

Chapter XIII

THE DENTAL SERVICE IN THE AMERICAN EXPEDITIONARY FORCES IN FRANCE, 1917– 1919: ORGANIZATION, ADMINISTRATION, PERSONNEL, TRAINING, AND SUPPLY

Introduction

The Allies had been fighting the war against Germany, Austro-Hungary, and the Ottoman Empire since August 1914, and Europeans on both sides were skeptical of the ability of the United States to make a meaningful contribution to the outcome. American planners themselves first anticipated a token ground effort, with greater naval activity and substantial logistical and financial support. When the Anglo-French Balfour Mission arrived in Washington in April 1917 and frankly described their horrendous losses and immediate needs, US leaders were quickly disabused of this naïve vision. Russia was on the verge of collapse, Britain's personnel resources were drying up at an alarming rate, and the French army was in a state of near mutiny. American planners realized concrete gestures needed to be taken quickly and that it would be necessary to raise and deploy a huge land force to Europe to shore up the Allies.¹

Pershing and the Initial Echelon of the American Expeditionary Forces

President Woodrow Wilson appointed Major General John J Pershing commander-in-chief of the American Expeditionary Forces (AEF) and gave him broad guidance to form a staff, go to France, and determine the size and composition of the American contribution to the ground war. Pershing's small AEF headquarters group sailed for Liverpool, England, on May 28, 1917, on the *SS Baltic*. Hastily constructed plans called for the equally quickly formed 1st Division to follow a few weeks later as a token force to raise Allied morale. Accompanying the party was Colonel (later Major General and Surgeon General, 1918–1931) Merritte W Ireland (1867–1952), Medical Corps (MC), post surgeon at Fort Sam Houston, Texas, where Pershing's southern department was headquartered. A long-time acquaintance of Pershing's dating back to the Spanish-American War and the Santiago campaign, Ireland led the initial contingent of medical officers and physicians from Johns Hopkins Base Hospital No. 18. Among the physicians was Dr Hugh Hampton Young, a leading American urologist and an expert on venereal diseases.

During the trip across the Atlantic, Young described the problems of venereal disease in a series of lectures to Pershing and his staff and spelled out the poten-



*Merritte W Ireland, surgeon general 1918–1931.
Photograph: Courtesy of the National Museum of Health and Medicine,
Armed Forces Institute of Pathology. NCP 3569.*

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tially debilitating consequences for the AEF if such diseases were not controlled from the very beginning. Pershing agreed and even before he arrived in France had decided on a strong program of venereal disease control to be headed by Young, who later became the chief consultant in urology to the AEF chief surgeon. In addition to the medical lectures, briefings on various topics took place between discussions on grand strategy and efforts to revive long-forgotten memories of high school and college French.²⁻⁴

The surgeons from Johns Hopkins Hospital were members of Red Cross Base Hospital No. 18, one of a number of Army hospitals requested in April 1917 by the Allied delegation for immediate deployment to the western front to augment British medical facilities. Six such base hospitals were overseas and in operation by the end of June. Each had at least two dental officers on staff, for a total of 13 dentists in place with the general hospitals serving the British.⁵

Dental Unit Number 1

While the Army hospitals were on their way, on June 12, 1917, Pershing's headquarters in Paris requested the assignment of Captain Robert T Oliver, the senior officer of the Dental Corps, to the AEF chief surgeon's staff as well as the assignment of sufficient dental officers to support the troops arriving in France. As with Ireland, the request for Oliver was no mere coincidence. At the time, Oliver was assigned dental surgeon at Fort Sam Houston's Base Hospital No. 1 and had known and treated Pershing in the Philippines and on the border. Ireland and Oliver had probably first become acquainted in 1901-1902, while Ireland was in charge of the medical supply depot in Manila and medical purveyor for the Philippine Division, and Oliver was the supervising contract dental surgeon. The War Department issued confidential orders to Oliver on June 25. Oliver then requested that the surgeon general approve formation of a six-dentist unit, including himself, to deploy with him for duty with the AEF. Designated Dental Unit No. 1, the small group assembled in New York between July 10 and July 15. It consisted of five dentists from the Regular Army—Captains Oliver, Rex H Rhoades, and Raymond E Ingalls, and First Lieutenants George D Graham and William S Rice—and one Dental Reserve Corps (DRC) officer, First Lieutenant John B Wagoner, as well as two sergeants and three privates from the Medical Department.⁶

The unit joined the personnel from Base Hospital No. 18 and troops from the 5th and 7th US Artillery Regiments on board the US Army transport *Saratoga* for the trip overseas. As the ship steamed out of New York harbor on July 30, an inbound ship, the US Army transport *Panama*, accidentally rammed it and the *Saratoga* had to be abandoned. Tugs towed the sinking vessel to a shallow area where it settled into the water off Bay Ridge, Brooklyn. Although the dentists saved much of their personal property, all of the unit dental equipment was a total loss. The marooned soldiers spent several frantic days procuring new supplies and equipment, some of which was donated by the SS White Dental Supply Company of Philadelphia. Finally, on August 7, they loaded the *SS Finland* and sailed once again for the war zone. The trip across the Atlantic proved largely uneventful, and Oliver filled the time with daily classes on Army procedures and customs of the service for his unit

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and five DRC officers from other units who were on board. The *Finland* docked at Saint Nazaire, France, on August 21, where the unit was temporarily attached for support to AEF Base Hospital No. 1 (Exhibit 13-1).⁷

Oliver's orders were to report to General Pershing himself, so the unit remained in Saint Nazaire only long enough to transfer its equipment from the docks onto a train and for the soldiers to exchange their dollars for francs. They left Saint Nazaire the next day, and Oliver reported to AEF General Headquarters (GHQ) the morning of August 23. Oliver had known Pershing since their time together in the Philippines in 1902, and they had last seen each other when Oliver treated Pershing at Colonia Dublán, Mexico, in September 1916.⁸ Pershing expressed pleasure at the unit's arrival and directed Oliver to report to the AEF chief surgeon, Colonel Alfred E Bradley, MC, to plan the assignments of unit members and to identify the requirements for theater dental support. On August 29 orders named Oliver as the AEF's senior dental surgeon and assigned him to the personnel division of the chief surgeon's office. Lieutenant Wagoner remained with him as "prosthetic assistant," along with Sergeants Wade and Henry. Captain Rhoades and Private First Class John E Carr went to the artillery training center at La Valdahon. Captain Ingalls and First Lieutenant Rice, along with Privates First Class Russell and Oldring, went to the 1st Division at Gondrecourt. First Lieutenant Graham assumed the duties of theater dental supply officer at Cosne.⁹

The responsibility for building the AEF's dental service from scratch fell to Oliver, whose years of supervisory experience since 1901 would now be tested. He immediately began planning for a comprehensive dental service for the combat and support forces that were anticipated, to include all personnel and equipment requirements. In this capacity, he functioned as a part of the AEF chief surgeon's personnel division. At the same time, he oversaw the establishment of a dental clinic and laboratory with the AEF headquarters in Chaumont and made technical visits to those dentists already at work with units throughout France. Not only did direct dental service to the troops have to be considered, but the support overhead

EXHIBIT 13-1

DENTAL UNIT NO. 1

Dental Unit No. 1 included: Captains Robert T Oliver, DC, Rex H Rhoades, DC, and Raymond E Ingalls, DC; First Lieutenants George D Graham, DC, William S Rice, DC, and John B Wagoner, DRC; Sergeants Lee Wade and MF Henry; Privates First Class John E Carr, William J Oldring, and Erskine Russel. The other dental officers, all first lieutenants, DRC, were Albert M Applegate and William M Irving, Base Hospital No. 8; JB Watson and HL Bull, Base Hospital No. 9; and RK Thompson, 1st Engineers.

Data source: Ingalls R. Diary of a dental officer. *Dental Bulletin Supplement to the Army Medical Bulletin*. 1939;10:1-18.

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also had to be determined. Oliver had to identify the administrative and logistical positions in the supporting line of communications (LOC, later redesignated the services of supply [SOS] in February 1918) which required dentists at depots, headquarters, and hospitals. Further, in conjunction with medical personnel, Oliver began to detail and select “oro-dental specialists” to augment hospital surgical staffs. Oliver relied on his Mexican border experiences to develop and distribute an informal correspondence course on Army administration to all incoming dentists. This sufficed until a more formal school opened in the 1st Division on September 15, 1917.⁶

The Structure of American Expeditionary Forces Dental Support

Oliver and his miniscule staff struggled to build dental support and the proper distribution of dentists as the AEF’s structure gradually emerged. The two major parts of the AEF quickly came into view—the Zone of the Armies containing the combat units and direct supporting elements and the LOCs that received, transported, stored, and distributed all supplies to the Army. The LOC was ultimately divided into 10 geographic areas—eight base sections in France (one being Paris and its environs) and the United Kingdom, an intermediate section of depots and storage, and an advance section with the Zone of the Armies that provided the direct logistical support to the fighting troops. The bulk of the medical support and hospitalization was sited within the LOC, with all of the camp and base hospitals, hospital centers, and main medical supply depots. The divisions, corps, and armies and supporting units of the AEF and their medical units, including evacuation and divisional field hospitals, were in the combat zones. They handled routine and battlefield care as well as evacuation of the sick and wounded.^{6,10}

The initial combat divisions, such as the 2nd, 26th, 41st and 42nd, that followed the 1st Division in 1917, reached France with 20 or fewer dentists attached. The October 6, 1917, dental reorganization bill allowed Oliver to increase the number to 31, but many of the divisions arriving in 1918 often had far fewer than that. For example, the 2nd Division already in France in October 1917 had only five dental surgeons assigned. One of them was Lieutenant (junior grade) Alexander G Lyle, Dental Corps, US Navy, assigned to support the 5th and 6th Regiments, US Marine Corps, that composed one of the division’s two infantry brigades, and who would later receive the Navy Medal of Honor in 1918 for heroism, serve as chief of the Navy Dental Corps during World War II (1943–1946), and become the only service dental officer ever to reach three star rank when he was promoted to vice admiral in 1948.¹¹ The senior dental officer was also designated division dental surgeon, who was responsible to the division surgeon for the supply, technical supervision, assignment, and evaluation of the division’s dentists. The AEF’s dental service grew proportionally with the force, with dental administrators assigned at each level of command, starting with Colonel Oliver at AEF GHQ. In the forward Zone of the Armies conducting combat operations against the Germans under GHQ, the First and Second Armies, and later the Third Army in November 1918 for occupation duties, had a chief dental surgeon who supervised the corps dental surgeons. The corps dental surgeons watched over divisions’ dental surgeons and activities.^{6,12–14}

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First Lieutenant CB Ray, Dental Officers' Reserve Corps, Ammunition Train, 26th Division, working on a patient in the dentist's chair of this motorized dental unit. La Ferte, France, July 9, 1918.

