An Orthopedic Surgeon's Story of the Great War

By H. Winnett Orr, M. D.

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An Orthopedic Surgeon's Story of the Great War

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Fellow of the American College of Surgeons, Member (Secretary 1915-1917) American Orthopedic Association, Member (Chairman Orthopedic Section 1920-1921) American Medical Association, Member (President 1920) Nebraska State Medical Association.

Lincoln, Nebraska, U. S. A.
December 1921.

Dedication

This little booklet is respectfully and affectionately dedicated to

Major John Ridlon of Chicago, under whose guidance first and principally, I have endeavored to acquire some proficiency in Orthopedic Surgery.

General Sir Robert Jones of Liverpool, Director of Military Orthopedics in Great Britain and Ireland and the greatest teacher of Orthopedic Surgery in the world He has done more than any other to awaken everywhere the "Orthopedic Conscience."

Colonel Joel E. Goldthwait of Boston, Chief Consultant in Orthopedic Surgery in the American Expeditionary Force.

H. Winnett Orr.

The following were on Duty as Medical Officers Assigned to the Orthopedic Division A. E. F., during 1917 and 1918.*

Adams, Major Z. B., Boston, Mass.
Base Hospital No. 6; Special Training Battalion, St. Aignan, British Army, C. C. S. No. 48, 26th Division, 41st Division; Orthopedic Consultant at Bordeaux Hospital Center.

Abbott, Major LeRoy C., Ann Arbor, Mich.
First Orthopedic Unit, May 1917, Bangour War Hospital, Edinburgh; Base Hospital No. 8 Base Hospital No. 9, Chateauroux, American Red Cross Hospital No. 2, Paris.

Alexander, Capt. D. T.
Chief Orthopedic Service, Base Hosp., 100, Savenay.

Allison, Colonel Nathaniel, St. Louis.
Orthopedic Surgeon Base Hospital No. 21; Assistant Director of Orthopedic Surgery, A. E. F., Consultant in Orthopedic Surgery First Army, Croix de Guerre.

Baldwin, Lieut.-Colonel Walter I., San Francisco, Cal.
First Orthopedic Unit, May 1917, Bangour Military Hospital, Edinburgh; Chief of Orthopedic Service, Letterman General Hospital, San Francisco, until June 23, 1919. Silver Citation G. H. Q., A. E. F.

Bidwell, Lieut. A. H.
Orthopedic Service, Base Hospital No. 88, Savenay.

Billington, Major R. W., Nashville, Tenn.
First Orthopedic Unit, May 1917, Senior Surgeon Orthopedic Centre, Newcastle-on-Tyne; Chief Orthopedic Service, Camp Meade Base Hospital and Reconstruction Centre.

Brackett, Col. Elliott G., Boston, Mass.
Director of the Division of Orthopedic Surgery, Surgeon General's Office, U. S. A. Official visit to the Orthopedic Division, A. E. F., in August and September 1918.

Brewster, Lt. Albert H., Boston, Mass.
Peter Bent Brigham Hospital.

Cary, Lieut. S. B. Roanoke, Va.
Welsh Metropolitan War Hospital, Cardiff, Wales, Base Hospital No. 8, Savenay.

Chollett, Capt. B. G., Toledo, Ohio.
B. E. F. No. 9, at Rouen, Shepherd's Bush Hospital, London. B. H. 9, Chateauroux. B. H. No. 114, Bordeaux. Camp Sherman, Chillicothe, Ohio.

Cilley, Lieut.-Colonel Arthur H., New York City.
Bella Houston Military Hosp., Glasgow; Base Hospital No. 36, A. E. F.; B. H. No. 119, Savenay, A. E. F.; U. S. Genl Hosp No 9, Lakewood, New Jersey.

Cole, Major Wallace, St. Paul, Minn.
First Orthopedic Unit, May 1917. Alder Hey Military Hospital, Liverpool.

Cone, Major Sydney M., Baltimore, Md.
First Orthopedic Unit, May 1917. Alder Hey Military Hospital, Liverpool.

Conn, Capt. Harold R., Akron, Ohio.
B. H. 8., Savenay.

Crum, Major C. C., Milwaukee, Wis.
Special Training Bn., St. Aignan; B. H. 48; Mars sur-Alter; B. H. 69, Savenay.

Danforth, Major M. S., Providence, R. I.
First Orthopedic Unit, May 1917, Bangour Mil. Hosp., Edinburgh; B. H. 69, Savenay; Orthopedic Service Walter Reed Hospital.

Dauterive, Capt. H. J. New Iberia, La.
Orthopedic Center, Bangour Hospital, Edinburgh; B. H. 9. Chateauroux; B. H. No. 8, and B. H. No. 69, Savenay.

Davis, Capt. A. G. Erie, Pa.
Welsh Metropolitan War Hospital, Cardiff, Wales. Base Hospital No. 8, Savenay.

Dickson, Major Frank D., Kansas City, Mo.
British Orthopedic Center, Oxford, England; Orthopedic Surgeon 26th Division; Orthopedic Surgeon First Army Corps; Consultant in Orth. Surg., to the Third Army.

Dignan, Capt. H. H., San Francisco, Calif.
Welsh Metropolitan War Hosp., Whitchurch nr. Cardiff, Wales.

Dillehunt, Major Richard B., Portland, Ore.
Chief Orthopedic Service Base Hospital 46. Consultant in Orthopedic Surgery, Hospital Center at Perigueux. Walter Reed Hospital. Discharged July 2, 1919.

Dorsey, Lt. George H.
Fort Sam Houston, Texas. Welsh Metropolitan War Hospital, Cardiff, Wales.

Dunlop, Major John, Los Angeles, Calif.
Member of the Committee on Preparedness American Orthopedic Association and American Medical Association. British Orthopedic Centers at Oxford, Shepherds Bush and Edinburgh War Hospital at Bangour. Later at Liverpool and Aberdeen. Discharged April 9, at Camp Dix.

Durham, Major L. T., New York City.
First Orthopedic Unit, May 1917. Alder Hey Military Hospital, Liverpool. Consultant in Orthopedic Surgery, Camp Hospital, Fort Dodge, Iowa.

Easton, Lieut. S. H. Peoria, Ill.
Amputation Service, Base Hospital No. 8, Savenay.

Eikenbary, Lieut.-Colonel Charles P., Spokane, Wash.
First Orthopedic Unit, May 1917, Orthopedic Center, Glasgow, Orthopedic Surgeon Second Division also Eighty-ninth Division. Orthopedic Consultant for the Hospital Centers at Beaune, Dijon, and Allerey. Orthopedic Surgeon Letterman General Hospital. Discharged May 1919.

Erving, Major W. G., Washington, D. C.
First Orthopedic Unit, May 1917. Orthopedic Center, Oxford, England. Walter Reed General Hospital, Washington, D. C.

Farr, Lieutenant Richard, New York City.
New York Orthopedic Hospital, N. Y. C.

Fayerweather, Major Roades, Baltimore, M.
First Orthopedic Unit, May 1917. British Orthopedic Center, Leeds. Divisional Surgeon's Hqrs., Second Division; Base Hospital No. 8; U. S. A. Gen. Hosp. No. 3; U. S. A. Gen. Hosp. No. 11; U. S. A. General Hospital No. 6. Discharged Oct. 1, 1919.

Figley, Capt. Karl D., Toledo, Ohio.
City of London Military Hospital. Special Training Battalion near Neufchateau, France. Orthopedic Surgical Team. At Compiegne Auto. Chir. No. 7; A. R. C. Hosp. No. 1; Mobile Hosp. 39; A. R. C. No. 114; Evac. Hosp. No. 12. B. H. 8., Savenay. Walter Reed Hospital

Fiske, Capt. E. W. Pittsburgh, Pa.
Chief Orthopedic Service, Base Hospital No. 27, Angers.

Fitch, Major R. R., Rochester, N. Y.
On duty with the French for the four years of the war. For the last part in charge of American Red Cross Hospital No. 109. Consultant in Orthopedic Surgery for the Area in and around Paris.

*This is published as a preliminary list. It is requested that additions and corrections be sent to the Author so that a complete and entirely correct list may be published at a later time.

Fradd, Lieut. N. W. Boston, Mass.
Physical Reconstruction Amputation Department Base Hospital No. 8, Savenay.

Francisco, Lieut.-Colonel C. B., Kansas City, Mo First Orthopedic Unit, May 1917, Orthopedic Center, Abderdeen. Consultant in Orthopedic Surgery First Division. 32nd Division. 35th Division, and 76th Division. Consultant in Orthopedic Surgery, Hospital Area at Mesves and later at Savenay.

George, Lt.-Col. Frank William, Worchester, Mass. Fort Benjamin Harrison, Ind. 7th Coast Artillery, Assistant Surgeon. Camp Hospital No. 13, A. E. F. Adjutant and Chief of Surgical Service. Commanding Officer Camp Hospital No. 13. Base Hospital No. 9. Base Hospital No. 69. Chief of Orthopedic Service. Discharged March 25, 1919.

Goldblatt, Lieutenant Harry, Cleveland, Ohio.

Goldthwait, Colonel Joel E., Boston, Mass. Chairman Preparedness Committee, American Orthopedic Association and Orthopedic Section, American Medical Association 1916: Commanding Officer First and Second Goldthwait Orthopedic Unites May and November 1917. Chief Consultant in Orthopedic Surgery A. E. F.

Goodwyn, Lt. Thos. P., Hurt Bldg., Atlanta, Ga. Asst. to Major F. G. Hodgson at Blois.

Graves, Lt. Col. James T. Rochester, N. Y. First Orthopedic Unit, May 1917. Bellahouston Military Hospital, Glasgow. Consultant in Orthopedic Surgery, Blois Hospital Area, A. E. F. Consultant Bordeaux Area.

Hall, Major Custis Lee. Washington, D. C. First Orthopedic Unit, May 1917. Welsh Metropolitan War Hospital, Whitchurch near Cardiff, Wales. Bangour Military Hospital, Edinburgh. Camp Hospital No. 2, St. Nazaire, A. E. F.

Hartmann, Major John V. Findlay, Ohio. Base Hospital No. 9; Consultant in Orthopedic Surgery, Hospital Centre, Kerhuon.

Harvey, Capt. T. W., Prattsville, Ark. Base Hospital 66. Base Hospital 206. Base Hospital 94.

Hawley, Lieut.-Colonel George W. Bridgeport, Conn. Chief Orthopedic Service and Commanding Officer, Base Hospital No. 9, Chateauroux. Hospital Consultant Orthopedic Surgery, Base Hospital No. 9, Limoges.

Hodgson, Major F. G., Atlanta, Ga. Chief Orthopedic Service Base Hospital 43. Consultant for the Area of Blois. Chief of Orthopedic Service, Camp Pike Hospital.

Jelks, Capt. Edward, Jacksonville, Fla. Second Northern General Hospital, Leeds, England. Base Hospital 36, A. E. F. Evacuation Hospital No. 2. Orthopedic Service, Savenay, Base Hospitals 8, 69 and 88. Orthopedic Service Base Hospital, Camp Grant, U. S. A. Discharged July 1919.

John, Major Rutherford L., Philadelphia, Pa. Fort Slocuns, N. Y., April 16, 1917. Base Hosp. 34, Sept. 4, 1917. Commanding Officer, Camp Hospital 25 A. E. F. Base Hosp. 34, Nantes. Consultant Hospital Area, Nantes. Discharged June 21, 1920.

John, Capt. R. L. Philadelphia, Pa.
Chief Orthopedic Service, Base Hospital No. 34, Nantes.

Johnson, Capt. W. H.
Orth. Service, Base Hospital No. 119, Savenay.

Jones, Major E. O., Seattle, Wash. Base Hospital 50.

Kidner, Major F. C., Detroit, Gross Pointe, Mich. First Orthopedic Unit, May 1917, on duty with the British. Consultant in Orthopedic Surgery for the A. E. F. in England.

Kramer, Lieut. James G., Akron, Ohio. On duty with the British. Orthopedic Surgeon 26th Division. Consultant in Orthopedic Surgery 7th Corps.

LaFerte, Major Alfred D. Detroit, Mich. Base Hospital 17.

Langworthy, Capt. Mitchell, Spokane, Wash. First Orthopedic Unit, May 1917, served with the British. Orthopedic Surgeon Second Division. Chief of the Orthopedic Service, Base Hosp. 23, Vittell.

Lawler, Capt. D. H. Baltimore, Md.
Orthopedic Service, Base Hospital No. 8, Savenay. Orth. Consultant Hospital Center, Kerhoun, Brest.

Luce, Captain, R. V., Akron, Ohio. Blackpool, England. Alder Hey Military Orthopedic Hosp., Liverpool. Welsh Metropolitan War Hospital, Cardiff Wales. Base Hospital 8, Savenay.

MacAusland, Lt. A. R., Boston, Mass. First Orthopedic Unit, May 1917, served in England, Alder Hey, Liverpool. Head of Surgical Team No. 2.

Magruder, Capt. Thos. V., Birmingham, Ala. Served in England, Special Training Battalion, St. Aignan. Base Hospital No. 8, Savenay.

Marble, Capt. H. C., Boston, Mass. Base Hospital No. 6, Chief Orthopedic Service, June 1917 to March 1919. U. S. Army General Hospital, No. 3, Colonia, N. J., June 1919.

McChesney, Major George J., San Francisco, Cal. B. E. F., Hospital No. 9, Rouen, France. Shepherd's Bush Military Hospital, London. Military Orthopedic Hospital, Birmingham, England. Consultant, Base Hospital No. 88, Savenay.

McHugh, Lieut. P. F., Wilkes-Barre, Pa. Brigade Orthopedic Surgeon, Third Division, Battalion Surgeon 6th, U. S. Engineers. Division Orthopedic Surgeon, 37th Division. Battalion Surgeon 147th Infantry. B. H. 113, Savenay.

McKenna, Capt. Charles H., Chicago. Welsh Metropolitan War Hospital, Whitchurch near Cardiff, Wales. Chief Orthopedic Service, B. H. 101, A. E. F. (St. Nazaire.)

McKenna, First Lieut. Donald H., Brooklyn, N. Y. Base Hospital No. 9. Base Hospital No. 63. Consultant Orth. Surg., Nantes Hosp. Center. Orthopedic Surgeon Grand Central Palace, Debarkatia Hospital No. 1. Orthopedic Surgeon General Hospital No. 1. Discharged Sept. 15, '19.

Metcalf, Lieut. Colonel Carleton R., Concord, N. H. First Orthopedic Unit, May 1917. Ulster Volunteer Force Hospital, Belfast, Ireland. Base Hospital No. 36, A. E. F. Vittel, France. At the Front with a Surgical Operating Team. Evacuation Hospital No. 6. Evacuation Hospital No. 3. Orthopedic Consultant at Mars, France. Chief of the Surgical and Orthopedic Service, Base Hospital No. 88, Savenay.

Meyers, Lt., Nashville, Tenn. Base Hosp. No. 32.

Miller, Captain Orville R., Louisville, Ky. Bellahouston Hospital, Glasgow, Scotland. Chief of Orthopedic Service, B. H. 66. Evacuation Hospital No. 8. B. H. 94. B. H. 88, Savenay.

Moore, Major Howard, Boston, (Newton) Mass. Chief of Orthopedic Service, Base Hospital No. 44. Chief of Orthopedic Service Convalescent Camp, Mesves Hospital Center.

Morgan, Capt. D. W.

Orthopedic Service, Base Hospital No. 8, Savenay.

Morral, Major Ralph R., Youngstown, Ohio. Chief of an Operating Team, St. Miheil and Argonne. Bella-Houston Hospital, Glasgow. Base Hosp. 31, A. E. F. French-Auto chir No. 7-3rd. A. R. C. Hospital No. 1. F. H.-163 Operating Team. Chief of Orthopedic Service, Base Hosp. 202 Orleans. B. H. 85, Angers, Chief of Orthop. Service. B. H. 69 and 88, Savenay.

Mumford, Capt. E. B., Indianapolis, Ind. Base Hosp. 32, A. E. F. Belgian Hosp. at La Panne (Dr. DePage). First French Army at Grandvillier.

Myll, Capt. Nelson A., Garden City, N. Y. On duty with the British. Orthopedic Surgeon 30th Division. Hospital Centre at Savenay.

Neill, Lieut. William Charlestown, W. Va. Orthopedic Surgical Team, Evacuation Hospital, No. 1. Surgeon in Charge Casual Operating Team, No. 11.

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Orr, Lt.-Col., H. Winnett, Lincoln, Nebraska. First Orthopedic Unit, May 1917, Orthopedic Center Welsh Metropolitan War Hospital, Whitchurch near Cardiff, Wales. B. H. 9, Chateauroux. Consultant in Orthopedic Surgery, Savenay Hospital Center, Nantes Hospital, Center B. H. 27, Angers, B. H. 101, St. Nazaire, and other Hospitals in Base Section No. 1, A. E. F. Consultant in Orthopedic Surgery, U. S. A. Gen. Hosp. 26, Fort Des Moines and Camp Hospital at Camp Dodge. Discharged June 1, 1919.

Osgood, Lieut.-Colonel Robert B., Boston, Mass. Base Hospital No. 5. Transferred in the summer of 1917 to the American Expeditionary Forces. On duty in England, Liaison Officer, American Orthopedic Group and R. A. M. C. First Assistant Director of Orthopedic Surgery, A. E. F. Consulting Orthopedic Surgeon, Surgeon General's Office, U. S. A.

Plummer, Major, W. W., Buffalo, N. Y. On duty in England. Special Training Battalion American Expeditionary Force. Consultant in Orthopedic Surgery hospital, Areas in the Advance Section.

Potter, Lieut. Allen. Brookline, Mass.
Sanitary Corps. Statistician Orthopedic Service, Base Hospital No. 8, Savenay.

Randolph, Capt. H. C., Aberdeen, Wash. Base Hospital 50.

Rooney, Capt. J. F. Hartford, Conn.
Orthopedic Service, Bordeaux. Hospital Center Base Hospital No. 8, Savenay.

Rose, Capt. E. J. Colonia, New Jersey.
Amputation Service Base Hospital No. 8, Savenay. Amputation Service U. S. G. H., Coron.

Schrock, Major Robert D., Omaha, Neb. Base Hospital No. 9. Chief of the Orthopedic Service, Base Hospital 114. Detached Service, Ambulance des Allies.

Shortell, Lieutenant Joseph, Boston, Mass.

Smith, Major Allan DeForest, New York City. On duty with the British. Orthopedic Surgeon First Division. 83rd Division. Base Hospital No. 27. Consultant in Orthopedic Surgery, Third Army.

Smith, Major R. V. Tulsa, Okla.
Base Hospital No. 9, Chateauroux. Amputation Service B. H. No. 8, Savenay. U. S. Gen. Hosp. No. 26 Fort Des Moines, Iowa.

Spencer, Capt. L. E., New Orleans, La. First Orthopedic Unit, May 1917. Orthopedic Center, Leeds, England.

Stephens, Capt. R., New York City. Base Hospital No. 9. Orthopedic Service, American Red Cross Hospital No. 1. Orthopedic Service, Carlis, Pa.

Thaxter, Captain Langdon T., Portland, Maine. Second Orthopedic Unit. Third Southern General Hospital, Oxford, England. British War Office, Assistant to Maj. Gen. Sir Robert Jones. Hospital Center, Savenay, Base Hospital Nos. 8, 69 and 88. Discharged at Camp Dix.

Thomson, Lieut. James E. M., Lincoln, Neb. Base Hospital 49, A. E. F.. Allerey, in Charge Orthopedic Service. Orthopedic Surgeon, Second Army Sanitary Train.

Tracy, Capt. W. J., Hornell, N. Y. Orthopedic Service, First Scottish General, Aberdeen, Scotland. Orthopedic Surgeon 26th Division. Division Orthopedic Surgeon 82nd Division, B. H. 69 and 88, Savenay.

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Willard, Major DeForrest P., Philadelphia, Pa. First Orthopedic Unit, May 1917. Shepherds Bush Military Hospital, London. Consultant in Orthopedic Surgery, Vichy Hospital Center, A. E. F.

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Wilson, Major Philip D., Boston, Mass. On duty with the French 1916-1917. In Charge Amputation Service, Division of Orthopedic Surgery, A. E. F., Base Hospital No. 9; Hospital Centre, Savenay. Walter Reed Hospital, Washington D. C.

Wolcott, Capt. W. E. Omaha, Neb.
Orthopedic Center, Alderhey, Military Hospital, Liverpool. Base Hospital No. 8, Savenay.

Wyant, Captain, James Edward. Hospital for Ruptured and Crippled, New York City.

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Introduction

The following pages are offered to the medical profession with a certain particular purpose. The war gave us a marvelous opportunity to learn something about accident—injury—reconstruction—orthopedic surgery. The war hospitals were an enormous laboratory for surgery. Many experiments were tried. The careful students learned much. Those who saw a great deal and worked hard arrived at certain conclusions. The writer saw many hospitals in England, France and America. He saw hundreds of surgeons at work and he examined and treated thousands of wounded soldiers. A few of his observations and conclusions are here offered, to those who will read, for what they are worth.

H. Winnett Orr.

An Orthopedic Surgeon's Story of the Great War

CHAPTER I.

Improvement in the civilian practice of surgery can be brought about by a more general recognition of the lessons of the war. The death rate, from disease and wounds was much lower during this war than in any preceding one. Not only that, but the return of wounded to duty was one of the astonishments of the entire military experience. We do not have accurate figures as to the return of industrial wounded to duty. I venture to assert, however, that for wounds of similar character the degree of crippling and the length of disability for our industrial wounded is more than twice what it came to be in the military hospitals of the American Expeditionary Force in France.

How this hospital efficiency came about is what the writer of this story desires to record. It is rather expected—perhaps even hoped—that the statements made here will arouse some discussion. Nevertheless, it is intended to set things down as they appeared to me at the time and since.

The writer of these pages has now been engaged in the practice of medicine and surgery—as a graduate—for 22 years. There were seven years of University training—and a sort of medical apprenticeship before that. After five years of general practice (fairly extensive) the study of Orthopedic Surgery was begun in Chicago under the direction of Dr. John Ridlon (to whom I am indebted for much help in many ways). From that time (1904) until the beginning of the war, I had devoted all of my time to orthopedic practice and to the development of what Sir Robert Jones calls an "Orthopedic Conscience." Orthopedic surgery had come to mean the prevention as well as the relief and cure of disability and deformity. Also it came to mean opportunities for relief and cure where the patient himself had given up hope.

In 1914 came the war. During its first year the orthopedic work in France, of Dr. Robert B. Osgood of Boston and Dr. Nathaniel Allison of St. Louis stirred my imagination. One knew that there must be much deformity to prevent and correct. With my family of five, however, and a far from certain financial position, it seemed quite out of the question for me to think of embarking upon a foreign military excursion.

In the summer of 1916 both the American Orthopedic Association (of which I was then secretary) and the Orthopedic Section of the American Medical Association appointed committees on preparedness. We were expecting American participation in the war. Dr. Ralph R. Fitch, former Secretary of the American Orthopedic Association, and Mrs. Fitch had gone to France in 1914 and were operating their own hospital. Dr. Joel E. Goldthwait of Boston, was made chairman of both preparedness committees, and with the foresight and energy for which he has since become universally known, he began to prepare for orthopedic participation in the war.

In the winter of 1916 the Central States Orthopedic Club met in Cleveland and Cincinnati; Dr. E. G. Brackett of Boston came out and spoke to us on the orthopedic work of Sir Robert Jones in Great Britain. Sir Robert had been made Director of Military Orthopedics for Great Britain and Ireland. He was undertaking the establishment in each of the British Military Hospital areas, of Orthopedic centers. There were neither trained surgeons nor surgeons to train to staff these proposed centers. Dr. Ridlon eloquently seconded Dr. Brackett's appeal for some of the Americans to volunteer. Even more than on the former occasion I was stirred to go. But the obstacles seemed insuperable. When America entered the war, however, in the following April (1917) the call came in direct form and I decided at once that it was time to respond.

The British Commission that came over immediately upon our entrance into the war, brought a request from Sir Robert Jones for twenty orthopedic surgeons to be sent to Great Britain. Dr. Goldthwait immediately accepted a commission as Major and set about the organization of the first Goldthwait unit. This unit was organized at once from volunteers by telegraph. The unit met

in New York, on May 17, 1917, and sailed on the St. Paul, the next day.

This unit like the earlier hospital units, was got together and sent out under the auspices of the Red Cross. Col. Jefferson R. Kean was acting as director at this time.

