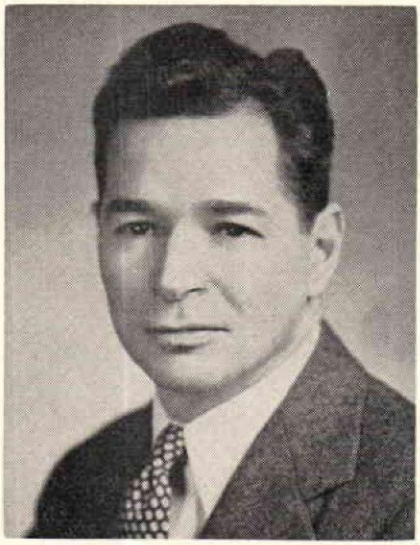
ABC PICKS TRAUTMAN AS HEAD

The Annual Certification Meeting took on new importance at the 1954 National Assembly. Among the significant events for the limb and brace profession were:

1) *Certification Examination.* A near-record group of candidates took the two-day series of tests at Philadelphia September 24 and 25. After a full day of written tests and interviews, the class assembled at dinner the first day to hear greetings from President Daniel A. McKeever and other Certification officials. Practical tests and work demonstrations took up most of the following day. These were held at the Naval Hospital in Philadelphia through the courtesy of Naval authorities. Board members and many of the candidates went on to Atlantic City at the conclusion of the tests, in order to attend Assembly sessions.

2) *Annual Luncheon.* Dr. T. Campbell Thompson, President of the Academy of Orthopaedic Surgeons and member of the Board, was the featured speaker at the annual Certification Luncheon September 28 (his address is printed in this issue of the Journal; see page 29).

CARLTON E. FILLAUER



EDWARD C. HOLSCHER, M.D.
Nominated by the Academy

3) *New Board Members.* Dr. Edward C. Holscher of St. Louis and Carlton E. Fillauer of Chattanooga, were elected to the Board for a three-year term. They fill the vacancies caused by the retirement of Daniel A. McKeever and Dr. Clinton L. Compere. Lucius Trautman, who is in his second year on the Board was elected President and Dr. Robert Mazet, Jr., was named Vice President, for the year 1955.

Dr. Holscher is a graduate of the Medical School of Harvard University. He was certified by the American Board of Orthopaedic Surgery in 1943, made a member of the American College of Surgeons in 1944 and the Academy of Orthopaedic Surgeons in 1949. He is an instructor in clinical orthopedic surgery in the Medical School of Washington University. Dr. Holscher is a Consultant to the VA Regional Office in St. Louis and the U. S. Air Force Hospitals at Belleville, Illinois. His hospital af-

filiations include Missouri Pacific, Barnes, Deaconess, St. Louis Childrens, St. Joseph, St. Louis City, St. Louis County and the VA Hospitals. He has been in the U. S. Army Reserve since 1931.

Carlton E. Fillauer is Secretary-Treasurer of Fillauer Surgical Supplies, Inc., and manager of its Orthopedic Department. During World War II he was in charge of Army Limb Shops at Letterman and Bushnell Hospitals. He was released from Army duty in 1946 to serve as a prosthetic technician for the Advisory Committee on Artificial Limbs.

4) *Apprenticeship Standards and Certification.* A new requirement for Certification is the successful completion of the Apprenticeship Standards (with due allowance for other training). Officers of OALMA and the Board have set up procedures whereby all apprentices are to be registered with the national headquarters in Washington, and send in monthly reports of their training.

5) *Advisory Council session.* Members of the Advisory Council met with President McKeever to go over certification prodecures and plans for advanced training.

6) *Improper Sales Activity.* Hereafter a Certified Facility shall, before accepting an order for a prosthetic appliance from a new amputee, first make diligent effort to obtain a referral, a prescription or approval from the amputee's physician. This rule and other Board rulings are being collected for distribution to all certified facilities.

OALMA HEADQUARTERS TO ASSIST IN RESEARCH PROGRAM

The June 1953 issue of this *Journal* announced the details of a joint program between OALMA and the National Research Council's Advisory Committee on Artificial Limbs which is designed to assist inventors in the artificial-limb industry in continuing development and obtaining scientific evaluation of prosthetic devices and techniques. This plan has been functioning quite satisfactorily, but owing to the ill health of the Chairman of the Industry Advisory Committee, Mr. Chester C. Haddan, and in view of experience gained, certain changes in procedures appear indicated.

The revised procedures are as follows:

1. Drawings and literature fully describing a devise or technique not now readily available to amputees should be forwarded to the Executive Director, Orthopedic Appliance and Limb Manufacturers Association, 411 Associations Bldg., Washington, D. C.

2. With the assistance of staff members of ACAL and in consultation with appropriate laboratories in the NRC's Artificial Limb Program, each project considered an advance in prosthetics will be referred to the Panel on Upper or Lower-Extremity Research and Development, as the case may be, for consideration under ACAL "transition procedures." Should the devise or technique possess shortcomings that make further evaluation impracticable, however, the inventor will be so advised.

3. The Panel will consider each accepted project and recommend the type of evaluation to be made.

4. New York University will be responsible for evaluation and issuance of a complete report, a copy of which will be furnished the inventor.

As stated in the past, the inventor will retain all patent rights, if such are involved, the object of this Program being to make available to amputees the best prosthetic devices and services that this country is capable of producing.

The Certification Board - Views of a Surgeon

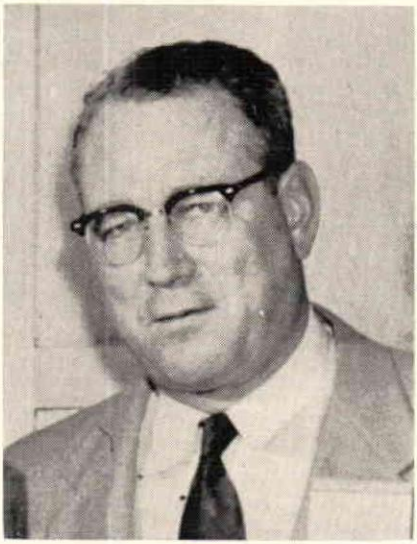
Address at the 1954 Certification Meeting

T. CAMPBELL THOMPSON, M.D.

President, The American Academy of Orthopaedic Surgeons
Director, The American Board for Certification

Mr. President, Mr. Executive Director and friends. I hesitate to address you as Orthotists and Prosthetists for several reasons. First, I never know how that one word will come out and secondly because I shall always think of you as my friends, the limbfitters and bracemakers. There is something good about words ending in "er." They represent action rather than just belief—"rider," "driver," "plumber," "wood chopper," "bricklayer," or an "engineer" is a man who does things. Everyone knows that a "tool maker" is superior to a machinist. Whether you like it or not, you will continue to be limbfitters and bracemakers and you have every reason to be proud of your craftsmanship as it requires topnotch work in a number of different lines. I know of no skilled worker who needs proficiency in so many diverse trades.

The only reason for having this American Board for Certification of the Prosthetic and Appliance Industry, Inc., is to insure in every way possible that the individuals and facilities engaged in this trade or profession will not only have the required proficiency but will use it. The ABC (and if you must use New Deal initials these are simple enough for even a child to remember) in its short existence of only six years has made a valiant attempt not only to insure but also to improve the caliber of work and ethical business-conduct in this field. Whether all of the actions or policies of this Board meet with your approval is not a question for me to debate today. I can however as one of the medical officers assure you that any actions taken or decisions made by the Board are done with due consideration and for the good of industry as a whole. I have never been associated with a more conscientious and hard working group than the officers and directors of your ABC.



T. CAMPBELL THOMPSON, M.D.

I have not come here to eulogize the Board as I am sure that some mistakes have been made and there is always room for improvement. The only people who make no mistakes are the ones who do nothing. I wish to talk to you briefly about the relationship between your profession and the medical profession. Whether you like it or not we are inextricably (how do you like that word?) inextricably bound together. Your "satisfied customer" is our "happy patient." Mr. Flick, for many years the director of the old Ruptured and

Crippled Hospital used to say with his Belgian accent — "Da patient komes first." This must be the never forgotten motto of both our professions. I am sure that like doctors many, if not most of you gentlemen, are in this field not because of the great fortunes that you expect to make but because there is an inner satisfaction in improving in any way possible the lot of our fellow human beings. I am not a religious person and I don't mean to claim that we are dedicated disciples who are giving our lives for the good of mankind, but you must admit that you get a kick out of seeing an amputee with a well-made leg or a polio patient with a real well-fitted brace stride out of your shop. I am sure that the great majority of you could make much more money if you had invested your brain, training, and money in some other line.

Because we are working on the same material (the patient) and toward the same end, the contacts between your profession and the medical one should be close, friendly, and mutually helpful. Unfortunately, this has not always been the case and a large part of the fault I am sure lies with the medical profession. Many of them feel that an amputation represents a failure of medical treatment and like many laymen avoid amputees like they were lepers. Even the surgeon who performs the amputation often thinks his duty toward the patient is finished and takes no further interest. As you know, an amputee can be the best (or the worst) possible patient with whom to deal. It depends upon what he has *left* (not what he has lost). This applies not only to the stump but to his mental and physical equipment, and most of all to his attitude toward life. If these are all right he will be easy to fit (or satisfy). But *remember*—this type who does not complain *deserves* the best and should not be allowed to go out with a second-rate job. We all know that "the squeaking wheel gets the grease" and I'm afraid that this applies to some of us.

The Orthotist (or may I say bracemaker) often has an even tougher job for he may have a subject who is trying to get some use out of an extremity that cannot be made to function even with the best possible bracing. You hear a lot about "rehabilitation," O! magic word, but who does the most rehabilitation for the amputees and the cripples? There is *no* question about it — the Prosthetists and the Orthotists. They have done a good job in the past, and I think are steadily doing a better one. The medical profession should help in every way possible. Unfortunately, not many doctors have the knowledge or interest to be of any help. Gradually more of them are getting into this field, and I would like briefly to introduce a few of them to you.

Since the organization of the ABC there have been eight doctors among your officers and directors. These, except for myself, have fortunately been well qualified Orthopedic surgeons with considerable experience and much interest in the entire amputee problem. They have been especially sympathetic with the idea of improving the limb-fitting and brace making throughout the country.

In England they have a very special specialist called a "limb-fitting surgeon." He is not a limb fitter as he does not make or fit limbs. He is not a surgeon as he does not operate. He has gained a good deal of experience with what constitutes a good fit of a satisfactory prosthesis but in my opinion this dictation to the surgeon as to what amputation he should perform and to the limb fitter exactly what type of prosthesis he should apply is not the ideal solution.

This idea of doctors and bracemakers working together is not new. Hugh Owen Thomas, the real father of Orthopaedics in Great Britain, was an expert bracemaker and made all his own braces. You all are familiar

with his ischial weight bearing ring. In this country about 1850 there was a small but successful brace shop on Lexington Avenue in New York City which made trusses for hernias and braces for cripples. The bracemakers called in some doctors to help advise them in some difficult problems (mostly severe tuberculosis) and the Hospital for Ruptured and Crippled was born. It still is centered around an active brace shop even though the name has been changed to Special Surgery. It is an interesting story about this change of name. About 10 or 15 years ago a group of doctors decided that they were losing a lot of fine Park Avenue patients because they did not want to tell their friends they were going to the Hospital for Ruptured and Crippled so now it is called "Special" Surgery. We don't know just what that means but some of us think it means a type you don't dare talk out loud about. Perhaps that is the way I feel about prosthetist and orthotist.