Photograph: Courtesy of US Army Military History Institute. SC 18277

In the LOC area, supervising dental surgeons were eventually assigned to each of the eight base sections as well as the intermediate and advance sections. Their job was to coordinate dental service in their geographical areas through inspection and technical supervision and to render reports on their actions and findings to Oliver's office, which maintained overall technical control but not command. They further organized central dental laboratories and clinics in their areas and developed necessary technical training. Finally, they operated a centralized dental supply system for their areas, processing requisitions and issuing materials. A hierarchy of inspections was instituted throughout the system to assure standards and respond to requirements.^{5,6}

Many of the dentists arrived in the AEF accompanying divisions or medical hospital units, but larger numbers also arrived monthly as bulk shipments of casualties and replacements earmarked for the LOC according to the AEF's M-415 shipping priorities. Although Oliver worked hard to achieve structure and coherence, his efforts in the beginning were largely transient, in part because of the novelty of the situation and the apparent inability of senior officers to envision the dental support that was required. Oliver first recommended a hierarchy of care, stretch-

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ing from forward units back through the base hospitals to the general hospitals in the United States. The nature of the work anticipated and the dispersion of the units also prompted him to recommend increasing the old ratio of one dentist per thousand troops. On September 6, 1917, he wrote to the chief surgeon, then Colonel (later Brigadier General) Alfred E Bradley, MC:

The number of Dental Surgeons for the Army under existing laws, is based upon a ratio of one to one thousand; which would give from twenty-five to twenty-eight for a Divisional organization under the provisions of the last table of organization. In as much as there is bound to be a vast number of all classes of Dental and Minor Oral surgical cases occurring among this number of troops it becomes readily apparent that this ratio of Dental Surgeons must be exceeded in order to provide adequate Dental attention for the Officers and men, and that the scope and character of treatment rendered must be such as to insure a degree of Dental fitness which will last thru the period of the War and thus assist in maintaining the greatest number of effectives for active duty.¹⁵

Bradley deferred Oliver's suggestions in favor of consideration for "one large dental plant" at Neufchâteau Hospital far forward in what became the advance section, instead of individual "divisional plants." Experience and practicality soon favored Oliver's approach, as did the October 1917 bill reorganizing the Dental Corps.^{6,16}

The October 6, 1917, law gave dental students the same exemptions from the draft as medical students and, more importantly, gave the Dental Corps officers the same grades and percentages within grades as the Medical Corps. As a result, the War Department officially authorized an increase to 31 dentists in each division in March 1918. However, these changes did not produce any immediate growth in the number of dental surgeons in the AEF, which a little more than doubled from 130 on November 17 to 282 on April 6, 1918. The influx of 29 US divisions and supporting forces from April through August 1918 resulted in a steady build up of the Dental Corps in the AEF (Table 13-1). From April 6, the strength grew to 739 by July 6, 1,081 by August 3, 1,345 by September 7, and 1,606 by October 5. Officers of the DRC accounted for the bulk of dental surgeons in the AEF. After the armistice in November 1918, there were 1,779 Army dental officers in Europe supported by more than 2,000 enlisted soldiers serving as dental assistants, mechanics, or laboratory technicians.^{6,17}

Personnel for the American Expeditionary Forces' Dental Corps

The AEF's Dental Corps grew from many sources simultaneously. Shortly after Oliver established himself in the chief surgeon's office, he was approached by several US dentists practicing in Europe who offered their services. Oliver recommended that dental boards be established and examination dates set to consider these dentists and any others who might apply for the Reserve or Regular Dental Corps or for dental officers who were eligible for promotion. Five highly qualified dentists were soon obtained from this source. Some foreign nationals trained at American dental colleges also applied but had to be turned away because they were not US citizens.¹⁸

The pressure to provide dental care to the soldiers in the units pouring into

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TABLE 13-1

DENTAL CORPS OFFICER STRENGTH IN THE AMERICAN EXPEDITIONARY FORCES, NOVEMBER 1917–SEPTEMBER 1919

Date	Officers	AEF	BEF	USAAS/F	USAAS/I	Total
November 17, 1917	DCRA	8				8
	DCNG	27				27
	DRC	95				95
	Total	130	0	0	0	130
February 2, 1918	DCRA	17				17
	DCNG	58				58
	DRC	149				149
	Total	214	0	0	0	214
April 6, 1918	DCRA	20				20
	DCNG	68				68
	DRC	194				194
	Total	282	0	0	0	282
June 1, 1918	DCRA	29				29
	DCNG	89				89
	DRC	345	10	1	0	356
	Total	463	10	1	0	464
July 6, 1918	DCRA	51				51
	DCNG	128				128
	DRC	547	12	1	0	560
	Total	722	12	1	0	739
August 3, 1918	DCRA	57				57
	DCNG	144				144
	DRC	868	12	2	1	883
	Total	1,069	12	2	1	1,081
August 7, 1918	All DC					
September 7, 1918	DC	1,330	12	2	1	1,345
October 5, 1918	DC	1,591	14	2	1	1,606
November 30, 1918	DC	1,765	11	2	1	1,779
January 4, 1919	DC	1,803	11	2	1	1,817
February 22, 1919	DC	1,712	12	2	1	1,727
April 12, 1919	DC	1,537	2	1	1	1,541
May 31, 1919	DC	1,113	0	1	0	1,114
June 28, 1919	DC	681	0	0	0	681
July 19, 1919	DC	312	0	0	0	312
August 16, 1919	DC	125	0	0	0	125
September 13, 1919	DC	67	0	0	0	67

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(table 13-1 continued)

AEF: American Expeditionary Forces

BEF: British Expeditionary Forces

USAA/F: US Army Ambulance Service with the French

USAAS/I: US Army Ambulance Service with the Italians

DCRA: Dental Corps Regular Army

DCNG: Dental Corps National Guard

DRC: Dental Reserve Corps

Data sources: (1) National Archives and Records Administration. Record group 120. American Expeditionary Forces, decimal file 200, Personnel, Medical Department. Boxes 4908 and 4909. Entry 2065. (2) National Archives and Records Administration. Record group 112. Decimal file 320.2-1 (AEF), "Personnel, Medical Department, AEF." Box 5. Entry 31.

France was constant. For example, on August 15, 1917, the surgeon of the 29th Provisional Aero Squadron at Issoudun asked for immediate care for at least six of his soldiers and possibly others. The chief surgeon's office could only reply 6 days later that one of the few dentists available was going on his rounds at bases in the vicinity of Issoudun and would be on hand as soon as possible.¹⁹

Medical units in the field often dealt with the situation by detailing to their dental sections enlisted soldiers who were graduate dentists. This happened to



Field dental station, Saulty, France.

Reproduced from: <http://www.nlm.nih.gov/ihm/images/A/22/436.jpg>.

Courtesy of the National Library of Medicine.

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*Teeth of a soldier being taken care of in the field hospital near Rimacourt, France.
Reproduced from: <http://www.nlm.nih.gov/ihm/images/A/22/437.jpg>.
Courtesy of the National Library of Medicine.*

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Captain EG Barkley, dental surgeon, operates on a patient in the dental department of Base Hospital No. 17 (Harper Hospital, Detroit, Michigan unit) at Dijon, France. September 5, 1918.

Photograph: Courtesy of US Army Military History Institute. SC 28123

Private Oscar Johnson at Base Hospital No. 36, who was originally sent to the hospital as a patient. The hospital's two dental officers were thrilled to learn that Johnson was a graduate of the University of Minnesota with a practice in Minneapolis. With Oliver's approval, Johnson remained at the hospital, took over a third chair in the clinic, and served as a dentist there for the duration of the war. Dr Johnson is presumed to be Oscar H Johnson, a 1916 graduate of the University of Minnesota College of Dentistry.^{20,21} In other cases, the hospitals found they had brought some dental talent with them. For example, Sergeant Harold F Lafayette was a third-year student at Harvard who enlisted in his college's hospital unit, Base Hospital No. 5, and deployed before he formally graduated. He was assigned to the dental laboratory making splints and dentures at British Hospital No. 11 and No. 15. However, as soon as his formal notice of graduation caught up with him in November 1917, Lafayette's supervising dental officer, First Lieutenant William H Potter, successfully recommended him to Oliver for examination and commissioning in the DRC.²²

During 1918, 92 graduate dentists were still serving in the line or as dental assistants in the AEF. All were encouraged to apply to be examined for commissions in the DRC.²³ These examinations were similar to those given by the regular

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dental examining board. In lieu of a candidate's original diploma and license, the board accepted a certificate stating the candidate's school and date of graduation and the source and date of license to practice dentistry (issued by the State Board of Dental Examiners). The board rated an applicant's performance on all subjects and rendered a general report on each candidate. The president of the board could terminate a candidate's examination at any time the board was convinced of "said candidate's disqualifications." A duplicate report was sent to the surgeon general's office via the chief surgeon's office, AEF.²⁴ On November 17, 1918, the examinations for temporary commissions in the Dental Corps were discontinued and the examination papers for such commissions were placed on file and suspended in the AEF for "an indefinite period."²⁵