Plans for the departure of the unit were not complete until about May 15. I left Lincoln at 4:30 that afternoon (Thursday.) I left with many misgivings. I had been in practice in Lincoln for 18 years and was ful) I got my Commission (as Captain) and drove about town and out to Walter Reed Hospital, collecting my outfit. Washington as I saw it at that time was in tremendous confusion. I was told at first that it would be quite impossible for me to get the necessary commission, orders, etc., to get to New York that night. The St. Paul was to sail next day. However, at three o'clock, Capt. Metcalf and I were at the station and with my outfit mostly in paper parcels we got off

1 2 3 4 5 6 7
8 9 10 11 12 13 14 15 16
17 18 19 20 21 22
23 24 25 26

The Goldthwait Unit at the home of Sir Robert and Lady Jones, Liverpool, May 28, 1917.
1—Capt. Fayerweather, Baltimore. 2—Capt. Graves, San Francisco. 3—Capt. Allison, St. Louis. 4—Lt. Willard, Philadelphia. 5—Capt. Kidner, Detroit. 6—Capt. Abbott, San Francisco. 7—Capt. Eikenbary, Spokane. 8—Capt. Cone, Baltimore. 9—Lt. Cole, St. Paul. 10—Capt. Baldwin, San Francisco. 11—Lt. McCausland, Boston. 12—Capt. Danforth, Providence. 13—Capt. Francesco, Kansas City. 14—Lt. Spencer, New Orleans. 15—Capt. Billington, Nashville. 16—Lt. Hall, Washington. 17—Col. Goldthwait, Boston. 18— 19— Major Erving, Washington. 20—General Sir Rob't. Jones. 21—Lady Jones. 22— 23—Lt. Langworthy, Chicago. 24—Lt. Durham, New York City. 25—Capt. Metcalf, Concord, N. H. 26—Capt Orr, Lincoln.

leaving my own family as well as my parents behind. The opportunity for important service, however, seemed very great. The British were asking for help and one could foresee that the American need might be considerable before the war was over. I speak of this because of certain situations to which I wish to refer later.

I arrived in Washington at nine o'clock on Saturday morning. Major Goldthwait and eighteen members of the unit had gone to New York the evening before. With a letter of instruction from Major Goldthwait and the help of Capt. C. R. Metcalf of Concord, N. H., (to whom I shall always be very grate-

to New York. Our orders were as follows:

WAR DEPARTMENT.
THE ADJUTANT GENERAL'S OFFICE,
WASHINGTON.

May 18th, 1917.

From: The Adjutant General of the Army.
To: The Commandant Army Medical School, Washington, D. C.

Subject: Travel Orders.

The Secretary directs as necessary in the military service that the following named officers of the Medical Officers Reserve Corps, now at the Army Medical School, proceed to New York City, and take the first available transportation for England, and upon arrival, proceed to London, and report in person to Colonel Alfred E. Bradley, Medical Corps,

Adastra House, Victoria Embankment, for further orders.

Captain Carleton R. Metcalfe.
Captain Hiram W. Orr.
First Lieut. George P. Howe.
First Lieut. Louis J. Genella.

W. M. Wright,
Adjutant General.

A true copy.
Major Medical Corps, U. S. Army.

At ten o'clock that night we were struggling with khaki shirts, belts, leggings, etc., for the first time. Next morning at ten we were on the boat. (The St. Paul.)

Our experience on the journey from New York to Liverpool did not differ in many respects from that of many thousands who followed us during the next year and a half. We left New York harbor toward evening. Base Hospital units No. 10 from Philadephia and No. 21 from St. Louis were the most important part of the passenger list. The Goldthwait Orthopedic unit numbered twenty-one.

Definite training for our work abroad began the first day out. We even had a little of the physical discipline of which so many officers had more in the camps later on. We lined up for the exercises and drill twice a day. On each occasion a few were missing on account of sea-sickness or from the effects of anti-typhoid vaccine. Once or twice a day there were discourses by Major Goldthwait, with an opportunity for questions and discussions by the other members of the unit. Church service was interrupted by our three and six inch guns at target practice. At first the passengers crowded the upper deck to watch the guns shooting at barrels which had been dropped astern. After about the second or third day, however, the decks were cleared of passengers during target practice; later we learned that this was because of the accident which happened on another boat leaving New York harbor the same afternoon we did in which two nurses were killed.

There was an obvious increase in nervous tension as we approached the European side and the boat began to zig-zag instead of going straight ahead. Lookouts for submarines were increased in number and kept constantly on duty. The gun crews remained by the guns at all times. Very early on the second morning before reaching Liverpool the word went around that a torpedo boat destroyer might be expected to convoy us in. From the time this rumor spread until the little destroyer, with the stars and stripes appeared, the decks were crowded with passengers. The sight of the destroyer gave us the most inspiring moment of the trip; it was greeted with a rousing cheer. We had had two days of rough weather and were just becoming anxious about the danger from submarines.

As we approached Liverpool the Irish sea was as smooth as a mirror. We were across without having been, at least in so far as we knew, in any serious danger. We came into the port at Liverpool late in the afternoon. We were not allowed to go ashore until about 7 o'clock the next morning. A British officer came aboard and gave us full instructions as to hotels, transportation to London, etc. Not only that, but he acted as our personal escort until we were safely established in the Hotel Curzon, London.

The trip to London was made next day. In the meantime we had the day in Liverpool with quarters at the North Western Hotel. Sir Robert Jones and Dr. Osgood, who was on leave from France, met us at the hotel. We were entertained at tea during the afternoon at their home by Sir Robert and Lady Jones.* At this time the situation in Great Britain was more definitely described to us. Quite large orthopedic centers were already going on at London, Liverpool and Edinburgh. Others were being started at Leeds, Bristol, Cardiff, Manchester, Glasgow, Dublin and Belfast. Plans were being made for the Americans to be assigned almost immediately. A few days opportunity, however, was to be offered for us to observe, in London, the work at one of the largest and most important Orthopedic clinics at Shepherd's Bush Military Hospital.

*Lady Jones died during the year following the war

CHAPTER II.

In Liverpool, Sir Robert Jones gave us our first accurate ideas of the British scheme for the care of the war wounded.

Upon arriving in London, Major Goldthwait immediately set about to give us a real course of instruction in the treatment of war wounds and fractures, and methods in war hospitals.

First of all, we were formally and officially welcomed. Ambassador Page and Mrs. Page entertained the nurses and officers of the various American organizations that had just arrived. At this reception Lady Astor invited us to visit the Canadian Red Cross Hospital at her own place at Taplow. We went out next day.

Officers, nurses and patients at a V. A. D. (Volunteer Aid Department) Hospital in Great Britain. This hospital operated during almost the entire period of the war as an auxiliary to one of the large section hospitals. There were beds for fifty patients. Commandant, secretary and nurses were volunteer, unpaid workers. Only the graduate nursing sister received compensation.

At this beautiful estate of several thousand acres, about 30 miles from London there was a Red Cross Hospital of 1100 beds for Canadians. At Lady Astor's house overlooking the Thames, we had tea. Before tea there was a baseball game. King George later attended an exactly similar function at this hospital.

We returned to London on the evening train and were the guests of Major Goldthwait at a performance of "Romance," by Miss Doris Keane. With war impressions accumulating, this wonderful play seemed out of place. The gaity of "Chu Chin Chow," a few evenings later seemed even more so. However, Captain Metcalfe and I went to see "London Pride," and found that even the theaters were only partly succeeding in getting away from the awful tragedy of the war.

On the next day (June 1, 1917) we really began our war hospital training. We went in a body to Shepherd's Bush Military Orthopedic Hospital at Hammersmith. Here there were about 1200 beds for orthopedic cases. Much of the best reconstructive surgery in Great Britain was being done at this hospital. Such well known surgeons as Elmslie, Dunn, Aitken and Bristow were on duty. Dr. Menell was in charge of the physiotherapeutic work. It was through the kindness of these men that we were permitted during the ten days following, to see the administrative, surgical and training methods by which the

*Later on a number of Americans were cared for at this hospital. During 1921 Lady Astor has built a beautiful memorial to the 40 Americans who died at "Clivedon."

British wounded were being rehabilitated after their physical injuries in France.

At this time, it was already more than two and one-half years since the beginning of the war. We were all astonished to find how many of the patients were past the period of youth. Also, we had our eyes opened to the very serious character of the war wounds. It was almost beyond belief to see how very extensive was the physical damage done. The infections were appalling. Large open wounds involving bones and joints were bathed in pus. In those who had survived, there were some fearful evidences of the destructive power of gas gangrene. The larger number of the amputes were at home or at Roehampton, (which will be described later) but we saw a few amputations done and a few patients recently amputated who gave us some impression as to what the loss of limb as well as the loss of life for America, was going to be.

It was curious then, for us to find that the number and kind of casualties were being predicted for both attacking and defensive engagements and that all the way from the Front to the Base Hospital, more or less definite provisions were made before each attack for the transportation and care of the various kinds of cases.

To illustrate how effective this service was, I may relate that I talked one Saturday night to a boy who was being taken off a hospital train in Cardiff. He told me that he had gone to France for the first time on Thursday. His company went to action about noon on Friday. He was hit in the leg late Friday afternoon, and he was back on a hospital train in Great Britain on Saturday morning. I, myself, saw him in bed in a Base Hospital the same evening. Moreover, he had on a good splint, a good dressing and had had antitetanic serum during the first few hours that he was hurt. How the British did this for their hundreds of thousands was what the Americans had come to learn.

Major Goldthwait, and the members of our unit were particularly interested at Shepherd's Bush, in the following problems:

1. Methods of immobilization for compound infected bone and joint injuries.
2. The cleaning up of infected wounds involving bones and joints.
3. The correction of late deformities after war wounds of bones, joints and soft parts.
4. The repair of peripheral nerve injuries.
5. Postoperative splinting by the methods of Hugh Owen Thomas and Sir Robert Jones.
6. Rehabilitation of war cripples by vocational training.

The British had already formulated an elaborate program covering this whole matter. However, much of it was still only on paper. In fact, for reasons that will be explained later, a large part of the program never did work out, (either in Great Britain or in the U. S.)

However, all of the problems suggested above had been solved to a considerable extent at the time we arrived at Shepherd's Bush. With money largely collected by King Manuel, (formerly of Portugal) excellent curative work shops had been built and five or six hundred men were working daily.

The shops served three purposes:

1. They gave occupations to a number of men whose recovery was hastened by the mere performance of certain arm and leg movements.
2. Other men were learning new trades adapted to their changed physical conditions.
3. The shops produced a large amount of splints, carpenter work, mattresses, brooms, brushes, etc.

From this time on our time was mostly spent on duty. However, we saw London Tower, and on the morning of June 3, attended an imposing flag ceremony at St. Paul's The Stars and Stripes were given a place of honor with the British flag at the head of the procession.

Sunday we spent, with thousands of other people on the Thames. The Thames on Sunday is a lively scene. We went as far as Hampton Court where Henry VIII spent so much of his time trying to solve one of the greatest of all problems.

Next day we went out in the same direction to Richmond to visit the Star and Garter Hospital on the site of the old hotel. Across the valley, as one climbed the steep hill, was Windsor Castle.

The Star and Garter was established and rapidly enlarged for the care of men hopelessly crippled because of spinal cord injuries.* These men were tended with special

*Fine new buildings have been built and this work is still being carried on.

care. Even they were encouraged to employ themselves as best they could. One poor chap was doing quite well making and selling flies to fishermen.

Roehampton, which we visited a few days later, presented quite another picture. There was an atmosphere of hope. With two thousand men minus arms and legs, almost every one was busy. Mr. Muirhead Little in charge, had done and is still doing excellent work. One may pause to remind the reader that it was Mr. Little's father who named Little's disease and who brought subcutaneous tenotomy from Stromeyer to England.

The British were facing an immense problem in the care of their men with amputations. Most of them were at home waiting for care. However, at Roehampton, stumps were being improved surgically, deformities were being corrected, temporary and artificial limbs were being put on, and best of all, the vocational schools were really working. From the motor repair training schools alone, about fifty limbless men a week were being graduated for work as expert motor mechanics or drivers.

So we were gathering our impressions and getting our first war training. We found that the British had achieved wonders in their preparation for and care of the wounded. Just when we were getting restless to lend a hand in the great work, assignments for the members of the Goldthwait unit began to come through.

One of the first contingents was sent to Liverpool. This consisted of Captain Cone, Captain Cole, Captain Billington, Captain Danforth, Lt. Durham and Lt. McAusland. A day or two later Captain Francesco and Lt. Langworthy went to Aberdeen. Capt. Graves and Capt. Eikenbary went to Glasgow. Major Erving went alone to Oxford. This was an interesting and important post. Capt. Fayerweather and Lt. Spencer went to Leeds. Capt. Metcalf was sent to Belfast where he did fine work. Captain Kidner* and Willard remained in London. Capt. Baldwin and Lt. Abbott were sent to Edinburgh, while Lt. Hall and I were ordered on June 12 to Cardiff.

On June 11, I received two important letters. My first from home, and the second, my orders to proceed for duty at Cardiff. This read as follows:

Any further communication on this subject should be addressed to—
The Secretary,
War Office,
Adastral House,
Victoria Embankment, E.C.,
and the following number quoted.

24/America/2. (A.M.D.4 .)

War Office,
Adastral House,
Victoria Embankment,
E.C. 4.

11th June 1917.

Sirs,

I am directed to request that you will proceed to Whitchurch for duty at the Military Orthopoedic Hospital, on 12th instant.

A railway warrant for your journey is enclosed herewith.

I am.
Sir,
Your obedient Servant,

for Director-General,
Army Medical Service.

Captain H.W? Orr,
Lieutenant C.L. Hall.
United States Medical Service,
Hotel Curzon.

*Major Kidner has written a separate chapter on the later work of the Americans in England.

CHAPTER III.

The members of the Goldthwait unit left the Hotel Curzon, where we had been staying in London, during June 11 and 12, 1917. Those assigned to Liverpool, Edinburgh, Glasgow and Aberdeen were the first to leave.

Lieutenant C. L. Hall of Washington and I, assigned to Cardiff, left London on the afternoon of June 12th; afterwards we learned that we just missed one of the worst air raids that London had during the war. We arrived at Cardiff at 7 o'clock in the evening. In keeping with the hospitality already shown us, we were escorted to the hotel by a fellow traveler and were cordially received by several Cardiff citizens, who promptly recognized the first of the American uniforms to arrive in that territory.

A young British officer, home on leave, and his father insisted upon our spending the evening at their home. This was typical of the cordial treatment we had during our whole stay in Great Britain. Minor incidents of a different character were nothing to the courtesies accorded us by nearly all of the English, Irish, Scotch and Welsh with whom we came in contact.

We were quite apprehensive as to the manner in which we might be received, not only by the British officers, but by the soldier patients. It took some time to establish the fact that we were on duty with the British with a sincere desire to be of service. When this had once been accomplished, however, we had very little difficulty in getting along either with the officers or with the men.

An interesting discussion arose over the question of uniforms. The insignia of rank are of course entirely different in the British and American armies. Very few of the British could tell whether we were corporals, sergeants, or captains, consequently we missed many a salute in the first few weeks because of the absence of sleeve marks, Sam Browne belts and sticks. After General Pershing had set a precedent for wearing the Sam Browne belt and after we learned how to carry gloves and canes, we were more readily recognized as proper officers by members of the British military establishment.

View of the Hospital from the outer edge of the "fan", showing wards. The tower was near the central offices.

On the morning after our arrival in Cardiff, we reported at the Welsh Metropolitan War Hospital to Lieutenant Colonel E. Goodall, the Commanding Officer, and to Major S. Alwyn Smith, the officer in charge of the Orthopedic service. The hospital was a beautifully built and equipped institution constructed a few years before the war, for the care of mental patients. It was built in the

shape of an open fan with the administrative offices at the center of the handle. The service buildings, were spread out over the fan proper with the corridors, passages, etc. Ten two-story wards extended out from the edge of the fan. There was plenty of space for about 1200 patients. The wards on the left of the fan with operating rooms, plaster rooms, X-ray, etc., were set aside for the orthopedic service. The right hand side of the fan was occupied then and later at different times, by the surgical, medical and mental services.

Here at the hospital, we were received cordially. It was not understood, however, just what our position, status or duties were to be. For some days, therefore, we waited about with nothing to do and no place to go.

After some little correspondence, however, with Sir Robert Jones, the liaison officers in London and the British quartermaster department; we secured for ourselves certain duties in the hospital, quarters outside the hospital, two meals a day in the officers mess and allowances from the British for sustenance. Salaries were paid by the United States.

Very shortly Colonel Goodall provided an office or examining room for the Americans, which operated under the direction of Major Smith in the conduct of the orthopedic department. The medical officers on duty at this time were as follows: There was a young Egyptian surgeon, Mr. M. Bayumi of Cairo. He was an F. R. C. S., and a fine worker. There was also a brilliant young surgeon from Lisbon, Dr. A. Bizarro. These two were assigned as assistants to two Cardiff surgeons, Mr. J. O. D. Wade and Mr. Geary Grant. These gentlemen were engaged as civilian contract surgeons. Each had charge of two wards of about fifty beds each.

In addition Dr. C. D. Story and Dr. W. H. Braddock, two Americans, were on duty with the British. Dr. Story was Red Cross and Dr. Braddock, R. A. M. C. The latter with his wife had just arrived in England after an exciting year in Serbia. They had both endured severe privations in the Serbian retreat.

In a word, there were enough surgeons on duty for the three hundred patients then in the orthopedic division of the Hospital. I soon saw that if Lt. Hall and I were to have an opportunity we must first locate special work and then demonstrate our ability to do it.

A single trip through the hospital revealed the fact that, as always in any large hospital, civilian or military, there were, from the orthopedic standpoint, a number of neglected cases. One found cases of chronic osteomyelitis with shell wounds that had not yet been X-rayed. There were ununited and malunited fractures poorly splinted or not splinted at all. There were gunshot wounds of wrist and ankle in which healing was taking place, with hands in palmar flexion and feet in plantar flexion. These were all things to correct. Orthopedic principles were not being generally applied. Major Smith was a pupil and former assistant to Sir Robert Jones, but he had been on duty only a short time and I felt that we could be of help to him in these matters. None of the other surgeons referred to, had had special orthopedic training.

In the Cardiff area the care of the wounded generally was under the jurisdiction of the Third Western General Hospital. This hospital, or center, had about 7,000 beds. From this entire area we were supposed to receive patients requiring orthopedic treatment. Actually they sent us only a fraction of such cases. Later, however, our orthopedic service, including six auxiliary hospitals, grew to about 700 beds. This included 50 beds for pensioners—for whom we did quite a lot of good work.

Soon after taking up the work, Major Smith agreed to a policy of having all new patients admitted through an examining room, and those already in the hospital, up for reconsideration at least once a month.

Very soon after the second Goldthwait unit arrived in Great Britian, members of this unit were distributed to the British Orthopedic centers to assist in the work and to become familiar with methods of administration, as well as methods of dealing with patients; which had been demonstrated to be useful by the experience of the British. Shortly after this time the organization of our orthopedic service at Whitchurch, was as follows:

Lt. Col. E. Goodall, R. A. M. C., Registrar.
Welsh Metropolitan War Hospital.

Capt. J. R. Beatty, R. A. M. C., Registrar.

Consulting Surgeon, Col. J. Lynn Thomas, C. B., C. M. G., Deputy Inspector Military Orthopedics—Western Command.

Officer-in-Charge Orthopedic Division, Major S. Alwyn Smith, D. S. O., R. A. M. C.

Assistant, Capt. H. Winnett Orr, M. R. C., U. S. A.

General Surgeon, Mr. J. O. D. Wade.

Examining Room, Monday 2-4:30; Thursday 10-12:30.

Ward M-1—Capt. Orr. 70 beds.

Ward M-1a—Dr. Bayumi. 64 beds.

Ward M-2—Lt. W. H. Braddock, R. A. M. C. 68 beds.

Ward M-2a—Lt. H. H. Dignan, M. C., U. S. A. 65 beds.

Ward M-3—Capt. C. H. McKenna, M. R. C., U. S. A. 54 beds.

Ward M-3a—Lt. Davis. 50 beds.

Ward M-4—Capt. Orr, Lt. L. W. Hughes. 45 beds.

Private J. Cummings, Corporal Haddon and Private Edwards, clerks in the Examining Room.

Ward M-5a—(Officers' Ward). 45 beds. Major Smith, Lt. W. D. Reid, M. R. C., U. S A., Lt. G. H. Dorsey, M. C., U. S. A.

Workshops—Lt. H. H. Dignan, M. C., U. S. A.

Prince of Wales Hospital—50 beds, Mondays 10-12 (Limbless patients). Col. J. Lynn Thomas, Major Smith, Mr. J. O. D. Wade.

Clyne House—Major Smith. 40 beds. Officers Hospital. Mr. Wade.

Penarth V. A. D.—60 beds. Fridays 2-3:-30. Capt. Orr, Lt. Braddock.

Samuel House—40 beds. Fridays 2-3:30. Lt. Davis, Capt. Orr.

Llandaff Lodge—50 beds. Fridays 3:30-5. Capt. Orr, Lt. Davis.

St. Pierre—48 beds. Tuesdays 2-3. Capt. Orr, Lt. Braddock.

Lt. Hall had been transferred to Edinburgh a short time before.

An interesting feature of our Examining Room, was the card index. It was a new feature of the work at this institution. A sample card is submitted to illustrate how it worked.

Name—Litchfield, A.
Rank, Pte. Regt., No. 14336.
Unit, 1st Coldstream Guards.
Age, 24.
Ward, M. 1.
Admitted, 28-3-17.
Diagnosis (in detail G. S. W. L. leg. Back. Fract. R. Leg. (No. IX. 4).

.....

.....

X-ray No. 2534. 2930.
Time in previous Hospitals. Six months.
Discharged from W. M. W. H. .....
To .....

REVERSE.

History: Wounded Sept. 15th, 1916 in France. Bullet went through a point above patella and came out inner side of knee joint. Knee joint stiff, foot in position of varus. Short 2¼ inches. Skiagram shows fracture of lower end of femur. 19-4-17. Operation. Inner sinus enlarged. Sequestrum removed. Full drainage established. Previous treatment. Drainage, dressings, etc.

Treatment here. 19-4-17. Inner sinus enlarged. Sequestrum removed. Bone scraped. Full drainage established. 18-7-17. Not yet healed. Sinus 3-inch. Hot fomentations. 3-9-17.

Examination Board: No attempts at extension. Through and through drainage. Sequestrotomy. Arthrodesis of second toe and tenotomy by Major Smith, 22-9-17. Operation of femur, also Sequestrotomy. 19-11-17. Wounds healing satisfactorily. Latest X-ray shows signs of bony union in good position. Shortening 1½ inches. Thomas splint with extension. 1-12-17. Erysipelas. To Ely Isolation Hospital. 24-12-17. Readmitted from Ely Hospital. 5-1-18. To get up. To have caliper splint and S. W. C. (Soldiers Wounded Convalescent) Boots.

In the examining room decisions were also arrived at as to operation; what kind and by whom to be done. Prescriptions were written for the gymnasium, electrical massage department or splint shop. Also transfers were arranged here, from the main hospital

to the auxiliary or back to the main hospital or special treatment were required. All transfers had to be arranged through the officer in charge of the Orthopedic Department and the registrar.

One of the features of the work during the fall and winter of 1917-18 was the staff meeting, held three times a week. A specimen weekly program was as follows:

WELSH METROPOLITAN WAR HOSPITAL
ORTHOPAEDIC DEPARTMENT STAFF
MEETINGS.

Monday, Nov. 19th, 1917, 12:30 P. M. "The Prevention and Correction of Deformities of the Hip and Thigh." Capt. Orr.

Wednesday, Nov. 21st, 6-7 P. M. "Demonstration and Discussion of the Uses of Electricity in Diagnosis and Treatment." Lieut. Bassett Jones.

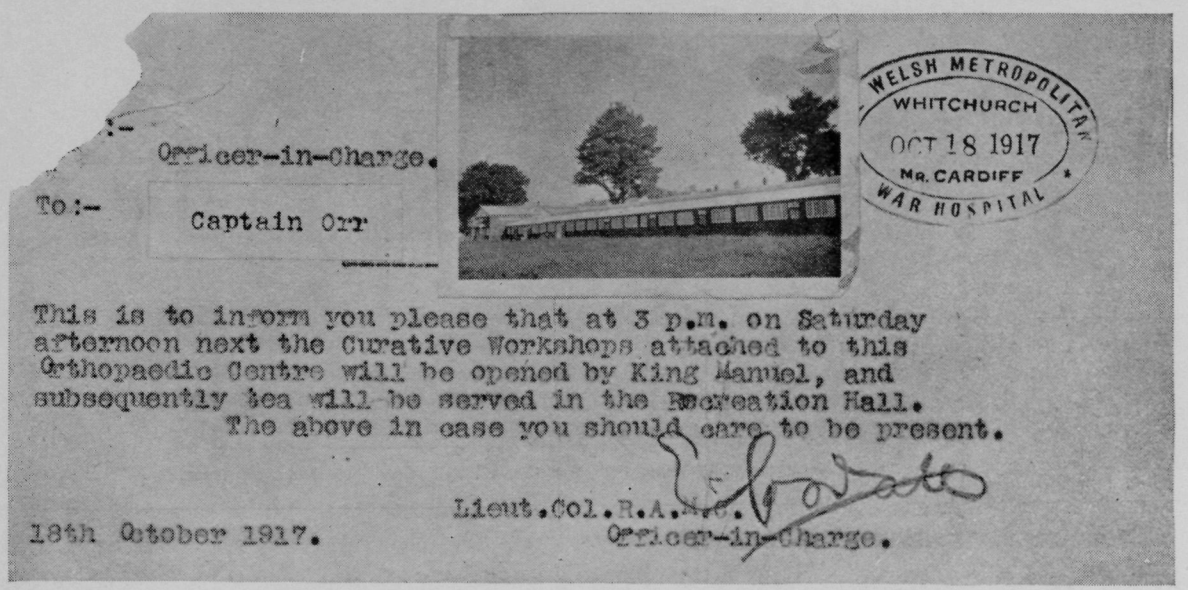
Friday, Nov. 23rd, 12:30 P. M. "Amputations and the Application of Artificial Limbs." Major Smith.