Whether a hospital, a rehabilitation center, or a Veterans Clinic should have its own brace shop or artificial limb factory, or both, are problems that I do not care to discuss today, but the fact remains that there is no question that the doctors and the limbfitters and bracemakers must work together and the more they cooperate and pull together the better chance we have of having a well-treated patient and a satisfied customer.

I cannot begin to give you the history of each of these Orthopedists who have or are serving on your Board.

Dr. Atha Thomas of Denver has been actively associated with amputee work for more years than I can remember. His books should be read by all of you.

Dr. Rufus Alldredge of New Orleans I have known since 1935 when he was a resident at the Ruptured and Crippled Hospital. When Walter Reed Hospital was made the first Army Amputee Center in 1943 I applied to Procurement and Assignment to get Dr. Alldredge released for duty in the Amputee Service. He had been in the Tulane unit as a Major but the University had declared him essential. By the time we got him released the order came out that any medical officer under thirty-five years of age had to come in as a first lieutenant.

Being three months under thirty-five, he had to be a first lieutenant. However, I was able to make him Assistant Chief of the Amputation Service where he supervised quite a number of Captains and Majors until he was stolen away to head up the 1100 bed amputation service at England General Hospital. This was, as you may know, housed right here in this hotel. He did a marvelous job and after the war toured Europe with a Committee from the National Research Council. As you may, or may not know, it was this Committee who was largely responsible for bringing the suction socket back into popularity in this country. Dr. Alldredge was also largely responsible for the Atlas on braces.

Dr. Henry Kessler has for many years been interested in cineplastic amputations and has written extensively on this subject. During the last World War he was responsible for the building up of the fine Navy Amputation Center at Mare Island. He now is Chief of the Kessler Rehabilitation Institute in New Jersey.

Dr. Robert Mazet, Jr., who is here today was also a member of the staff of Ruptured and Crippled until he entered the Navy in 1941. He became interested in amputees at Oak Knoll and since 1946 he has continued to have an amputee clinic at the Veterans Hospital in Los Angeles. Recently, he has organized a children's amputee clinic in the Pediatrics Department of UCLA.

Dr. Charles Bechtol became interested in amputee work in the service and participated in a lot of the experimental lower extremity research

work in the San Francisco Bay area. Many of you will remember him best for his fine work as an instructor in the Upper Extremity courses in Los Angeles. I am happy to report that he has recently moved to New Haven, Conn., as Assistant Professor of Orthopedics at Yale University. We in the East will gain what the West has lost.

Dr. Clinton Compere, who has just finished three years service on this Board, worked at the Amputation center at McClosky Hospital in Texas during the war and continues his interest in amputees by supervising several clinics in the Chicago district.

Dr. Edward Holscher of St. Louis, the new member of this Board, was Chief of the Army Amputation Center at Lawson General Hospital in Atlanta during the war. He will be a big help to you as you can't put anything over on him. While I was at Walter Reed I had a very good limbfitter (I mean Prosthetist) whose home was in Atlanta. There was a good boy in the shop at Lawson General from Washington. I had a very hard time arranging a transfer as Ed thought I was trying to send him a lemon. Incidentally, this man that he got has turned out to be one of the leaders in your profession.

As for myself, I can only say that at Walter Reed I had 700 amputees on the service at all times and could not help but learn a little about them. I had a few simple things to do—like submit complete plans for a limb shop on twelve hours notice with no specifications as to how many men were to work in it, nor how many limbs were to be made each month. I can say that we think we did a little better job than my partner Dr. Philip D. Wilson and General Norman Kirk (then Major) did in the 1st War. In 1946 with Dr. Jerome Lawrence, I started an amputee clinic for civilians at the Ruptured and Crippled and though it is not very fancy, our relations with your group are most cordial, and in spite of the fact that we get the toughest problems imaginable our failures are surprizingly few.

I have just returned from an Army Consultants' trip through Germany and France. I attended the International Orthopedic Association meeting in Berne, Switzerland and the International Polio Conference in Rome.

In Rome among many other things I saw a Danish long leg brace that had only a single inside bar from the knee down to the shoe. The slip lock was on the outer side and the band below the knee, which connected this inside and outside bar, was solid in front instead of behind. The absence of the side bar below the knee improved the cosmetic appearance greatly. This brace was only useful for holding a flail knee in full extension but apparently did this very well.

In Frankfurt I spent several hours in the Schede-Habermann limb factory and was greatly impressed. They claim great advantages for their special knee joints which are certainly ingenious. I was most impressed, however, by their method of taking the mould for the suction socket which they use almost entirely. I am sure, however, that you will get a first-hand report tomorrow of many more things in Europe than I could tell you.

In conclusion, let me tell you again what a pleasure it has been for us of the medical profession to work with you all for the advancement of your industry. Any improvement that has been or can be accomplished is primarily due to your own efforts. Those improvements will necessarily be reflected in improved care of our patients. Let me thank you primarily for them and express the deep appreciation of your numerous friends in the medical profession for the fine work you are doing.

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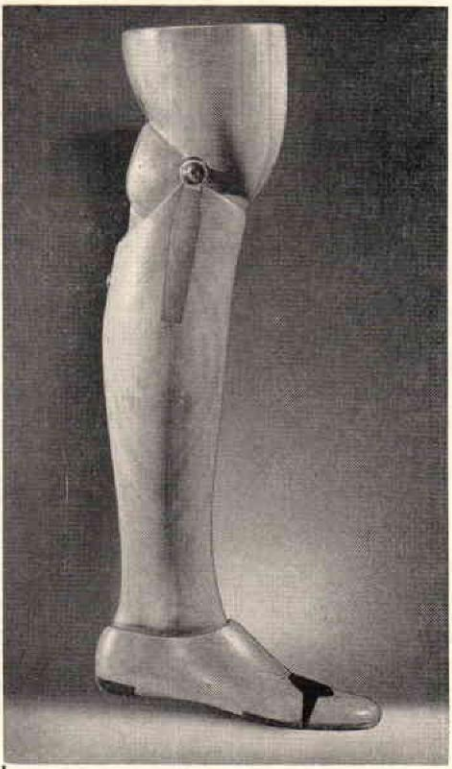
Certification Exhibits

The American Board of Certification has furnished exhibits for several important national conventions recently. The two pictures at the top show our exhibit at the National Rehabilitation Association Conference in Baltimore. TOP LEFT: Lionel Burgess reviews the program with C. D. Denison of Baltimore. TOP RIGHT: C. H. Dankmeyer of the Hanger organization is showing the Registry to T. D. Braun, Baltimore District Supervisor of Vocational Rehabilitation. CENTER RIGHT: Paul Leimkuehler, OALMA Regional Director and President-elect of the Ohio Rehabilitation Association chats with R. C. Thompson, NRA Conference Chairman.

BOTTOM picture shows the Certification booth at the American Medical Association meeting in Miami, Nov. 29-Dec. 2. Left to right: Jack L. Caldwell of Tampa; Mrs. Mary S. McLain, Dr. John E. Burch and Nicholas M. Treuhaft, all of Miami.



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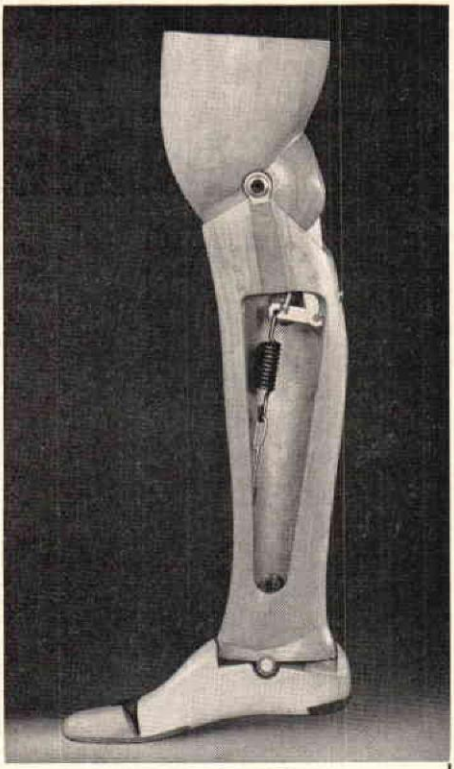

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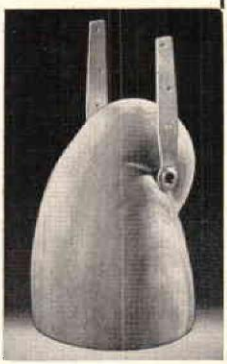
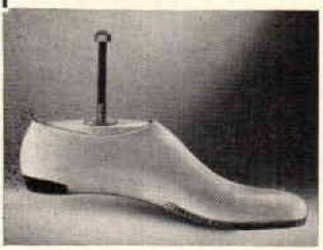


FOOT SET-UP



ATLAS

LIMB SUPPLIES

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CROSS-COUNTRY REPORT

The South, The West and New York Invite You!

Three OALMA Regions will hold meetings this spring which will draw visitors from wide areas of this country and Canada. Members of OALMA and readers of the Journal are asked to note the following dates. They are cordially invited to attend one or all of them:

Region No. II and the Metropolitan Association hold their Fourth Annual Seminar April 29 and 30 in New York City. The first day is devoted to appliances and artificial limbs for children. Dr. Henry Kessler will demonstrate cases of congenital and other amputation. The problem of how soon to brace a juvenile patient or prescribe an artificial limb will be reviewed.

The annual Dinner Dance of the Metropolitan Association will be held the evening of April 29 in the Roosevelt Hotel which will also be the scene of all Seminar sessions.

For the second day the Committee in charge has invited Dr. Charles O. Bechtol to discuss problems of fitting the elderly and middle-aged patient. The presentation of new appliances and devices, which was such a popular feature of last year's Seminar, will again be under the direction of David E. Stolpe.

The Committee in charge of this New York meeting includes Mrs. Mary Dorsch, Chairman; William Spiro, Secretary; Herbert Hanger, Leo Waller, Charles Goldstine and A. A. Margoe.

Region IV (the Southeastern States) meets at Memphis at the Peabody Hotel March 18 and 19. This session has always been popular with OALMA members from the North who are anxious to enjoy Southern weather. The Committee has had them in mind in planning a program of more than regional interest: Dr. Marcus Stewart will lecture on upper extremities and Dr. T. L. Waring on bracing the spine. Other speakers include OALMA Director Glenn Jackson, Dr. George Higley and J. Hank Smith, Director of the Tennessee Rehabilitation Service. Bert Titus of Durham, Director of Region IV and Ralph D. Snell of the Program Committee, have arranged a program which will be of considerable interest, not forgetting the ladies.

Region VIII, the Southwest, has scheduled its meeting March 26 and 27 in order that Director Jackson might be present. James D. Snell, Regional Director, R. N. Witt and Edward Latimer are in charge.

Region IX, Southern California and Arizona, is joining with the Society of Orthotists and Prosthetists in holding its annual meeting March 11 and 12 at the Statler Hotel in Los Angeles. Harvey Lanham, Regional Director and Charles Hennessy, Vice President of OALMA, send this word: "There is a visit to Southern California due you, and this is the time to make it!"