Despite the moratorium, applications continued to arrive at the chief surgeon's office. On November 20, 1918, Colonel Oliver notified the president of the dental board that he had 57 sets of application papers from enlisted dentists for appointment in the DRC.²⁶ On December 7, 1918, Captain Charles F Huber, the 88th Division dental surgeon, reported that he had 16 "authorized dental assistants" who were graduate dentists in his division.²⁷

The majority of graduate dentists serving in the Army as enlisted troops were eventually used as dental assistants. Some of them had tremendous experience, such as Private First Class James Loraine Shipley (Northwestern University Dental School, 1915), who stated on his application for a dental commission that he had "six months at Base Hospital, Camp Grant, Ill. Two months in operating pavilion. In that time gave about two hundred general anesthetics. Four months as dental assistant in dental infirmary."²⁸

This procurement program concluded on February 20, 1919, when the AEF chief surgeon, Colonel Walter D McCaw, recommended that 88 enlisted dentists (86 privates and 2 sergeants) be appointed and commissioned as first lieutenants in the dental section of the Officers' Reserve Corps. These dentists (all dental graduates) had been examined during November and December 1918 and passed the prescribed professional and physical examinations too late for active AEF service.²⁹

Dental Reserve Candidates for the Regular Army

During 1918 some of the DRC officers opted to transfer to the Regular Army Dental Corps. On March 1, 1918, eight reservists filed their papers for preliminary examination for the corps and were invited to appear before the Army Dental Board on March 11, 1918. One candidate, First Lieutenant Schuyler E Waller, a graduate dentist, was serving as an officer in the 101st Engineer Train, AEF.³⁰

Conversely, the dental board also examined candidates for appointment in the DRC. On March 13, 1918, a Canadian Army Dental Corps officer, three civilian dentists (practicing in such diverse places as London, England; Bombay, India; and Berne, Switzerland), and 10 US Army enlisted soldiers filed their application papers and were invited to appear before the board on March 18. Of this group of 14, 10 completed the examination, three failed to report for the examination, and one was rejected for physical reasons. In May 1918 five more enlisted soldiers sent in their application papers and two were found qualified. In June 1918 seven more enlisted dentists and a Red Cross dental officer applied for commissions in the DRC.³¹⁻³⁵

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Army Dental Schools

From the beginning it was obvious that dental officers coming from such a variety of sources needed orientation on Army procedures and military dentistry. The first groups to arrive in France attended the impromptu 1st Division School, whose example was emulated by later arriving units. Topics covered included various administrative procedures, visits to Allied medical units, and briefings on the growing AEF system of dental support.⁶ Greater structure was imposed in November 1917 when orders established the Army Sanitary School at Langres.

The mission of the dental section of the Army Sanitary School was simply stated as follows:

The purpose of this school is to give dental surgeons attached to Combat divisions or the S.O.S. instruction in preparation for field service in the A.E.F., which will supplement that given in the training camps in the United States and with troops in France.³⁶

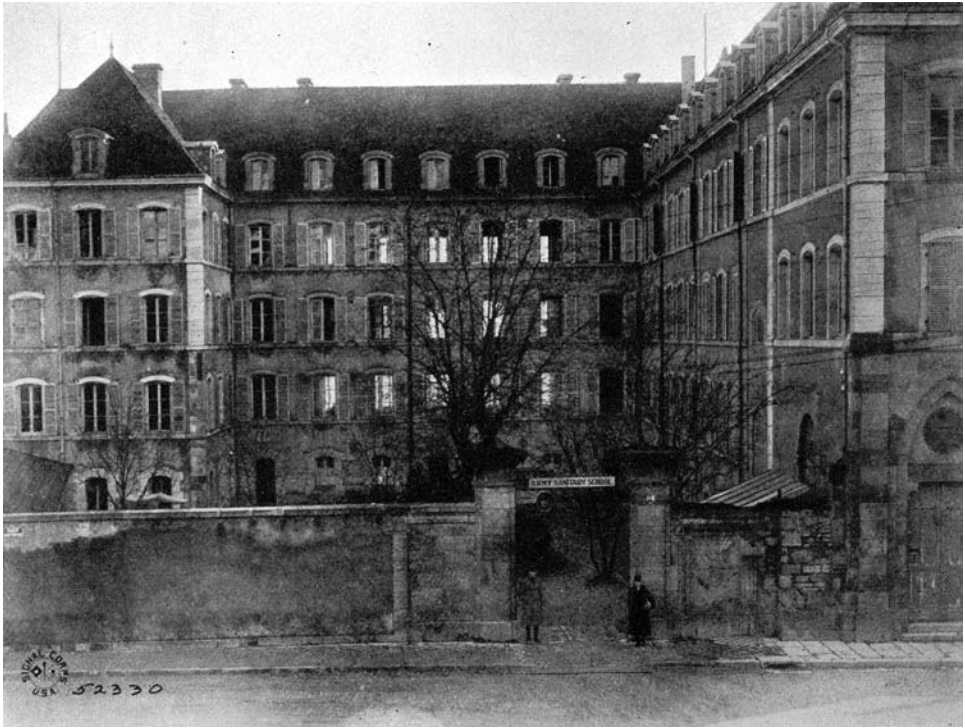
The first dental faculty member was First Lieutenant William S Rice, Dental Corps (DC), a veteran of the *Saratoga* disaster and an original member of Oliver's Dental Unit No. 1. On December 7 Rice transferred from the 1st Division to the dental section at the Army Sanitary School, Langres, France. The same month, he successfully requested a complete base dental laboratory outfit for the school.³⁷⁻³⁹

Classes began in January 1918 under the direction of now Major Rice (Rice was promoted directly to major on October 6, 1917).⁴⁰ On January 16, the first students arrived from the 2nd, 26th, and 42nd Divisions.¹¹ The new group of 13 dental officers included Lieutenant (junior grade) Alexander G Lyle, US Navy, of the 5th Marines, 2nd Division (Exhibit 13-2).¹¹ The session ran from January 16 to January 29, 1918, and included classes in medico-military subjects, oral surgery, oral surgical prosthesis, oral and general hygiene, courts martial and military law, maps and map reading, organization of the sanitary department, military discipline, oral manifestations of systemic disease, first aid, bandaging and splinting, general anesthesia, operating room technique, and gas instruction (Exhibit 13-3).^{42,43}

On January 26, 1918, Colonel Seibert D Boak, the first contract dental surgeon hired in 1901, reported as the dental section's new director.⁴⁴ One of his first innovations was to require each student to write a thesis, the grade of which was incorporated in a report of the student's standing submitted to the commandant of the Army schools, the chief of training session, and to the appropriate division dental surgeon. Toward this end, Colonel Boak requested that the dental section be furnished with its own copies of all special and general orders, bulletins, circulars, and memoranda from AEF GHQ and the post.^{45,46} A new session began on February 4, 1918, and included field trips to the Army Central Laboratory (to study bacteriology techniques), an American evacuation hospital, and an advanced medical supply depot. The classes were scheduled every 6 weeks thereafter with about the same curriculum.^{47,48} Each class graduating until the armistice had 25 to 30 students.⁴⁹

Among the textbooks used by the students were Truman W Brophy's *Oral Surgery: a Treatise on the Diseases and Malformations of the Mouth and Associated Parts*⁵⁰; and George Van I Brown's *The Surgery of Oral Diseases and Malformations: Their*

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Army Sanitary School at Langres, France.

Reproduced from: Bispham WN. Training. Vol 7. In: Lynch C, Weed FW, McAfee L, eds. The Medical Department of the United States Army in the World War. Washington, DC: Government Printing Office; 1927: 601.

*Diagnosis and Treatment.*⁵¹ The surgeons conceded that “the dentist is the logical man to look after all fractured jaw cases, for the wiring as applied by most surgeons is but a crude method that little or no attention is given the proper occlusion of the teeth.”⁵²

On March 25, 1918, Colonel Boak, Major Rice, and First Lieutenant William H Potter, DRC went to Paris to observe the trauma techniques used at the dental clinic of the former American Ambulance Hospital, now American Red Cross Military Hospital No. 1, at Neuilly, run by Doctors George B Hayes and William and Isaac Davenport (Exhibit 13-4).⁵³⁻⁵⁵ The next day, they visited the dental department of the French Military Red Cross Hospital No. 65 (under the direction of Major Leon Frey of the French army). They then toured the stomatology service of the Val de Grace Hospital, one of the largest French military hospitals, and the Hospital Michelot under Dr Georges Villain. They returned to the dental clinic at Neuilly to study jaw fracture models for use in teaching at the Army Sanitary School.⁵⁶

On May 5, 1918, led by the commandant, the class in session began a 2-week tour of observation and instruction at the French front while its successor started arriving at the school. From May 5 to May 18, 1918, this succeeding class, which in-

EXHIBIT 13-2

ALEXANDER GORDON LYLE

Alexander Gordon Lyle, Baltimore College of Dental Surgery, class of 1912, was commissioned a lieutenant (junior grade) in the US Navy Dental Corps in 1915. In 1917 he went to France with the 5th Regiment of Marines attached to the 2nd Division, American Expeditionary Forces. On April 23, 1918, under heavy shellfire on the French front at Verdun, Dr Lyle rushed to the assistance of Corporal Thomas Regan, who was seriously wounded, and "administered such effective surgical aid while bombardment was still continuing as to save the life of Corporal Regan." He was awarded the Navy Medal of Honor for "extraordinary heroism and devotion to duty." Dr Lyle participated in the Aisne Defense, the Aisne-Marne Offensive, Saint Mihiel Offensive, and the Meuse-Argonne Offensive. He received two Army Silver Star awards, the Italian "Merito de Guerra," and the Victory Medal with five bars. After the war, he was stationed with the 4th Marines in China. He then served on various ships and stations. From 1932 to 1936 he was chief of the dental service at the Newport Naval Hospital. In 1939 he was promoted to captain and served at Quonset, Rhode Island. In March 1943 he was commissioned a rear admiral and appointed the chief of the US Navy Dental Corps, the first dentist to hold flag rank in the US Navy. In 1946 he received a doctor of science degree from the University of Maryland. Admiral Lyle retired in 1947 after 32 years of service and in 1948 was advanced on the retired list to vice admiral.