Certain other features of the work in Cardiff as it developed and the activities of the other members of the Goldthwait unit will be described in the next chapter.

CHAPTER IV.

In July, 1917, the American officers who came to Great Britain as members of the first Goldthwait unit were all located and working in the British Military Orthopaedic centers. About this time Major Goldthwait received orders to return to the United States. He spent two months in the Surgeon General's office in Washington. This time was devoted, with Col. E. G. Brackett, Director of Orthopedic Surgery in the United States, to developing plans for the American orthopedic activities in France and to return to the United States by November. However, it had become clear that there was no particular need for most of us in France and that our greatest field of usefulness for the present, lay with the British. Consequently, most of the members of both the first and second Goldthwait units remained or were now assigned for duty, with the British.

On November 7th, Major Goldthwait was given the rank of Lieutenant Colonel and appointed Director of the Orthopedic Service



Note from the Commanding Officer on the occasion of the formal open ing of the work shops. The photograph (by Dr. Orr) inserted shows all of the shops and the gymnasium at the left.

cruiting the second Goldthwait unit for service overseas. This unit, consisting of forty-five officers and twelve nurses, left the United States in October. It was my privilege to visit members of this second unit, in the Curzon Hotel in London, early in November.

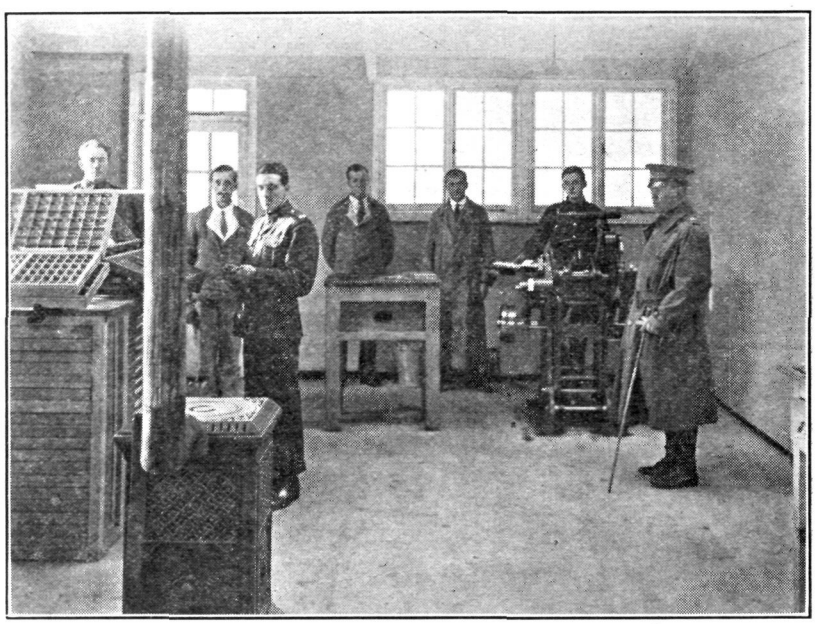
During the time between June and November there had been many changes in our ideas as to what our part was to be in the war and as to the future of the Orthopedic Service. Original plans had been that we should remain on duty with the British only a few months; and that American orthopedic participation in the war would require our services in France or perhaps even our return to the United States by November. However, it had become clear that there was no particular need for most of us in France and that our greatest field of usefulness for the present, lay with the British. Consequently, most of the members of both the first and second Goldthwait units remained or were now assigned for duty, with the British.

On November 7th, Major Goldthwait was given the rank of Lieutenant Colonel and appointed Director of the Orthopedic Service for the American Expeditionary Forces in France. Major Osgood was appointed as his first assistant. More definite plans for the conduct of the Orthopedic Services in France were begun at this time. It was, however, some months before Col. Goldthwait's original ideas had much effect upon the organization and operation of the hospital services in France.

At any rate my visit to London enabled me to talk over with Col. Goldthwait, Major Osgood and a number of other old friends, the work so far, and to get at least some hazy ideas regarding the future.

By way of consoling myself for the

disappointment of not getting to France, I secured permission to visit the orthopedic centers at Edinburgh and Glasgow. I had already spent a few days with Major Erving at Oxford. The orthopedic service there was smaller but very interesting. Patients were distributed through the dormitories and living quarters of several of the Oxford Colleges. Major Erving, himself, was quartered in New College, where I had the privilege of being entertained at dinner with the members of the faculty at the "high table".



Curative Print Shop at the Welsh Metropolitan War Hospital, Fall of 1917. (Capt. Orr in charge).

Later on, I visited at Oxford again, this time as the guest of Dr. and Mrs. Charles Singer. Dr. Singer was professor of the History of Medicine and an associate of Sir William Osler. I am happy to say in passing, that no one in Great Britain was more cordial to the Americans than Sir William and Lady Osler. Sir William made trips to nearly all of the places where Americans were stationed and performed many acts of kindness and generosity to contribute to their comfort and welfare.

At Edinburgh, I found Captain Baldwin and Captain Danforth doing very important and very useful work. Sir Harold Stiles received me at his home and took me out in his car to the Surgical Clinic at Bangour Hospital the morning that I arrived. He was particularly enthusiastic about the work of both the above Americans, each of whom had charge of approximately 500 beds in the Orthopedic Service. A number of other Americans including some of those who had just arrived in Great Britain were associated with Captains Danforth and Baldwin as juniors. This same plan brought to Cardiff the other Americans who have already been mentioned, for training in the Orthopedic Service.

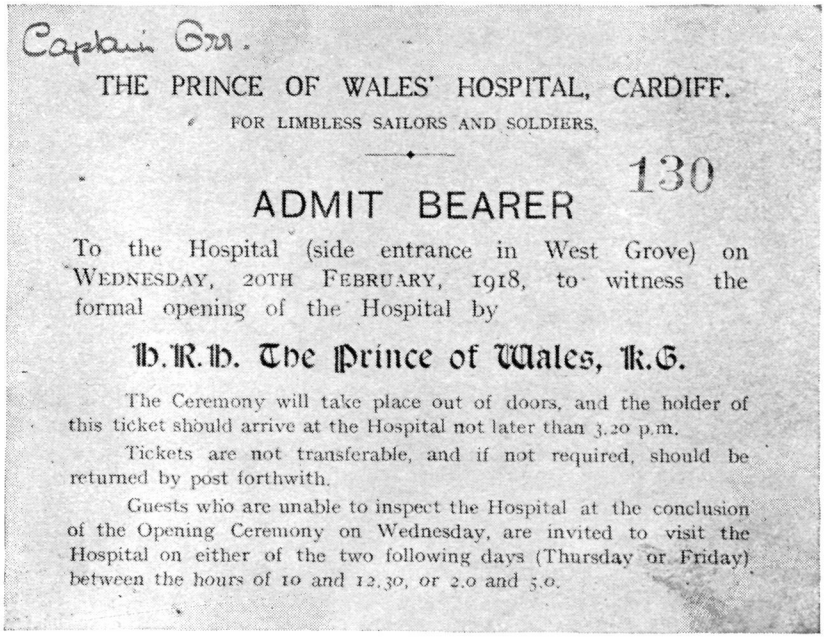
The next afternoon I had the pleasure of having dinner in Glasgow with Captains Graves and Eikenbary and the other Americans who were on duty at Bellahouston Hospital. The Orthopedic Service here was neither so well organized nor so well developed as at Edinburgh, but the two American officers referred to, both of whom were sound orthopedic surgeons, were exercising a definite influence upon the orthopedic work in Glasgow.

I was sorry for many reasons not to get up to Aberdeen where Capt. Francesco, a very good orthopedic surgeon from Kansas City, and Lieut. Langworthy of Chicago were at work. Both of these officers also did good work with divisions in France later on.

At Edinbugh, Sir Harold Stiles was doing some of the best technical surgery to be seen in Great Britain. This was true particularly of his work on the injuries of the peripheral nerves. It is gratifying to find so satisfactory an account of this work in Sir Robert Jones' recent book, "The Orthopedic Surgery

of Injuries". As pointed out at that time and since, the war hospitals have brought us to a much more definite realization of the importance of reuniting divided principal nerves. Still more important has it been shown to be, to liberate from scar tissues, the injured or divided nerves that have become involved in the wound at the time of accidental injury.

On the return trip from Liverpool to Edinburgh, I spent a few hours in London just after a terrific air raid. As we came into the station at 7:00 o'clock in the morning, we found the concrete corridors, stairways and platforms crowded with people who had spent the night there. The crowd was apparently not very much alarmed but very uncomfortable and thoroughly resentful. In the streets it was found that a good deal of material damage had been done.



Captain Gee.

THE PRINCE OF WALES' HOSPITAL, CARDIFF.

FOR LIMBLESS SAILORS AND SOLDIERS.

130

ADMIT BEARER

To the Hospital (side entrance in West Grove) on WEDNESDAY, 20TH FEBRUARY, 1918, to witness the formal opening of the Hospital by

H.R.H. The Prince of Wales, K.G.

The Ceremony will take place out of doors, and the holder of this ticket should arrive at the Hospital not later than 3.20 p.m.

Tickets are not transferable, and if not required, should be returned by post forthwith.

Guests who are unable to inspect the Hospital at the conclusion of the Opening Ceremony on Wednesday, are invited to visit the Hospital on either of the two following days (Thursday or Friday) between the hours of 10 and 12.30, or 2.0 and 5.0.

Invitation card to the formal opening of the Prince of Wales Hospital. It was upon this occasion that the American officers were presented to His Royal Highness The Prince of Wales.

During the fall of 1918, at Cardiff we developed the Orthopedic Service considerably. The auxilliary hospitals were well organized and were taking care of several hundred of our patients during the time when they required less active treatment.

The curative work shops were formally opened and became a useful adjunct in the prosecution of our work. In the print shop, in which I was especially interested, a considerable number of men were taught to develop usefulness in crippled hands, wrists and fingers. Soldiers with lame knees were encouraged to run the foot power printing press. Those who had lost right hands were taught typesetting and distributing to increase skillful use of the more or less clumsy left hands and fingers.

We had here, however, a difficulty which was always a serious matter in the vocational retraining of soldiers; that is, many of the men were too old to adapt themselves readily to education or reeducation of any kind. In particular many of them had difficulty in deciding upon work in which they would be interested or in applying themselves to the serious mastering of a new trade. At Cardiff the printing shop really succeeded in developing a few such men. Our best shop in this regard was perhaps the boot shop. Here a considerable number under the guidance of an accomplished and skillful instructor became proficient in boot and shoe repairing. Quite a number of the men also did good work in the brush shop, and weaving shop, the brace shop and the carpenter shop. In addition, our Sergeant Jones contributed to the progress of many of those with amputations and stump deformities in the gymnasium.

The care of our amputated at the Welsh Metropolitan War Hospital almost deserves

a separate chapter. Certainly my experience in this work had a considerable influence upon my attitude towards the large number of our own amputations that I saw with Capt. Phillip D. Wilson in our service at Savenay in France.

The British had got so far behind in the care of their amputated men that they were compelled to send them home from the hospitals as soon as the primary wounds had healed. The intention was to bring the men back to the limb fitting centers to be cared for as rapidly as possible and to have artificial limbs put on. Neither the hospitals nor the artificial limb factories, however, were able to keep pace with this demand. In 1918 there were said to be about 10,000 men waiting at home to be sent for for limb fitting. Our experience with these men showed how important it is to make the treatment continuous from the time of the original operation. Of 500 patients who returned to Whitchurch and went through our service, more than 300 required either reconstruction or surgical treatment, or both, before their limbs could be put on. Many of the men had discharging sinuses from osteomyelitis or from foreign bodies in the stump, that had not been removed. Others had contracture deformity, flexion of the thigh, flexion of knee, adduction of the arm, etc., so severe that an artificial extremity could not be put on in a position to be worn. All of these things had to be corrected. In two instances I had the privilege of correcting by the Soutter operation, a thigh stump flexion deformity which had been pronounced by the limb factories too severe for an artificial leg to be worn. Both of these men were successfully wearing artificial limbs when I last saw them.

For the success of this service in Wales, the greatest possible credit is due to Colonel Sir John Lynn Thomas, who conceived, secured the funds for, and successfully developed the Prince of Wales Hospital for limbless men in Cardiff. This hospital is still performing an excellent function for these men and will doubtless continue to do so for many years. In December, 1920, this hospital also opened a ward for crippled children, a feature which I had the privilege of discussing with Sir John Lynn Thomas on several occasions during my stay in Cardiff.

In December, 1917, a conference of all surgeons on duty in the British Military Orthopedic Centers, was called by Sir Robert Jones, to meet in Liverpool. For that conference, I prepared a paper on "The Importance of Tendon Surgery in the After Care of Injured Soldiers with Irreparable Peripheral Nerve Injuries."

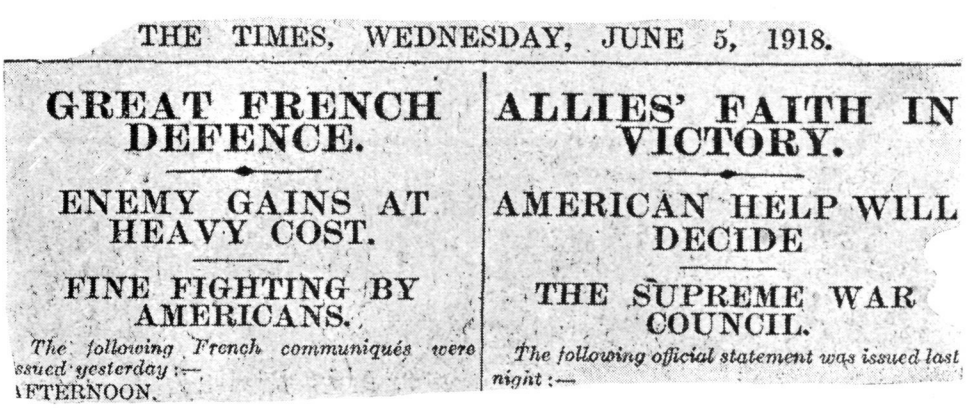
The largest part of the discussion, however, was given over to peripheral nerve surgery alone. Sir Robert Jones presided at the conference and gave us the benefit of his comments on the papers presented and the influence of his always interesting and helpful personality. It was my privilege on this occasion to visit Sir Robert Jones' rooms at No. 11, Nelson Street, where he and Hugh Owen Thomas before him have cared for their thousands of patients. This in itself, was a most helpful and inspiring experience. The three days following this conference were spent in Ireland, visiting the Orthopedic Centers at Black Rock, Dublin and at Belfast.

CHAPTER V.

One of the most interesting and pleasant surprises of my stay in Great Britain was the celebration, even under war conditions, of the Christmas holidays. I found that at all times the Britisher has an extraordinary capacity for laying aside business and other cares when a proper rest time arrives. This applies to afternoon tea, week ends, bank holidays and all other similar occasions. At Christmas time in 1917, war conditions had still not become so bad but that we were able to really enjoy the elaborate provisions that and a conclusive demonstration as to the strength of the British spirit, even after three years of war.

The end of 1917, however, was marked by a good deal more than the celebration of Christmas. The British War Office and the Ministry of Pensions had just become aroused on certain questions which were of great importance.

The shadow of the coming spring offensive on the western front was already



THE TIMES, WEDNESDAY, JUNE 5, 1918.

GREAT FRENCH DEFENCE.

ENEMY GAINS AT HEAVY COST.

FINE FIGHTING BY AMERICANS.

The following French communiqués were issued yesterday :—

AFTERNOON.

ALLIES' FAITH IN VICTORY.

AMERICAN HELP WILL DECIDE

THE SUPREME WAR COUNCIL.

The following official statement was issued last night :—

were made for the season. A great deal of food had apparently been stored away for Christmas. We had been strictly economical up to that time but in the Welsh Metropolitan War Hospital and among the British friends who had been so kind to us at other times there was sufficient food for several very excellent Christmas dinners. We had these at various times from Christmas up to New Year's Day. Major Alwyn Smith, Mr. Bayumi, Mr. H. Spence Thomas and the Lord High Sheriff Mr. Radcliffe, all acted as hosts to the Americans who were on duty in Cardiff at that time. The nurses, officers and men in the hospital all entered very thoroughly into the spirit of Christmas. Singing troupes were organized and several concerts were given in the Hall at the hospital, the wards were all gaily decorated. At the Officers ward (M5A) two dances were given to which the American officers were invited. To me at least the entire holiday season was a succession of pleasant surprises spreading over the country. The British hospitals of all kinds, permanent and emergency were filled even in the comparatively quiet times about the holidays. Many sick and wounded were arriving in the British Isles daily. This situation led to an investigation which revealed the fact that patients were being detained in hospitals longer than necessary. This was the result both of failure to provide prompt treatment upon arrival at hospital and efficient treatment afterwards. The important question of methods of shortening the period of disability arose. It was soon found that a considerable number of cases could be returned to usefulness much more promptly by transfer from general to orthopedic hospitals. This was true particularly of those patients who had been months in the hospital with drop foot, contraction of the hip or knee or some other disabling deformity that could be corrected surgically or by mechanical apparatus. There was a considerable in-

crease in the activity of the orthopedic centers after this time.

It was also found that many men were delayed in hospitals because of failure to systematically re-examine patients; consequently they were not promptly discharged when ready. It is not commonly appreciated how much unnecessary disability there is because of failure to inspect frequently patients of this class. Very often the removal of a sequestrum, the correction of a contracted knee, the splinting of a drop foot is all that is necessary to return to duty in a few weeks a patient who otherwise would be lying in a hospital or sitting around home for months. This was one of the points that was brought out by the visits and inspections of the A. D. M. S. (assistant directors of medical services), who began making their tours of British hospitals during the winter of 1917 and 1918. These inspectors came with authority to examine particularly every patient who had been in the hospital more than sixty days. They were to discharge all such patients at their discretion. As a result of this weeding out process many beds were vacated, which had been occupied for months, and hospital preparation was begun for the tremendous rush which we were shortly to be called upon to take care of.

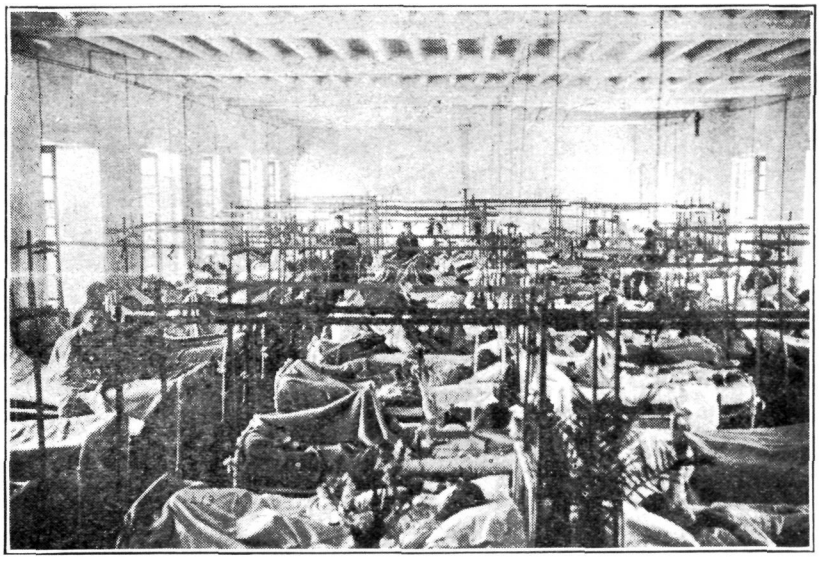
At about this time also the hospitals were called upon by the Ministry of Pensions to furnish more satisfactory written reports regarding our patients. It was found that the patient's record side of many hospitals had been very seriously neglected. Fortunately for us, our card index system which had been in operation for nearly six months supplied us promptly with most of the information which was called for. However, the increased "paper work," as it was called, was a serious burden to the medical staff and it was only by the loyalty and industry of some of the patients themselves who acted as clerks that much of what was required could be supplied.

This sugar ration paper gave us each one half pound of sugar per week.

An important step taken by the British War Office during the winter of 1917 and 1918 also was that which was taken with regard to the treatment of fractures of the femur. It was found that the results being obtained in the treatment of this condition were far from as good as they should have been. Great progress had been made in the three years of the war in the emergency treatment of these patients. It was a matter of record that during the first year of the war about 60 percent of all the men who sustained gunshot wound fracture of the femur died. With the inauguration of the emergency splinting of these patients on the battle field by the Thomas splint, there was an immediate marked improvement in this regard. By the third year of the war the death rate had been reduced from 60 to about 12 percent. Now, however, it was found that the ultimate results in these cases were not good enough. There was found to

be a large amount of shortening and deformity in the femur and leg cases. This was said to be due largely if not entirely to failure to maintain continuity of treatment as good as the first splinting. Somewhere between the advanced dressing station, and the base hospital the treatment broke down and the patients were recovering with serious deformity and consequent permanent disability. It was at first supposed that this was the result of the transportation of these patients from France to the British Isles. We were told that an attempt would be made to treat all femur cases in France until union with good length and position had been obtained. Later, however, we understood that this had been found to be impracticable and the patients were brought as before to the Base Hospitals in Great Britain for treatment. There was, however, as a result of the "shaking up" an immediate improvement in the treatment of these cases. And there was a corresponding improvement in the character of results. The principal factors in this change were the more general efficient use of the Thomas splint, the employment of traction by ice tongs and certain other measures that came to be insisted upon in the orthopedic and other hospitals.

The various reforms above referred to came at a good time. The spring offensive on the Western Front instead of being started by the British was started by the Germans. The British sustained some very serious punishment. From February until May the British wounded were brought across the channel in thousands. With all the measures at our disposal for vacating beds, keeping up our records and operating upon and splinting our patients, we were still hardly able to meet the tremendous surgical and hospital problems that were presented during those months. Even during those dark days, however, the hopes of many of us were kept up to a large extent by the news of rapidly arriving American reinforcements. Just when things were getting to their worst the Americans entered the fray and by their inspiring early victories gave us fresh courage and a definite hope that the new forces from America would be able to turn the tide against Germany.



Miscellaneous fracture ward in Base Hospital No. 27 at Angers. The overhead frames are the Balkan frames which were used for suspension and extension in fracture cases.

CHAPTER VI.

By Spring of 1918, some sixty to seventy Americal medical officers had been assigned for duty in the British Orthopaedic Centers. They were assigned with a double purpose; that they might help as much as possible in caring for the British wounded and also that they might learn and apply, when the proper time came, the dearly bought lessons of the British in their two and a half or three years of war experience.

Especially after the British War Office investigations referred to in the last chapter, the Americans on duty with the British were thoroughly impressed with the importance of the prevention and early correction of deformity.

The American medical officers had also been given an opportunity to familiarize themselves with the excellent splint methods employed by all the assistants and disciples of Sir Robert Jones. This experience was not only with the ring Thomas knee splint, which had proven so successful in the treatment of fractures of the femur; but with the long and short posterior irons for ankle joint, knee joint, sciatic nerve and hip injuries; the Jones humerus traction splint for upper arm and elbow injuries; the long and short cock-up splints for forearm, wrist and hand injuries, etc. All of these splints were being employed in the British hospitals with or without surgical operations and a tremendous amount of deformity was being prevented or overcome.

Already the work of the Orthopaedic Centers had made a considerable impression upon all the surgeons in the British Isles. It was hoped, therefore, that the experience which had resulted in considerable progress in the surgery of injuries in Great Britain, might be passed along to the Americans as promptly as possible. In this way valuable lives and limbs might be saved without the bitter experience the British had had during the first year or two of the war.

The application of orthopedic principles to the surgery of injuries had not become universal in Great Britain. It was evident to everyone, however, that a great deal of progress along these lines had been made. One of the best indications of progress among the British was the circulation during the fall of 1918 of a circular defining the scope of orthopedic surgery in the British hospitals.

The text of this circular can not at this moment be given. But in general it specified

France, March 3, 1918.

Circular No. 11.

The following instructions are issued for the guidance of all Medical Officers:—

1. Injuries to the bones and joints, as well as of the muscles and tendons adjacent to these structures, represent a large percentage of the casualties of both the Training and the Combat Periods of an Army.

2. To restore useful function to these injured structures is one of the purposes of the Medical Organization of the Army. The problems involved in this have to do not only with the cleansing and healing of the wounds, but also with the restoration of motion in the joint or strength to the part. This latter part naturally follows the first, but it is essential that the first part be carried out with reference to that which is to follow. Unless this second part of the treatment, the restoration of strength and motion, is carried out, much of the first part is purposeless.