Ted W. Smith, Director of Region VII, reports that this Midwestern area will hold its meeting at Kansas City, Missouri. The tentative dates are April 15 and 16.

The Navy Department has notified OALMA headquarters that these two items are available for release for general manufacture (1) The Navy type Below-Elbow Joint, and (2) Functional Long Leg Aluminum Brace. These were developed at the Naval Limb Shop, Oak Knoll. Blueprints may be obtained by writing to: OALMA, 411 Associations Bldg., Washington 6, D. C.

SIMPLE ?

COMPLEX ?

THE LAST WORD .....

CATALOG NO. 2000 . . . . . RIGHT HAND
CATALOG NO. 2001 . . . . . LEFT HAND

123 E. MONTECITO AVEN

Mrs. Ruth Finlay
President

TO THE LADIES:

from OALMA's Woman's Auxiliary

I want to thank the members for having elected me president of your auxiliary for this coming year. I appreciate the honor and the confidence you have placed in me, and I will fill the office to the best of my ability.

Mrs. Florence Kraft
Vice President

I am sure the women who attended the Assembly enjoyed every minute of it. To those of you who were unable to attend, I would like to bring you up to date on the Atlantic City meeting: The Assembly was attended by 39 women, 18 of whom were attending for the first time. The big sister idea, inaugurated last year at Chicago, was carried out again this year, giving everyone the opportunity of getting acquainted.

Mrs. Ruth Brown
Vice President

Our Past President, Kay Leimkuehler, certainly planned a variety of entertainment and the boardwalk lived up to all expectations. A tour back stage of Haddon Hall, luncheon in honor of Past Presidents, Sightseeing Boat Trip and a dinner dance in the Rutland Room on Wednesday evening were a few of the highlights of the convention.

Mrs. Agnes Bennington
Treasurer

Our business meeting was held on Wednesday morning. Officers elected were: Florence Kraft, 1st Vice President; Ruth Brown, 2nd Vice President; Virginia Hedges, Secretary; and Agnes Bennington, Treasurer. The Birthday Card committee consists of Betty Hanicke and Beverly Gruman.

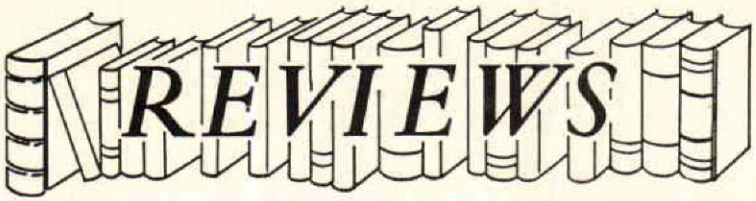
Our organization is one that functions mainly during the Assembly, (However, we will have a page in each publication of this *Journal.*)

I will be most happy to hear from any of you during the year with any information or suggestions for this page or for our next Assembly.

Mrs. Virginia Hedges
Secretary

Our next Convention will be held in New Orleans at the Jung Hotel, October 16 to 19, 1955. Let's all start making plans to attend.

Ruth Finlay
President



HUMAN LIMBS AND THEIR SUBSTITUTES

By Paul E. Klopsteg, Ph.D., Sc.D., Philip D. Wilson, M.D., et al. Published by McGraw-Hill Book Company, New York, Toronto, London, 1954. 844 pages. $12.00 (This book may be ordered through any local bookstore.) Reviewed by Robert C. Gruman, The Winkley Company, Minneapolis, Minn.

This is undoubtedly the most complete account of present-known facts relating to amputees and artificial limbs. The scope is explained in its subtitle: "Presenting Results of Engineering and Medical Studies of the Human Extremities and Application of the Data to Design and Fitting of Artificial Limbs and to the Care and Training of Amputees." This 840-page book is the work of 30 contributors including surgeons, prosthetists, engineers, physical therapists and other specialists. It is not intended as a classroom text, but has been planned and arranged as a comprehensive reference work. The material arises as the outgrowth of an intensive 8-year research and development program sponsored jointly by the Department of Medicine and Surgery, U. S. Veterans Administration, and the Office of the Surgeon General, Department of the Army, and coordinated by the Advisory Committee on Artificial Limbs of the National Research Council.

Among the familiar and respected names of authors, we note particularly Chester C. Haddan's account of the principles of fitting and Col. Maurice J. Fletcher's description of the new hands and hooks. Dr. Eugene F. Murphy of the Veterans Administration contributes several chapters. Two former members of the Certification Board are listed as authors: Rufus H. Alldredge, M.D. and Charles O. Bechtol, M.D.

It is always difficult to prepare in one publication the writings of several authors. This difficulty has been conquered in this excellent book — due largely to A. Bennett Wilson, Jr. who served as General Coordinator of the project and to Bryson Fleer, Editor of the *Artificial Limbs* journal, who handled all of the copy editing and who is responsible for the very helpful Index.

Containing 450 illustrations and thoroughly documented, the new volume deals with all the problems arising from the loss of limb and the need for replacement with maximum functional value. The following *Table of Contents* will give some idea of its value to the artificial limb facility:

11. The Mechanics of Voluntary Muscle
12. Control Design and Prosthetic Adaptations to Biceps and Pectoral Cineplasty
13. The Electric Arm

Part II The Lower Limb And Its Substitutes

14. The Functional Structure of the Lower Limb
15. The Principal Elements in Human Locomotion
16. The Locomotor Mechanism of the Amputee
17. New Developments in Lower-extremity Prostheses

Part IV. Adjustment Of The Limb To The Amputee

18. The Principles of Fitting
19. Fitting the Artificial Arm
20. Suction-socket Suspension of the Above-knee Prosthesis
21. Alignment of the Above-knee Artificial Leg
22. The Fitting of Below-knee Prostheses

Part V Training And Evaluation

23. Training the Upper-extremity Amputee
24. Training the Lower-extremity Amputee
25. The Principles of Artificial-limb Evaluation

THE PAINFUL PHANTOM: PSYCHOLOGY, PHYSIOLOGY, TREATMENT

By Lawrence C. Kolb, M.D., Section on Psychiatry, Mayo Clinic.

Charles C. Thomas, Publisher, Springfield, Illinois, $1.50, 50 pages.

Reviewed by: Chester C. Haddan, Consultant to the American Board for Certification.

This publication is one of a series of the American Lecture Series in Neurology and is pointed to the practicing psychotherapist rather than to the prosthetist or the orthopedist or the general surgeon. It points up a problem that all of those with long clinical experience in dealing with amputees recognize as a very serious and unsolved problem. The author suggests that the psychotherapist might well have a much greater role in the diagnosis, care, and treatment of the amputee with severe painful phantom.

The author reviews with considerable skill the literature on the subject of the phantom limb from the earliest works of Ambrose Pare in 1649 to the present time. Considerable emphasis is placed upon the fact that while "it is common knowledge that repeated surgical treatment of the stump and peripheral nerves is unlikely to be effective in relieving the phantom of pain," such surgical procedures are still being carried out repeatedly. This publication would have little, if any, practical value in the hands of the practicing certified prosthetist.

The author states that "I have seen patients who have undergone, singly and successively, reamputation at higher levels, exploration of the stump, removal of the terminal neuroma, plastic operations on the stump, rhizotomies, sympathectomies, cordotomies, injections of alcohol into the neuroma, paravertebral anesthetic block of the sympathetic ganglia, spinal anesthesia and resection of the postcentral cerebral cortex, and have remained unrelieved of their symptoms." Every certified prosthetist with long clinical experience in seeing large numbers of amputees has seen hundreds of patients such as those described by the author and, as has been stated by the author, few if any of us have ever seen a patient who has actually been improved by these extensive surgical procedures.

This publication suggests to the reviewer that the successful prosthetic clinic of the future may well find it necessary to add another member to the clinical team, namely the competent, well-trained, interested psychotherapist.

This work is recommended as a *must* for the well-rounded Prosthetic Clinic Library.

ONLY *Realastic*

The above natural appearing glove is for the revised Becker Lock-Grip.

All custom made, with or without zipper, sleeve extending about 6 inches above the wrist. The REALASTIC glove is engineered for a perfect fit — each category and type hand has its own special mold from which it is made. There is no wrinkling, no impediment to the hand's movement. All pigmenting is permanently cured into the glove — additional tinting is possible through the use of external colorants. Hair, that may be obtained from the amputee himself, is ventilated right into the glove for a natural effect.

Becker Lock-Grip There have been a dozen *Realastic* molds developed for this make of hand, alone. For the newly revised Lock-Grip, XL-13, XL-14, XL-15 and XR-13, XR-14 and XR-15 are designed to cover the 7½, 8 and 8½ left and right, respectively. The manufacturer has narrowed the coil springs, lengthened the rubber finger pads and has accentuated the knuckles so that a much more natural and pleasing appearance is now possible. The woman's size Lock-Grip is accommodated with *Realastic* molds XL-8 and XR-8. Also still available are 4 molds used for the old type hand.

Becker Plylite This hand is noted for its lightness and natural modeling. *Realastic* molds XL-11 and XR-11 are used for men's sizes 8, 8½ and 9. There has been no specific mold developed for women's sizes but the X-8's can be used and the X-7's make a very nice appearance, too.

Trautman Real and SLTH The outward shape and appearance of these two good-looking hands are identical, the difference being that the 4th and 5th digits of the Real are flexible. *Realastic* molds XL-5 and XR-5 were originally developed for this hand but the X-10's were also found to do a good job of fitting without distortion. In the women's sizes, molds XL-7 and XR-7 were designed especially for this make.

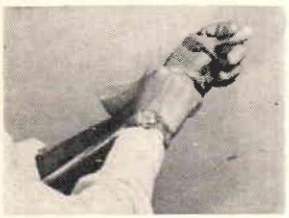
Pecorella *Realastic* molds XL-12 and XR-12 were engineered for this very different hand. A pleasing and symetrical appearance has been obtained without interfering with the ideas of the appliance's designer. In one size, only.

• What is a mold?

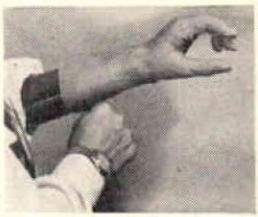
A mold in the sense that it is used here, is a die for producing cosmetic gloves. REALASTIC Hand molds are made of metal (for permanence and for optimum cure of the material) and in two pieces to permit the "locked-in" type of coloring. REALASTIC pigments can neither be washed off, nor worn away by action of the appliance underneath.

COVERS THEM ALL!

Hand Appliances — Some New, Some Old, Some Tremendously Improved — No matter which make, gloves for them are available in REALASTIC'S 48 New, Natural Colors.



REALASTIC gloves are applied to the hand appliance by means of the zipper opening. No stretching, no special equipment is necessary. In an emergency, even the amputee can mount the glove as shown with the Miracle Hand in the accompanying photograph.



Miracle Molds XL-6 and XR-6 are designed for the H-1 Friction hand and one size of the wood dress hand, as well. As can be noted in the two photographs the hand and glove make a very life-like appearance. Two smaller size dress hands are covered by the X-10's and the X-7's. Both the mechanical and the dress appliances are finely sculptored.

APRL The Sierra 4-C is the research hand and a precision instrument. Because the utmost precaution must be taken that the cover permits full freedom in operation, all *Realastic* gloves for the APRL are checked out on one of the hands. XL-10 and XR-10 are the molds that were developed for this appliance. Soon to be commissioned are two additional adaptations which will feature more accentuated skin detail and characterizations.