Data source: Foley GPH, ed. *Proceedings of the 125th Anniversary of the Baltimore College of Dental Surgery March 4, 5 and 6, 1965 Baltimore, Maryland*. Baltimore, Md: Alumni Association and the Faculty of the Baltimore College of Dental Surgery, Dental School, University of Maryland; 1966: 188-189.

cluded six enlisted dentists, began a 2-week tour of the American front. Those of the previous class who had not been to the front were assigned to temporary duty with the 2nd, 26th, and 42nd Divisions, while those who had been went to temporary duty at Evacuation Hospitals No. 1 and No. 2. On May 18 the class reassembled at the sanitary school for the balance of the course. Transportation was furnished by the ambulance company attached to the Army schools.⁵⁷

On July 2, 1918, Boak formally requested that Captain Fernand LeMaitre, surgical chief of French Maxillofacial Hospital No. 45, Vichy, be detailed to lecture to the dental section students on "The Importance of Cooperation between Surgeons and Dental Surgeons in the Treatment of Head Wounds." Boak wanted to show the students the prosthetic appliances, photographs, and masks that Dr LeMaitre had developed for facial wound emergency cases at Hospital No. 45.⁵⁸

The next day, Boak's request was approved by Colonel Bailey K Ashford, MC, the commandant, who endorsed Captain Maitre's appearance as of the "highest importance" to the dental school.⁵⁹ The general staff passed the request on to the French Military Mission with the American Army, promising railway transportation on an American military train from Nevers to the school and arrangements for his "entertainment while at the Army Sanitary School."⁶⁰

EXHIBIT 13-3

THE ARMY SANITARY SCHOOL AT LANGRES

Besides courses in oral surgery, the following subjects were included in the school's initial curriculum: first aid bandaging and splinting; gas instruction (description and use of gas-proof dugouts, gas drill and testing of respirators and masks in lachrymatory gas, and treatment of gassed patients); oral manifestations of systemic disease; Army Regulations; local anesthesia (including facial); interrelation of the dental surgeon and the general and plastic surgeon; martial and military law, courts-martial, military jurisdiction, and tribunals; oral hygiene for injured mouths; general anesthesia (ether, nitrous oxide); trench mouth and relation to systemic infection; general and personal hygiene; customs of the service, salutes, courtesies, and military discipline; duties of a dental surgeon (the Army dental office); organization of the sanitary department; maps and map reading; operating room technique; the work of the dental surgeon at a base hospital; organization of a dental unit to care for personnel and patients; care of wounds of the face and anti-tetanus injections; the battalion and regimental surgeon in trench warfare; the history of Army Dental Corps (organization, distribution, status, and duties); the Medical Department manual (dispensary management, hospital administration, medical attendance, disposition of records, register of dental and medical patients, property accountability); first aid to the wounded (hemorrhage, wounds and dressings, fractures, shock, tetanus, nutrition); treatment of jaw fractures (simple, compound, and comminuted); official military correspondence (forms, enclosures, endorsements, replies, and the like); dental diseases peculiar to the Army (diagnosis, prognosis, and treatment); plastic operations of the face; removal of foreign bodies from the face and neck; dental sterilization in the field; methods of handling wounds and fractures in the field where medical supplies are limited; dental supplies and materials (requisitions, transfers, vouchers, receipts, property responsibility, etc); drill and setting up exercise; and duties of division and supervising dental surgeons.

Data sources: (1) National Archives and Records Administration. Record Group 120. Program, third session, dental section, Army Sanitary School, 16–29 January 1918. No. 3603–368. Box 1301. Entry 11. (2) National Archives and Records Administration. Record Group 120. Dental section, Army Sanitary School: program of instruction & record of course. Folder 1. Box 1781. Entry 397.

At the same time, Boak requested that Major Vilray P Blair, AEF senior consultant, Maxillofacial Service, lecture the students. Boak thought it was important for the front line dentists to know how the maxillofacial department wanted them to treat head wounds involving the jaws; experience showed that the earlier patients were given "intelligent first aid and treatment," the greater their chances for a quick recovery and good results. Blair demonstrated the various appliances (splints, bands, headbands with attachments for chin cups, and the like), which were to be issued to all the dental surgeons at the front to immobilize jaw fractures and conserve "soft tissue and bone." This information was essential to the students if they were to speed up the evacuation of the wounded from the front and intelligently cooperate with the maxillofacial surgeons at the evacuation and mobile hospitals.⁶¹

DENTAL SERVICE IN THE AMERICAN EXPEDITIONARY FORCES IN FRANCE



Col. S. D. Boak.

Colonel Seibert D Boak was one of the original contract dental surgeons of 1901 and initial members of the Dental Corps in 1911. He was director of the dental section of the Army Sanitary School at Langres, France, during World War I and later the first director of the Army Dental School (1922–1923).

*Photograph: Courtesy of Major General Oscar Snyder Collection.
Located at: National Museum of Dentistry, Baltimore, MD.*

EXHIBIT 13-4

WILLIAM H POTTER

William H Potter, age 51, was professor of operative dentistry at Harvard Dental School and came to France with Base Hospital No. 5, landing in England on May 22, 1917, and in France on May 30, 1917. He served with this hospital in France at Camiers and at Boulogne until December 8, 1917, when he was assigned to the dental section of the Army Sanitary School as an instructor in oral surgery. His research and translations made both English and French maxillofacial procedures available to the student officers. First Lieutenant Potter was promoted to major, Dental Reserve Corps, on July 30, 1918 (with rank from February 9, 1918). On November 18, 1918, he was recommended for the Distinguished Service Medal. On December 5, 1918, after 18 months overseas service and with the closure of the sanitary school imminent, Major Potter requested he be allowed to return to his teaching position at Harvard.

Data sources: (1) National Archives and Records Administration. Record Group 120. Colonel SD Boak, director, dental section, Army Sanitary School, to commandant, Army schools, American Expeditionary Forces, 18 November 1918. Memo. Folder 2. Box 1780. Entry 395. (2) National Archives and Records Administration. Record Group 120. Major RA Dickson (for chief surgeon, American Expeditionary Forces, services of supply), to First Lieutenant William H Potter, 25 August 1918. Memo. Folder 2, Box 1780. Entry 395. (3) National Archives and Records Administration. Record Group 120. Major William H Potter, DC, to chief surgeon, American Expeditionary Forces, headquarters, services of supply (through military channels), 5 December 1918. Memo. Folder 2. Box 1780. Entry 395.

On July 7, 1918, Boak received permission for himself, Major Rice, First Lieutenant Potter, and an enlisted photographer, Sergeant John W Cooke, to visit the 82nd Division for 4 days to obtain material for instruction in the classroom (Exhibit 13-5).⁶¹⁻⁷¹ Boak also visited the Ecole Dentaire at Paris to observe the war surgery work of Dr Georges Villain (Exhibit 13-6).⁷² Colonel Boak was so impressed with Dr Villain's fracture work that on July 23, 1918, he requested that Villain, a dental graduate of the University of Pennsylvania, be invited to give the dental section a lecture called "Fractures of the Maxillae, and their Treatment." Boak emphasized that Villain had an "extra-ordinary ingenious grasp for the problem incident to facio-maxillary prosthesis" and that his lecture to the students was "highly desirable, if not a necessity."^{73,74}

The same day, Boak requested that Dr Varaztad H Kazanjian (Exhibit 13-7), an American with General Hospital No. 20, British Expeditionary Forces, be invited to lecture on maxillofacial prosthesis and plastic surgery.⁷⁵ Dr Kazanjian had been serving with the British Army since the spring of 1915, and Boak believed that the students should "have the benefit of his experience."⁷³ Despite the approval of the school's commandant, Kazanjian's visit was disapproved by AEF GHQ because of the "travel and expense involved;" leaving the dental officers unable to experience the teaching of the dental surgeon called the "Miracle Man of the Western Front."^{75,76} Meanwhile, apparently Captain LeMaitre's lecture on the French methods was so well received that on August 19, 1918, Boak

EXHIBIT 13-5

JOHN W COOKE

On February 8, 1918, Sergeant Cooke requested that he be transferred from the medical department to the dental section, Enlisted Reserve Corps, and returned to the United States to complete his dental education at Harvard. While a third-year dental student at Harvard (with an AB degree from Harvard, 1915), he had enlisted as a private, sanitary detachment, 101st Engineers, National Guard, at Boston on July 24, 1917, and was shipped overseas on September 24, 1917. He later transferred from the National Guard to the Regular Army and was assigned to duty at the dental section, Army Sanitary School, American Expeditionary Forces, on December 13, 1917. He was promoted to sergeant on January 19, 1918. Cooke cited General Bulletin No. 61, paragraph 5, War Department, dated October 23, 1917, as the basis for his request. This bulletin stated that "all regulations concerning the enlistment of medical students in the Enlisted Reserve Corps and their continuance in their college course while subject to call to active service, shall apply similarly to dental students." Although approved by his commanding officers, Colonels Boak and Ashford, Cooke's application was disapproved by the surgeon general, who decided on November 22, 1917, that the quoted legislation did not apply "under existing unusual circumstances to dental students abroad." On June 24, 1918, Sergeant Cooke requested permission to take the examination for commission in the US Army Dental Corps. Boak, for whom he had been working since Boak assumed command of the school on January 26, 1918, endorsed him as "capable and efficient" and having the "necessary educational and professional qualifications . . . as would make him a desirable candidate for the Regular Corps." Ashford also gave his approval. Finally, on July 1, 1918, Cooke was invited to take the examination given by the Army Dental Board on July 8 at Langres. Cooke completed a successful examination for appointment to the Dental Reserve Corps on July 12, 1918. In October 1918 First Lieutenant Cooke applied for a Regular Army commission and was directed to report to the examining board on November 1, 1918. He passed the examination. In November 1918 Cooke lectured the dental officers of the 82nd Division at Haute-Marne. On January 19, 1919, he was transferred from the sanitary school to Base Section No. 3, AEF.