3. To insure to the man not only the proper treatment for this type of injury, but the proper supervision until he is as fully restored as possible, necessitates some form of radical control that makes it impossible for a man to be overlooked in inevitable transfers, from service to service, or hospital to hospital.

4. Since so much of the ultimate result in these conditions depends upon orthopaedic measures after the first treatment of the wounds has been carried out, the following will govern:—

The Director of Orthopaedic Surgery is responsible for the treatment of the injuries or diseases of the bones or joints, exclusive of the head and face.

He will be held responsible for the treatment of injuries or diseases of the ligaments, tendons or muscles, that are involved in the joint function, of the extremities.

Officers attached to other Divisions may operate upon and treat such conditions, but the Division of Orthopaedic Surgery, through its Director, will be held responsible for the character of the treatment and for the final results.

It is expected that the direction and supervision of the treatment here indicated will be carried out, in so far as is possible, in co-operation with the Director of the Division of General Surgery.

5. To carry out the instructions of this circular, the Director of the Division of Orthopaedic Surgery will arrange so that representatives of his Division will see all cases of the nature described, to determine whether or not their management is proceeding satisfactorily so as to obtain the best possible results. These representatives will report to the Commanding Officers of the hospitals in which such patients are being treated and their services as consultants will be freely utilized: any recommendation made by them as to change of treatment, transfer to some other professional service, or hospital will ordinarily, if the military situation permits, receive favorable consideration.

6. It is not the intention of this order to interfere with the routine work of hospitals, but to insure to the soldier proper supervision during the time of his treatment and the period of his convalescence.

By Command of General Pershing:

APPROVED:

J. G. Harbord,
Chief of Staff.

A. E. Bradley,
Brig. Gen., N. A.,
Chief Surgeon.

First document issued in France to fix the status of orthopedic Surgery in the A. E. F.

that all bone, joint, peripheral nerve and soft parts injuries with existing or impending deformity should be classified as orthopedic and referred to orthopedic centers or consulting orthopedic surgeons for treatment or advice.

Col. Goldthwait succeeded early in 1918 in having a similar circular issued from headquarters of the American Expeditionary Force in France. This circular was so important that a copy is being reproduced herewith: (Circular 11.)

Somewhat later, in May, 1918, Circular No. 29 was issued from the Chief Surgeon's Office, A. E. F., as follows:

Circular No. 29. France, 21 May, 1918.

The following instructions are issued for the guidance of all medical officers, superseding Circular No. 11, C. S. O., March 6, 1918:

1. Injuries to the bones and joints, as well as of the muscles and tendons adjacent to these structures, represent a large percentage of the casualties of both the Training and Combat Periods of an Army.

2. To restore useful function to these injured structures is one of the purposes of the Medical Organization of the Army. The problems involved in this have to do not only with the cleaning and healing of the wounds, but also with the restoration of motion in the joint and strength to the part. This latter part naturally follows the first, but it is essential that the first part be carried out with reference to that which is to follow. Unless this second part of the treatment, the restoration of strength and motion, is carried out, much of the first part is purposeless.

3. To insure the man not only the proper treatment of this type of injury, but the proper supervision until he is as fully restored as possible, necessitates some form of radical control that makes it impossible for a man to be overlooked in inevitable transfers, from service to service, or hospital to hospital.

4. Since so much of the ultimate result in these conditions depends upon orthopedic measure after the first treatment of wounds has been carried out, the following will govern:—

The Senior Consultant, Orthopaedic Surgery, will, under the Chief Consultant, Surgical Services, make such recommendations relative to treatment of "injuries and diseases of the bones and joints, other than those of the head, as well as to the injuries or diseases (other than those of nerve lesions) of the structures involved in joint functions," as will insure early restoration of functions, shorten convalescence, and hasten return to active military duty.

He will supervise the sub-divisions of surgery, pertaining to bones and joints, in a manner which will permit the complete surgical harmony necessary for cooperation in treatment of these cases by either general or orthopaedic surgeons, in formations from front to rear. To insure a minimum loss of function to the parts involved, uniform cooperation must be maintained by the Chief Consultant, Surgical Service, during both early treatment and all stages of convalescence.

5. To carry out the provisions of this circular, the Chief Consultant, Surgical Services, will make such provisions as are deemed necessary to insure a complete survey of these cases at regular intervals, and determine if the treatment is progressing in a satisfactory manner. Consultants in orthopaedic surgery who are charged with the supervision of such cases within Hospital Centers and other formations will ordinarily be called in consultation for special cases, through the Commanding Officers of the units in question, and the Consultants will report to him prior to completion of their investigations. Commanding Officers of hospitals are expected to freely utilize the services of these consultants in the manner described above. Any recommendations made by them as to change of treatment, or transfer to some other professional service or hospital, will ordinarily, if the military situation permits, receive favorable consideration.

6. It is not the intention of this order to interfere with the routine of hospitals, but to insure to the soldier proper supervision during the time of his treatment and the period of his convalescence.

M. W. Ireland,
Brig. Gen., M. C., N. A.,
Chief Surgeon.

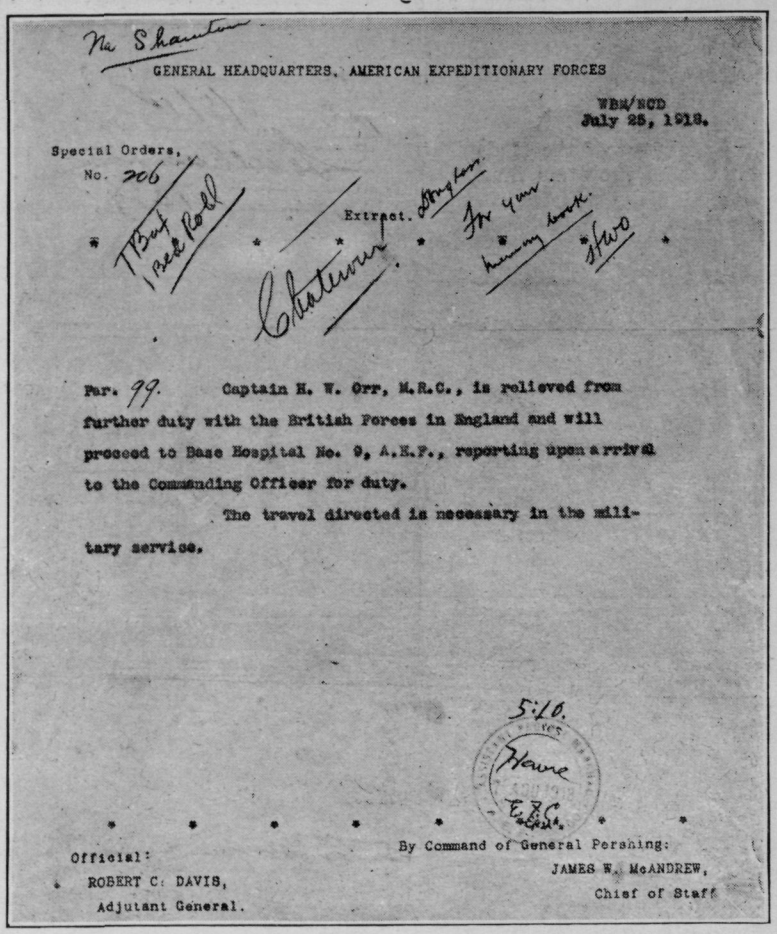
It will be remembered that the first contingent of the Americans, twenty in number, had been assigned to various centers in Great Britain with the idea of remaining about three months.

The time had now gone on until in July, 1918, some of us had been at our stations with the British for more than a year. With the increase of activity and participation of the Americans in the fighting, we became very anxious to carry on that part of our work which had to do with the application of our experience to the problems of the American wounded.

Personally, I felt that I had had an experience which would be of some advantage if properly applied in France. I had not only examined, prescribed for and treated a great many British wounded; but I had had an opportunity to come in contact with many of the administrative problems in the British hospitals. The British officers in our own center at the Welsh Metropolitan War Hospital, had become most cordial, not only personally but professionally. When Col. Ferguson was making his inspection visits as A. D. M. S. in the territory of the Third Western General Hospital, Col. Goodall (in charge of our hospital) very kindly allowed me to accompany them. In this way I got the viewpoint of Headquarters as well as our local officers on the treatment, return to duty, and discharge (from hospital and from the army) of the various kinds of wounded. This experience as it afterwards proved, was an extremely valuable one for me.

In July, 1918, a conference of medical officers on duty in Orthopaedic Centers was called by Sir Robert Jones to meet in Liverpool. Not having had leave of absence during more than a year abroad I decided to ask for two weeks' leave following the conference. I was hoping that I could get to France and get some first hand knowledge as to what was happening among the Americans.

My application for leave was approved, but just as I was leaving Cardiff to attend the Liverpool conference, orders came assigning me to duty in France. In fact, I had only a few hours to get my things together and take the train. I went to the Liverpool meeting, which was an extremely profitable one, but from there instead of returning to Cardiff, I went to London, Southampton, and Le Havre.



GENERAL HEADQUARTERS, AMERICAN EXPEDITIONARY FORCES

WBM/HCD
July 25, 1918.

Special Orders,
No. 206

Extract.

Par. 99. Captain H. W. Orr, M.R.C., is relieved from further duty with the British Forces in England and will proceed to Base Hospital No. 9, A.E.F., reporting upon arrival to the Commanding Officer for duty.

The travel directed is necessary in the military service.

5:10.
Le Havre
E.F.C.

By Command of General Pershing:
JAMES W. McANDREW,
Chief of Staff

Official:
ROBERT C. DAVIS,
Adjutant General.

At Southampton I met Capt. Kidner, who was on leave from his duties in London for an official visit to some of the American hospitals in France. He was due to return to England as Orthopaedic Consultant to the American hospitals. Others of us were destined to be assigned in similar capacities to American hospital areas in France. Temporarily, I was to proceed to Base Hospital No. 9 at Chateauroux. This hospital, at that time under the command of Lt. Col. George W. Hawley, had become the first important American Orthopedic Hospital in A. E. F.

Upon my arrival at Base Hospital No. 9 I was extremely interested to find the conditions which presented themselves in the first of my American hospitals in France. There were about 2,000 patients in the hospital. About one-half of these were of the more serious kind of battle casualties; bone and joint injuries, injuries to the peripheral nerves and soft part injuries with existing or impending deformity. There were several officers assigned as orthopedic surgeons or on the general surgical divisions who were doing first class work in the care of these patients. Lt. R. D. Schrock of Omaha, and Lt. Richmond Stephens of New York, were notable among these. Capt. Hartman of Findlay, Ohio, was also taking an active interest in these cases. It is fair to say that as far as the efforts of these industrious surgeons and a few others were concerned, the patients were receiving, from an orthopedic standpoint, excellent care.

However, one found here as elsewhere a

considerable number of wards in which, either because of lack of knowledge, lack of interest or lack of industry on the part of the ward surgeons, there were uncorrected, unsplinted, and otherwise more or less neglected patients. This neglect showed itself in a few principal ways. There was shortening and deformity of some fractures, especially of the compound fractures. There were also many patients with shoulders, elbows, wrists, knees, and ankles that were healing after compound injuries in bad position.

One of the most striking illustrations of this was to be found in the upper arm and elbow injuries. These patients were mostly returning from the front in what were called hinged ring Thomas arm splints. This splint made traction on the arm with the whole arm straight and the hand pronated. It was a good splint for transportation because the arm would lie beside the patient on a litter or in a cot. It was a bad treatment splint, however, because the straight stiff arm is a useless arm. In many of these cases, however, at Base Hospital No. 9 and elsewhere, this straight splint was left on while large shoulder, upper arm, or elbow wounds were being carefully dakinized and healed. Our method of dealing with this large problem at Savenay will be spoken of in another chapter.

One found in the Army hospitals a considerable number of surgeons who were never able to adjust themselves to the problem of splinting a compound fracture. This was one of the things we had borne down upon us in our experience with the British. I was extremely anxious to apply here, at my first opportunity, the methods of Sir Robert Jones, which we had learned in the British hospitals. To my genuine sorrow, however, I found neither in Base Hospital No. 9 nor elsewhere a receptive attitude in this matter. Those who had had a few months of experience with the Americans had acquired methods with which they were satisfied. Those who had had little or no experience whatever, in such cases were apparently even less willing to learn.

My own position in Base Hospital No. 9, therefore, resolved itself into the care of the patients in one 40 bed ward and a few days later of the officer patients in the officers' ward.

At about this time, Col. Brackett, Chief of the Orthopedic Service in the United States, who had come over from Washington, visited our hospital. With his usual generosity he afforded me an opportunity to discuss this situation with him. He had many interesting and valuable comments and suggestions to make. A day or two later Col. Joel E. Goldthwait, Chief Consultant in Orthopedic Surgery, A. E. F., also arrived. As an immediate result of a similar conference with him, I was assigned as consultant in Orthopedic Surgery to Base Section No. 1, A. E. F., with headquarters at Base Hospital No. 8, Savenay. Other Americans who had been on duty with the British were assigned as consultants the same time.

On my way to the new station, I stopped for a few hours in Angers with Captain E. W. Fiske. Captain Fiske was conducting a large and important orthopedic service at this hospital (Base Hospital No. 27). He was furnishing good care to a considerable number of patients. In Angers I saw for the first time the very extensive use of Balkan frames, weight and pulley traction and elaborate apparatus which had become quite generally used in the American hospitals, especially in Paris. This work was along the line of methods worked out by Col. Joseph A. Blake, and differed to a considerable extent from the simpler and what appeared to me to be the more practical methods of the British.

Upon arrival at Savenay a most interesting situation was found. I was assigned as Chief of the Orthopedic Service and Consultant in Orthopedic Surgery to Base Hospital No. 8, Savenay, Base Hospitals No. 34, 38, and 11 at Nantes, and Base Hospital No. 101 at St. Nazaire. My duties as specified particularly, were to inspect all patients in Savenay or upon arrival as to their condition for transfer to the United States. A large hospital center had already been planned for Savenay and the area had been designated as the hospital center through which all American sick and wounded were to be sent to America. Already one or two train loads of patients had been sent, and it had been reported that their condition for transportation had not been satisfactory.

It became, then, my duty to decide whether the wounded, upon arrival in Savenay, were suitable for immediate transfer to the United States or whether they should be detained for splints, the correction of deformities, further surgical treatment or even amputation.

It was stipulated in orders that no amputations were to be done in any area except after consultation with and approval by the Consultant in orthopedic surgery.

My position was one which, of course, brought me at once into conflict with the splints, wrists, ankles and knees which were healing or ankylosed in bad position. Some cases of nerve injuries had drop wrists and drop feet with no splints to support them.

All of these patients were marked for rewards. The Chief of Surgical Service pro-

AMERICAN EXPEDITIONARY FORCES

France, 27th August, 1918.

CIRCULAR LETTER NO. 7-A.

From: The Chief Surgeon.

To: C. O.s all Base Hospitals, Hospital Centers and Surgeons of Sections.

Subject: Consultants in Orthopaedic Surgery.

1. The following named officers have been appointed as Consultants in Orthopaedic Surgery for the hospitals in the districts given after their names. Hospitals requiring the services of consultants in orthopaedic surgery can apply to the nearest Consultant at the address given:

Name	Address	District
Major Geo. W. Hawley, MRC	Base Hospital No. 9	Base Hospital No. 9 Limoges
Capt. Z. B. Adams, MRC	Base Hospital No. 114	Beau Desert Center Bordeaux Vauclaire
Capt. C. F. Eikenbary, MRC	Beaune	Beaune Center Allerey Center Dijon Autun
Capt. C. B. Francisco, MRC	3rd Depot Division	3rd Depot Division St. Amand-Montrond Mars Center Mesves Center Pougues-les-Eaux
Capt. J. C. Graves, MRC	St. Aignan-Nevers	1st Depot Division Tours Blois Orleans
Capt. H. W. Orr, MRC	Base Hospital No. 8	Savenay Center Nantes Center St. Nazaire
Capt. W. W. Plummer, MRC	Base Hospital No. 116	Bazoilles Center Vittel-Contrexeville Neufchateau Chaumont Langres Rimaucourt
Capt. DeForest F. Willard, MRC	Vichy Center	Vichy Center Chatol Guyon Royat Roanne

M. W. Ireland,
Brig. Gen., M. C., N. A.,
Chief Surgeon.

surgical service. Until the moment of my arrival, patients had been designated for transfer to the United States by the ward surgeons, who were accountable to the Chief of Surgical Service. In making up the first convoy to leave Savenay, after my arrival, this plan was followed. I was given no opportunity to see the patients until they were on the train. Upon inspection of this train load of patients, about 400 in number, I found about 40 whom I considered unfit to go. They presented such conditions as compound fractures, ununited and without moval from the train and return to their

tested my decision with regard to these cases but Colonel Webb. E. Cooper, Commanding Officer, after considering carefully my written and signed report in regard to these patients, made a ruling sustaining me in the matter. It affords me much pleasure to say that this attitude of Colonel Cooper was one he maintained consistently throughout our entire service at Savenay. During the time that he was commanding officer in Base Hospital No. 8 and subsequently of the Savenay Hospital Center, both officially and unofficially he was always deeply concerned for the welfare of soldier and officer patients.

CHAPTER VII.

The subsequent experience of the Orthopedic service at Savenay was one which I shall always be very glad to remember. In the first place Colonel Goldthwait sent to Savenay a number of the very best medical officers available for this special work.

Captain LeRoy C. Abbott came a few days after my arrival. He developed into a fine surgeon and did most of the surgical work in the Orthopedic Department at Base Hospital No. 8. He became chief of the Orthopedic service in Base 8, and was promoted to the rank of Major.

With the transfer of the amputation service from Chateauroux, Captain Wilson (later Major) also came to Savenay. More than 3,000 amputation cases came through our department there and Captain Wilson developed a fine service. To these two officers and later to Major Murray S. Danforth, who came in December to Base Hospital No. 69, we were largely indebted for the really excellent work that was done in the Orthopedic Service at the Savenay Hospital Center.

In addition to the excellent personnel of the Orthopedic Staff, we developed many good friends in other departments who contributed in many ways to the care of our large service. Col. Webb E. Cooper, commanding officer of Base Hospital No. 8, and Lt. Col. R. J. Estill, who succeeded him were both in hearty sympathy with the surgical and splint methods worked out for the transport and treatment of these cases. Miss Amy F. Patmore, who was chief nurse of Base Hospital No. 8, and later chief nurse of the Savenay Hospital Center, was always sincerely devoted to the welfare of the soldier patients. The nurses on the operating room staff of Base Hospital No. 8 were always of the greatest help in carrying out our plans for the care of these patients.

Finally and of great importance were the Reconstruction Aides, who came to Savenay in September, 1918. They worked not only in the field for which they came, physiotherapy and occupational therapy, but assisted in many ways in the progress of our work. Miss Marguerite Sanderson, Chief Aide for the A. E. F., and Miss Leah Thomas, Chief Aide for Base Hospital No. 8, lent themselves and their helpers to the conduct of the Orthopedic headquarters, splint department, operating room and even to the making of plaster of Paris bandages, when the situation required the help and cooperation of everyone. All of these features contributed in no small manner to the tremendous amount of work that was accomplished during the fall of 1918, and during the rush at the Savenay Hospital Center following the Armistice.

One can sketch only very superficially what happend during these seven months at Savenay. From July 1918 to March 1919, more than sixty thousand patients passed through the Savenay Hospital Center. Of these about sixteen or eighteen thousand were classified by us as orthopedic. This included a large share of all the battle casualties. We had not only flat feet, sacro-iliac and back strains, and the various bone and joint disabilities of a minor sort; but also all of the fractures, all of the joint injuries, all amputations, practically all of the peripheral nerve injuries and soft part injuries in which, because of scar contraction or failure to splint, there were beginning or fully developed contracture deformities.

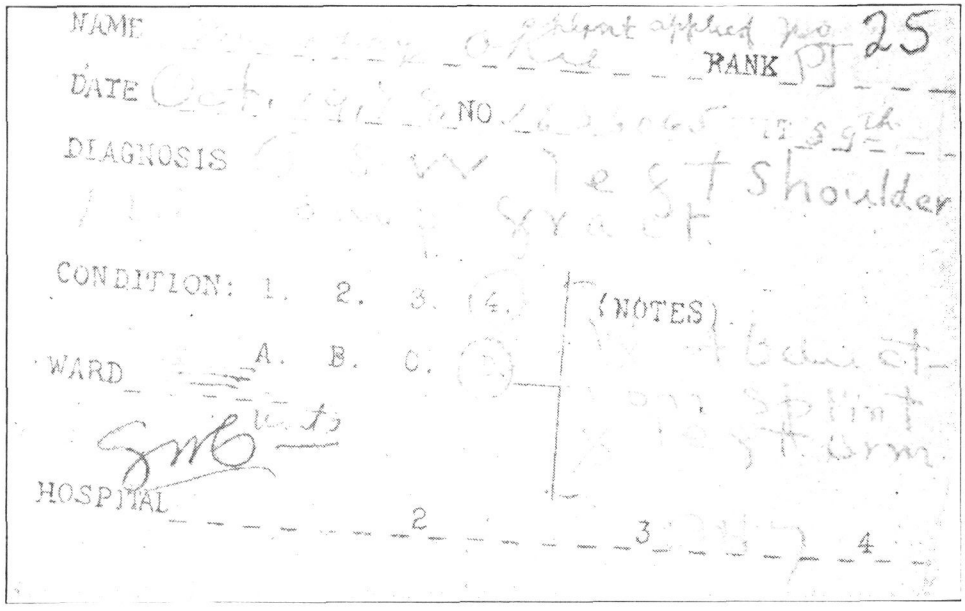
Savenay had been designated as the area to receive all sick and wounded from all the other base hospitals throughout France. At Savenay the patients were to be classified for return to duty, transfer to the United States, or to be held for treatment. It became my duty therefore, as Consultant in Orthopedic Surgery, to pass upon all of the kinds of patients referred to above, with reference to these points.

Patients were arriving during August at the rate of about five thousand per month. One of the first indications, therefore, was for a scheme by which patients belonging to the Orthopedic department could be located and dealt with immediately upon arriving at the Savenay hospital center. Two plans were adopted for this purpose. One was to locate the patients needing our attention as they came through the receiving room, and the other was to assign patients to certain wards according to diagnosis.

A little later we had in Base Hospital No.

8, separate wards for femur fractures (192 beds), arm fractures (256 beds), leg fractures (128 beds), knee joint injuries (34 beds), amputations (320 beds), etc. The other hospitals in the center followed this plan to some extent. This was true especially of Base Hospitals 69 and 88, where the work developed splendidly under Major Danforth and was continued later by Major Metcalf to whom I referred in Chapter I.

In order to assist us in this matter, we also adopted the plan of having a daily card index made in the registrar's office. These cards were prepared between midnight and



morning by soldier clerks, who were assigned to this special duty. On my desk at eight o'clock in the morning, I found sometimes fifty and sometimes several hundred cards for patients admitted with orthopedic conditions during the preceding twenty-four hours. These cards were at once distributed to medical officers who went out to the wards and located the men wherever they were. The cards came back at noon marked, "return to duty", "transfer to the United States", "splint required", "operation required", or with such other information or recommendations as the medical officers thought proper. Recommendations regarding treatment were usually compiled with the same day.

In a certain number of instances each day it was necessary for me to see these patients in consultation to decide upon the kind of operation, kind of splint, or for a decision as to other disposition of the case.

I have had several gratifying experiences since my return to civilian practice as the result of this kind of work. A young man came into my office not very long ago with three useful fingers attached to what was left of his right hand. He was using the hand and fingers very well and asked me what I thought of it. I told him I could see no indications for further treatment except for the removal of a small scar which was painful upon certain movements. He then reminded me that the question came up at Savenay as to whether or not his hand should be amputated because of a compound infected wound, I made the decision at that time against amputation, although it had been recommended. He was very grateful and appreciative on account of the hand having been saved.

Sometimes decisions in these cases were difficult to make. On one occasion we had two brothers brought to me for examination, one more seriously injured than the other. They were both anxious to return to the United States. It was far from easy, therefore, to mark one of these brothers for transfer home and the other for return to duty in France.

During September and October, we examined and passed upon more than five thousand patients in the Orthopedic service. Cap-

PATIENTS RECEIVED AT BASE HOSPITAL NO. 8, SAVENAY SEPTEMBER 1st TO 28th, 1918.

Showing: Total number from each Hospital.
Condition as regards splinting on arrival explained in numbers.*
Condition as regards splinting on arrival explained in per centum.
Remarks: "a" indicates an improvement in later convoys.
"b" indicates poorer condition in later convoys.