Robin-Aids The newest manufacture of hands is taken from *Realastic's* own standard molds, which are modeled from life. Available now are child's sizes, 5-7 year molds, EL-4 and ER-4 and woman's sizes about #7, HL-2 and HR-2. Soon to follow will be the establishing of E-5's for 7-10 age group and E-6's for 10-13. A second woman's mold, the H-3's will also be developed. The manufacturer designs the hands after completion of the glove molds for a more natural shape.

Miscellaneous Carnes, wood hands of all descriptions, felt hands, foreign makes, etc, are also covered by *Realastic* although it is best that the dealer send the appliance to the laboratory for adapting.

OF SAN FRANCISCO

*Realastic**

"Looks REAL—It LASTS"

***Trade-Mark**

• **Ordering:**

REALASTIC gloves may be ordered directly from Prosthetic Services or for greater convenience, from the appliance maker at the same time as purchasing the hand. Three things should be borne in mind:

1. *Where there are various sizes of the hand available, allowance for the glove should be made. Order ½ size smaller to compensate.*
2. *Unless the paint used for the hand appliance is a baked-on-metal type, it should be removed.*
3. *Give diagram and measurements of forearm Prosthesis so that sleeve of glove will fit accurately.*

Copies of the complete Manual of *Apprenticeship Standards* for Prosthetists and Orthotists, including samples of the report forms, may be obtained from the Orthopedic Appliance and Limb Mfrs. Association, Washington, D. C.

APPRENTICESHIP STANDARDS

RELATED ACADEMIC TRAINING

Introduction

Wherever it is possible, the related training courses should be taken in classes, along with other apprentices. In many cities, there will not be enough apprentice prosthetists and orthotists to warrant establishment of special classes. In such cases, it will be necessary for the apprentice, his supervisor and the local school system, to work out a method of obtaining this instruction. The apprenticeship training consultant can render expert advice and assistance in this regard.

In the following pages the related training courses are described, the objectives explained, and information is given on helpful reading matter. Reasonable variations from the courses as outlined, to meet local conditions, are permissible.

It is expected that by use of this material, the apprentice will complete successfully the courses which are considered so important for his advancement toward the goal of Certified Prosthetist or Orthotist.

Persons starting their apprenticeship after Jan. 1, 1955, will be required to complete all the courses listed, or their equivalent, during the apprenticeship period. Apprentices who started their training prior to Jan. 1, 1955, when they are enrolled in this program, will be informed by the Education Committee as to which work processes and related training courses they should take in the remaining period of their apprenticeship.

For further information concerning any of the courses, write the Orthopedic Appliance and Limb Manufacturers' Association, Washington, D. C.

I. FUNCTIONAL ANATOMY FOR ORTHOPEDIC TRAINEES: 144 HOURS

This is a special course designed to cover the principal fields of medical knowledge which are most important to the prosthetic and orthopedic trainee. The student will find reading material pertinent to each section of

**Part I of the Apprenticeship Standards including the Table of Instructional Courses was printed in the September, 1954 issue of this Journal pages 32-41.*

the outline listed, and should choose at least one of the books to study for each section. These books may be borrowed from a local medical library. Discussion with a local doctor will be helpful whenever a difficult point arises.

A. NORMAL ANATOMY

I. General

1. Terminology and definitions
2. Bones
   a. Classification.—b. Function.—c. Structure.
3. Joints
   a. Function.—b. Classification.—c. Structure.—d. Method of measurement of range of motion.
4. Muscles
   a. Function.—b. Classification.—c. Structure.
5. Tendons
6. Ligaments
7. Cartilage
8. Nerves
   a. Central nervous system.—b. Peripheral nervous system.—c. Autonomic nervous system.—d. Neuron—motor, sensory, upper and lower motor neuron.
9. Blood vessels
   a. Function.—b. Classification.—c. Circulation.

References

Grant Boileau, J. C.: A Method of Anatomy. Baltimore, Williams and Wilkins, 1948. Section 1.

Hollinshead, Henry W.: Functional anatomy of limbs and back. Philadelphia, W. B. Saunders Co., 1951. Section 1.

Anson, B. J.: Atlas of human anatomy. Philadelphia, W. B. Saunders, 1950.

II. Principles of Kinesiology

1. Purpose—definition
2. Body mechanics
   a. Center of gravity, line of gravity.—b. Stability.—c. Momentum.—d. Friction.—e. Segmentation.
3. Mechanics of human motion
   a. Classification of motion.—b. Levers—classification, law. c. Force—magnitude, direction, angles of origin, insertion, pulleys.—d. Parallelogram of forces.
4. Physiology of muscular action.
   a. Contraction—types, elasticity, energy consumption, fatigue.—b. Innervation.—c. Motor unit.—d. Tonus.—e. Spasticity and flaccidity.—f. Stretch reflex.—g. Reciprocal innervation.

References—Kinesiology

Wells, Katharine F.: Kinesiology. Philadelphia, W. B. Saunders, 1950. Chapters 1-7.

Bowen, W. P.; Stone, Henry A.: Applied Anatomy and Kinesiology. Philadelphia, Lea & Febiger, 1953. Chapters 1-4, 6, 7.

Morehouse, L. E.; Cooper, J. M.: Kinesiology. St. Louis, C. V. Mosby Co., 1950. Chapter 5.

Steindler, A.: Mechanics of Normal and Pathological Locomotion in Man. Springfield, Ill., Charles C. Thomas, 1934. Chapters 3, 4, 6, 30.

References—Physiology

Morehouse, L. E.; Miller, A. T.: Physiology of Exercise. St. Louis, The C. V. Mosby Co., 1948. Chapters 1-5.

Schneider, E. C.; Karpovich, P. V.: Physiology of Muscular Activity. Philadelphia, W. B. Saunders Co., 1948. Chapters 1-5.

III. Body as a Whole

1. Skeleton
   a. Skull, atlanto-occipital, atlanto-axial joints.—b. Vertebral column, cervical thoracic, lumbar, vertebrae, sacrum, coccyx.—c. Thorax, ribs.—d. Pelvis, illium, ischium,-os publis. e. Function of the chest.—f. Function of the spine.
2. Principles of posture
   a. At rest.—b. In motion.

References

Bowen, W. P.; Stone, H. A.: Applied Anatomy and Kinesiology. Philadelphia, Lea & Febiger, 1953. Chapters 18, 19, 20.

Goldwaith, J. E., et al.: Essentials of Body Mechanics in Health and Disease. Philadelphia, Lippincott, 1945. Chapter 2.

Anson, B. T.: Atlas of Human Anatomy. Williams & Wilkins, Baltimore, 1950.

Howorth, Beckett M.: A Textbook of Orthopedics. Philadelphia, W. B. Saunders Co., 1952. Section II, Chapter 5.

IV. Upper Extremity

1. Shoulder girdle
   a. Bones, clavicle, scapula, humerus.—b. Ligaments.—c. Joints, sterno-clavicular, acromio-clavicular, shoulder.—d. Muscles, origin, insertion, innervation, function.—e. Function of the shoulder girdle as a whole.
2. Elbow and forearm
   a. Bones, radius, ulna.—b. Ligaments.—c. Joints.—d. Muscles, origin, insertion, innervation, function.
3. Wrist and hand
   a. Bones, carpal, metacarpal, phalanges.—b. Ligaments, fasciae. c. Joints.—d. Muscles, origin, insertion, innervation, function.

References

Quiring, D. P., et al.: The Extremities. Philadelphia, Lea & Febiger, 1951.

Hollinshead, H. W.: Functional Anatomy of Limbs and Back. Philadelphia, W. B. Saunders Co., 1951. Section 2.

V. LOWER EXTREMITY

1. Pelvic girdle
   a. Femur.—b. Ligaments.—c. Hip joint.—d. Muscles, origin, insertion, innervation, function.
2. Knee
   a. Bones, tibia, fibula, patella.—b. Ligaments.—c. Knee joint. d. Muscles, origin, insertion, innervation, function.
3. Ankle and foot
   a. Bones, tarsal, metatarsal, phalanges.—b. Ligaments.—c. Joints.—d. Muscles, origin, insertion, innervation, function.

References

Quiring, D. P., et al.: The Extremities. Philadelphia, Lea & Febiger, 1951.

Hollinshead, H. W.: Functional Anatomy of the Limbs and Back. Philadelphia, W. B. Saunders Co., 1951. Section 4.

VI. TRUNK

a. Bones (in III).—b. Ligaments.—c. Joints.—d. Muscles, origin, insertion, innervation, function.

References

Quiring, D. P.: The Head, Neck and Trunk. Philadelphia, Lea & Febiger, 1951.

Hollinshead, H. W.: Functional Anatomy of the Limbs and Back. Philadelphia, W. B. Saunders Co., 1951. Sections 3, 5.

B. ABNORMAL ANATOMY

VII. GENERAL PATHOLOGY

1. Degenerative processes
   a. Fatty degeneration.—b. Calcification.—c. Necrosis.—d. Gangrene—causes, practical application.
2. Circulatory disturbances
   a. Hyperemia, ischemia, venous congestion.—b. Hemorrhage. c. Thrombosis and embolism.—d. Edema.—e. Shock.
3. Inflammation
   a. Exudates.—b. Acute, chronic, allergic.
4. Healing
5. Infection
   a. Resistance.—b. Allergy.
6. Growth
   a. Atrophy.—b. Hypertrophy.—c. Malformation.
7. Tumors
   a. Benign.—b. Malignant.

References

Carter, C. F.; Smith, A. L.: Microbiology and Pathology. St. Louis, The C. V. Mosby Co., 1953. Chapters 40-44.

VIII. Nervous System

1. Vascular lesions of the brain
   a. Hemorrhage—hemiplegia, monoplegia.—b. Thrombosis—monoplegia.—c. Embolism—hemiplegia, monoplegia.
2. Lesions of the spinal cord
   a. Quadruplegia.—b. Paraplegia.—c. Cauda equina.
3. Herniation of the nucleus pulposus
   a. Back pain.
4. Virus diseases of the nervous system
   a. Anterior poliomyelitis (infantile paralysis).—b. Encephalitis.
5. Syphilis
   a. Meningoencephalitis.—b. Tabes dorsalis.
6. Multiple sclerosis
7. Dystrophies
8. Cerebral palsy
9. Peripheral nerves
   a. Injury.—b. Repair.—c. Neuritis.

References

McDonald M.S., Ghusid J. G.: Correlative Neuronatomy and Functional Neurology. Los Altos, California, Lange Medical Publications, Chapters 20-24.

Larson C. B., Gould M.: Calderwood's Orthopedic Nursing. St. Louis, The C. V. Mosby Co., 1953, Chapters 16, 18, 20.

Howorth B. M.: A Textbook of Orthopedics. Philadelphia, W. B. Saunders, 1952, Chapters 25, 28, 30, 32.

IX. Peripheral Vascular Diseases

1. Arteries
   a. Arteriosclerosis—senile, diabetic, hyptertensive.—b. Thrombo-angiitis obliterans.—c. Embolism, thrombosis.—d. Frostbite.
2. Veins
   a. Varicose veins.—b. Thrombophelebitis.—c. Venous thrombosis.

References

Stafford E. S., Diller D.: A Textbook of Surgery for Nurses. Philadelphia, W. B. Saunders Co., 1954, Chapter 16.