Data sources: (1) National Archives and Records Administration. Record Group 120. Sergeant John W Cooke to commandant, Army Sanitary School, Army schools, American Expeditionary Forces, 8 February 1918. Letter. Folder 1. Box 1780. Entry 395. (2) War Department. Bulletin no. 61, par 5, 23 October 1917. In: *General Orders*. Washington, DC: Government Printing Office; 1917. (3) National Archives and Records Administration. Record Group 120. Colonel Robert T Oliver to Colonel Boak, 13 February 1918. Endorsement. Folder 1. Box 1780. Entry 395. (4) National Archives and Records Administration. Record Group 120. Sergeant John W Cooke to chief surgeon, American Expeditionary Forces, 24 June 1918. Letter, with endorsement. Folder 1. Box 1780. Entry 395. (5) National Archives and Records Administration. Record Group 120. Colonel Robert T Oliver (for chief surgeon, American Expeditionary Forces) to Sergeant Cooke, 1 July 1918. Letter. Folder 1. Box 1780. Entry 395. (6) National Archives and Records Administration. Record Group 120. Major WS Rice, recorder, Army Dental Examining Board, to surgeon general, US Army (through chief surgeon, American Expeditionary Forces), 12 July 1918. Folder 1. Box 1780. Entry 395. (7) National Archives and Records Administration. Record Group 120. Colonel Robert T Oliver, American Expeditionary Forces, to Lieutenant Cooke, 7 October 1918. Letter. Folder 1. Box 1780. Entry 395. (8) National Archives and Records Administration. Record Group 120. Alonzo G McCue, recorder, Army Dental Examining Board, to surgeon general, US Army (through chief surgeon, American Expeditionary Forces), 12 November 1918. Letter. Folder 1. Box 1780. Entry 395. (9) National Archives and Records Administration. Record Group 120. Colonel SD Boak, director, dental section, Army Sanitary School, to commandant, Army schools, American Expeditionary Forces, 28 November 1918. Memo. Folder 2. Box 1780. Entry 395. (10) National Archives and Records Administration. Record Group 120. First Lieutenant Cooke to chief surgeon, American Expeditionary Forces (through channels), 19 January 1919. Memo. Folder 1. Box 1780. Entry 395.

A HISTORY OF DENTISTRY IN THE US ARMY TO WORLD WAR II

EXHIBIT 13-6

DR GEORGES VILLAIN

Dr Georges Villain was born in Paris in 1881 and graduated as Chirurgien Dentiste de la Faculte de Medicine de Paris in 1903. For 2 years he attended school in High Wycombe (England), where he acquired a complete command of the English language. Later, he entered the University of Pennsylvania, Department of Dentistry, and received his DDS degree in 1906. After returning to Paris, he became professor of prosthetics on the faculty of l'Ecole Dentaire. In 1914 he organized and directed the maxillofacial section at the school. He was one of the organizers of the Federation Dentaire Internationale in 1921. He died in an automobile accident on April 26, 1938.

Data source: Dr. Georges Villain, Paris, France (1881–1938). *Dental Cosmos*. 1938;25:1131.

successfully requested that he be invited back the week beginning September 8, 1918.^{77,78} Boak thought so highly of Major LeMaitre that he recommended him for the Distinguished Service Medal on November 17, 1918, under the provisions of Confidential Memorandum, General Orders No. 26, GHQ, November 16, 1918. LeMaitre had not only assisted the sanitary school's dental section through lectures and onsite visits to French Maxillofacial Hospital No. 45, but had furnished photographs, radiographs, plaster models, and appliances used in the classroom.^{79,80}

In September 1918 Boak, Rice, now Major Potter, and Sergeant Cooke visited Maxillofacial Center No. 6 at Lyons for 5 days to "obtain material for instruction purposes" at the school.^{81,82} In October both Boak and Rice were assigned to tem-

EXHIBIT 13-7

DR VARAZTAD HOVHANESS KAZANJIAN

Dr Varaztad Hovhanness Kazanjian was a 1905 graduate of the Harvard Dental School. On June 26, 1915, he was commissioned a temporary honorary lieutenant, Royal Army Medical Corps, Harvard Surgical Unit, and assigned to General Hospital No. 22, British Expeditionary Forces, as the chief of the dental section. In July 1915 he organized a department of oral reconstructive surgery. In September 1915 he was transferred to General Hospital No. 20, British Expeditionary Forces. Dr Kazanjian was promoted to major in June 1916. His tour of duty was not completed until January 20, 1919. He was commissioned an honorary major, Royal Army Medical Corps, and awarded the Order of Saint Michael and Saint George.

Data source: Hapgood RL. *History of the Harvard Dental School*. Boston, Mass: Harvard University Dental School; 1930: 301.

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porary duty at Mobile Hospital No. 6 for 3 days and Evacuation Hospitals No. 6 and No. 7 for 4 days each to get more current data.⁸³ The Army Sanitary School continued its dental section sessions through October 1918.⁸⁴

In November 1918, after the armistice, Boak decided that it was important to record and fully document the activities of dental officers and the dental service in the combat divisions during the preceding 4 months of combat. He recommended that designated dental officers be ordered to report to the sanitary school sometime during the month of December 1918 to lecture the dental section on their experiences. Boak's request was approved by GHQ (Exhibit 13-8).^{85,86}

The dental section of the Army Sanitary School, Langres, closed at the completion

EXHIBIT 13-8

DENTAL OFFICERS ORDERED TO REPORT TO THE SANITARY SCHOOL DURING DECEMBER 1918 AND THEIR ASSIGNED TOPICS

Dental Officer	Topic
Lieutenant Colonel Samuel H Leslie, chief dental surgeon, III Corps	The Corps Dental Surgeon
Major Gerald G Burns, division dental surgeon, 77th Division	The Division Dental Officer in Combat
Major Rea P McGee, Mobile Hospital No. 1	The Treatment of Maxillofacial Wounds
Captain John E Hughes, division dental surgeon, 29th Division	Transportation of Dental Equipment during Combat
Captain JA Corrizeau, division dental surgeon, 8th Division	Coordination of Dental Officers with Medical Department
Captain JT Ashton, division dental surgeon, 6th Division	Dental Administration in a Division
First Lieutenant Joseph H Jaffer, division dental surgeon, 3rd Division	The Duties of Dental Officers as Auxiliary Medical Officers during Combat
First Lieutenant MF Carney, division dental surgeon, 27th Division	Dental Service in the Rest Areas
First Lieutenant Leo Winter, Mobile Hospital No. 6	Duties of the Dental Officer with a Mobile Hospital

Data sources: (1) National Archives and Records Administration. Record Group 120. Colonel SD Boak, director, to G-5, general headquarters, American Expeditionary Forces (through channels), 19 November 1918. Letter. No. 3603-539. Box 1309. Entry 11. (2) National Archives and Records Administration. Record Group 120. Brigadier General Frank E Bamford, 20 November 1918. Endorsement. No. 3603-539. Box 1309. Entry 11.

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of the course ending December 17, 1918.⁸⁷ Boak reported his departure on January 19, 1919, for reassignment to headquarters, Base Section No. 2, AEF, as supervising dental surgeon.⁸⁸

Enlisted Support

The need for a large number of qualified enlisted assistants was met through the organization of schools at Saint Aignan and Neuilly. The former was established at one of the largest replacement depots, allowing numbers of enlistees to be screened. Many of these candidates had some medical or dental training prior to entering the Army. Most of them took a short course to become dental assistants prior to assignment throughout the theater, but others remained for more intensive courses at Saint Aignan to become "laboratory assistants-dental mechanics." Those who performed the most competently among these graduates were sent to a more advanced class at Neuilly, Army Reserve Corps Hospital No. 1. There they took 6 weeks of instruction in the manufacture of splints and dental prosthetics before being assigned to major hospitals where advanced maxillofacial surgery took place. One other school for enlisted soldiers was established after the armistice at Bordeaux, where training was given in oral hygiene and prophylaxis. Nearly 400 students graduated before the school closed in May 1919.⁶

Female Dentists Overseas

Some female dentists managed to see overseas service with the Red Cross base hospitals in England and France. On May 13, 1918, Dr Sophie Nevin of Brooklyn, New York, assigned to a refugee hospital under construction at Labouheyre, France, offered her services as a dentist to Brigadier General William S Scott, the commander of Base Section No. 2, Bordeaux, Gironde. It seems that while Nevin was waiting for her hospital to open, she began performing some dental treatment on the 4th Battalion, 20th Engineer Regiment, stationed at Mimizan, Les Bains, Landes. The engineer unit had no dental surgeon or any immediate prospect of having one assigned to it. Unfortunately, the available field dental equipment had also been removed. Dr Nevin felt that with the proper equipment, she could perform a valuable service while she waited for her duties to begin at the refugee hospital. The next day, May 14, General Scott sent a memorandum to the base surgeon outlining Nevin's proposal and recommending that it be accepted. On May 17, Colonel Henry A Shaw, the base surgeon, replied that the available Army dental surgeons in the area were "adequate" to furnish all necessary dental care for the 20th Engineers and he recommended that Dr Nevin's offer be declined. In notifying Dr Nevin of this decision on May 18, General Scott stated that he regretted that he could not make her "Commander-in-Chief and boss of all the dental work" for the district.⁸⁹⁻⁹²

In July 1918 Spanish-American War nurse, Dr Katherine Alice Doherty, who was practicing dentistry in Milwaukee, Wisconsin, went overseas to work at the American Women's Hospital No. 1 at Neufmoutiers, France. The hospital treated refugee children and young adults. Later, the hospital was moved to Luzancy. Dr Doherty was assigned to Boullay Thierry to treat a group of 86 refugee children

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Katherine (Kate) Alice Doherty, graduate of Northwestern University Dental School (1901), went overseas to work at the American Women's Hospital No. 1 at Neufmoutiers, France. Photograph: Courtesy of Northwestern University Dental School Library, Chicago, Illinois.