Name	Total	No. 1	No. 2	No. 3	No. 4	% 1	% 2	% 3	% 4	Remarks
B. H. No. 1	266	67	29	69	101	25	11	25	39	"a"
B. H. No. 3	86	18	13	20	35	22	15	23	40	"a"
B. H. No. 6	359	135	38	97	91	36	11	27	26	"b"
B. H. No. 7	5	1	0	2	2	20	00	40	40	
B. H. No. 8	3	2	0	1	0	66	00	34	00	
B. H. No. 9	103	51	9	18	23	50	9	18	23	"a"
B. H. No. 11	19	4	2	4	9	20	10	20	50	"a"
B. H. No. 12	1	0	1	0	0	00	100	00	00	
B. H. No. 13	12	4	0	3	5	34	00	25	41	"a"
B. H. No. 14	8	2	1	1	4	25	12.5	12.5	50	"a"
B. H. No. 15	14	2	1	2	9	14	7	14	65	
B. H. No. 17	7	5	0	0	2	73	00	00	27	
B. H. No. 18	8	1	1	4	2	12.5	12.5	50	25	
B. H. No. 19	28	9	1	8	10	32	4	28	36	"b"
B. H. No. 20	24	5	4	4	11	21	16	17	46	"a"
B. H. No. 22	23	13	3	4	3	57	14	15	14	"a"
B. H. No. 23	18	7	3	4	4	39	17	22	22	"b"
B. H. No. 25	15	9	0	0	6	60	00	00	40	"b"
B. H. No. 26	42	9	3	21	9	21	7	50	22	"b"
B. H. No. 27	137	42	19	43	33	31	14	31	34	"b"
B. H. No. 28	25	7	0	9	9	28	00	36	36	"b"
B. H. No. 29	21	1	0	0	0	100	00	00	00	
B. H. No. 30	58	22	4	17	15	38	7	29	26	
B. H. No. 31	21	3	15	2	1	14	71	10	5	"a"
B. H. No. 32	3	2	0	1	0	66	00	34	00	
B. H. No. 34	100	21	23	35	21	21	23	35	21	"a"
B. H. No. 35	2	0	2	0	0	00	100	00	00	
B. H. No. 36	6	4	0	1	1	66	00	17	17	
B. H. No. 38	27	7	5	8	7	26	8	30	26	"a"
B. H. No. 39	1	1	0	0	0	100	00	00	00	
B. H. No. 40	6	2	0	1	3	33	00	17	50	
B. H. No. 44	9	3	0	0	6	34	00	00	66	
B. H. No. 46	2	1	0	0	1	50	00	00	50	
B. H. No. 48	46	5	8	27	6	11	18	56	15	"a"
B. H. No. 49	2	0	0	0	2	00	00	00	100	
B. H. No. 50	8	3	2	1	2	37	25	13	25	"a"
B. H. No. 66	2	1	0	0	1	50	00	00	50	
B. H. No. 67	131	56	11	20	44	43	9	15	33	
B. H. No. 68	14	4	2	5	3	29	14	36	21	
B. H. No. 101	54	14	5	14	21	26	9	26	39	"a"
B. H. No. 114	71	27	12	12	20	38	17	17	28	"a"
B. H. No. 115	17	7	0	2	8	41	00	13	46	
B. H. No. 116	3	1	1	1	0	33.3	33.3	33.3	00	
B. H. No. 202	4	0	0	1	3	00	00	25	75	
RC. H. No. 1	1	0	0	0	1	00	00	00	100	
RC. H. No. 2	14	3	0	3	8	22	00	22	56	
RC. H. No. 5	5	1	0	2	2	20	00	40	40	
Mil. Hosp. No. 1	1	0	0	0	1	00	00	00	100	
St. Aignan.	23	14	0	3	6	61	00	13	26	
Blois	6	3	0	0	3	50	00	00	50	
Camp Hosp's	26	14	6	1	5	54	23	4	19	
Total	1904	614	227	482	581	32	12	25	31	

Received at Base Hospital No. 8 September 1 to 28, 1918.

*The above is a summary of patients seen in the Orthopedic Service at Savenay during September 1918. In the vertical columns (condition upon arrival at Savenay) No. 1 indicates "No. Splint required", No. 2 "Splint on and Satisfactory." No. 3 "Correction of position or Change of Splint or both Required." No. 4 "Condition requires correction of position or application of Splint or both."

tain Abbott, who had become our chief reliance in the operating room and Captain Wilson, in charge of amputations, were operat- and October. Even so, "the worst was still ing almost every day. Some days Captain Abbott had as many as fifteen or twenty operations. Three principal splint shops had been developed in which a hundred to two hundred plaster casts and splints were being applied daily.

The question of the use of plaster of Paris was an interesting one. At first the use of plaster was forbidden. Within a few days after arriving at Savenay, however, our supply of splints gave out. After that we manufactured most of our own splints. We even developed a very creditable shoe shop which did a great deal of fine work. Crinoline and plaster of Paris, were available and several of the officers assigned to this department by Colonel Goldthwait, were experts in the use of plaster. With my own fondness for plaster as a fixative dressing, it came therefore into extensive use. Even a great many of our spine and fracture cases were put into plaster of Paris for transfer to the United States. Plaster of Paris came to be the preferred dressing for both simple and compound fractures below the knee, and many hundreds of these casts were put on. We never heard of any very serious effects as result of this method. In fact the only complaint we had was that occasional cooties were found inside the casts.

With regard to the condition of patients upon arriving in the United States, the following letter received by us after the armistice, indicated that on the whole the patients arrived in a satisfactory condition.

The end of the war which came suddenly and dramatically on November 11, found us extremely busy. Before the Argonne offensive began, the forward hospitals had been cleaned out and we were crowded. Strenuous efforts were being made to clear beds for the victims of the severe fighting that was expected and that we had during September to come". With the signing of the Armistice, there was almost a panic among the hospitals to get home. Train loads of patients came pouring into Savenay from hospitals all over France and our patient population grew from 8,000 to 11,000 in a few days in spite of the fact that some thousands were sent away.

Even so, the signing of the Armistice was an occasion of great rejoicing. No one who had seen the thousands of shattered and crippled men could fail to be glad that the firing

In reply refer to S.G.O.....RBO:HML

WAR DEPARTMENT
OFFICE OF THE SURGEON GENERAL
WASHINGTON

November 30, 1918.

From: The Surgeon General, U. S. Army.

To: Major H. Winnett Orr, Base Hospital No. 8 A.E.F., France. (Thru Chief Surgeon)

Subject: Returning wounded.

1. I have had the opportunity to visit nearly all the hospitals in this country to which the wounded are returning, and it is extremely gratifying to find that the care and overhauling which the cases received at Base Hospital No. 8 is resulting in their returning to this country in most excellent condition. There are very few preventable deformities and the splinting is well done.

2. They are bearing their transport excellently. This, we realize, is largely due to the remarkable supervision which you and Abbott and your staff are giving the cases. The few cases of preventable deformities which we have found have, as far as we have been able to ascertain, not come under your supervision.

By direction of the Surgeon General:

R. B. OSGOOD,
Lt. Colonel, Medical Corps, USA

In replying please refer 24 Dec 1918 to file No. C S 321623

2396

1st Ind.

O.C.S., Am.E.F., France, December 24, 1918.* To Major H. Winnett Orr, M.C. (Thru C.O., Hospital Center, Savenay, AEF).

1. Forwarded.

By Direction:

FWW-JES

F. W. WEED,
Lt. Col., Med. Corps.

Rec'd Hosp Center Dec 27, 1918.

All communications should be addressed to the Surgeon General U. S. Army, Washington, D. C.

"TRUE COPY"
(copy)

at the front had stopped. At any rate, we felt that when we were repairing the damaged limbs we could make some progress with the job as a whole. There would not be more and more train loads of wounded to take the places of those who got well. One wondered how the British and the French could have carried on for over four years with thousands of wounded coming in every month and never an end of the war in sight.

After the first big rush matters began to ease up again. Evacuation of the wounded to the United States began to be easier and more regular. Medical officers were released from the front and began to help us in the rear. Some were pretty anxious to get home but we had the assistance of many.

It was soon apparent that the war was far from over for us. During all of November and December our hospital was completely filled and it was not until January that we began to receive the last of the patients from some of the other Base Hospitals and Hospital Centers. In the meantime my own consultation territory had been widened so that not only Savenay, Nantes, and St.

Nazaire had to be visited but Angers, Vannes and Camp Hospitals at Coetquidon, Montoir and La Baule (19 in all) were in our area.

This gave us a real glimpse of lower Brittany and a wider scope for usefulness.

Several other things stand out in my memory of the service at Savenay. During October I spent a week in bed with bronchitis. We had just begun to arrive at definite conclusions regarding the scope of our work and the best methods to be employed. With the assistance of Miss Margaret Blake, who was a most helpful Reconstruction Aide, and with the collaboration of Captain Abbott and Captain Wilson, I wrote a fairly complete outline of the teachings of Sir Robert Jones and Colonel Goldthwait together with our own conclusions regarding the work. This was accepted at once by Colonel Cooper and sent out by him as Circular No. 138, Savenay Hospital Center*, to all chiefs of services and to all ward surgeons. Later at the suggestion of Col. Goldthwait this was sent to other Base Hospitals also.

The following letter sent out in November is along similar lines and suggests both methods and results of our work.

45e Année. — N° 12.754 Directeur : Gaston VEIL

Edition spéciale

EDITIONS : Maine-et-Loire, Vendée, Charente-Inférieure, Morbihan, Finistère, Ille-et-Vilaine, Nantes, Saint-Nazaire, Loire-Inférieure

LE POPULAIRE DE NANTES

Direction : 13, Rue Crébillon TELEPHONE : 16 et 28

Publicité : Place du Commerce, 6 PARIS, 2, Rue des Colonnes

1918 LUNDI 11 NOVEMBRE

Victoire ! La Guerre est finie !

TRIBUNE LIBRE

L'autre Danger

L'Armistice est signé

Les Hostilités sont suspendues

Les Fonctionnaires sont invités à rester à leurs postes

(Officiel) L'Agence Havas nous télégraphie:

L'Armistice a été signé aujourd'hui Lundi à 6 heures.

Les hostilités ont été suspendues Lundi matin à onze heures.

M. ANTONIN DUBOST VIENT DE CONVOQUER LE SÉNAT TÉLÉGRAPHIQUEMENT POUR UNE SÉANCE QUI AURA LIEU AUJOURD'HUI A 15 HEURES.

Les Socialistes prennent la direction du Mouvement

UNE PROCLAMATION au Peuple allemand

Berne. — Le nouveau chancelier vient d'adres-

Citoyen

Nov. 20, 1918.

From: Consultant in Orthopaedic Surgery, Savenay.
To: Chief of the Surgical Service Base Hosp.
Subject: Orthopaedic Patients.
Sir:

Since Sept. first a statistical study has been made of patients arriving in Savenay for evacuation to the United States. The conclusions reached and to which it is desired to call your attention in this communication are based upon the observation of somewhat more than 4,000 cases.

It has been found that about 350 patients of each 1,000 arrive in condition for immediate transfer to the United States, requiring no treatment or splinting of any kind. About 200 of each 1,000 arrive wearing proper splints. Some may require simple surgical dressings. A few patients of this class require drainage operations but most are ready for transfer to the United States within a few days.

300 patients of each 1,000 require extensive modification or complete change of splints with or without other treatment. The majority belong to two classes: (a) Gun shot wounds of the upper arm

*This circular of 36 pages will be printed in full when this story is published in book form (See page 50).

or elbow (75 to 100 per 1,000 of all cases), (b) Gun shot wounds of the hip, femur shaft or knee (also about 75 per 1,000 of all cases). A large percentage of all these cases require readjustment of position under anesthetic, additional drainage, change from straight Thomas arm splint to some device with the elbow in flexion and the hand in supination, applications of new Thomas traction splint for femurs, etc. Also a considerable factor under this same heading is that of GSW. of wrist and hand with palmar flexion and GSW. of the ankle and foot with drop foot. These two classes of injury contribute approximately 35 to 50 cases respectively per 1,000.

Finally 250 cases per 1,000 arrive at Savenay without splints, for whom either with or without preliminary operation or readjustment of position, the application of splints is necessary. This class includes practically every kind of war injury, although naturally most of the severe conditions have been dealt with in preceding hospitals. Some of the more important items may be briefly mentioned.

First: GSW. of the shoulder with fracture (about 20 per 1,000 cases). For this condition it is frequently advisable to apply an abduction splint (Aeroplane splint).

Second: GSW. injuries of the median, musculo spiral or ulnar nerves (20 per 1,000 cases).

Third: GSW. of the hip, and shaft of the femur (50 to 75 per 1,000 cases).

Fourth: GSW. of the knee (25 per 1,000 cases). It has been observed that knee joint injuries are apt to come without splints, especially those who are convalescent. For bed patients, plaster of Paris or the Thomas splint and for walking patients the walking caliper splint should practically always be put on to be worn during the trip to the United States.

Fifth: In compound leg fractures (75 cases per 1,000) readjustments of position have been more frequently necessary than in any other injury. Neither the Thomas traction splint nor the usual leg splints have proven adequate to maintain, while traveling, length and position in these difficult fractures. Having due regard for wounds, plaster of Paris is especially to be considered in this class of cases. Skillfully applied it has been found to serve the purpose much better than anything else.

Sixth: Soft part wounds of the upper and lower extremities (respectively 40 and 50 per 1,000 cases) also very commonly arrive at Savenay requiring change of splints either with or without preliminary stretching and with or without anesthetic. Contracture deformities of the knee are much more common than any other deformity of this class. In general then, it may be observed that our experience justifies the conclusion that of each 1,000 Orthopaedic patients arriving at Savenay, approximately 500 require changes of splint or the application of the new splints and that of these ¼—⅓ require preliminary operation consisting of readjustment of positions or drainage.

It must be assumed that any unit now working in Savenay doing less work along these lines than is indicated above, is falling short of the requirements of its patients. One of the first things necessary is to locate patients requiring such attention as they come into the hospital. Only in this way can they be promptly and effectually dealt with.

A report along similar lines is being prepared for the amputation service and will be sent you in due course. H. W. ORR, Major M. C.

In January I was told that I might remain indefinitely on duty in France. There were said to be 8,000 to 10,000 orthopedic cases still in France. Toward the end of February, however, I learned that there were only about 2,000 to 3,000 outside of Savenay and Major C. B. Francisco arrived about February 20th to take my place.

CHAPTER VIII.

Following the Armistice some of the medical officers relieved from duty with Divisions at the front returned to Savenay where they became ward surgeons. In this and other ways they assisted us with the large amount of work we then had in our area.

Colonel Goldthwait made two visits to the Hospital Center in November, and gave lectures to the Orthopedic Staff along general and special orthopedic lines. The Orthopedic Staff at that time at the Savenay Hospital Center consisted of seventy-two surgeons. A number of staff meetings were held. One group consisting of medical officers, nurses, and reconstruction aides, was transferred to Brest, and equipment sent along for the organization of an Orthopedic Service at that place. Captain Cole of St. Paul, Major Graves now of Rochester, New York, and Major Hartman of Findley, Ohio, who were successively in charge of this service at Brest, all came to Savenay during November or December and made a study of our work.

We in turn were ordered to Paris on several occasions to attend the Red Cross Hospital Conferences, and to see the work of the Base hospitals in that area. It was upon one of these visits that I had the privilege of seeing the work of Professor Chutro. He had worked out a unique organization and an operating room and dressing technique. His service was the only absolute surgical monarchy I have ever seen. But he was doing fine surgical work and securing some excellent results.

On the whole this was a rather difficult time. The hospital was crowded with patients, many of them in serious condition. Base hospitals at Mesves, Mars, Allerey, Orleans and even some of the Paris hospitals were being entirely evacuated. In some instances at least, wounded men were being transferred to us in more serious condition than at any previous time. Consequently we saw at Savenay some very serious deformities, some very severe injuries, and a number of patients who required major surgical procedures before they could be fitted for transfer to the United States. It was among these patients that we had to break up a considerable number of malunited femurs and other serious malpositions for improvement in length and position before the patients could be sent home.

After the Armistice, the medical staff suffered to some extent in the same way as the combat forces. There was a decided let-down in the general morale. A large number of the officers and men were extremely anxious to get home. In spite of the very considerable hospital problems still remaining, the feeling was prevalent that the war was over.

To add to our other difficulties we had a great deal of rain in our part of France. It was said that from October to January, there was rain at Savenay during part or all of every day for seventy days.

During November and December there was, however, a steady stream of patients as well as troops toward the United States. The policy was established of sending home one medical officer with every one hundred and fifty patients. In this way a number of those who had been prominent in the work, came through Savenay on the way to the United States.

Major Ralph R. Fitch of Rochester, New York, came through Savenay on December 20th, having finished four years of continuous war service with the French and the Americans. He and Mrs. Fitch in their own hospital at Etaples had done a great deal of fine work for almost the entire period of the war.

In January it was my privilege to meet in conference with Colonel Nathaniel Allison of St. Louis, and Major DeForest Willard, of Philadelphia, at Angers. There was a question as to what disposition to make of the remaining American wounded in France. It had at first appeared that the more seriously wounded might have to remain in France for many months. Colonel Goldthwait had under consideration a plan for semi-permanent Orthopedic Centers, with staffs and equipment for a prolonged period of reconstruction treatment.

After reviewing the situation, however, at headquarters, it was decided to send the patients home, even the seriously wounded, as rapidly as possible. Consequently the preparation of the balance of the American

wounded for transportation to the United States fell upon our well organized staff at Savenay. This work began to lighten considerably toward the end of January and became still lighter in February.

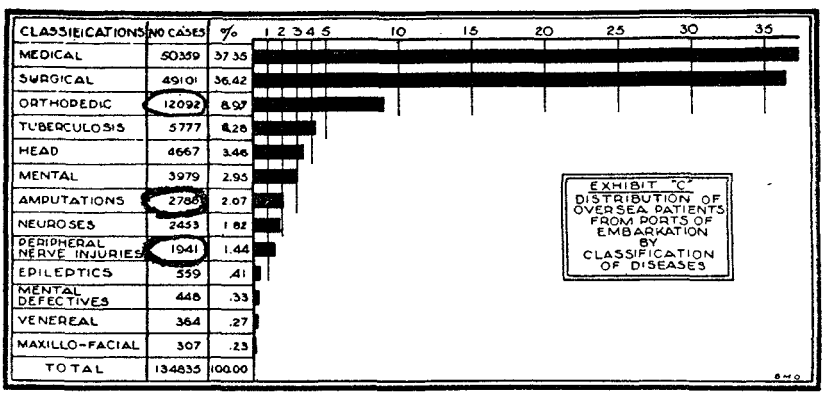
Major Francisco of Kansas City, arrived on February 9th to take over my duties as Consultant in Orthopedic Surgery in this area.

I remained at Savenay for a few days longer in order to comply with the request of Colonel Cooper for a written review of our work at Savenay. This was finished and I was sent to Brest about February 19th in charge of a detachment of convalescent patients. At Brest I had the common experience of being delayed a few days for a suitable boat for our patients. On the night of February 24th, we embarked for the United States, with about three thousand convalescent patients.

The return from France was far from the restful voyage I had hoped to have. I was assigned immediately in charge of a compartment containing over eight hundred convalescent sick and wounded. The first four days out were very stormy and many patients and officers were seasick. However, we reached New York without serious difficulties of any kind. Thanks to a splendid captain and a highly efficient troop commander, we made the journey in eight days and delivered our convalescent detachments at Hoboken without the loss of a man.

I returned to the United States to find new surprises in store for us. We should have been accustomed by this time to surprises of almost any kind in the military service. The changed atmosphere in the military hospitals in the United States and the different attitude of medical and surgical services toward the American wounded was one of the greatest surprises I had had.

After a conference with Colonel E. G. Brackett, Chief of Orthopedic Services in the United States, I was assigned to duty at Fort Des Moines, Iowa. Meantime, I was granted a few days in which to visit my family. For more than a year they had been in California. This visit was a great reward after my two years of foreign service.



Taken from the report of the Surgeon General, United States Army, 1919.

My further experiences in the medical hospitals, especially at Fort Des Moines and Camp Dodge, I shall reserve for a later chapter upon "The Effects of the War Upon the Practice of Civilian Surgery."

At any rate it seemed to me that the surgical lessons of the war in France, Great Britain and Italy had been very little felt in this country. In fact, their influence has not been felt very much even now. It is to be hoped, however, that as time goes on, the care of the injured and crippled in the United States will follow the newer lines of orthopedic reconstructive surgery. In regard to these Sir Robert Jones, Colonel Joel E. Goldthwait, Colonel E. G. Bracket, and others, have drawn conclusions, formulated rules, and established principles which rest upon our best previous knowledge and our most valuable war experiences.

SUPPLEMENT. *

The first American orthopedic Surgeons went to Great Britain in May, 1917. The officers in this group were assigned for duty in Great Britain personally by Colonel Goldthwait and Sir Robert Jones. The assignments were as follows:

To Oxford:
Major W. G. Erving.

To Leeds:
Capt. Rhoades Fayerweather.
Lt. L. T. Spencer.

To London:
Capt. F. C. Kidner.
Capt. De Forrest Willard.

To Liverpool:
Capt. S. M. Cone.
Capt. Wallace Cole.
Lt. A. R. McAusland.
Lt. H. A. Durham.

To Aberdeen:
Capt. R. W. Billington.
Capt. C. B. Francisco.
Lt. M. Langworthy.

To Glasgow:
Capt. Jas. P. Graves.
Capt. C. F. Eikenbary.

To Belfast:
Capt. C. P. Metcalf.

To Edinburgh:
Capt. W. I. Baldwin.
Capt. M. S. Danforth.
Lt. L. C. Abbott.

To Cardiff:
Capt. H. Winnett Orr.
Lt. C. L. Hall.

Near the end of the six months period during which the first twenty orthopedic surgeons who went to the British Isles had been on duty with the British, Major Goldthwait, arrived in London with the second orthopedic group. This group consisted of about forty officers, some of whom were also qualified orthopedic surgeons. Some re-distrbution of the original twenty was made at this time. Most of the new arrivals were sent to British Orthopedic Centers for experience in the work already going on. A few of the new officers and some of the officers who had been in Great Britain were taken to France for association with training camps and hospitals which were about to be organized. With the arrival of this group in France Colonel Goldthwait received the appointment as Director of Military Orthopedics for the A. E. F.*

CHIEF SURGEON'S OFFICE
A. E. F.

France, November 7, 1917.

From : Commander-in Chief, A. E. F.
To : Major Joel Goldthwait, M. R. C.
Subject : Appointment as Director of Military Orthopedics, A. E. F.

1. You are hereby announced as Director of Military Orthopedics for the American Expeditionary Forces.

2. You will proceed to such places in the training areas as may be necessary from time to time for consultation with medical officers serving with the American Expeditionary Forces, in matters pertaining to orthopedic surgery.

In this connection, your attention is invited to G. O. No....., Dated October....., 1917, an advance copy of which is herewith furnished you.

3. At the end of each month you will submit, for confirmation by these Headquarters, a list of the journeys performed by you under these instructions.

4. Commanding Officers of the places visited by you are hereby directed to afford you proper facilities for carrying out this work; this letter to you is to be considered their authority for such action.

By command of General Pershing:
(Signed) Robert C. Davis.
Adjutant General.

B/M.

At about the same time Dr. Robert B. Osgood of Boston, then Major, now Colonel was appointed as one of the associates of Colonel Goldthwait; and Dr. Mathaniel Allison of St. Louis, then Captain, now Colonel, as the other. A little later Dr. W. S. Baer, now Lieutenant Colonel, was also appointed a Consultant and associated with this group. During the eight months following this time Colonel Allison was given the responsibility for the hospitals with the combat troups; Colonel Baer, the evacuation hospitals and hospitals in the zone of advance; while Colonel Osgood was Consultant and Director of Orthopedic Services in the Base Hospitals. A little later Colonel Osgood was transferred to Great Britain where he was associated with Colonel Sir Robert Jones, and acted as liaison officer between the British war office and the American officers on duty with the British.

In March 1918 the first circular relating to the place of Orthopedic Surgery in the gen-

*This supplement was prepared in 1919 by Lt. Col. H. W. Orr, primarily as a review of the work of the Orthopedic Service in Base Section No. 1 A. E. F.

*See circular 11 on page 30.

eral hospitals scheme of the A. E. F. was issued and was as follows.*

This circular was the one which influenced the origin and first development of the Orthopedic Service until the issuance of circular No. 29 (see page 31).

Still later the service was expanded and more clearly defined by circular No. 46, which follows:

AMERICAN EXPEDITIONARY FORCES

CIRCULAR NO. 46 France, 16, August, 1918

1. Upon the recommendation of the Chief Consultant in Surgery, and with the approval of the director of Professional Services, the following instructions are published for the information and guidance of all concerned.

INSTRUCTIONS CONCERNING THE TREATMENT IN ORTHOPEDIC CONDITIONS INCLUDING FRACTURES AND JOINT INJURIES.

2. The work of the Division of Orthopedic Surgery in the medical organization of the army divides itself quite clearly into two parts, one having to do with the preparation of the men for the expected combat, and the other assisting in their recovery if wounded. The first has to do with saving men for service who would otherwise be discharged as physically unfit and also, as the result of careful training, increasing the number of days that should be expected of the men for active duty. The second has to do with the saving for service of men who but for such work might not have lived, or had they lived, been so crippled as to be of no use to the army.