X. Bones

1. Osteoporosis
2. Fractures
   a. Repair
3. Infections
   a. Osteomyelitis.—b. Tuberculosis.—c. Syphilis.
4. Tumors
5. Osteodystrophies

References

Carter C. F., Smith A. L.: Microbiology and Pathology. St. Louis, The C. V. Mosby Co., 1953, Chapters 40-44.

Larson C. B., Gould M.: Calderwood's Orthopedic Nursing. St. Louis, The C. V. Mosby Co., 1953, Chapters 26-33.

XI. JOINTS

1. Sprains, dislocation
2. Arthritis
   a. Osteoarthritis.—b. Rheumatoid.—c. Rheumatoid spondylitis.—d. Traumatic.
3. Ankylosis

References

Carter C. F., Smith A. L.: Microbiology and Pathology. St. Louis, The C. V. Mosby Co., 1953, Chapters 40-44.

Larson C. B., Gould M.: Calderwood's Orthopedic Nursing. St. Louis, The C. V. Mosby Co., 1953, Chapter 14.

XII. MUSCLES, TENDONS, BURSAE

1. Atrophy
   a. Disuse.—b. Neuropathic.
2. Fibrosis
3. Myositis ossificans
4. Tenosynovitis
5. Bursitis

References

Stafford E. S., Diller D.: A Textbook of Surgery for Nurses. Philadelphia, W. B. Saunders Co., 1954, Chapter 45.

XIII. AMPUTATIONS

1. Causes
   a. Disease.—b. Thauma.—c. Congenital.
2. Sites
3. Pathology of the stump
   a. Contractures.—b. Neuroma.—c. Vascular.—d. Phantom pain.

References

Thomas A., Haddan C. C.: Amputation Prosthesis, Philadelphia, Lippincott Co., 1945, Chapter 2.

Handbook on Amputations, Chicago, American Medical Association, 1942.

XIV. CONGENITAL DEFORMITIES

1. Club foot, flat foot, bow leg, knock knee
2. Dislocation of the hip
3. Scoliosis, lordosis, kyphosis

References

Larson C. B., Gould M.: Calderwood's Orthopedic Nursing, St. Louis, The C. V. Mosby Co., 1953, Chapter 6, 23.

Howorth B. M.: A Textbook of Orthopedics. Philadelphia, W. B. Saunders, 1952, Section II, Chapter 5.

Stafford E. S., Diller D.: A Textbook of Surgery for Nurses. Philadelphia, W. B. Saunders Co., 1954, Chapter 43.

For those places where a class in this course is not available, materials now under preparation will be furnished.

II. SKETCHING AND PLAN READING, PATTERN MAKING, PRINCIPLES OF ALIGNMENT: 36 CLASSROOM HOURS

PURPOSE: To enable student:

1. To understand simple plans and diagrams received in shop and to translate these into working sketches.
2. To make simple patterns.
3. To understand fundamental alignment principles involved in construction of appliances and use of sketches, patterns etc., to apply principles.

SKETCHING AND PLAN READING

I. Glossary of Shop Terms
II. Abbreviation for Shop Terms
  a. Prosthetists.—b. Orthotists.
III. Basic Principles (Explanation of)
  a. Visible outlines.—b. Hidden outlines.—c. Center lines.—d. Construction lines.
IV. Use of Scales in Plan Reading
V. Draw Simple Plan to Scale

PATTERN MAKING

I. Tools—Explanation of
  a. Purpose.—b. Correct use.
II. Draw Rough Sketch of Article
  (on graph paper)
  1. Place dimension on rough sketch
III. a. Draw pattern to exact dimension
  b. Trace on heavy paper or cardboard
  Cut for use as stencil
IV. a. Principle of reducing pattern
  b. Principle of enlarging pattern

PRINCIPLES OF ALIGNMENT

I. Foot, Ankle
  a. Position of mechanical joint
II. Knee Joint
  a. Position
III. a. Sockets
  b. Ischial Rings etc.
  1. Position.—2. Weight bearing & non-weight bearing.
IV. a. Supporting Cuffs—Corsets
  1. Position.—2. Type.—3. Shape.
  b. Hip Joint
  1. Position & Shape.
V & VI. Back and Neck
  a. Height & Leverage.—b. Position of bands.
VII & VIII. Upper Extremity
  a. Fingers.—b. Elbow.—c. Shoulder.
  1. Supporting & Active

IX. General Application

For those places where a class in this course is not available, materials now under preparation will be furnished.

III. WELDING: 36 HOURS

Following is a list of topics to be covered. A course in welding should be available in the local high school, in an evening adult training course, or in a trade school.

The list of topics should be discussed with the teacher of this course and a schedule drawn up so the apprentice may attend the course when these topics are being covered.

I. Care and Use of Torch & Gages

II. General Welding

a. Carbon Steel up to 45 point carbon.—b. Stainless Steel.—c. Monel Steel.—d. Aluminum.

III. Brazing

a. Steel to Steel.

IV. Silver Soldering

IV. HEAT TREATING AND FORGING: 36 HOURS

Following is a list of topics to be covered. A course in heat treating and forging should be available in the local high school, in an evening adult training course, or in a trade school.

The list of topics should be discussed with the teacher of this course and a schedule drawn up so the apprentice may attend the course when these topics are being covered.

I. Forging

a. Heating.—b. Drawing.—c. Upsetting.—d. Bending.—e. Brazing.

II. Control of Metals

a. Case Hardening

b. Tempering

1. Oil.—2. Water.

c. Drawing

V. ELEMENTARY MECHANICS AND MATHEMATICS: 36 HOURS

PURPOSE: To acquaint the student with basic mechanical and mathematical principles, sources and types of information needed in the selection of tools and the properties of commonly used materials.

Mathematics

A. Measuration

1. Angles.—2. Arcs.—3. Planes.—4. Solids.

B. DEFINITIONS

1. Circle.—2. Rectangle.—3. Square.—4. Triangle.—5. Cube.—6. Oblong.—7. Ellipse.—8. Cylinder.—9. Trapezoid.—10. Hexagon.—11. Octagon.—12. Polygon.—13. Diameter.—14. Radius.—15. Area.—16. Parrallelogram.—17. Cone.—18. Sphere.—19. Perimeter.—20. Hypotenuse.

C. MATHEMATICAL & GEOMETRICAL PROBLEMS

1. Area of a Rectangle.—2. Area of a Triangle (Base & Height Given).—3. Area of a Circle (Diameter, Radius Given).—4. Circumference of a Circle (Radius Given).—5. Hypotenuse of Right Triangle (Base & One Side Given).—*6. Draw a parallel line (Base Line Given).—*7. Erect a perpendicular on a straight line.—*8. Bisect a line.—*9. Bisect an angle.—*10. Construct a Square.

Elementary Mechanics

A. MEASUREMENTS

1. U. S. Standard.—2. Metric System.—3. Gages, common.

B. MEASURING DEVICES AND THEIR USES

1. Rules and Tapes.—2. Calipers.—3. Micrometers.—4. Drill and Tap Gages.—5. Depth Gages.—6. Pressure Gages.—7. Screw Pitch Gages.—8. Protractors.—9. Dividers.

C. DRILLS AND DRILLING

1. Types of Drills
   a. Carbon Drills.—b. High Speed Drills.—c. Carbide Tipped Drills.
2. Drill Sizes
   a. Fractional (Jobbers).—b. Number Drills (Twist).—c. Letter Drills.—d. Taper Drills.—e. Countersink Drills.
3. Other Characteristics and Specifications
   a. Left Hand and Right Hand Drills.—b. Straight Shank.—c. Taper Shank (Morris and Brown & Sharp).—d. Stub.—e. Flutes.
4. Sharpening Drills
5. Speeds and Feeds
6. Cutting Lubricants and Compounds
7. Starting the Drill Point
   a. Centerpunch.—b. Scribing.—c. Gouging.
8. Drilling Large Holes
9. Deep Drilling

D. TAPS AND TAPPING

1. Types of Taps
   a. Carbon.—b. High Speed.—c. Cut Thread.—d. Commercial Ground.—e. Precision Ground.—f. Machine Screw Taps.—g. Bolt Taps.—h. Pipe Taps.
2. Cutting Lubricants and Compounds
   (See C-6 above.)

* Using a straight edge and compass or dividers.

E. GRINDING

1. The Grinding Wheel
   a. Vitrified.—b. Silicate.—c. Shellac.—d. Resinoid.—e. Rubber.
2. Grinding Wheel Specifications
   a. Grain Size (Grit).—b. Grade (Hardness).
3. Cylindrical Grinding
5. Selection of Wheels
6. Belt Sanding and Grinding

Strength of Materials

A. MATERIALS COMMONLY USED

1. Aluminum
   a. Physical Properties
      (1) Specific Gravity.—(2) Ductility.—(3) Effect of Heat Treatment.—(4) Corrosion Resistance.
   b. Mechanical Properties
      (1) Tensile Strength.—(2) Yield Strength.—(3) Hardness. (4) Endurance Limit.
   c. Heat Treated Alloys
      (1) General Characteristics.—(2) Specific Uses.
   d. Common Forms
      (1) Rolled.—(2) Extruded.—(3) Cast.—(4) Forged.
2. Steel
   a. SAE Designations
   b. AISI Designations
   c. Factors Influencing Characteristics
      (1) Alloy.—(2) Heat Treatment.—(3) Cold Working.
   d. Selecting Steel for Orthopedic Uses
      (1) Uprights.—(2) Joints.—(3) Bands.—(4) Back Braces.
   e. Nomenclature of Steels for Orthopedic Uses
      (1) Surgical Steel.—(2) Spring Steel.—(3) Stainless Steel. (4) Cold Rolled Steel.—(5) Tool Steel
   f. Terms and Definitions
      (1) Annealing.—(2) Case Hardening.—(3) Cold Working. (4) Corrosion Resistance.—(5) Hardening.—(6) Mechanical Properties.—(7) Physical Properties.—(8) Quenching.—(9) Stress.—(10) Tempering.

This requirement of Elementary Mechanics and Mathematics may be fulfilled by taking a course in a local high school, in an adult training course, or in a trade school.

VI. APPLIED OR BUSINESS PSYCHOLOGY: 36 HOURS

PURPOSE:

To give the basic knowledge of psychology needed by the employee or manager of an orthopedic and prosthetic facility

1. in his contacts with the handicapped and their families
2. with the surgeon and others who serve the handicapped—such as rehabilitation workers, physical therapists, etc.

SCOPE

A. Psychology
   1. What it is and why we study it
B. Types of People
C. How People React and Adjust
D. Developing Your Own Personality
E. Psychology in Business
   1. Influencing the behaviour of your associates
   2. Influencing the behaviour of your clients
F. Analyzing People and How It Affects
   1. Getting a job
   2. Gaining promotions, etc.
G. The Executive and the Individual Employee
H. Supervision
I. Advertising
   1. Its psychological base
J. Group Psychology
   1. Its influences in business cycles
   2. Its influences in marketing
   3. Its influences in our social evaluation
K. Psychology of the Handicapped
   1. What they expect
   2. How they will react

Reading List

1) Psychology Applied to Life and Work, by Harry W. Hepner, New York, Prentice-Hall, Inc. 1943, 771 pages.
2) Psychology for Life Adjustment, by Charles F. Foster. Published by American Technical Society at Chicago. 456 pages and Study Guide. $3.90.
3) The Psychology of Physical Handicap, by Lawrence E. Abt, in Orthopedic and Prosthetic Appliance Journal, June, 1954, pages 19-22.
4) "Psychological Factors in the Adjustment of Amputees"—a chapter by L. E. Abt in the book "Human Limbs and Their Substitutes," New York, McGraw-Hill Co., 1954.