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and then to Viele Maisons to perform emergency work for the passing soldiers. She treated 472 patients alone. In February 1919 she was joined by Dr Kinney and Dr Edna Ward of Colorado. In 1 month at Luzancy, the three dentists treated 288 patients. Dr Doherty later received the Reconnaissance Francaise Citation from the French government for her 20 months of service.⁹³ Another dentist, Dr Marie J Hyman, also served with the women's hospital group.⁹⁴

Female dentists in the United States also cooperated with the Preparedness League of American Dentists to treat the large number of draftees. In addition, dental hygienists also helped to clean up the recruits' mouths.⁹⁴

Some female dental assistants applied to the Army in 1917. On May 2, 1917, Maude M Kerr of Ada, Ohio, asked the surgeon general if there was "a place for Dentists' assistants" in the Army. On May 19, 1917, Frances Weiland of Chicago, Illinois, wanted to know if there was such a position as "Female Dental assistant" in the war zone.⁹⁵ On June 16, 1917, Antonette Faytinger of David City, Nebraska, requested an application blank as a dental nurse or assistant in the Dental Corps. All three women were given the same reply: "women" were not eligible for appointment.⁹⁶



*Dental infirmary, interior view with personnel, November 1918. Montrichard, France.
Photograph: Courtesy of the National Museum of Health and Medicine,
Armed Forces Institute of Pathology. Reeve 015397.*

EXHIBIT 13-9

DR HELEN E MYERS

The first woman to be commissioned in the US Army Dental Corps under the Army Female Medical Department Act of 1949 (HR 4384) was Dr Helen E Myers of Philadelphia and Lancaster, Pennsylvania, who had received her DDS degree from Temple University in 1941. She was ordered to active duty on March 21, 1951, as a captain and assigned to Fort Lee, Virginia.

Data sources: (1) National Archives and Records Administration. Record Group 407. Precedent & History File 858. Press release, "First woman dentist in Army to report for duty March 21," 15 March 1951 [no. 354-51]. No. 44. (2) GI molars get feminine touch. *Ark Dent J.* 1953;24:50-52. (3) Cimring H. Something different in uniforms. *J Am Dent Assoc.* 1961;63:96-97. (4) Hyson JM, Jr. Female dentists in the U.S. Army: the origins. *Mil Med.* 1995;160:60-61.

On March 4, 1918, Major General Peyton C March, the acting chief of staff, said that "women physicians could not be commissioned" in the Medical Reserve Corps, and that it would take an "Act of Congress" for that to change. However, female physicians who wished to serve could apply to the Medical Department as laboratory technicians, anesthetists, and nursing instructors. Furthermore, he emphasized:

Women physicians have not the physical qualifications which would be required for the performance of any duty which may be required of a medical officer. There are limitations both on the places in which their services may be utilized and the kind of services which they may perform. Therefore male physicians who are available for any and every duty that may fall to the part of a medical officer in any place whatsoever, are under the terms of the law commissioned as officers in the Medical Reserve Corps and female physicians being limited to special duties and to serving in special places are employed by contract.⁹⁷

The same guidelines were invoked for female dentists applying to the Dental Corps, and the war ended without any appointments. No legislation for the commissioning of women was enacted until 1950, when the exigencies of the Korean War dictated a change in Army policy (Exhibit 13-9).⁹⁸⁻¹⁰¹

Dental Supplies and Equipment

When the AEF first arrived in France, an obvious shortage of dental supplies and equipment existed in part because the US Army was competing with the Red Cross, which had established itself in Europe shortly after war began in 1914. In July 1917, for example, Dr Herbert L Wheeler of New York notified the Medical Department that 12 dental chairs, 12 fountain cuspidors, a supply of instruments for 4 or 5 chairs, and about \$10,000 was to be made available in Paris for the AEF. However, all the property was diverted to the American Red Cross.¹⁰²

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The first dental surgeons sent to France had their portable dental outfits issued to them before they left the United States, and many were able to begin work as soon as they arrived at their stations. However, for reasons of limited shipping space, this policy was discontinued and the dental surgeons arriving later brought no dental equipment with them. For instance, the dental surgeons assigned to the 2nd and 26th Divisions were without equipment and none was available in the medical supply depot, where planners presumed it would be. Because most of the dental supplies in France were already depleted, the Army had to rely on the British for equipment. Unfortunately, the British had little stock and did not anticipate another delivery for 8 to 12 weeks. Consequently, the AEF chief surgeon's office at first decided to wait for supplies from the United States.¹⁰³⁻¹⁰⁵

Later, in March 1918, the medical purchasing officer, Major Daniel P Card, reported that a second large requisition for dental supplies and equipment submitted to the French Mission was again refused because of the scarcity of dental material in France. Likewise, the British War Office refused requisitions and recommended that the supplies be brought from the United States. In some instances, dental equipment was lost and accidentally found later, as Oliver noted on August 8, 1918: "50 odd boxes of freight, (chests and boxes), containing dental supplies, was found yesterday in the store-houses at Gievres where they have been for an indefinite period of time." Ten packages of dental supplies were found at Base Port No. 5 and several at Base No. 1 and No. 2. Oliver recommended that "steps be taken to unearth all dental supplies that may possibly be stored at the several depots of the medical supply department for the purpose of immediate shipment to Intermediate Medical Supply Depot No. 3."¹⁰⁸

In August 1917 Lieutenant Colonel Clement C Whitcomb, MC, commanding the AEF Medical Supply Depot in France, reported in response to an August 16 requisition from the 5th Regiment, US Marines, that no dental supplies were in stock. A few days later he requested that a cable be sent to the surgeon general in Washington stating the urgent need for "twenty-five portable dental outfits" for stock at his depot. As a temporary measure, an emergency requisition was authorized for the eventual purchase of dental equipment, including instruments and supplies for 25 dental outfits in Paris. The AEF Medical Supply Division hoped to accumulate surplus stock from all possible sources prior to the arrival of large numbers of US units. On August 22, 1917, the medical depot in New York City shipped the first 20 portable outfits to the depot in France and continued to ship outfits throughout the war, shipping 391 complete outfits in the period June 1 to August 31, 1918, alone.¹⁰⁷⁻¹¹⁰

Another significant problem the Dental Corps in France soon encountered was the fact that its supplies and equipment were being ordered by medical, not dental, officers. For example, Lieutenant Colonel Whitcomb questioned whether two base dental outfits for each of the 60 hospitals were necessary. In September 1917 he commented on a dental requisition: "If one base outfit, in addition to one portable outfit for each Dental Surgeon on duty there, is deemed sufficient for each hospital (and in my opinion that equipment is ample), it is requested that this requisition be returned."¹¹¹

DENTAL SERVICE IN THE AMERICAN EXPEDITIONARY FORCES IN FRANCE

In other instances, the portable dental outfits assigned to travel with the dental surgeons to France were misplaced en route and when the dentists got to France, there were no tools available for them. In August 1917 First Lieutenant Reginald S Murdock, DRC, experienced this problem when he arrived at Camp Saint Martin, Boulogne, France.²¹ Murdock, a 1915 graduate of Washington University, Dental School, was assigned to the infirmary, 12th Engineers (Railway) and assisted the only British dental officer servicing the sector of 75,000 troops. The regimental surgeon commented on the British dentist:

His equipment is so scanty that amalgam fillings can be used only in the more favorable cases, the greater part of his work consisting of extractions and cement fillings. Murdock is assisting him and doing what work he can for our troops, but is of comparatively small value without equipment, and the British are not prepared to furnish it.^{112,113}



Dental infirmary at US Army Base Hospital No. 57, Paris, Seine, France, January 30, 1919. Left to right: First Lieutenant CH Nash; Ruth Dennis, assistant; Captain WW Cursler; Ruth Ioy, assistant; Private GW Charlton; and Private LW Stewart.

Photograph: Courtesy of US Army Military History Institute. SC 52129.

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Another dental surgeon, First Lieutenant Agustin L Magruder, DRC a 1916 graduate of Tulane University of Louisiana, College of Medicine, School of Dentistry (New Orleans College of Dentistry), had the same problem upon his assignment to the 17th Engineers (Railway) at Camp No. 1, Section No. 1.²¹ His equipment was aboard the ill-fated *Saratoga*, sunk in New York Harbor with its wartime cargo. Nothing could be done to resupply Magruder until "other material arrives from the United States." A requisition for his new equipment would be "filled as soon as practical."^{114,115}

Even after the armistice, there was still a shortage of dental equipment at some AEF hospitals. On November 30, 1918, the surgeon at Camp Hospital No. 33 complained that many cases of "face wounds and fractured jaws" from the front arrived and the hospital still had only dental field equipment; therefore, it was "impossible to treat these men as they should be." In addition, they had no oral surgeon on duty with the "special training" required for that type of work. Certain dental equipment items were deemed essential to the maxillofacial service, like anatomical articulators, investment flasks, maxilar metal for cast splints, and maxilar flux powder.^{116,117}

The shortage of divisional dental laboratory outfits was also a problem as late as June 1918. On June 27, 1918, Lieutenant Colonel James R Mount, MC, Medical Supply Depot No. 3, sent a memorandum to the chief surgeon, AEF, saying that the divisional dental equipment contained only "one laboratory outfit." He recommended that 50 complete outfits be requisitioned from the United States and that "provision be made to have this item made a part of the initial equipment of troops leaving the United States." In October 1918 First Lieutenant Stephen F French, DC, Base Hospital No. 43, reported that on October 12 he had used the last of his alloy and on October 15 the last of his oxyphosphate cement, and that he was "unable to obtain any more."^{118,119}