3. Without such methods of treatment available for those needing such care in the pre-combat or training period, large numbers of men will be lost for active duty as the ordinary medical measures can only give temporary relief.

4. Without such methods in cases of combat or other injury there will be much unnecessary loss of function and much of the acute surgical treatment will be purposeless.

5. In each of the large hospital centers, a base hospital with special personnel and equipment for caring for such cases will be installed, while in the detached base hospitals special services will be established so that there will be the least possible transferring of cases from one hospital to another.

6. Consultants in Orthopedic Surgery will be assigned to groups of hospitals whose function it will be to keep in touch with the Orthopedic work of the given group. These consultants should be freely used by the staff of the respective hospital and can be reached through the commanding officers of the hospital centers.

7. To best accomplish the purpose of the division and, to make the services of its members available the following instructions will govern.

AMPUTATIONS.

8. Cases of amputation of either extremity will be assigned as soon as possible to the Orthopedic Service for the needed special treatment. A guillotine amputation for instance, without other injuries, can usually be moved without risk in one week and with suitable measures rapid closure of the wound is usually possible so that an artificial leg can be fitted and the man get about without crutches many times in from four to five weeks from the time of the injury. It is desirable that transfer to the Orthopedic Service take place as early as possible before contractures have taken place so that the temporary artificial limb, in case that is desirable, can be most favorably fitted on and the most muscles used to the best advantage.

TENDON INJURIES OR INFLAMATION.

9. The cases of injury to the tendons or inflammation in or about the tendons should be assigned as soon as the primary wound healing is well established or as soon as the acute inflammatory reaction has subsided, to the Orthopedic Service. Early transfer to the special services is important in order that the treatment having to do with full restoration of function in the part that has been injured or inflamed may be established at the earliest possible moment and before adhesions have formed or have become organized.

10. Cases of flat, weak, or pronated feet associated with pain, swelling or inflammation, when admitted to a hospital should be assigned to the Orthopedic Service. As soon as the acute symptoms have passed, the cases should be transferred to the nearest convalescent camp. From here, in keeping with the degree of difficulty, the cases should be transferred for full duty or to the Orthopedic Training Camp, Depot Division, for training to fully overcome the weakness, or for non-combat duty under "C" classification.

11. No cases of uncomplicated flat foot should be exempted from services or recommended for transfer to the United States as all can be made useful for military service.

SPINAL STRAINS, WEAK BACKS, CHRONIC BACKACHES.

12. Cases of weak, painful, or lame backs, or of sprain of the spinal or sacro-iliac joints, should be transferred to the nearest convalescent camp as soon as the acute symptoms have passed and from there, after a reasonable time, they should be transferred either for full duty, or for non-combat duty under class "C" classification.

GENERAL BAD POSTURE.

13. Cases of general bad posture, which is commonly associated with lack of vitality or general endurance as well as being part of the condition leading to weak feet and weak backs, should be sent for training to the Orthopedic Training Camp, Depot Division.

FRACTURES.

14. For all cases of fracture of bones other than the head and face, or of extensive muscle injuries, it is of the utmost importance that proper splints be applied at the earliest possible moment so that the transfer of the patient to the hospital in which treatment is to be given, is associated with the least possible damage to the tissue adjacent to the injured bone. The Thomas Leg Splint, the Hinged Half Ring Splint, the Thomas Hinged Arm Splint (Murray Modification), the Cabot Posterior Splint and the Ladder Splinting are appliances most needed for such work.

155. In case the fracture is compound, the wound treatment at the Evacuation or other hospitals should follow the principles outlined by the Chief Consultant of Surgical Services.

16. After the primary wound treatment has been given these cases should be transferred to the Orthopedic Service in which the most approved methods for the early restoration of function to the injured part will be available. An effort should be ever possible, within a week or ten days of the time made to transfer the cases to such services, whereof injury, this being the most favorable time as regards bone repair. All fracture cases which, for any reason, cannot or should not be transferred to one of the services as indicated above should be reported to the Senior Consultant in Orthopedic Surgery, or the Orthopedic Consultant of the area.

17. Simple fractures should not be converted into open fractures except under very exceptional conditions or after consultation with one of the Orthopedic Consultants. A result which may not be as perfect anatomically as might have been obtained by open operation, may nevertheless be functionally good. This is so commonly the case that the risk of infection which is greater under the war conditions than in civil life should be avoided whenever possible.

JOINT INJURIES.

18. All injuries of the joints should be protected with the same care for transport to the hospital in which the treatment is to be given that has been indicated for fractures. Suitable splints should be applied immediately and the standardized list of splints of the Army provides types that will meet all the needs.

19. In case the injury is associated with open wounds, the principles of the wound treatment are those which have been laid down by the Chief Consultant of General Surgery.

20. Since in all such injuries ultimate function of the joint is the chief requisite, treatment having for its purpose the restoration of function should be instituted as soon as possible, and for this purpose it is desirable that cases of such injury be transferred, as soon as the primary wound treatment has been given to the Orthopedic Service. It is important that such transfer be made before unnecessary adhesions have formed so that the restoration of function can be obtained in the least possible time. In all such functional restoration it should be clearly understood that while motion is to be encouraged at the earliest possible moment it should consist entirely of active motions performed by the patient in which case the reflex muscular contraction will protect the joint from undue injury. All passive motion should be avoided.

21. Operations upon the joints that are not emergency in character and should not be performed until after consultation with one of the Consultants in Orthopedic Surgery.

TRANSFER TO THE UNITED STATES.

22. It will be the policy to send to the United

*See circular 11 on page 30.

States as soon as transportable, all cases that are of Class "D" type, or cases in which prolonged treatment will be required for restoration to duty.

M. W. Ireland,
Brig. Gen. M. C. N. A.
Chief Surgeon.

This was followed a few days later by the following:

All of the base hospitals came to be to a large extent evacuation hospitals. At the same time, however, serious cases like compound fractures of the femur were usually retained until convalescence was well estab-

AMERICAN EXPEDITIONARY FORCES

CIRCULAR LETTER NO. 7A.

From : The Chief Surgeon
To : C. O. s. all Base Hospitals, Hospital Centers, and Surgeons in Sections.
Subject: Consultants in Orthopedic Surgery.

The following named officers have been appointed as Consultants in Orthopedic Surgery for the hospitals in the districts given after their names. Hospitals requiring the services of consultants in Orthopedic Surgery can apply to the nearest consultant atthe address given:

NAME	ADDRESS	DISTRICT
Major Geo. W. Hawley MRC	Base Hospital No. 9.	Chateauroux Base Hospital No. 9, Limoges.
Capt. Z. B. Adams MRC	Base Hospital No. 114.	Beau Desert Center, Bordeaux Vauclaire.
Capt. C. F. Eikenbarry MRC	Beaune	Beaune Center Allery Center Dijoe Autun
Capt. C. B. Francisco MRC	3d Depot Division.	3d Depot Division St. Amond Montrond Mars Center Mesves Center Pougues-les-Meux
Capt. J. J. Graves MRC	St. Aignan-Noyon	1st Depot Division Tours Blois Orleans
Capt. H. W. Orr, MRC	Base Hospital No. 8	Savenay Center Nantes Center St. Nazaire
Capt. W. W. Plummer	Base Hospital No. 116	Bazoilles Center Vittel-Contrexeville Neufchateau Chaumont Langres Rimaucourt
Capt. DeForest P. Willard, MRC	Vichy Center	Vichy Center Chateau Guyon Royat Roanne

M. W. Ireland, Brig. Gen., M. C.

Capt. F. C. Kidner, Medical Corps was assigned at the same time to the American Hospitals in the British Isles as Consultant in Orthopedic Surgery.

Letters of instruction were sent to the consultants on Orthopedic Surgery as follows:

AMERICAN EXPEDITIONARY FORCES
Office of the Chief Surgeon

In replying please
refer to File No.
C. S. 201.....
7765

August 23, 1918

From : The Chief Surgeon
To : Captain H. W. Orr, MRC (Through C. O., Base Hospital No. 8, A. E. F.).
Subject: General instructions

1. You have been designated as Consultant in *Orthopedic Surgery, with station at Base Hospital* No. 8.

2. It is expected that you will not only act as Consultant in the hospital in which you are stationed, but will also, at regular intervals, visit the hospitals at Nantes and St. Nazaire, to see, with the Hospital Staff, cases of bone and joint injuries, the cases of amputation of extremities, and other orthopedic conditions.

3. These visits are to be made not only to assist in the establishing of the same standardized methods of treatment in each of the hospitals, but to assist in the selection of the cases for evacuation to the United States or to other hospitals.

By direction:
J. D. Glennan
Colonel, Medical Corps.

LJO-JES

lished. It was necessary during October and November 1918, to send a considerable number of ununited compound fractures home in order to make vacancies in hospital beds. These special convoys were sent under the direct supervision of an officer of experience in Orthopedic Surgery and on the best boats obtainable. Fifty such cases were sent across on the hospital ship Mercy with Major A. H. Cilley in charge, and arrived at Hoboken in excellent condition.

During the first two weeks after the arrival of the Consultant in Orthopedic Surgery at Savenay about four hundred orthopedic patients had to be splinted and consigned to the United States.

One effect of this was to exhaust almost at once the supply of splints available in Base Hospital No. 8. Splints being almost impossible to obtain at the moment, improvised splints and Plaster of Paris had to be used. The situation was greatly helped by the efforts of a number of the patients who, under the direction of two of the B. H. No. 8

Corps men, made hundreds of Hand Cockup Splints, splints for the support of drop-foot, and even the more complicated Finger Extension and Flexion Splints, and Aeroplane Splints*.

These splints were made mostly of wood, but the Salvage Department was called upon to furnish shoes and the iron bars of mosquito-bar supports from the beds which had been thrown away. These were ingeniously converted into splints that were entirely satisfactory in every way, except that they lacked the finished appearance of the conventional splint.

Savenay Hospital Center at this time had reached a size of about three thousand patients. Immediate segregation of special classes of patients being manifestly impossible, one of the first requirements of the department was a system by means of which all patients with orthopedic conditions could be located and dealt with. This was both for the benefit of the patient and to avoid delays in making up of passenger lists for convoys. The four features found necessary to establish this connection were as follows:

1. The cataloguing and inspection of every orthopedic patient as he entered the hospital.

2. The written opinion of every medical officer as to the patients that he saw.

3. Centralized operating, splint and plaster of Paris rooms to which patients could be brought for treatment.

4. A card index catalog with a follow-up system by which recommendations made by medical officers, could be checked and controlled until the patient was pronounced fit for transfer to the United States.

The first centralized splint room or dispensary, established about September 1, 1918, proved one of the most helpful features. In the course of a few days it reached a capacity of from thirty to fifty patients daily. On one Sunday, after receiving a large convoy, over one hundred patients were splinted and had plaster casts applied during the day. Walking patients principally, but also a few cot cases, were brought to the splint room from the wards and dealt with by the surgeons in attendance, as in any dispensary clinic. At this time the number of new orthopedic patients arriving at Savenay was averaging about seventy per day.

Much has been said and written about the use of plaster of Paris in war injuries. The technique employed at Savenay was as follows. Wounds were carefully dressed, the entire extremity was covered with cotton wadding and muslin or gauze bandage applied evenly and smoothly. Then plaster was put on firmly but not too tight. Large windows were cut over all open wounds and over Patellae, heels, etc. Casts were not split. Plaster of Paris was used especially for fractures of the femur, leg, and upper arm. In femur and upper arm cases, body casts were employed.

From September to December about one thousand plaster casts per month were put on and practically all sent to the United States. No complications as to casts were reported and in general the patients were found to have travelled safely and comfortably. For those patients who had to have manipulative correction of deformity existing at the time of arrival in Savenay, plaster was the ideal splint because of the better immobilization and protection against motion irritation of injured or infected parts.*

From the beginning, patients were rechecked as they were sent to the trains leaving the hospital. Defects in splinting were in this way usually caught up and remedied as the patients departed. After the first fortnight practically every patient in each convoy had been carefully and adequately splinted, whether for the needs of immediate treatement or for protection during the journey to the United States.

Also, by way of suggestion to medical officers and nurses into whose hands the patients passed on their way home, tags were printed and attached to the splints at the time of the patients' departure from Savenay. The following are given as illustrations:

*(Foot Note) A point for consideration in connection with the scarcity of splints in the base hospitals is that during July and August 1918 orders had been received for tremendous quatities of supplies and equipment of all kinds to be sent up into the zone of advance for impending activities. Many hospitals and supply depots sent forward so many splints that when the burden of care of patients was transferred later to the hospitals at the rear they found themselves without adequate supplies of splints or even splint materials. This was true of other kinds of equipment as well. Even ambulances were sometimes extremely difficult to get for the transfer of patients from one point to another. In the end, of course, a fair balance was finally restored so that sufficient splints of certain kinds were available in all of the hospitals.

*The author considers this a very important point. After any correction of deformity by manipulation, especially in a previously infected region, immobilization of the part in plaster of Paris is the ideal treatment. By this means both inflammation and swelling may be prevented. Also, contrary to a popular notion, stiffness in joints is prevented, rather than caused, by a suitable period (5-10 days at least) by such fixation. In the same connection, it may be observed that such forcible manipulations should be done with a few movements and as little damage to the parts as possible. To quote again from Sir Robert Jones, "Do not use 'pump handle' methods."

TAG NO. 1—FOR THOMAS HUMERUS TRACTION SPLINTS:

"The arm is to be kept securely bandaged into splint at all times. Only the bandage immediately over the wound is to be removed for dressings. The hand is to be kept in supination and dorsiflexed. The elbow is to be kept at or slightly beyond a right angle."

TAG NO. 2—FOR THOMAS FEMUR TRACTION SPLINTS:

"Please do not release the traction or lift the leg out of the splint for dressings. Remove bandages only immediately over the wound and keep all others and the traction tight and neat."

The exact methods employed in dealing with patients on admission may best be illustrated by quoting from a circular which was published from the headquarters of the Orthopedic Department, September 22, 1918.

22 September, 1918

From: The Consultant in Orthopedic Surgery Hospital Center, Savenay

To : All Medical Officers

In dealing with patients with bone and joint injuries, amputations, tendon injuries, or inflammations, soft part injuries with contraction or impending deformity, spine injury, flat-feet, etc., please observe the following points:

1. Medical officers will be supplied each morning with index cards containing, for patients admitted during the past twenty four hours, blanks for name, diagnosis, etc. Medical Officers are to add to these cards by marking under the heading "Condition," whether the patient:
   1. Requires no splint.
   2. Is wearing satisfactory splint.
   3. Requires change of splint or operation.
   4. Without splint but splint required.

In case of "3" or "4" specify the patient's requirement under the heading of "Notes" or on the reverse side of the slip.

2. Amputation cases are to be reported separately on special slips, or brought to the attention of Captain Wilson by reporting patient's name and ward.

3. Under the heading, "Diagnosis," the diagnosis number (as indicated on Special Diagnosis Table already furnished) is to be intered, e. g. 17 for GSW elbow joint. (See table at end of this letter.)

4. The buff cards must be completed and turned in to the Orthopedic Office on the same day they are received. There must be no exception to this rule.

5. In the case of patients who are to be splinted in the wards, the Wardmaster's report is to be sent to the Orthopedic Office as soon as the application is finished.

6. If any patient requires operation, recommendation for such operation must be sent to the Chief of Surgical Service, Base Hospital, No..... The Medical Officer in charge of the ward will be notified as to the time, place and by whom the operation is to be performed. No operation by any member of the Orthopedic Staff is to be arranged in any other way.

7. Ambulatory patients, requiring splints, are to be referred to the Splint Room for the application of splints or plaster between the hours of 1:30 and 4:30 A. M., daily. All Medical Officers are requested to accompany and to apply splints and plaster to their own patients, if they care to do so. Field Medical Cards should accompany patients, so that proper entries can be made at the time treatment is given.

8. In sending in reports, it should be specified in every case; whether or not the patient must be detained in the hospital for treatment, and if so, for what length of time.

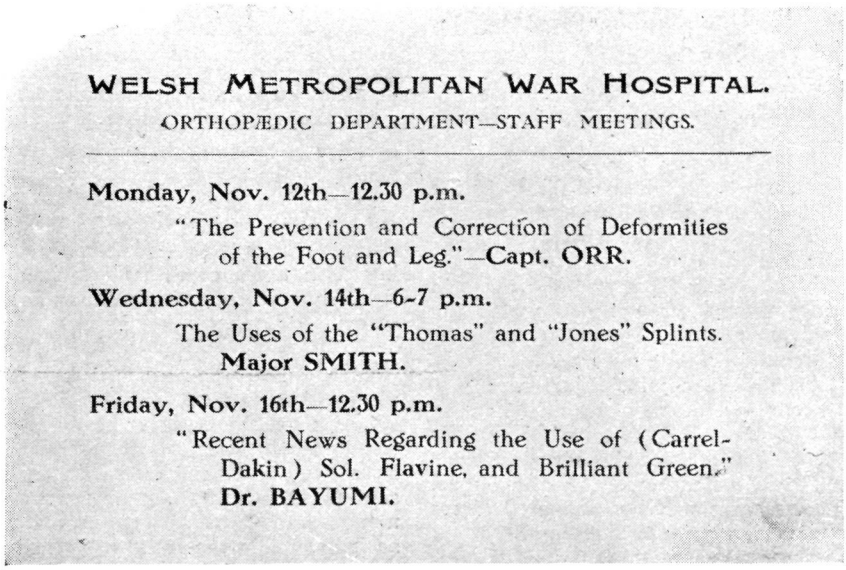
Approved: J. F. Conners.
Chief Surg. Service
B. H. No. 8

H. W. Orr
Captain, M. C. U. S. A
Consultant in Orthopedic Surgery
Base Hospital No 101
and Hospital Centers at
Savenay and Nantes.

The following arbitrary diagnosis table was used to save writing out diagnosis in full.

TABLE OF DIAGNOSIS

10. G. S. W. or other head injuries with paralysis.
11. G. S. W. neck with paralysis.
12 G. S. W. shoulder, fracture (including scapula and clavicle).
13. Fracture, simple, shoulder (including scapula and clavicle).
14. Fracture, simple, humerus.



Orthopedic Staff Meetings in Great Britain

15. G. S. W. fracture, humerus.
16. Elbow injuries (not G. S. W.).
17. G. S. W. elbow joint.
18. Simple fracture, forearm or hand
19. G. S. W. fracture, forearm, wrist and hand.
20. Median, musculo spiral or ulna nerve injury.
21. Spine disease or injury (not G. S. W.).
22. G. S. W. spine—with fracture
23. Fracture, pelvis, simple or G . S. W.
24. Fracture, simple, hip.
25. G. S. W. hip
26 Fracture, femur, shaft.
27. G. S. W. femur, shaft.
28 Fracture, simple, knee.
29. G. S. W. knee
30 Knee joint injury (not G. S. W. or fracture).
31 Sciatic, external popliteal or other nerve injury, G S. W. or otherwise.
32. Fracture, leg, simple.
33. Fracture, leg, G. S. W.
34. G. S. W. and other injury, foot and ankle.
35. Flat-foot. foot strain, bunions, hallux rigidus, etc.

Another circular was published in October following the completion of a plan by which an extensive segregation of patients according to diagnosis had been made, and the patients placed in groups in special wards.

At Savenay the first special wards to be provided were those for fractures of the femur and for amputations. These were provided during September. The obvious advantages of this plan led to the approval by Colonel Cooper early in October of a larger plan, by means of which, more than fourteen hundred beds were set aside in Base Hospital No. 8 with special wards for leg fractures below the knee (sixty-four beds), battle injuries of the knee joint (thirty-two beds), gun shot wounds and fractures of the upper extremities (two hundred fifty-six beds), gun shot fractures of the femur (one hundred ninety-six beds) and amputations (two hundred fifty beds).

The following is the plan outlined in the Circular issued October 15, 1918 to be used in receiving patients:

"A"—Patients will be admitted from the Receiving Room to Wards A-1 to A-15 and to Ward 5 in the following groups.

"B"—No patients are to be admitted direct to the "B" Wards. These will be reserved for patients who are ready for transfer to the United States.

A-1	(64 beds)—Miscellaneous (For cases in regard to the diagnosis of which the Receiving Office is in doubt.
A-2 & 3	(98 beds)—Amputation cases.
A-4	(32 beds)—Knee joint injuries.
A-5	(64 beds)—Leg fractures.
A-6, 7, 8, 9	(256 beds)—All injuries of the upper extremity including shoulder injuries.
A-10, 11, 12	(196 beds)—Fractures of the femur. (Femur cases will be evacuated direct from these wards to the train.)
A-15	(64 beds)—Foot injuries.
Ward No. 5	Will remain, at present, a ward for miscellaneous orthopedic cases."

"On the morning following the patients admission to Savenay, special buff cards for the Orthopedic Service will be distributed. They will contain the patient's name, number, unit, date of admission here, and diagnosis. They are to be completed in the manner indicated by the following:

"Yes" or "No" or "No"
NAME.....Doe, John.....RANK.....Pvt. .....
DATE.....Oct. 15, 1918.....No. .....1,000,000.....
UNIT.....Co. 1, 10 Inf. .....
DIAGNOSIS G. S. W. left leg with F. C. C. femur and injury to sciatic nerve.
(Diagnosis number) 27-31
CONDITION 1 2 3 4 (NOTES)
No splint
A B C D Treatment:
Thomas Splint
(Initials of Medical Officer) SAMPLE
Hosp. .....1.....2.....3..... BH.....4..... CARD

Condition as to readiness for transfer is indicated by writing on the top margin of the card as follows:

"Yes"—If no treatment is required and case is ready for immediate transfer.

"No"—If splinting is required and case will be ready for immediate transfer after the required splinting is completed.

"No"—If prolonged treatment is required to prepare case for evacuation.

Diagnosis numbers are entered in accordance with charts of diagnosis numbers already prepared.

Condition: 1—No splint required and wearing none.
2—Wearing satisfactory splint.
3—Wearing unsatisfactory splint.
4—Wearing no splint, but needing one.

A, B, C, D,—Classification as to the extent of disability.

Hosp. Number of hospitals through which patients have successively passed should be entered here, space (3) being for hospital from which cases have been transferred to this center.

These slips must be finished and returned to the Orthopedic Office before noon of the same day. There must be no exceptions to this rule.

Patients admitted during the preceeding 24 hours, who are found to require radical changes of splint or the application of new splints, may be sent at once or during the afternoon from 1:30 to 4:30 to the Plaster of Paris and Splint Room, where special Medical Officers will be on duty to deal with them. The splint or plaster cast recommended should be indicated on the special slip prepared for this purpose and should accompany the patient. In case of doubt, regarding the exact operation, or procedure to be used in the treatment of any patient, it is expected that the services of the Orthopedic Consultant or someone designated by him will be called for. Certain standard methods have been evolved for dealing with these conditions; but in this Center particularly with both treatment and evacuation in mind, careful judgment must be used, in order that the best interests of the patients may be served.

During the period of waiting for evacuation for most of the patients and during the stay in the hospital, extensive use is to be made of the services of the Reconstruction Aides. Walking patients are to have exercise and massage in groups and must be sent to the Orthopedic Department with special notes as to treatment suggested, at certain hours, as indicated in the following schedule:

(a) Patients with median, musculo-spiral and ulnar nerve injuries 10:30 to 11:30 every morning.

(b) Patients with knee-joint injuries for knee-joint, thigh, or leg massage, 1:30 to 2:30 p. m.

(c) Patients with sciatic, external popliteal, or

other nerve injuries of the lower extremities, 2:30 to 3:30 p. m.

(d) Patients with elbow injuries for forearm, hand or finger exercises, 3:30 to 4:30 p. m.

Other Reconstruction Aides, Occupational, will be available for directing the employment of bed patients. Any note directed to the consultant in Orthopedic Surgery on this subject, as to dealing with individual patients or wards as a whole, will receive prompt attention.

These points with regard to the records of these patients must be strictly complied with:

(a) The admission cards must be completed before noon of the day following the patient's arrival at the hospital and the cards must be sent at once to the Orthopedic Office.

(b) The patient's condition, when admitted, and the first recommendations must be entered the same day on the Field Medical Card so that the Field Medical Cards,as the patients proceed from admitting wards to the evacuation wards, will be complete in so far as Base Hospital No. 8 is concerned.

(c) The Orthopedic Office must be supplied at 9 o'clock each morning by the Medical Officer or the Nurse in charge of each ward with names, identification numbers, and organizations of all patients admitted to or discharged from the wards, above mentioned, during the 24 hours up to midnight of the day preceding. Lists of the wards will be checked every morning in the Orthopedic Office as to whether or not these reports have been received, and the reports must be sent before nine o'clock without fail."

Signed, H. W. Orr,
Capt., M. C. Chief of the Orthopedic Service, Base Hosp. No. 8, A. E. F.