This requirement of Business or Applied Psychology may be met by

1) taking a course in General and Applied Psychology from a Junior College or

2) taking a similar course from an approved extension or correspondence school.

VII. ELEMENTS OF BOOKKEEPING: 36 HOURS

PURPOSE

To Develop Sufficient Understanding of the Fundamentals of Bookkeeping

1. To enable the apprentice to perform elementary recording duties
2. To enable the apprentice to handle a simple set of books under supervision

3. To provide business training which will aid him in the management of his future financial activities—personal or business

SCOPE

A. The Purpose of Accounting and Its Values
B. Why Keep Records
C. The Balance Sheet
D. The Profit or Loss Statement
E. Accounts and the Ledger
F. The Day Book and the Journal
G. Accounting for the Single Proprietorship
H. Accounting for the Corporation
I. Accounting for the Partnership
J. Business Capital
K. Current Assets
L. Long Life Assets and Inventories
M. Manufacturing Costs
N. Cost Planning and Control and Cost Finding
O. Liabilities and Net Worth
P. Tax Records

Reading List

1) Small Business Problems—Record Keeping for Small Stores. Washington, Government Printing Office, 1945. $0.50.
2) An Outline of Elementary Accounting, by Royal D. M. Bauer and Paul H. Darby. 3rd ed. New York, Barnes and Noble, 1952. $1.25.
3) The Small Businessman and His Financial Statements, by Gerald M. Francis. Washington, Government Printing Office, 1948. $0.20.
4) Accounting: a Management Approach, by Ronald H. Robnett, T. M. Hill and J. A. Beckett. $7.35.
5) Chapter IV, Necessary Financial Records, in "The Business Side of Medical Practice," by T. Wiprud. Philadelphia, Saunders Co., 1949. $4.00.

This course requirement may be satisfied by 1) A course in a local adult training class; 2) the course in bookkeeping offered by the International Correspondence Schools or other approved extension course.

VIII. PLASTICS: 18 CLASSROOM HOURS

PURPOSE

To acquaint the apprentice with the terminology, characteristics and uses of plastics as applied to orthopedic and prosthetic appliances.

I. Types of Plastics
   A. Laminating Resins
   B. Fillers
II. Plastic Terminology
III. Identification of Plastics

Reference

Plastics, by J. H. Dubois. Publishers, American Technical Society, Chicago, Ill.

For those places where a class in this course is not available, materials now under preparation will be furnished.

IX. LEATHER AND TEXTILES: 18 HOURS

PURPOSE

To acquaint the apprentice with the terminology, characteristics and uses of leather and textiles as applied to orthopedic and prosthetic appliances.

LEATHER

1. Tannage
   A. Aldehyde Tanning.—B. Quinone Tanning.—C. Chrome Tanning. D. Vegetable Tanning.—E. Iron Tanning.—F. Alum Tanning. G. Synthetic Tanning.
2. Types
   A. Strap.—B. Elk.—C. Latigo.—D. Horsehide.—E. Lace Splits.—F. Calf.—G. Rawhide.—H. Pig.—I. Sheep.—J. Kips.—K. Chamois.
3. Finishes
   A. Glaze.—B. Dull.—C. Oil.—D. Boarded.
4. Measurements
   A. Hides.—B. Sides.—C. Back.
      1. One ounce to ten ounce.—2. Extra light.—3. Light.—4. Medium light.—5. Heavy.
5. Uses
   A. Russet Strap
      1. BK corsets.—2. Liners.—3. Pelvic belts.—4. Tongues and billets.—5. Collars.
   B. Elk
      1. Tongues and billets.—2. Fork straps.—3. Pelvic belts.—4. Lug straps.—5. Pick-up straps.—6. Pulley cords.
   C. Latigo
      1. Foot bushings.—2. Pulley cords.—3. Fork straps.—4. Guide loops.
   D. Horsehide
      1. Foot covers.—2. Bushings.—3. Brace linings.—4. Limb liners.—5. Extensions.—6. Strings.—7. Back pads for AK limbs.—8. Lacer linings.
   E. Lace Splits
      1. Strings
   F. Calf
      1. Extensions.—2. Tongue and billets.—3. Brace coverings.—4. Knee caps.
   G. Rawhide
      1. Limb coverings
   H. Pig
      1. Foot coverings.—2. Back pads for AK limbs.—3. Lacer linings.

I. Sheep
1. Back pads for AK limb.—2. Padding.

J. Kips
1. Extensions.—2. Brace coverings.

K. Chamois
I. Linings

TEXTILES

Webbing—Non-elastic and elastic
1. Color
A. Drab.—B. Unbleached.—C. White.

2. Widths
A. ½".—B. ⅝".—C. ¾".—D. 1".—E. 1½".—F. 2".—G. 2½". H. 3".

3. Weight
A. Limb.—B. Brace.

Stump Socks
1. Materials available
A. Wool.—B. Cotton.—C. Nylon.—D. Combinations.

2. Weights
A. One to seven-ply inclusive

3. Sizes
A. Stock.—B. Special.

4. Care
A. Washing.—B. Storage.—C. Rotation.

Corsets and Belts
1. Stock garments
A. Material and strength.—B. Garment most suited for the prescription.—C. Proper application.

2. Special-made custom garments
A. Material and strength.—B. Color.—C. Thread used to fabricate.

Elastic Hose
1. Materials
A. Type of rubber used

2. Covering
A. Nylon.—B. Cotton.—C. Silk.—D. Other synthetics.

3. Weights

Underhose
1. Material
A. Wool.—B. Cotton.—C. Combination.

2. Sizes
A. 8 to 10½

References

The Chemistry of Leather Manufacture, by McLaughlin, Geo. D., and Thesis, E. R., Reinhold Publishing Corp., 1945.
Orthopedic Appliances Atlas, Vol. I, 1952, pp. 17-28.
Stump Socks, Their Manufacture, Use and Care, by Fawver, L. J., and Smith, T. W., OALMA Journal, Aug. 1951, pp. 27-32.

For those places where a class in this course is not available, materials now under preparation will be furnished.

X. PROFESSIONAL RELATIONS: 18 HOURS

PURPOSE

To enable orthotists and prosthetists to work professionally with their colleagues and to meet the day-by-day contacts with physicians, patients, families, the public, public agencies, research and educational agencies and ancillary professions. A careful study of the Code of Ethics as officially promulgated by the American Board of Certification is, in reality, the essence of this course.

SCOPE

A. The philosophy of rehabilitation. Definitions. History of this field.

B. The patient—relationships with—attitudes, fears and desires.

C. The patient—his relationships to those who serve him—attitudes of agencies, atmosphere, possible prejudices.

D. The family and friends of the patient. As problems. As aids to the prosthetist and orthotist. How to handle them.

E. The public—A survey of their attitudes toward this profession. How improve by public education.

F. Public rehabilitation agencies and related activities. State, city, county and Federal agencies and their relationships to patient and this profession. Using their reports and literature.

G. Rehabilitating the patient—the functions and essential techniques of this profession. Establishment of standards: particularly as to fitting and training.

H. A survey of the ancillary professions—physicians, nurses, social workers, occupational and physical therapists. Their various codes, practices and organizations.

I. Research—The history and status of research as related to this field. The profession as a prime participant in the work of research for improved products and services.

J. Professional ethics as *between* the professions. The problem of "professional jealousy."

K. Relationships within the profession—as owners of businesses, as employees, employers—as professional men.

L. Relationships within the profession—members of a professional group.

M. The Code of Ethics—its beginnings—its contents—its effect. The place of the "Fair Hearing."

N. Looking ahead—goals for betterment of services and products.

Reference

The official Codes of Ethics for: A. Manufacturers of artificial limbs; B. Manufacturers of orthopedic appliances.

XI. PUBLIC SPEAKING: 36 HOURS

Prosthetists and Orthotists are in daily personal contact with the patients whom they serve. New patients usually are ill at ease, apprehensive or confused when they first come in for the fitting of a prosthesis or a brace. Therefore it is essential that apprentice prosthetists or orthotists learn to

express themselves clearly, with sincerity and understanding, with good poise and self-confidence, in handling such patients.

The primary purpose of this course is to help train the apprentice to meet these requirements. A secondary objective is to train him to make a speech about his work, should the occasion arise.

FIRST SESSION

A. Discuss your faults, failings and your future as a speaker.
B. How to form a short speech of an unprepared nature.

SECOND SESSION

A. Select the subject for your *Number One* speech.
B. How to speak over the radio.

THIRD SESSION

A. Learn how to use analogies.
B. How to get your speech delivered.

FOURTH SESSION

A. Few people read aloud well; do you?
B. Start preparing your *Number One* speech.

FIFTH SESSION

A. How to make speeches for presentation and acceptance.
B. Applying the principles of How to Win Friends and Influence People in your speeches.

SIXTH SESSION

A. Make a speech to an unfriendly audience.
B. How to make the speech to inform.

SEVENTH SESSION

A. How to say "Welcome" and "Farewell" in speeches.
B. How to speak in defense or in opposition.

EIGHTH SESSION

A. How to speak for charitable organizations.
B. How to open and close your talks.

NINTH SESSION

A. How to make announcements.
B. Speaking in panel-form.

TENTH SESSION

A. & B. Learning how to get action in organized groups.

ELEVENTH SESSION

A. Solving problems in organized groups.
B. Putting showmanship in your speeches.

TWELFTH SESSION

The talk you have been preparing for in the previous eleven sessions.

This course requirement may be fulfilled by completion of a public speaking course in a local school, a "Dale Carnegie" course, or equivalent.

XII. GAIT AND POSTURE TRAINING: 18 HOURS

I. THE LOAD LINE

(The load line may be considered as having to do with locomotion and gait training.)

A. In the sagittal plane.—B. In the frontal plane.

II. THE LINE OF GRAVITY

(The line of gravity may be considered as a dynamic or specific anatomical reference having to do with alignment and fitting.)

A. In the sagittal plane.—B. In the frontal plane.

III. THE BASE OF THE LOAD

A. Flexibility and extensibility of the spine.
B. Pelvic motions.
C. Stump and extremity motions.

IV. HUMAN LOCOMOTION

A. The basic pattern of locomotion.
B. The locomotor mechanism.
C. The fundamental features of locomotion.
D. The control of locomotion.
E. Application to walking.

V. SPECIFIC MUSCLES INVOLVED IN THE WALKING PATTERN OF THE AMPUTEE

Bibliography

National Research Council, 1954. Revision. Suction Socket brochure.

Steindler, Arthur, 1950. Post-Graduate lectures on Orthopedic Diagnosis and Indication. Vol. I, Section A. Charles C. Thomas, Springfield, Ill.

Thomas, Atha and Chester C. Haddan, 1945. Amputation Prosthesis. J. B. Lippincott Company, Philadelphia, Pa., 1945.

Elftman, Herbert, Jan. 31, 1951. The basic pattern of human locomotion. Annals of New York Academy of Sciences, Vol. 51, Art. 7.