In December 1918 Major Howard I Benedict, attending dental surgeon, advance section, complained to Colonel Oliver that he had reported for duty and found "no dental equipment of any nature" on hand. When he visited the newly arrived Evacuation Hospitals No. 3 and No. 12, and Field Hospital No. 301 and No. 303, he found they had no dental outfits. The 6th Infantry dental surgeons had "only a few instruments for emergency work." For his efforts, "one complete portable dental outfit" was shipped to him from the medical supply depot at Cosne. As late as January 1919 the 815th Pioneer Infantry at Glorieux, Meuse and the 816th Pioneer Infantry at Verdun, Meuse "badly needed" dental outfits.¹²⁰⁻¹²²

Throughout the war, dental surgeons continued complaining about the lack of dental outfits available. In February 1918 First Lieutenant William C Webb, Jr, at the II Corps school reported that he had "no personal equipment on hand" and had to share a colleague's for a week. On August 5, 1918, Major Raymond W Pearson, the 33rd Division dental surgeon, sent a memo to his division surgeon that three of the 129th Infantry Regiment's dental outfits were still stored at Le Havre and attempts to get them had been unsuccessful. Other dental outfits for the three infantry and two field artillery regiments of the division were still probably at Brest. The 33rd Division had no surplus outfits on hand to send to these units. In September 1918 Captain Walter L Wilson, DC, of the 5th Corps Replacement Battalion, reported that he had neither a portable dental outfit nor supplies.

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One dental surgeon with the 2nd Corps Replacement Battalion at Pont De Metz, France, reported that he had been working without a contra angle handpiece from October 18 to the end of November 1918.¹²³⁻¹²⁶

Confronted by these shortfalls, Oliver's office did its best to find solutions. An automatic requisition system was put into effect in the summer of 1917 for every 25,000 troops reaching France, and dental supply officers were assigned to all depots handling medical material. Shortages still occurred because of accidents, congestion, and improper handling at the ports. Dental supply officers were assigned to places on the dates indicated: Cosne Depot, September 1, 1917; Advance Medical Supply Depot, Is-sur-Tille, March 1, 1918; Medical Supply Depot No. 1, February 1918; and Base Port, Base Section No. 1, Saint Nazaire.^{5,6} Most of the maxillofacial material was misplaced on the Marseille docks and not recovered until 1919. Railroad personnel had to be educated to give dental equipment adequate shipping priorities.

Even with the best planning, the vagaries of war often intruded. When purchasing officers turned to European sources, they encountered the availability problems. When they finally shipped the dental laboratory equipment that had accumulated in England, the ship carrying it was torpedoed in the English Channel. Much more dental equipment was lost when a freighter from the United States was sunk off the Irish coast. A particular problem arose while attempting to procure the special equipment necessary "for maxillofacial surgery and for the prosthetic and reconstruction procedures required in the practice of that specialty." The dental section report told the story:

Adequate consideration and study had been given this subject prior to the departure from the United States of specialists in this line, and provision had been made whereby special chests containing maxillofacial unit equipment would be shipped immediately on their departure. These plans failed and the much needed special equipment for this service was not received until after the signing of the armistice. It was found subsequently in the midst of a quantity of supplies at the port of Marseille.^{6(p117)}

American medical supply specialists turned to French and British manufacturers to obtain much of the missing equipment, but not all of the requisitions could be met due to their own demands for these materials. Though this equipment was not available on many occasions when it was needed by the dental officers at evacuation hospitals, mobile hospitals, and a few base hospitals, the deficiency was well met by individual ingenuity and by improvisation.⁶

Problems with the Transportation of Dental Equipment and Supplies: The Origins of American Expeditionary Forces General Order No. 99

An enormous problem that developed at the division level was that the tables of organization did not include dentists or their assistants and equipment and were not modified during the war to include them. This meant that no trucks or road transportation were specifically dedicated to move the 6 tons of professional equipment that the division's dentists and their assistants needed to carry. In fact, they had to beg rides just for themselves. Thus, when urgent movements became more commonplace starting in the spring of 1918, huge amounts of dental equip-

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ment had to be abandoned or turned over for salvage. When the divisions reached their new locations, the dental surgeons flooded the medical supply depots with emergency requisitions for whole new dental sets.^{5,6}

The postwar official history of the AEF's dental section, most likely written by Oliver, recounted this problem and its consequences:

In combat divisions, the transportation of dental equipment and supplies was always a problem and when not carried individually, a source of irritation to division commanders, transportation officers, and division surgeons. This was largely due to the fact that no provision had ever been made in the Tables of Organization for dental personnel, commissioned and enlisted, or for dental equipment. Omission in these Tables of the Dental Corps and of provision for transport of its supplies resulted in the loss of much equipment and the consequent temporary lack of dental services in several divisions. The First Division on its movement into a combat area in May, 1918, found it expedient to abandon all its dental equipment on account of the lack of transportation, for the material had not been considered by its transportation officer in making his allowances for the rapid movement of equipment and supplies. This loss was immediately investigated and efforts were made for finding and salvaging the abandoned equipment. Though not found at the time it was subsequently redeemed through the salvage service. In the interim, through the efforts made at intermediate medical supply depot No. 3, the dental service of the division was reequipped with modified portable outfits.^{6(pp116-117)}

While the issue was never fully resolved during the war, Oliver quickly realized what a serious problem it presented to effective dental care and took a number of steps to rectify the situation. The increased tempo of American operations in the late spring of 1918 brought the seriousness of the problem to a critical state in some front line divisions. On May 14, 1918, Colonel Walter D McCaw, acting in the absence of the chief surgeon, sent a memo (probably composed by Oliver) to the chief of staff, SOS, outlining the problem and laying out a recommended distribution of dental officers and equipment in a division. The basic problem remained the lack of dentists in the division table of organization:

The Tables of Organization, Series "A", January 14, 1918, fail to mention the authorized personnel, commissioned and enlisted, of the Dental Corps. This omission has occasioned considerable difficulty in the adjustment of Medical Department personnel (both commissioned and enlisted) and recently in Divisions preparing to move into combat areas, has been the cause of much confusion with the problems of transportation and shipment of equipment. It seems the question of transportation has been estimated largely on citations made in the Table of Organization. There being no representation therein for dental officers, their enlisted assistants or their equipment, this excess of transportation facilities has been lacking.¹²⁷

While Oliver did not achieve the inclusion of the Dental Corps in revised war-time tables of organization, he at least partially rectified this crippling oversight with AEF General Order No. 99 on June 19, 1918, which "for the first time" accounted for the dentists within the division (see Chapter 12, "Organizing the Dental Corps for the War in Europe").⁶

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The problems of the division table of organization and transportation of dental equipment and supplies only further exacerbated the basic shortcomings of the portable dental outfit that the dental surgeons took to France. Originally created by John S Marshall and Robert Oliver in 1901 for use in the Philippines, this portable outfit was simply too heavy and bulky. Once American divisions entered the line and active ground combat operations in the late spring and summer of 1918, the existing portable dental outfits were quickly revealed as impractical "for active field service." Oliver's office determined that the complete portable outfits would be kept for use at camp hospitals and detached units of the SOS, which could more easily transport them. For the dentists in the combat divisions, a modified portable outfit was developed that could be packed into three chests or footlockers containing all of the essential equipment, including a dental engine, medicines, and supplies required for practicing dentistry under field conditions. On June 19, 1918, AEF GHQ published General Order No. 99, which allocated 10 complete and 20 modified portable dental outfits and directed their disposition within each division.⁶



*Dental infirmary, interior view with personnel, 1918. Meusnes, France.
Photograph: Courtesy of the National Museum of Health and Medicine,
Armed Forces Institute of Pathology. Reeve 015404.*

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Dental Emergency Kits

On May 11, 1918, in a memorandum to division dental surgeons from the office of the chief surgeon, AEF, Oliver developed other solutions to the problem of moving dentists and their equipment around front line tactical units and combat areas. Experience at the front had shown that even the newly slimmed-down dental outfits were not all that portable along the front lines, so they were consigned to the divisional rear areas and the field hospitals in the sanitary train. For divisions in front line battle areas, an even more stripped down outfit, called the "campaign equipment," was provided, which consisted of the dental engine chest and the dental emergency kit. Oliver designated the dental emergency kits as personal dental equipment and directed dental surgeons to carry two emergency kits with standardized contents with them at all times when accompanying their commands into combat areas. Two of the old style Hospital Corps pouches were adapted for carrying light canvas or khaki cloth instrument rolls. In the absence of this type of instrument roll, a tightly rolled hand towel secured with a rubber band was recommended. The dentists carried the 9 pound Pouch No. 1, which contained a small blank book with indelible pencil (for dental records) and three rolls. Roll number one had the extraction forceps and oral surgery instruments; number two carried the operating instruments; and number three contained the medicines and a small amount of supplies. The enlisted dental assistant carried Pouch No. 2, which weighed 8 pounds. This pouch contained roll number four, which included amalgam, cements, a glass slab, cotton rolls, ligature wire, towels, soap, and other miscellaneous supplies. Later, a 4 ½ pound folding aluminum trench chair was added and carried in a container slung over the dental assistant's shoulder.^{128,129}

These kits were intended to be used strictly for emergency treatments for roughly a 2-week period. Oliver cautioned the dental surgeons: "It is not considered necessary to attempt more than emergency treatment for the relief of pain in the majority of cases however, should time and condition permit, plastic fillings (alloy or cement) may be accomplished in those cavities that permit of excavation by hand instruments." Individual preference could determine the exact content of the temporary kits, as would available stocks of supplies. Oliver instructed the dental surgeons to make arrangements with their regimental surgeons for evacuating dental cases that required more than emergency treatment. These cases were to be sent to the dental service at division field hospitals where modified portable dental outfits were installed. While the emergency kits helped solve the transportation problem, dentists and their assistants were left to shoulder the extra load.^{128,129}