The following report indicates that when possible, patients were followed to St. Nazaire and Brest for final inspection on the boats.

AMERICAN EXPEDITIONARY FORCES
BASE HOSPITAL NUMBER 8.
September 15th, 1918.

From : Chief of the Orthopedic Service.
To : Commanding Officer.
Subject: Condition of patients for transfer to the U. S.

Reporting on the condition of patients on board the.....visited on your instructions this afternoon, the following is respectfully submitted:

1. Patients leaving the Hospital at 10:00 p. m. last evening were placed on the boat between the hours of 9:00 and 10:00 this morning. Splints and apparatus were in good condition. No surgical dressings had been done since the patients left the hospital.

2. All splints had tags of instructions attached. The Medical Officer on the boat had deferred the surgical dressings until our arrival. He was in doubt as to the method of dealing with surgical dressings for patients in splints (samples of tag instructions are attached hereto for your information).

3. A number of the bed patients should have been dressed this morning. The ambulatory patients were all in good condition.

4. No Medical Officer or hospital corps man was found who had had previous experience in dealing with this class of patients, a considerable number of whom were elaborately splinted and require daily surgical dressing. For these patients to travel in comfort and safety it is necessary that the dressings be done without disturbing the splints and that the staff of surgeons and orderlies be adequate even under unfavorable conditions.

5. It is suggested that hereafter a medical officer accompany these patients until they are on board the boats, at least until they have had their first surgical attention. Also that arrangements be made so that in the case of larger convoys a medical officer from the Hospital with special experience in dealing with this class of cases should accompany them to their destination.

H. W. Orr, Capt., Chief of Orth. Service.

It was not until November that orders were given from the office of the Chief Surgeon A. E. F. that a medical officer should accompany each one hundred and fifty convalescent patients to the United States.

Hq. Hosp. Center Savenay,
27 November, 1918.

MEMO NO. 165

The following telegram is quoted for the information and guidance of all concerned:

CO. HOSPITAL CENTER SAVENAY*
2111
TO COMPLY WITH CABLED INSTRUCTIONS WAR DEPT., NOV. 23, 1918 A MORE CAREFUL SELECTION OF PATIENTS FOR RETURN TO THE UNITED STATES WILL BE MADE. NO CASE OF AMPUTATION COMMA BONE COMMA JOINT INJURY OR OTHER ORTHOPEDIC CONDITIONS WILL BE SENT TO THE U. S. WITHOUT APPROVAL OF ORTHOPEDIC CONSULTANT OF THE AREA. MC CAW

By direction:
C. S. ADAMS,
1st. Lt. San, Cps. Adjt.

1ph
copies to
8
69
100
113
119
214
Maj. Orr———
file

The following note is suggested by Colonel Goldthwait:

"The above telegram was, in part at least, the direct result of the conditions which followed a blunder upon the part of someone in sending several trainloads of patients direct to ships for the United States without preliminary treatment to prepare them for transportation. These patients went through a port at which no organization for the inspection and treatment of patients destined for the United States had been perfected, and the unfavorable condition of the patients for transfer to the United States was so apparent that another organization similar to the one which had been in operation at Savenay was prepared and placed in charge of the port through which, from that time forward, patients were to be sent from France to the United States."

To comply with the above, special slips were printed and signed by the Consulant in Orthopedic Surgery. One of these was thereafter affixed to the Field Card of each officer and man ready for transfer to the United States.

This procedure rendered formal the method of evacuating patients to the United States which had been employed since August at Savenay.

The final organization for the surgical side of the work at Savenay was only reached after the promulgation of Circular No. 57 and after the signing of the Armistice. During November the total number of patients in the Savenay Center reached eleven thousand. Of this number from forty-five hundred to five thousand were battle casualties. These were distributed to special wards as far as possible. Two principal operating rooms and five plaster and splint rooms were in almost constant operation. For the first time the influx of patients had been so great that it was quite impossible to deal with all the patients immediately upon arrival, as had usually been done before. It was necessary therefore to center all the efforts of the staff upon the problem of dealing adequately with all of the patients listed for convoys going out. That this was done with measurable success is evidenced by a letter received during January from the Surgeon General's Office:

(This letter will be found on page 39).

Also during November 1918, a more elaborate circular of instruction for methods of dealing with orthopedic patients arriving at Savenay was prepared by the consultant in orthopedic surgery. This was distributed to all ward surgeons, with the approval of the Commanding Officer of the Savenay Hospital Center and the Commanding Officers of Hospitals at Angers, Nantes and St. Nazaire. Additional copies were also prepared at the request of Colonel Goldthwait and sent to other Hospitals. This circular in itself tells so much about the Orthopedic side of the surgery in Base Hospitals that it is included entire.

"Hq. Hospital Center, Savenay,"
28 November 1918.

MEMO NO. 178

The following is published for the information and guidance of all concerned:

By Direction of
W. E. Cooper
Lt. Col., M. C., Commanding Officer.
C. S. Adams
1st Lt. San. Cps.
Adjutant.

INTRODUCTORY.

Certain data and conclusions resulting from a study of several thousand orthopedic cases at Savenay are submitted herewith as suggestions to the surgical services and the surgeons of this area. This information has been collected at the request of the Consultant in Orthopedic Surgery.* The conculsions reached have been concurred in by the officers whose names are attached. It is believed that the safety and comfort of patients being prepared for and sent on convoys to the United States would be materially improved by an observance of the suggestions following.

THE TREATMENT OF ORTHOPEDIC PATIENTS IN BASE HOSPITALS.

The considerations involved in the treatment of war wounds in Base Hospitals must be made to include not only existing and imminent surgical pathology but ultimate position and function of injured parts as well. It is these latter points which in both civil and military surgery, operators have been prone to overlook. A bleeding or an infected wound especially if of considerable size makes an immediate and urgent demand upon the surgeon's attention.. There has been a tremendous accumulation of evidence in this war to prove, however, that wounds of whatever size and character heal better if all the parts involved are restored immediately to and adequately maintained in as nearly as possible normal anatomical relations. The different effect of such treatment upon the patient's ultimate career should be almost too obvious to require comment.

IT IS A FACT, HOWEVER, THAT NOT ONLY BECAUSE OF THE STRESS OF WAR CONDITIONS, BUT BECAUSE OF THE FAILURE OF SURGEONS TO INTEREST THEMSELVES IN WHAT FOR CONVENIENCE, MUST BE CALLED THE ORTHOPEDIC VIEW POINT, MANY OF THESE PATIENTS IN BASE HOSPITALS FOR TREATMENT OR IN PREPARATION FOR CONVOY TO THE UNITED STATES HAVE NOT BEEN DEALT WITH ADEQUATELY IN THIS REGARD.*

At Savenay we have now received and passed on to the U. S. enough patients to justify us in reaching certain conclusions as to what these patients require. Patients arriving at Savenay have been dealt with largely from both standpoints of immediate need and the probable ultimate effect of the existing condition.

In presenting the following, one must say that conclusions are drawn not only from many years of experience in orthopedic surgery but from a more recent experience, extending over a year, in which under the direction of Sir Robert Jones and in association with Col. I. Lynn Thomas and Major Alwyn Smith, some thousands of British soldiers and pensioners were studied and operated upon. These patients were seen from a few months to more than three years after their original war injuries. At Savenay also we have now seen and treated several thousand of the American wounded. In the following discussion, reasons for the recommendation made, rest upon this experience.

The question of the operative and mechanical treatment of war injuries as they present themselves at Base Hospitals can best, for the purposes of this discussion, be considered in three ways.

First: The anatomical parts involved.

Second: The number of cases in each group per one thousand of orthopedic cases.

Third: Points in treatment to be observed.

As a result of our experience the suggestions in the following paragraphs will be made with just these points in mind and in the same order.

HEAD INJURY WITH PARALYSIS.

(Five cases per 1000). (Musculo spiral paralysis, ulnar paralysis. median paralysis, deltoid paralysis). Splints required: Hand cockup splint. aeroplane splint. In these conditions it is important to bear in mind that in many of these nerve injuries where there is only partial loss of power become paralysis becomes complete in time through failure to splint

*Special acknowledgement should be made of the help of Lt. Allen Potter, S. C. and Miss Margaret Blake, Reconstruction Aide in the preparation of this material.

*See table on page 37.

early. If the necessary nerve and muscle tissue are conserved, during the entire period of convalescence, an entirely unexpected amount of function will be found to be present at the end of treatment. Failure to maintain in relaxation, muscles involved in even temporary paralysis, results in quite unnecessary permanent disability. One of the points to be constantly borne in mind in the splinting of war injuries is that it is necessary to protect against overstretching muscles or muscle groups from which the nerve supply has been temporarily or permanently cut off. This is of the greatest importance in cases which within two or three months time require neuroplastic or teno-plastic operations.

GUNSHOT WOUNDS OF THE SHOULDER WITH FRACTURE.

(Thirty-five cases per 1000). In this condition immediately upon arrival at Base Hospitals either the aeroplane splint or a plaster of Paris jacket including the affected arm should be applied. In a considerable number of these cases, ankylosis of the shoulder is the end to be sought. For this purpose, plaster of Paris is the ideal device. The upper arm should be at an angle of from fifty to sixty degrees from the trunk, the arm carried well forward. The elbow should be at a right angle, the hand supinated and dorsiflexed. This position should be maintained from twelve to sixteen weeks. This gives a very full range of motion for the upper arm and much earlier healing than treatment in any other splint. When preliminary healing with flail shoulder has been permitted arthrodesis of the shoulder should be sought by secondary surgical treatment along similar lines.

GUN SHOT WOUNDS OF THE UPPER ARM WITH FRACTURE OF THE HUMERUS.

(Seventy-five cases per 1000). Practically all gun shot fractures of the humerus are received at Base Hospitals in the straight Jones splint with the elbow straight and the hand pronated. For purposes of transportation and during the first two or three weeks following injury, this splint has much to commend it. It is very commonly poorly applied. Enough traction should be used to keep the ring firmly in the axilla and to contribute to the immobilization of the entire arm. Care must be taken to avoid the application of too much traction. Several cases have been seen in which one or two inches have been added to arms with humerus fractures by excessive traction in the splint. Not very much traction is necessary. Immediately upon arrival at a Base Hospital, the straight splint should be removed and the elbow flexed with the hand supinated. The Jones humerus traction splint may be used as an ambulatory splint or with the patient in bed and the arm suspended. Plaster of Paris can often be used to advantage. (There has been some disposition to discuss the propriety of flexing elbows in fractures of the lower third. It is especially important to do so, however, even fractures in which the lower fragment cannot be entirely controlled). Further modification of the arm at the point of callus is easier than if bony ankylosis of the elbow appears.

GUN SHOT WOUNDS OF THE ELBOW.

(Fifty cases per 1000). In general the same remarks apply as for fracture of the humerus. It is important to remember that extremely serious damage to the elbow joint must be considered not as a contra indication to flexion as has often been the case, but as an indication. Secondary surgery following complete ankylosis of the elbow is sometimes necessary to provide rotation of the forearm. This can be accomplished by removal of the head of the radius at a point below the orbicular ligament. Various operations have been performed for mobilizing stiff elbows. In general it may be said, however, that for most severe injuries of the elbow joint ankylosis in the position of election has proven superior to even the fairly successful mobilized elbow joint.

GUN SHOT WOUND WITH FRACTURE OF THE FOREARM, WRIST AND HAND.

(Two hundred cases per 1000). For early treatment three principal considerations are essential; immobilization, supination of the forearm, and dorsal flexion of the hand. This injury provides one of the most common and one of the most difficult disabilities of the war. In old cases, non-union of the radius and ulna has been rather common. Immobilization is the answer. No other splint is so satisfactory for the forearm as plaster of Paris extending to the shoulder. In wounds of the wrist and meta carpals, a straight arm and hand splint has been and is being commonly used. That and the Jones full cock-up splint, except for very short periods, should be entirely discarded. The cock-up position of the hand should be used but with a splint which permits full flexion of the fingers. If there is a tendency toward contracture deformity of the fingers, they should be kept in the fully extended position a short time every day.

GUN SHOT WOUNDS OF THE MEDIAN, MUSCULO SPIRAL OR ULNAR NERVES.

(Eighty-five cases per 1000). The arm and forearm splints required are the same as in gun shot wounds of the brachial plexus. Injuries to these nerves occur either independently or associated with fractures of the humerus. The nerve injury may also be complete division or only a partial division or contusion. The accompanying paralysis in any case must always be splinted in the same way as long as it exists and until complete recovery results, spontaneously or following surgical treatment. Operative reunion of completely divided nerves can only be undertaken after some weeks of sound healing. The rule of the British was six to twelve weeks. It was also suggested by the British that from one to two weeks massage of the wound area, as a preliminary to operation would serve to indicate whether or not operative trauma would be tolerated. Extensive loss of nerve tissue opens up also the question of tendon transference in these cases, as does also extensive loss of muscle tissue. This question must be discussed at another time. The details of technique of nerve resuture have also been extensively discussed in the literature of the past two years. Careful splinting after all these operations and the best methods of electro therapy, massage and vocational therapy must also be employed particularly in these cases to obtain the best ultimate result.

GUN SHOT WOUNDS AND OTHER INJURIES OF THE SPINE.

(Ten cases per 1000). The indications in either spine injuries or in secondary Potts diseases (a few cases of which have been seen) are usually for fixation either in a plaster jacket or on a Bradford frame. It is now recommended that the trench litter take the place of the Bradford frame for the transportation of these cases. By making use of the retaining straps on a rigid litter, these patients can travel quite safely and comfortably. In very few of the cases seen has any immobilization or protection of any kind been provided. In a few cases in which adequate early immobiliation has been used, early recovery from the paralytic symptoms has been observed. Laminectomy must of course be done in carefully selected cases.

GUN SHOT WOUNDS AND OTHER FRACTURES OF THE HIP.

(Ten cases per 1000). Early and adequate splinting of gun shot fractures of the hip and shaft of the femur has yielded some of the most brilliant results in the treatment of war conditions. The mortality has been greatly reduced for both transportation and treatment in Base Hospitals. No other single factor has contributed so much as the Thomas Thigh Traction Splint. It is unfortunately true that the efficiency of the splinting has not always been maintained between the front lines and the hospitals further back. The Thomas splint should be applied and cared for always in the same manner. The introduction of individual methods invariably leads to a loss of efficiency, as patients pass from the hands of one surgeon or hospital to another. The following points must be observed. A long splint and a well fitting ring must be selected. It must be bent to an angle of 10 to 15 degrees at a point 1½ inches above the level of the knee joint. Having regard for wounds, the adhesive traction bands (of Sinclair glue or Moleskin plaster) must include as much skin of the leg and thigh and extend as high as possible. The traction ropes, for twisting, attached to the lower end of the adhesive, should be of ¼-inch rope or of 4 ply muslin, fastened very securely into the adhesive, so that it will not give way under a pull of even 15 to 20 pounds. Muslin hammocks of not more than 4 inches in width should be placed across the splint for its entire length at a sufficient tension so that the leg rides well on the top of the splint. The splint is then put on and the traction straps tied firmly over the lower end with back of the ring tight against the tuberosity of the ischium. A right angle foot piece is put on and the foot and knee bandaged in such a way as to put the entire extremity at rest in the splint. The twisting of the traction bands should have attention once or twice daily. The lower end of the splint should be tied to the outer end of the foot of the bed in such a position that the lower end of the femur rotates slightly outward. The foot of the bed should be raised 12 inches so that the patient's body acts as a counterweight to pull against the anchored splint. By following exactly this technique it has been possible at Savenay to demonstrate an average gain in length of more than 3 Cm. in a series of over 300 cases. In dealing with open wounds in this splint, it is only necessary to release one or two of the four-inch hammocks. Care must be taken so that the area of the fracture is not moved or allowed to sag below the level of the normal anterior curve of the femur. In fractures of the neck, as soon as feasible, good traction and slight abduction having been maintained in the meantime, a plaster of Paris spica with full abduction (Whitman method) should be applied. The Thomas double abduction splint should not be used except by those with experience in the use of this particular device. In complete destruction of the neck with loss of substance, early excision of the head, through a posterior incision, is advised. Following this operation also, as soon as the wound permits, a plaster spica with full abduction should be used. Departure from the principles enunciated above for special purposes should seldom be made. Lowering of the foot of the bed or raising of the head are only justifiable under exceptional circumstances.

GUN SHOT WOUNDS AND OTHER FRACTURES OF THE FEMUR.

(Seventy-five cases per 1000). All of the remarks just above with reference to the application of the Thomas splint in hip fractures apply to fractures of the shaft. An astonishingly large number of femur fractures of the shaft, apparently well splinted at the front, arrive at Savenay at the end of six to twelve weeks with from one to three inches of shortening. A large amount of this must be charged to failure to make continuous efficient use of the Thomas splint. This splint either with or without overhead suspension in the Balkan frame must be considered to have proven by far the best method of treatment.

GUN SHOT WOUNDS OF THE KNEE JOINT.

(Twenty-five cases per 1000). Omitting from this discussion the question of open or closed treatment of knee joint injuries at the front, one must discuss the two questions of treatment of septic knee joints by immobilization or with motion and the question of drainage in the later severe septic knee cases. By the work of Willems, it has been adequately shown that certain acute septic knees can be treated to best advantage with adequate drainage and active motion. It is obvious, however, that this motion must be intelligent and carefully controlled. It is not to be construed that such patients may be permitted to travel either from one hospital to another or the United States without such immobilization either in a Thomas splint or plaster of Paris that they are protected against traumatism. Any of the septic cases may require additional drainage. All the methods, including reflection of the patella have been tried. One of the most valuable incisions for draining the popliteal space has been worked out and used by Capt. L. C. Abbott. It consists of about a 4-inch incision along the inner and posterior border at the upper end of the tibia. This is followed up through the space under the insertion of the popliteus into the knee joint and drains one of the most dependent and difficult of access synovial spaces in the joint. This incision may be extended upwards over the back of the internal condyle. By keeping in close contact with the bone, the entire popliteal area can be drained with much less risk to the vessels than through any posterior incision.

OTHER DERANGEMENTS OF THE KNEE JOINT.

(Ten cases per 1000). One of the constant problems arising out of military service is that ordinarily placed under this rather vague heading. This includes loose bodies, damage to the external and internal semilunar cartilages, rupture of or damage to the crucial ligaments, or the extrinsic ligaments of the knee joint. A very considerable number of these cases have not yet reached the Base Hospitals but will eventually be the means of excluding men from military service. Treatment includes; modification of boots; removal of loose bodies or semilunar cartilages, as has been so skillfully practiced by Sir Robert Jones; and even in some cases, reconstruction of new crucial ligaments from ham string tendons or fascia lata as has been so successfully carried out by Major Alwyn Smith at Cardiff and Major Hey Groves at Bristol. Differential diagnosis of these conditions presents some difficulties. An operation should not be done until not only a diagnosis has been made, but the possibilities as to operative results following operations for comparatively trivial conditions have been seen. The experience of civil practice has shown the wisdom of resection and arthrodesis for prolonged infections of the knee joint or those which become tuberculous.

GUN SHOT WOUNDS OF THE THIGH AND LEG WITH NERVE INJURY.

(Fifty cases per 1000). These patients usually present themselves with drop foot, due to injury of the sciatic or external popliteal nerve. Such cases must always be carefully splinted to maintain the

foot at a right angle. The question of nerve resuture, tendon transference, or arthrodesis of the ankle which will arise later, involve too many questions to discuss here. For patients able to walk the right angle posterior iron of the British or the modification of the French splint with the double lateral iron outside the shoe should always be used to protect the patient against drop foot. Walking patients should always wear a simple right angle splint at night. Injuries of the anterior crural are rarely seen. When found, however, a long splint should always be worn to protect the knee which is inclined to recurvation.

GUN SHOT WOUNDS WITH FRACTURE OF THE LEG.

(One hundred cases per 1000). This is one of the most common of the war injuries and one of the most difficult to treat satisfactorily. Adequate fixation with the Thomas splint or with the ordinary posterior thigh and leg splints is rare. This is especially the case when patients are being moved about. It is especially in this class of cases that plaster of Paris may be and should be used. It is the only device that uniformly provides length, position, and immobilization. Many of these cases with extensive loss of bone substance will recover if carefully treated in this way. (Non-union, and mal union, however, are seen very commonly.)

GUN SHOT WOUNDS OF THE FOOT AND ANKLE.

(One hundred twenty cases per 1000). Adequate fixation of these wounds with the foot at a right angle to the leg and slightly inverted must be the invariable rule. Practically all of these wounds even including those of the toes, cause much disability. Where there is extensive damage to the calcaneum or the metatarsus, amputation must frequently be considered. When the ankle joint only is involved, astragalectomy with adequate drainage will often give a good result. After the period of active treatment, the use of right angle foot splints, inside or outside irons or double lateral irons, as so extensively practiced by the British, is to be highly recommended. Splints should be used until stability of the foot and ankle is well reestablished.

FLAT FOOT, FOOT STRAIN, BUNIONS, HALLUX RIGIDUS.

These are dealt with in military hospitals usually by non surgical methods. Arch supports and foot plates are practically never employed. The long or short Goldthwait straps are useful in weak foot and metatarsalgia. For the rest, Thomas heels, sole bars, and inside wedges on soles must ordinarily be relied upon. The shape and size of shoes must, of course, be right to begin with.

SOFT PART WOUNDS WITH DAMAGE TO MUSCLES AND TENDONS OF THE UPPER AND LOWER EXTREMITIES.

(One hundred twenty-five cases to 150 cases per 1000). Especially in the vicinity of joints, these wounds contribute a very large share of the serious war wound deformities. It should always be remembered that any deformity of this sort represents healing in a malposition that could have and should have been prevented in the first instance by proper splinting. Contracture deformity of the knee from posterior thigh and leg wounds is especially common. This and associated drop foot may always be prevented by the simple expedient of applying suitable apparatus before malposition developes. The apparatus should be worn continuously until healing is complete.

AMPUTATION STUMPS.

This class of patients constitutes a group which has commonly been neglected and require special care directed toward the end of securing the maximum function when the stumps have been finally provided with the proper prosthesis.

Three types of amputation may be distinguished and their frequency in cases arriving at Savenay is as follows:

1. Guillotine or Flapless, (500 per 1000 amputations).
2. Flaps, but without suture, (300 per 1000 amputations).
3. Primary Suture, (200 per 1000 amputations).

The frequency of amputation at various sites is as follows:

Shoulder Disarticulation, (30 per 1000 amputations).
Upper Arm, (120 per 1000 amputations).
Forearm, (120 per 1000 amputations.
Hip Disarticulation, (10 per 1000 amputations).
Thigh, (500) per 1000 amputations).
Leg, (120 per 1000 amputations).
Ankle, (30 per 1000 amputations).
Tarsus or Metatarsus, (40 per 1000 amputations).

The treatment at an embarkation center, such as Savenay, is directed toward checking the condition of the patient upon arrival and in improving that condition until it reaches the standard which justifies transfer to the U. S.

WOUND TREATMENT.

No case should be evacuated in which the wounds are dirty, discharging profusely, or pocketing, or in which there is uncovered bone protruding. In the first category the sepsis is most commonly due to pus pockets and incision and drainage will correct it. In the second category a simple bone shortening operation, removing the bone ½ to ¾ inch above the wound level and without any attempt at closure, gives the best result and prepares the stump for final plastic closure upon arrival in the U. S. On the other hand it has been noted that stumps whose wounds present large open surfaces travel well, provided they are clean, red, and healthy, and that the bone is covered with granulation tissue. Reamputation or secondary closure should be postponed in all cases where the patient is able to travel with safety until his arrival in the U. S.

TRACTION.

The inevitable retraction of the skin and soft parts from the end of the bone in all cases where the wound is left open demands the application of traction to counteract this tendency in a large number of cases. The experience at Savenay has shown that a large number of cases who require traction arrive without it. The remarkable results that may be obtained in pulling down and closing amputation wounds, which seemingly have hopelessly retracted, makes it advisable to apply traction even when the skin edges are adherent and the soft parts no longer mobile in their retracted position. For purposes of travel, traction is practicularly valuable as it immobilizes the tissues about the wound, restores muscle tone, and prevents contracture deformity of the stump.

Traction to be maintained during the voyage must be obtained by use of the Thomas traction splint. Traction bands of moleskin 3 inches in width are fastened to the skin of the stump in the vertical direction over as large an extent as possible beginning at a point about one inch distant from the wound margin. The number and arrangement of these strips varies with the shape of the wound and the work to be accomplished. For a guillotine wound four is the usual number and they are fastened above, below, and at the sides. The dressing is then applied and secured by a few turns of bandage, the traction tails remaining free. A properly fitting

Thomas splint is then applied. In cases where the thigh is small, the Thomas arm splint may be used, and in arm cases, the hinged Thomas arm splint is good as it allows motion at the shoulder. In leg cases where the patient is upon crutches, the end of the splint may be bent over, thus shortening it so as to permit walking. The stump is supported in the splint by four-inch muslin slings, passing underneath and fastened to the side bars. The traction is obtained by fixing the traction tails to a square wooden spreader which fits between the side bars of the splint and which in turn is pulled down and tied to the end of the splint by means of two strands of rope or muslin, attached to the center of the block. By inserting a tongue depressor or nail between the strands of the rope and twisting,* any desired amount of traction may be secured. Ordinarily the traction spreader or block is furnished with buckles on each of its four sides so that the traction tails may be quickly and conveniently fastened. A few turns of gauze bandage around the stump and splint securely fix the stump in place.