Haddan, Chester C. and W. Belfrage, 1948. Physical Therapy for Lower Extremity Amputees with Suction Socket Prostheses. OALMA Journal, Vol. 2.

U. S. War Department, June, 1946. War Department Technical Manual TM8-293, Physical Therapy for Lower-Extremity Amputees.

Todd, Mabel E., 1949. The Thinking Body. Charles T. Branford Co., Boston, Mass.

National Research Council, Human Limbs and Their Substitutes. 1954. McGraw-Hill, New York, N. Y.

Inman, Verne T., 1947. Functional aspects of the abductor muscles of the hip. The Journal of Bone and Joint Surgery, Vol. 29, No. 3.

Saunders, J. B., Verne T. Inman, and Howard D. Eberhart, 1953. The major determinants in normal and pathological gait. The Journal of Bone and Joint Surgery, Vol. 35-A, No. 3.

Levens, A. S., Verne T. Inman, and J. A. Blosser, 1948. Transverse rotation of the segments of the lower extremity in locomotion. The Journal of Bone and Joint Surgery, Vol. 30-A, No. 4.

Morton, Dudley J., 1952. Human Locomotion and Body Form. The Williams and Wilkins Company, Baltimore, Md.

XIII. TECHNIQUES OF PHYSICAL THERAPY AND REHABILITATION: 18 HOURS

PURPOSE

To acquaint the student with those basic principles of physical therapy and rehabilitation related to the orthopedic and prosthetic field, and to increase understanding of the function of the "Rehabilitation Team."

(Course Materials are under Preparation)

Bibliography

Thomas, Atha and C. C. Haddan, 1945. Amputation Prosthesis. J. B. Lippincott Co., Philadelphia, Pa.

U. S. War Dept., June 1946. War Dept. Technical Manual TM8-293. Physical Therapy for Lower Extremity Amputees.

Bryce, Margaret, 1954. Physical Therapy after Amputation. University of Wisconsin Press, Madison, Wisconsin.

XIV. TOOL CARE AND USAGE: 18 HOURS

Academic training in tool care and usage would best be obtained by enrolling in a machine shop class at an adult education center. No attempt is made to dictate to the instructor as to the text books to be used. The apprentice should, however, show his instructor his copy of "Orthopedic Appliances Atlas, Volume 1," to show the instructor the nature of the things which he will be making. He should draw the instructor's attention to pages 165, 166 and 167, which will name the tools and machines commonly used by orthopedic limb and brace makers.

The leg pulling tools will undoubtedly be strange to the average instructor. Nor is there any text dealing with their use or care. If the apprentice is faced with a delay in scheduling his attendance in a machine shop class he should purchase a copy of "Machine Shop Theory and Practice," by Wagner and Arthur, published by D. Van Nostrand, New York. He should also avail himself of free publications on the use of tools, which are published by leading manufacturers and institutes, such as:

Micrometer Reading Made Easy. The Lufkin Rule Co., Saginaw, Michigan.

The Tools and Rules for Precision Measuring. The L. S. Starrett Co., Athol, Massachusetts.

How to Select and Use Wrenches. J. H. Williams & Co., 75 Spring Street, New York.

Safe Speeds for Grinding Wheels. Grinding Wheel Institute, P. O. Box 64, Greendale, Massachusetts.

Machinist's Practical Guide. Morse Twist Drill & Machine Co., New Bedford, Massachusetts.

The Use and Care of Reamers. The Cleveland Twist Drill Co., 1242 East 49th Street, Cleveland 14, Ohio.

XV. BUSINESS ENGLISH: 36 HOURS

A course in Business English is of primary importance to the certified prosthetist or orthotist because intelligent and effective communication affects every situation where people make contact with each other.

A list of real life situations is listed below as examples where good English plays an important part:

1. Discussing a case with the doctor.—2. Participating in a clinic.—3. Writing letters to doctors, patients or agencies.—4. Making out a report on a case.—5. Analyzing a prescription for an orthopedic or prosthetic appliance and acting upon it.—6. Taking tests, examinations.—7. Writing good adjustment or collection, or complaint letters.—8. Writing articles for publication or stories for papers.—9. Answering inquiries.—10. Making good records of work, or of training, or of cases served.—11. Making effective community contacts as an important part of being a good citizen.

These are the topics that are most common to the interests and needs of this field. (Other topics may well be added and some may be omitted without serious loss.)

1. The effective use of words—good rules of punctuation—grammar—spelling—figures of speech.—2. Letters—the mechanics of—appropriate stationery—letterheads.—3. Producing a good letter—dictation substitutes for dictated letter—form communications.—4. Letters of order—ways of placing the order—acknowledging the order. 5. Letters of inquiry and reply.—6. Good-will letters.—7. Credit letters.—8. Complaints and adjustments.—9. Reports and minutes of meetings.—10. Records—making, keeping, filing.—11. Primary laws of business—contracts, sales, banking, insurance—agency, partner or corporation.—12. Patents, trade-marks, trade names.—13. Alphabetizing—filing—indexing.—14. Speaking—uses of good English in.

Where to Find a Course in Business English

Courses in Business English are found in most if not all cities. It may be in a high school, day or evening classes; at a junior college; a technical or trade school; in a nearby college's regular class or extension course. Where, after full inquiry, no course is found to be available, the student still has the opportunity for self-study with one or more of the textbooks listed in the Bibliography. A correspondence course arrangement may be arranged.

The National Education Committee of the OALMA will assist any student on his educational problem.

What Textbooks Are Available?

The list below is but a part of the available supply of good material in Business English. Consult with instructors in this field or with your local library.

Green, Z. E., A Text in Business English. New York, Henry Holt & Co.

Babenroth, A. Charles and Peter T. Ward, Modern Business English. New York, Prentice-Hall, Inc., 1937.
Marcoux, Harvey L., "A College Guide to Business English." New York, D. Van Nostrand Company, Inc., 1939.

XVI. SKETCHING AND DRAWING—THE HUMAN FORM: 18 HOURS

PURPOSE

To enable student to draw rudimentary sketches for illustration of anatomical conditions as pertains to bone relationship.

Pre-requisite: 18-36 hours functional anatomy; with emphasis on nomenclature, bones and body landmarks.

I. Tracing and Shading Bones. Upper Extremity Anterior and Posterior View

II. Tracing and Shading Upper Extremity Bones. Medial—Lateral View

III. Tracing and Shading of Lower Extremity Bones, Anterior and Posterior Views

IV. Tracing and Shading of Lower Extremity Bones, Lateral—Medial View

V. Tracing of Photograph or Anatomical Drawings.

VI. Simple Preliminary Sketching of Upper Extremity, Anterior and Lateral Views

VII. Simple Preliminary Sketching of Lower Extremity, Anterior and Lateral Views

VIII. Simple Abstract Preliminary Sketch of Skeletal Framework of the Human Form—Anterior View

IX. Final Drawing of Skeletal Framework With Outline Sketch of the Human Form

The essentials of this course should be available in a local school.

XVII. BUSINESS ECONOMICS: 18 HOURS

PURPOSE

To give the basic knowledge of economics and the American business system needed by the employee and managers of orthopedic-prosthetic facilities.

SCOPE

A. Why Man Works

B. How Man Works
   1. Tools

C. Pay for Work

D. Why We Need Money
   1. Its basic purpose
   2. How money moves
   3. How bank credit is created

E. Business Enterprises
   1. The Single Proprietorship
   2. The Partnership
   3. The Incorporated Business

F. The Businessman and His Financial Statements

G. The Businessman and His Bank

H. Office Management
   1. Necessary financial records
   2. Proper handling of the patient's accounts
   3. Credit systems
   4. The billing of customers
   5. Business dealings with government agencies—VA, etc.

I. Insurance
   1. Protection against business risks
   2. Product liability insurance

J. Investments

Reading List

1) How to Think About Economics, by Fred G. Clark and Richard St. Rimanoczy. New York, Van Nostrand Co., 1952, 112 pages. $2.75.

2) The Small Businessman and His Financial Statements, by Gerald M. Francis. Washington, Government Printing Office, 1952, 26 pages. $0.30.

3) The Small Businessman and His Bank. Washington, Government Printing Office, 1947, 13 pages. $0.25.

4) Chapters III, IV, V, VI, VII, IX, and X in "The Business Side of Medical Practice," by T. Wiprud. Philadelphia, Saunders, 1949. $4.00.

5) Chapters X, XI and XII in Outline of Elementary Accounting. New York, Barnes and Noble, 1952, 221 pages. $1.25.

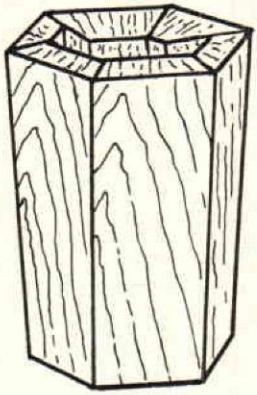
6) "Sources of Business" chapter in Dr. Howard Boyland's Surgical Appliance Technician's Handbook. Cincinnati, Surgical Appliance Industries, Inc., 1954. $10.00.

This requirement of Business Economics can be satisfied by completing a high school course in Economics.

NEW BLOCKS

You can save time and money with these thigh socket blocks. These straight grained, thoroughly dry blocks enable you to pull sockets in half the time.

All blocks 14" long
Wall thickness 1¾"



Size 6	$ 4.35
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Size is inches across flats at top

NEW PRICES

Materials for making SEE 8 Orthopedic Appliances

SEE 8 RESIN

¼ Unit **$4.80**
½ Unit **8.85**
1 Unit **15.00**
5 Unit **13.50 (per unit)**
10 Unit **12.00 (per unit)**

1 Unit consists of
½ gallon of 8A and 1 pint 8B

SEE NET

38" wide cloth—1 to 10 yds. **$2.55 yd.**
38" wide cloth—11 to 50 yds. **2.30 yd.**
38" wide cloth—125 yards **1.95 yd.**

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40" wide 1 to 5 lineal yds. **$0.90 yd.**
40" wide 6 to 15 lineal yds. **.81 yd.**
40" wide 16 to 30 lineal yds. **.73 yd.**
40" wide 31 over **.66 yd.**

NEW POWDER

Ampu-Talc—The IDEAL Amputee's Powder
Satin smooth—Ideal for SUCTION SOCKETS
Odorless—No agitating perfumes
Retards perspiration—not medicated
1 pound can—$1.00 Retail

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¾" Wide, roll, 36 yds. $1.80
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WHEN AVAILABLE

1½" Wide, roll, 36 yds. 4.70
3½" Fiberglass Tubing $.91 yd.
2½" Nylon Stockinette .50 yd.
3½" Nylon Stockinette .55 yd.
5½" Nylon Stockinette .91 yd.

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134 Baker Street, N.E., Atlanta, Georgia
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SUPPLIES SECTION

Index to Advertisements

In Memoriam

J. ANGUS BELL of Reading, Mass., died December 28, 1954. Mr. Bell was a certified prosthetist - orthotists, and had been associated with John J. Lockwood, Manager of the Pomeroy Company facility in Boston for twenty-five years.

W. T. HINNANT, President of the W. T. Hinnant Artificial Limb Company of Charlotte, N. C. and Columbia, S. C., died in December, 1954 after an illness of four months.

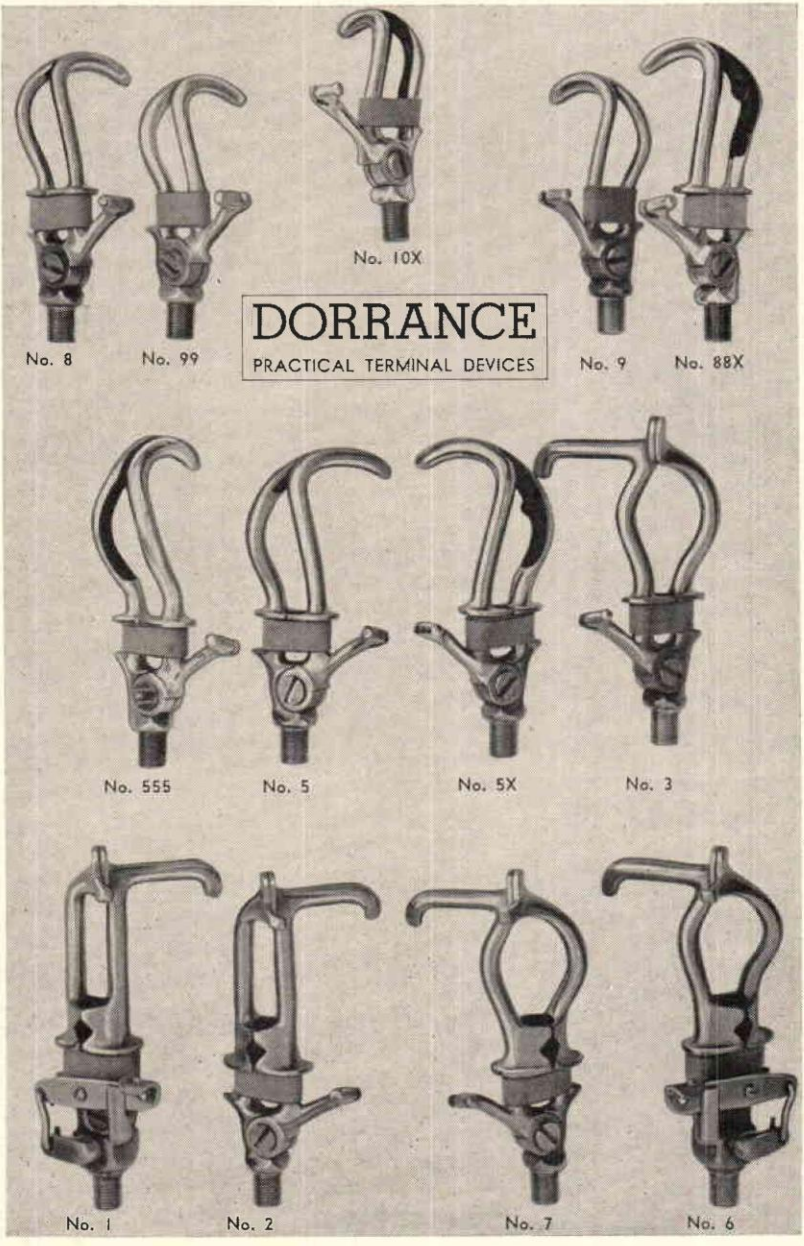
Mr. Hinnant was born March 13, 1896 in Johnston County, North Carolina. He was educated at Bingham Military School and served in Naval Aviation during World War I. During the 1920's, Mr. Hinnant was engaged in the automobile business and formed his own company. In 1930, he lost a limb as the result of an automobile and train accident. The following year he began fitting artificial limbs and in 1936 opened his own facility.

Mr. Hinnant's main interest was building and improving appliances for the benefit of the handicapped person. In the years he was in business, he trained many prosthetists, some of whom now have their own establishments. Mr. Hinnant trained his two sons at an early age in the business with him and they will continue to operate the company.

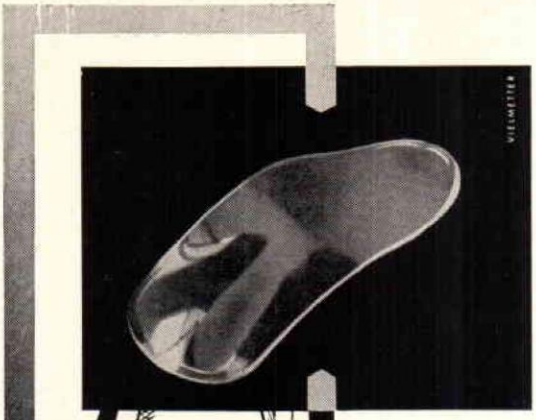
He is survived by his wife, Mrs. Ruby D. Hinnant, one daughter, Mrs. Lewis Whitehead, and his two sons, John and Milton Hinnant.

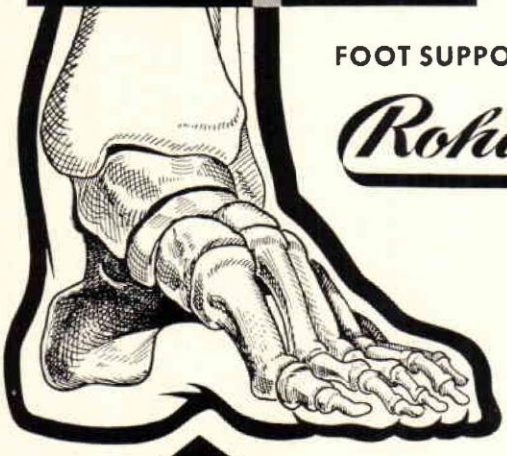
FRANK PATRICK, Certified Prosthetist, died Dec. 11, 1954 in Minneapolis, at the age of 64. He was an employee of the Minneapolis Artificial Limb Company. Mr. Patrick is survived by his widow and one son.

REGARDLESS of your choice, you can always depend on DORRANCE for Quality, Dependability and Economy



P.O. Box 1128 **San Jose 10, Calif.**





FOOT SUPPORTS made of

Rohadur

Foot troubles can best be cured by foot supports. For successful orthopedic treatment, however, foot supports should meet special requirements. Besides matching smoothly the outer shape of the foot, they must give the foot the particular support so important for the static-mechanical functioning of the foot bones. ROHADUR can be cut and hot shaped very easily. The plastic being tough yet highly elastic activates the foot continuously. It does not tire the foot, stain the stockings or wear out the shoes. Easy to wash, not subject to corrosion by perspiration, will not break. Let your patients enjoy the wonderful feeling walking on supports made of ROHADUR.

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"I've Been Wondering

D. Wilmore Bremer

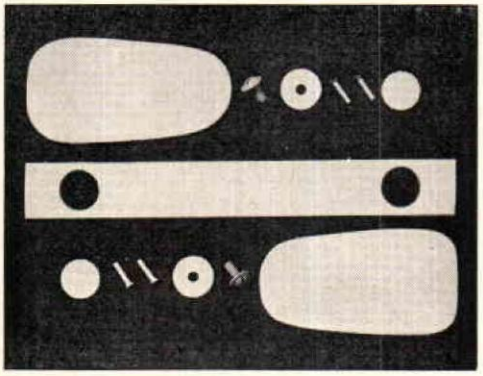
. . . if a lot of folks in our line of business wouldn't like to know about a couple of items we make and can sell to other shops that'll save them time and money.

One is our complete kit of all necessary parts for making up the Denis-Browne Splint in aluminum. You just rivet the special die-cut adjusting plugs to the shoe plates, drill and tap the plugs for the set screws and washers — and it's ready for finishing and attaching to the shoes.

The other item is our cutting and drawing compound we've been making for ourselves and others for more than 15 years because it's better than anything we can buy. Quite a few brace shops and industrial plants agree with us . . . the Navy does too."

—Wilmore

P.S. "Bremer Brease" is the stuff that makes it possible to cut aluminum with an emery wheel. —D.W.B.



"DENIS-BROWNE KIT"

All necessary parts for a complete Denis-Browne Splint. Easily assembled — light in weight. 40 different "sure-lock" settings.

New Low Price **$1.00** *per kit*

Note: made in 6" - 7" - 8" - 10" length bars (center to center). Other lengths to order at same low price.

"BREMER BREASE"

Gives you fast, trouble-free cutting. Tool edges stay sharp longer. Keeps drills, reamers and taps from sticking or freezing.

Price **$3.00** *per can*

Note: Contents of can not less than 5 pounds net.

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1107 Margaret Street, Jacksonville 4, Florida

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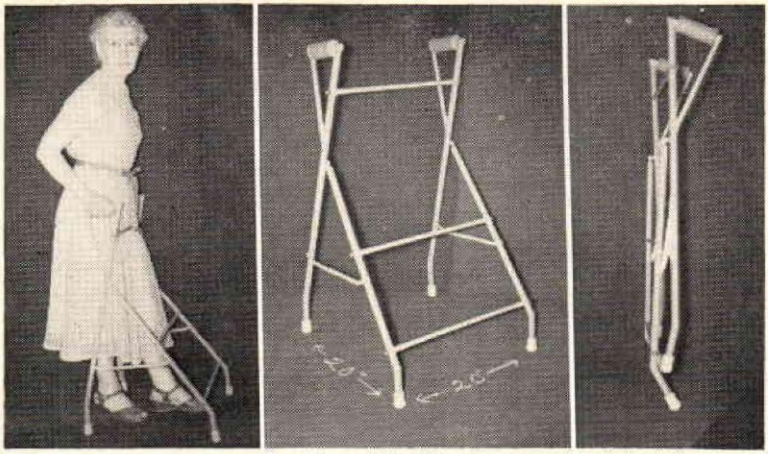


THE LATEST—

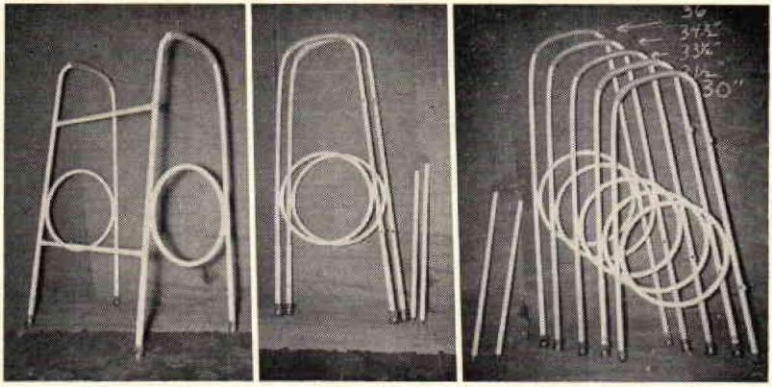
New Improved "Walborn's" Folding Walking Aid

More Floor Coverage—Safer For Patient—Will Not Tip Forward

Large Sponge Latex Handle Grips "Easy on the Hands" — Rubber Feet.
Height—34 inches, Can be cut down to 29 inches — Light Weight—5½ lbs.
Made of Light Weight Air Craft ¾ inch "Steel". All Joints Brazed with Bronze.
No Electric Welded Joints.
Recommended for Patients who are able to be up and around. Easily folded to carry in auto or to store

Manufactured to fill the demands of Orthopedic Surgeons and Hospital Staffs to help convalescent patients.

PRICE $17 95



"Walborn's" Adjustable Height-Walking Aid

Adjusts From 30—31½—33½—34½—36"

Easily adjustable for different height patients—Light Weight—5½ lbs.
Rubber Handle Grips—Rubber Feet.
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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.