It must be emphasized that there is not another factor so valuable in the treatment of amputations as traction. In severe cases of retraction it may be necessary to utilize the counter-weight of the body by fixing the end of the traction splint to the foot of the bed and elevating the latter about twelve inches in order to secure adequate traction. No appreciable gain may be noted at first, but a good result is almost always secured finally.

STUMP TREATMENT.

Contractures have been found to exist in 12% of the amputation cases admitted to Savenay. These are usually flexion contractures of the thigh at the hip or of the leg at the knee. They occur usually as a result of the baneful practice of propping stumps on cushions. They constitute, when allowed to persist, a serious cause of impairment in final function and if not corrected early become very resistant to treatment. Thigh contractures may not be noticed unless the precaution is taken in testing for them of flexing the sound thigh upon the abdomen in order to immobilize the pelvis.

At Savenay no great difficulty has been experienced in correcting stump contractures by simple methods of massage and exercise. The patient must be taught the necessity of moving the stump through the full range of motion several times a day and a certain amount of supervision must be given to this. Where reconstruction aides are attached to a hospital their services have been of great value in this respect. Where simple methods do not suffice, traction will usually correct the deformity. It should be emphasized that where traction has been used these deformities do not occur. In the upper extremity flexion contracture of the forearm, loss of supination and limitation of abduction at the shoulder are the common deformities and should be guarded against by massage and putting the stump through the full range of motion several times a day.

PROVISIONAL PROTHESIS.

Application of temporary artificial legs or pegs to leg stumps which are healed or in which the wound is small has proven of the greatest value in restoring function. Not only is the muscular power restored, but any tendency to contracture or joint stiffness is prevented. They promote stump shrinkage and shorten the time before the final prothesis can be applied. (By providing and pressure pads the end of the stumps is hardened and weight bearing increased). The effect upon the patient's morale is notable. The limbs used at Savenay are far above the knee stump pegs provided with plaster of Paris buckets, and far below the knee skeleton legs with articulated feet. These forms of apparatus are finished ready for application within 24 hours after the patient's first visit to the shop. The men require a certain amount of instruction and practice before they walk well or use their leg with facility. For this reason instruction classes are held daily under the direction of an officer experienced in physical education. Not only are the men given practice in walking but classes in which general physical training is given are held. These have proven of great benefit.

*The so-called Spanish Windlass.

PROGRAM OF TREATMENT.

1. Following the plan in use for receiving all orthopedic patients at this center, amputation patients should be seen within 24 hours of their arrival by the orthopedic officer specially delegated to look after these cases. The wound should be inspected and note made as to its condition. If surgical treatment is necessary this should be immediately arranged for. At the same time the range of motion of the stump should be examined and deformities looked for. Traction should be applied where indicated. If the latter is all that is required the case should be marked "for transfer to the U. S." either as a bed, a clutch, or a walking case.

2. If the patient is ambulatory he should be directed to report to the Center Gymnasium for physical training. Arm classes are held at 9:00 a. m., and leg classes at 10:00 a. m. Attendance at these classes does not warrant delaying transference of the patient to the U. S. However, attendance is required during the man's stay in the center.

3. In leg cases in which the stump is sufficiently healed to wear a provisional limb the patient should be told to report to the Center leg shop at 9 a. m. the following day.

4. The benefits to be obtained from the massage and exercise, as given by the Reconstruction Aides attached to the hospital should be constantly born in mind and where indicated should be prescribed on prescription blanks and the patient sent with the note to the massage clinic at designated hours.

5. No case in which a temporary limb has been ordered should be allowed to be evacuated until the leg is applied and a certain amount of instruction given in its use. The maximum time required for this is five days.

FINAL INSPECTION OF ORTHOPEDIC PATIENTS.

In conformity with the instructions from the Chief Surgeon, A. E. F., of November 27, 1918, no orthopaedic case should be evacuated until a proper note of the man's condition and treatment has been made upon the Field Medical Card and the envelope marked ORTHOPEDIC PATIENT, APPROVED FOR TRANSFER TO U. S. and signed by the officer to whom this responsibility has been delegated.

(Signed)
H. W. Orr, Major, M. C.
Consultant in Orthopaedic Surgery
Hospital Area of Savenay, Nantes and St. Nazaire.
P. D. Wilson, Capt., M. C.
Consultant in Orthopedic Surgery (Amputations)
Hospital Area for Savenay.
L. C. Abbott, Capt. M. C.
Orthopedic Service, Base Hospital No. 8.

A little later it was found that we had in our base hospitals somewhat the same tendency that had been observed with the British; namely, that a few patients were being

overlooked in the special effort required to care for the more seriously wounded and to expedite the return to the United States of those better able to travel. A plan was adopted, therefore, similar to one successfully used by the British for locating patients who were an unduly long time in Base hospitals. This had a double purpose of locating the seriously wounded by a visit of the Consulting Orthopedic Surgeon, and of discovering any who were able to be transferred but who had been overlooked.

The following circular was sent to Chiefs of Surgical Services as indicated.

Office of the Consultant in Orthopaedic Surgery for Hospital Center Savenay, Base Hospital No. 101, Nantes and Angers.

MEMORANDUM TO CHIEFS OF SURGICAL SERVICES:

On and after October 31st, 1918, it is requested that lists be submitted to this office showing the number of patients on hand in your service of Bone and Joint Injury, Amputation, Spine Injury, Sacro-iliac Injury or disease, Flat Foot, Weak Foot, Existing or impending deformity due to the above or soft part injuries who have been in your Hospital sixty (60) days or more. This list is to take the form indicated below and should be arranged in order according to the dates of admission of patients to the Hospital. Lists must be completed and either sent or delivered in person not later than the fifth of the month following.

Report of Base Hospital No..... for the month ending.....191.....

Patient's Name	Identification No.	Diagnosis	Days in Hosp.	Reasons for being in hospital more than 60 days.

(Signed).....

Chief of Surgical Service.
H. W. Orr, Major, M. C.

The following are specimen reports sent in response to the above.

Report of Base Hospital 27, Angers for the Month Ending Oct. 31, 1918.

Name	Number	Diagnosis	Days in Hospital	Reason
Althus, Edward	273709	Shell Concussion *right knee*	85	Difficulty in diagnosis, prospect of recovery Now "D".
Boyke, W. R.	39774	C. C. F. head of rt. humerus	100	Serious infection and poor general condition.
Burlingham, N. J.	188277	Sprain of rt. ankle and Tendo-Achilles	70	Gradual recovery with good prognosis.
Chorengle, Chas.	563084	c. c. f. head of left humerus	75	Serious infection and poor general condition.
Elkin, Jacob	106858	g. s. w. left knee and fractured patella	100	Serious infection with secondary abscesses.
Good, Albert	269375	G. S. W. left knee	85	Prospect of good function. Now "D".
Holder, Purdy	304849	g. s. w. left shoulder	90	Held as ward orderly.
Kerr, F. W.	1245654	g. s. w. both thighs penetrating	105	In Hosp. Annex. Did not report for examination.
Strautman, H. H.	.....	f. c. c. left tibia	135	(as above).
Nordan, H. R.	1680143	g. s. w. rt. foot	61	(as above).
Murray, Chas.	1941228	g. s. w. rt. knee	75	Serious infection with secondary abscesses.
Jirvey, F. J.	Captain	f. c. c. left oscalcis	88	Serious infection with multiple abscesses.
Stallings, L. T., Jr.	2nd Lt.	g. s. w. rt. knee	100	Serious infection Poor general condition. Now "D".
Fillmyer, Jos.	1241718	g. s. w. rt. knee	75	Secondary abscess. Now "D".

(Signed) E. W. Fiske, Capt. M. C.
Chief of Orthopedic Service.

Base Hospital No. 101, SOS, U. S. A. P. O. No. 701, S t, Nazaire, France. November 5, 1918.

REPORT OF BASE HOSPITAL NO. 101, FOR THE MONTH ENDING 31st, OCTOBER, 1918.

Patient's Name	Identification No.	Diagnosis		Reason for Being in Hosp. Over 60 Days.
1. Clark, Eugene Private, Co. 83 6th U. S. M. C.	122145	GSW. left knee.	143	Severe infection has made evacuation impossible.
2. Campbell, Thomas F. Corporal, C. B 11th Infantry.	1243540	GSW. left leg; fracture compound cominuted left femur.	117	Has not been in condition to evacuate.
3. Katzenberg, Geo. W. Corporal, Co. 55 5th U. S. M. C.	119455	GSW. left thigh; fracture compound left femur.	69	Has not been in condition to evacuate.
4. Garufi, Joe Private 1-c Co. L 11th Infantry.	1245748	GSW. right thigh, fracture compound comminuted rt. femur.	69	Has not been in condition to evacuate.
5. Lepechoux, Jean	None	Fracture, simple, fibula and tibia, left.	88	Not able for duty.
6. Colacello, John	51732	Hallux valgus, bilateral (Operated 3 Oct., 1918) Admitted June 11 with carbuncle, lumbar region.	143	Has not recovered from operation.
7. Pinel, Claire French Civilian.	None	Fracture, compound, vault of cranium; fracture simple rt. tibia and fibula, lower, ⅓; lacerated wound, fibula, lower ⅓; lacerated wounr, dorsum right foot.	100	Convalescing.
8. Halles, Francois French Civilian Employee.	None	Lacerated wound right wrist, dorsal surface; contusions, multiple, severe, right thigh and knee, anterior surface left chest; lacerated wounds, multiple, on scalp.	64	Not able for duty.

To: Consultant in Orthopedic Surgery for Hospital Center Savenay.
P. P. Nesbit, 1st Lieut. M. C., U. S. A.
Chief of the Surgical Service.

PPN-JLB

The following represents practically the final arrangement of affairs at Savenay. At any rate this plan held until in February 1919, at which time the Consultants changed.

Savenay, December 16, 1918.

FROM: Consultant in Orthopedic Surgery.
TO: Commanding Officer, Savenay Hospital Center.
SUBJECT: Appointment and duties of officers assigned to duty as Orthopedic Surgeons.

SIR:

In order to carry out the instructions of the Chief Surgeon as provided in Circulars No. 46 of August 16, 1918, and No. 57 of November 20, 1918, the following recommendations are respectfully submitted.

(a) That appointments be made as follows:

In Base Hospital No. 8—
Chief of the Clinical Service in Orthopedic Surgery. Capt. L. C. Abbott.
As Special assistants, Captain W. C. Roberts, Lt. L. T. Thaxter, and Lt. G. H. Reams.

In Base Hospital No. 69—
Chief of the Clinical Service in Orthopedic Surgery,
Major M. S. Danforth.
As special assistants, Lt. H. J. Dauterive and Lt. Edw. Jelks.

In Base Hospital No. 100—
Chief of the Clinical Service in Orthopedic Surgery,
Major A. H. Cilley.
As special assistants, Lt. D. L. Alexander and Lt. J. B. Webster.

In Base Hospital No. 113—
Chief of the Clinical Service in Orthopedic Surgery,
Lt. Staben.
As special assistant, Lt. B. L. Corbett.

In Base Hospital No. 119—
Chief of the Clinical Service in Orthopedic Surgery,
Lt. McKay.
As special assistant, Lt. J. R. Pritchard.

(b) It is recommended that it be made the duty of the Chief of the Clinical Service in Orthopedic Surgery to secure the name and the diagnosis and to record in writing a recommendation as to treatment for every patient upon admission for whom it is prescribed that he shall have orthopedic treatment and care. (Circular No. 46 of August 16, 1918).

It is recommended also that these notes be made in the form of index cards which can be filed; and these shall include, among other items of information; name, organization, regimental number, date of admission diagnosis, condition upon admission, and hospital from which admitted; and that the above, with recommendations as to treatment and the report as to whether this treatment is carried out, be made a minimum requirement as to information concerning each patient passing through this department in each hospital.

(c) It is also recommended that the Chiefs of the Clinical Service in Orthopedic Surgery shall be requested to conform in general to the recommendations, regarding treatment contained in Memorandum 173, Headquarters Savenay Hospital Center, of November 28, 1918, and that ward surgeons, in treating cases of the classes therein discussed, shall make departures from the methods therein recommended only after consultation with and permission from the Chiefs of the Clinical Service in Orthopedic Surgery or their assistants.

It is also recommended that differences of opinion between ward surgeons and Chiefs of the Clinical Surgery be referred for decision to the Consultant in Orthopedic Surgery.

(d) It is recommended that the Chief of the Clinical Service in Orthopedic Surgery for each hospital

be instructed to submit at the end of each month a list of medical officers assigned to duty in his hospital as orthopedic surgeons and a supplementary list of medical officers assigned to duty as ward surgeons in wards where orthopedic cases are being treated.

(e) This report should indicate also in general the character of work done in each of the wards or departments to which the above officers are assigned, and the number of days of service in each ward or department, and any recommendations regarding containuation of or changes in such assignments. Special reports with regard to any of the above may be made at any time when deemed necessary.

It is recommended also that this report include a statement specifying the number of patients admitted to, treated in, and discharged from the department during the month, the number and in general the character of the surgical operations performed, the number of plaster casts applied, and the number of splints changed or applied for the first time.

It is recommended also that the Chief of the Clinical Service in Orthopedic Surgery in each hospital shall be instructed to include in his monthly report and to make special report at other times as required in regard to such changes in organization, conduct of department and wards, including operating rooms and surgical rooms, as may be necessary for dealing most satisfactorily with patients of the above classes as are under treatment or who may be expected for treatment. This may be made to include also recommendations regarding necessary equipment or supplies. Reports upon any other matters of interest to the Chief Surgeon A. E. F. or the Consultant in Orthopedic Surgery as indicated in Circulars No. 46 and No. 57 shall also be provided for.

2. Respectfully submitted,

H. W. Orr, Major, M. C.

The following was the first of the reports called for by Circular No. 57.

Hospital Center, Savenay
December 30, 1918.

FROM: Consultant in Orthopedic Surgery, Base Hospitals 8, 69, 100, 113, 119 at Savenay, Base Hospitals 11, 34, 38 and 216 at Nantes, Base Hospital No. 101 at St. Nazaire, Base Hospital No. 27 at Angers.

TO: The Chief Surgeon, American E. F.

SUBJECT: Report for November.

Sir: In compliance with Circular No. 57 of November 20th, 1918, from the Office of the Chief Surgeon, American E. F. the report herewith is respectfully submitted.

1. Attention is requested to the following points which are dealt with in greater detail in the report.

2. The efforts of the Orthopedic staffs in the above hospitals have been centered upon adequate surgical treatment and careful splinting of these patients during their stay in Hospital and upon the application of therapeutic and protective mechanical appliances for their transportation to the United States.

3. The chief features of the plan for dealing with patients of these hospitals have been:

(a) A card index system with a card for every patient upon admission, indicating his condition upon arrival and providing for inspection and recommendation in regard to treatment within twenty-four hours of arrival.

(b) The appointment of special officers who either by special visits to wards or by checking in the dispensary clinics have made sure that all such recommendations were promptly carried out.

(c) The provision of clinics corresponding to outdoor dispensary clinics to which patients could be sent for splint and plaster work and the provision of special teams in these splint rooms and operating theatres for the carrying out of such recommendations.

(d) The re-examination and checking as to condition of all patients upon passenger lists and upon their departure from Savenay for transfer to the United States.

4. Final figures are not available but the results so far emphasize the fact that conservative surgery and careful splinting have reduced mortality and hastened the healing of wounds.* The period of stay in hospital has been materially shortened and many extremities have been saved. The number of amputations necessary has been comparatively small. At one hospital (Base Hospital No. 8), through the orthopedic service of which in November more than three thousand patients passed, not a single arm amputation has been done.

*See letter on page 38.

5. In the amputation service, Captain Phillip D. Wilson in charge, two features have been emphasized; the application of traction to the skin in order to preserve the length of amputation stumps; and the provision of temporary artificial legs to shorten the period before permanent legs can be applied and for its effect upon men who would otherwise be spending a much longer time on crutches.

6. Under the head of surgical operations performed it will be noted that many are manipulations or corrections under anaesthetic. These are almost uniformly revisions of position of bone and joint injuries or of contractures following nerve injury which would become fixed deformities and require much more radical surgery if permitted to travel to the United States and remain uncorrected even four or six weeks longer. Some of the most valuable work in this service has been done in this way. The total number of such cases treated has averaged not far from 25 to 50 a day.

7. The work of the Reconstruction Aides was inaugurated actively in November. The division of Physiotherapy during that month cared for 2,870 bed cases and 570 clinic cases—a total of 3,440 treatments for the month.

The occupational training department was begun in November with an average of 50 cases a day. The capacity of the shop is being increased and the equipment improved to meet the requirements of the work.

8. Excellent cooperation in the carrying out of the measures advocated for these patients by the orthopedic service has been obtained in all of the hospitals of this center without exception. Exceptionally favorable conditions have been provided and exceptionally good work has been done in Base Hospitals Nos. 8, 11, 34, 69, and 101. In the other hospitals the organization is proceeding and similar work and similar results may be expected.

9. Additional officers and increasing equipment and supplies which have been arriving since November 15th have greatly facilitated the work. Certain further requirments are specified on page —— of the report.

10. No report of this work would be complete without a tribute to the great influence of the visits to this center of the Chief Consultant in Orthopedic Surgery. The inspiration derived from his labors and ideals has been one of the chief factors in whatever has been accomplished and whatever may be done from this time forward.

11. It is desired also to place on record the fact that the Commanding Officer of the Savenay Hospital Center because of his vision in regard to this work and because of numerous decisions contributing to the development of this department has been

largely instrumental in the favorable solution of many of our difficult problems.

12. Respectfully submitted,

H. W. Orr, Major, M. C., U. S. A.

Base Hospital No. 8 was the first and the most active of the hospitals in Base Section No. 1. The more important surgical cases were cared for in Base Hospitals Nos. 8, 11, 27, 34, 69, 88 and 101. The following table is for Base Hospital No. 8 alone, but gives some idea of the movement of patients—from 50 to 75% of these patients from August to December 1918 were surgical and orthopedic cases.

Base Hospital No. 8, B. S. No. 1, American E. F.

	No. admissions during month	Average Daily number patients	No. of SCD cases to USA during month	No. deaths during month
Sept. 1917	84	30	None	None
Oct. 1917	149	86	"	"
Nov. 1917	226	117	3	1
Dec. 1917	408	223	None	1
Jan. 1918	652	359	247	15
Jan. 1918	652	359	247	15
Febr. 1918	356	380	83	3
Mar. 1918	1115	683	233	3
Apr. 1918	805	866	345	3
May 1918	423	709	158	2
June 1918	1559	1051	344	6
July 1918	2333	1735	657	4
Aug. 1918	3439	2257	1561	15
Sept. 1918	4834	2949	1885	20
Oct. 1918	7347	3721	3149	63
Nov. 1918	7057	4941	4897	31
Dec. 1918	1936	3867	2859	31
Jan. 1919	2472	2397	2160	20

During January the Consultant in Orthopedic Surgery was directed to visit all Camp Hospitals in Base Section No. 1. This was done and reports made to the Base Surgeon.

AMERICAN EXPEDITIONARY FORCES,
FRANCE.
Hq. Hospital Center, Savenay, Jan. 30, 1919.

SPECIAL ORDERS:

* * * EXTRACT * * *

24. Pursuant to instructions contained in Par. 13, SO 27, Hdqurs. Base Section No. 1, SOS, dated January 27, 1919, Major H. W. Orr, M. C., Consultant in Orthopedic Surgery, Base Hospital No. 8, this Center, will proceed to Vannes, Carnac, and Plouharnel (Morbihan) for temporary duty for the purpose of ascertaining the number of cases of bone and joint or other orthopedic conditions in the vicinity of the above named places and will report his findings to the Surgeon, Base Section No. 1. Upon completion of this duty, Major Orr will return to his proper station.

The travel directed is necessary in the military service.

by ORDER OF COLONEL COOPER:
R. E. Frederickson,
Capt. Sanitary Corps,
Adjutant

Copies to:
File 1
Pers. Adj. 1
Surg. B. 1
Chief Surg 1
C. O. BH 1
Officer 3

No review of the activities of the Savenay Hospital Center, would be complete without acknowledging more definitely the factors which have been responsible for the manner in which the work has been done and for the results which contributed materially to the welfare of so many wounded men. The work was done almost entirely upon the basis of the vision, cooperation and inspiration of two officers more than any others. These were Colonel Joel E. Goldthwait, Chief Consultant in Orthopedic Surgery and Colonel W. E. Cooper, at first Commanding Officer of Base Hospital No. 8 and afterwards Commanding Officer of the Center. Every move in the direction of progress was made either at the suggestion of, or with the approval of these two officers.

The harmonious combination of effort of the Surgical Staff and of the Officers assigned as Orthopedic Surgeons was a factor of the greatest importance. The liberal and even enthusiastic cooperation in the work of Miss Amy F. Patmore, at first Chief Nurse of Base Hospital No. 8, and afterwards of the Savenay Hospital Center, was also of the greatest significance. The nurses and their assistants, the ward Sergeants and Wardmasters, made possible a kind of care for the men, which would have been quite impossible except for them. Finally, only because they were the last to arrive as members of the organization, must be mentioned the Reconstruction Aides. This organization, which was planned in the United States during 1917, was unfortunately unable to report for duty in France until the end of the summer of 1918. As an active part in the Savenay Hospital Center, however, they arrived fortunately fairly early. Three forms of activity were employed—massage and occupational therapy in the wards, a massage clinic in dispensary fashion, and an occupational (curative) workshop. The combination of these three regularly exercised an influence upon from five hundred to one thousand men per week in the Savenay Hospital Center. The amount contributed by these activities to the more rapid recovery of stiffened, contracted and slowly recovering extremities can hardly be measured. The results were more rapid in the case of hands and fingers, which often under the influence of such treatment made more progress in a few days than had been made in weeks preceding.

The following Reconstruction Aides were

on duty at the Savenay Hospital Center during November, 1918.

Miss Marguerite Sanderson, Chief Aide, A. E. F.
Barber, Grace
Beer, Salome
Berg, Alma
Bergquist, Alma
Blake, Margaret
Buffington, Louise
Cook, Maude
Cooper, Lucy
Craven, Sarah
Davidson, Mary
Delano, Saidee
Donner, Mia
Green, Constance
Green, Louise (Head Aide)
Hickok, Margerie
Holton, Mary
Humphrey, Jaunita
Hupp, Carrie
Jansen, Ovea
King, Helen
Masterson, Sara
Moeller, Gretchen
Pack, Greta
Reicheldorfer, Ruth
Dunbar, Daphne
Dreyer, Ethel
Eisenbreu, Clara
Figley, Marie
Green, Elizabeth
Rogers, Alexandria
Stewart, Ella
Stevens, Edna
Strohm, Augusta
Taft, Ellen (Head Aide)
Thomas, Leah (Head Aide)
Tyler, Florence
Wilson, Susan
Yothers, Florence
Zernow, Leila

Savenay Hospital Center, February 11, 1919.

From: Consultant in Orthopaedic Surgery.
To: Chief Surgeon A. E. F.
Subject: Report.

1. Capt. C. B. Francisco having been appointed Consultant for this area. (Hdq. S. O. S. 32 par 99) it is respectfully reported that I have completed my service at this post.

2. In making the final report for this Center it is desired to call attention to the following officers who have been conspicuous for their ability, devotion, and enthusiasm in the care of all the surgical patients intrusted to our care.

Abbott, L. C. Capt. M. C., Base Hospital No. 8.
Alexander, D. L. Lt. M. C., Base Hospital No. 100.
Bidwell, A. H. Lt. M. C., Base Hospital No. 69.
Danforth, M. S. Major M. C., Base Hospital No. 69.
Figley, K. D. Lt. M. C., Base Hospital No. 69.
Fradd, N. W. Lt. S. C., Base Hospital No. 8.
Johnson, W. H. Capt. M. C., Base Hospital No. 119.
Luce, R. V. Lt. M. C., Base Hospital No. 8.
McKenna, W. H., Capt. M. C., Base Hospital No. 101.
Morgan, D. W. Lt. M. C., Base Hospital No. 8.
Potter, Allen Lt. S. C., Base Hospital No. 8.
Rooney, J. F. Capt. M. C., Base Hospital No. 8.
Rose, E. J. Lt. M. C., Base Hospital No. 8.
Van Gorder, G. H. Lt. M. C., Base Hospital No. 69.
Walsh, J .J. Lt. M. C., Base Hospital No. 8.
Wilson, P. D. Capt. M. C, Consultant Orthopedic Surgery Hospital, Center, Savenay.
Wolcott, W. E. Lt. M. C., Base Hospital No. 8.

H. W. Orr, Major M. C. D.