As a result of developing and pushing forward the dental emergency kits, the divisional dental service was significantly enhanced:

Thus officers were enabled to render first-aid dentistry at all times for the relief of pain and for minor oral surgical and dental operations. This modification of dental equipment helped solve many of the transportation problems for the dental service in combat divisions, and while it increased the weight carried by dental officers, it proved advantageous by making it possible for anyone requiring dental service to obtain it at any time from the dental officer of his command.^{6(p116)}

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The whole issue of dental equipment and supply was referred to a dental equipment board in July 1918. Working within the larger medical equipment board, the dental board was expected to re-evaluate the equipment considered essential for dental officers in tactical units and hospitals in direct support of combat. It concluded substantial revisions were needed based on actual experiences and was in the process of modifying at the time of the armistice. In March 1919 Lieutenant Commander Cornelius H Mack, DC, US Navy, then the 2nd Division's dental surgeon, stated that the outfit "panned out so badly on account of transportation." He believed that a "more compact and less weighty" portable outfit would be an improvement over the current design. Oliver informed him that the dental equipment board was considering modifying the field outfit based on wartime experience. The board's findings carried over into postwar changes in field dental equipment and supplies.^{5,130-132}

Captain Haymes's Wooden Chair Design

The persistent shortages in dental equipment and supplies inspired a great deal of inventiveness on the part of the hard-pressed dentists. Because of the shortage of dental chairs, in 1918 Captain John E Haymes, division dental surgeon, 36th Division, AEF, designed an improvised portable wooden dental chair for field use. The dental officers in the division used his chair "in the absence of the authorized chair." Oliver liked the idea because the chair could be constructed from materials readily found in the quartermaster department and in the locality of field operations. He promised to submit the description and diagram to the dental equipment board and give Captain Haymes "full credit for priority and invention of this chair in case it proves of practical value." From the diagram, it appears that Haymes's design served as the prototype for the all-metal World War II portable dental chair. The chair required about 12 feet of 1-by-10 or -12 lumber, a few yards of rope, and 5 hinges with screws. The hinges were placed so that when the chair was closed it would lie flat on the back board. A detachable headrest could be devised to be removed in transit.^{133,135}

The "Amex War Denture"

In the early spring of 1917 a man with the standard removable vulcanite denture was barred from voluntary enlistment in the US Army on the basis that the dentures were a liability and subject to break. Consequently, the Army began experimenting with aluminum as a substitute denture base. Actually, aluminum had originally been introduced into the dental profession by Dr James Baxter Bean, the former Confederate dental surgeon who had organized the world's first military maxillofacial hospital ward in Atlanta during the American Civil War. In November 1866 Dr Bean exhibited his cast aluminum plate at the second meeting of the Maryland Association of Dentists in Baltimore. It was recorded in the minutes that this was the "first successful effort known to the association in casting aluminum as a base for teeth."¹³⁵⁻¹³⁸

In June 1917 First Lieutenant Edward H Raymond, Jr, DC, in conjunction with

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First Lieutenant John B Wagoner, DRC, did the initial wartime work on casting aluminum dentures at the Base Hospital No. 2 (Presbyterian Hospital Unit), British Expeditionary Forces, in France. On August 8, 1918, Colonel Boak asked Lieutenant Wagoner to deliver a lecture and demonstration on the new all-aluminum plates to Army Sanitary School students. The Army called the new cast aluminum denture the "Amex Denture," and officially adopted it as the "war denture" for the AEF in France. Captain Raymond and Major Wagoner were given the credit for its development as a vulcanite substitute.^{139,140}

In introducing the new denture, the Army cited the unusual wartime conditions as the reason for developing "a standard type denture sufficiently strong to withstand the hardships of masticating field rations, to resist fracture from all ordinary accidents and to prevent malicious distortion or mutilation." Because of the cramped space and poor lighting in tents, huts, and dugouts at the front, dentures that were removed for the night were broken far more often in military than in civilian life. Intentionally breaking one's dentures to get away from the front, like the self-inflicted wound, was probably rare, but the metal denture made it even less common.^{135,141}

The Amex Denture was inexpensive, easily made of materials locally procurable, durable, light in weight, had good thermal conductivity, and was easy to clean; all of which commended its use. The denture consisted of a metal plate with metal teeth all cast together in one piece. The posterior teeth were always cast as part of the denture, but porcelain teeth could be used for the six anteriors, if time could be spared for vulcanizing. The objectionable appearance of full upper dentures with all-metal teeth had to be disregarded on the basis that war service efficiency outweighed aesthetic considerations. Clasps for partial dentures could be incorporated into the casting.¹³⁵

The Amex casting flask was developed from a model made of a section of a "Soixante Quinze" (French 75-mm artillery) shell. The materials required for the denture were aluminum ingots, pink baseplate wax, casting wax for tooth forms, investment compound of pulverized silox and Plaster of Paris, and DuTrey's Anterior Diatheric teeth. Old newspaper soaked to a pulp was used as a substitute for fiber asbestos in the lid of the casting flask. The average all-metal denture weighed 22 grams and cost about 6 or 7 cents for the metal. On November 7, 1918, all the AEF dental laboratories were ordered to begin fabricating the war denture. Apparently, the armistice of November 11, 1918, halted the mass production of these new "war dentures" so examples are very rare. In fact, the extensive denture collection of the National Museum of Dentistry in Baltimore, Maryland, does not include a single specimen. In the 1920s the aluminum base was highly touted by Dr Dayton Dunbar Campbell, special lecturer in dental prosthetics at the Kansas City Western Dental College and founder and president of the Campbell School of Prosthetic Technic.^{135,142,143}

Invention of Carpule Syringe

Local anesthesia was introduced in 1905 with the synthesis of novocaine hydrochloride by Alfred Einhorn (1856–1917) of Germany. The drug was supplied in powder form, so dentists had to mix up a new solution each time they needed it.

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This process was time consuming and awkward on the battlefield. Unfortunately, stock solutions deteriorated rapidly. Harvey S Cook, an Army surgeon from Valparaiso, Indiana, solved this problem by inventing the carpule. He was inspired by the cartridges used in Army rifles and made the first carpule syringe himself. He fabricated a brass syringe, which locked a double-pointed needle in place, cut the glass tubes, and used pencil erasers as rubber stoppers. He spent his evenings sterilizing the solutions and filling the carpules for the next day's work. His invention revolutionized the delivery system for all types of medication, particularly local anesthesia in dentistry.^{144,145}

Prosthetic Treatment Policy

In general the provisions of Paragraph 1401, Army Regulations, provided for kind of treatment accorded the enlisted men in the AEF. Loss of teeth occurring "in line of duty" was to be replaced by "suitably constructed dentures (vulcanite)." Special treatment with "extra materials," which the dental officer provided, was authorized only in "exceptional cases" in the "best interests of the service." Crown and bridgework and gold for cast inlays was recommended for officers only. The dental surgeons were to keep this "special material" on hand and be reimbursed for the "cost of materials actually used," plus a small percentage to cover waste (Table 13-2).^{146,147}

At least one medical officer, Colonel John W Hanner, commanding officer of Base Hospital No. 116, thought this process was unfair to the dental surgeons. In June 1918 he sent a memo to the chief surgeon, AEF, in which he stated,

If the Government feels that it is for the best interests of the service that such work should be done, necessitating these extra materials, it seems just to me that the government should furnish the stock of materials that would be required for this work, and the dental surgeon should not be required to purchase them personally.¹⁴⁸

Vulcanite or aluminum dentures were the only type of prosthetic service offered to the enlisted soldiers, gold was not authorized. If clasps were used, they had to be made of German silver or the French metal, Melchoir.¹⁴⁹ The prosthetic work was to be completed by the dental officer in charge of the division's portable dental laboratory. In combat areas, its usual location was at one of the field hospitals farthest removed from the front lines. In training areas, it was located at the headquarters dental office.¹⁵⁰

French Centres de Prosthèse Dentaire

There was significant cooperation between the American and French Dental Corps throughout the war. In the absence of US Army dental surgeons, American soldiers billeted near French centres de prosthèse dentaire (centers of dental prosthetics) often received routine dental and prosthetic appliances from the French. The fee charged was 5 francs per tooth for appliances made of vulcanite with German silver clasps. Oliver believed this was fair and equitable, but recommended that American patients be transferred to American hospitals as soon as possible

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TABLE 13-2
ALLOWABLE FEES FOR NONGOVERNMENT METALS

Metal	Price
Gold, simple	\$2.00
Gold, compound	\$2.50–\$3.50
Gold inlays, simple	\$3.00–\$3.50
Gold inlays, compound	\$4.00–\$5.00
Gold shell crowns, bicuspid, swaged cusps	\$5.00
Gold shell cast cusps	\$6.00
Molars, swaged cusps	\$6.00–\$7.00
Cast cusps	\$7.00–\$8.00
Gold porcelain crowns (richmond, goslee, steele, or ash facings, and bridge dummies)	\$5.00
Porcelain crowns, with cast gold base	\$3.00
Bridges	charges based on components plus a charge for consolidation, not to exceed \$1.00 for each interproximal space soldered

Data sources: (1) National Archives and Records Administration. Record Group 120. Special instructions governing the character of dental treatment accorded in the American Expeditionary Forces, chief surgeon, American Expeditionary Forces. Memo. No. 703. Folder 18. Box 5149. Entry 2065. (2) National Archives and Records Administration. Record Group 120. Circular no. 4, office of the chief surgeon, headquarters, American Expeditionary Forces, 22 December 1917. Box 5464. Entry 2072.

(without risk to the patient), and that only emergency dental treatment be given, except for unusual cases that could be retained for long periods. The American hospitals were treating the French soldiers in the same manner.^{151–153}

On the Line of Communications: Base Section No. 1, American Expeditionary Forces

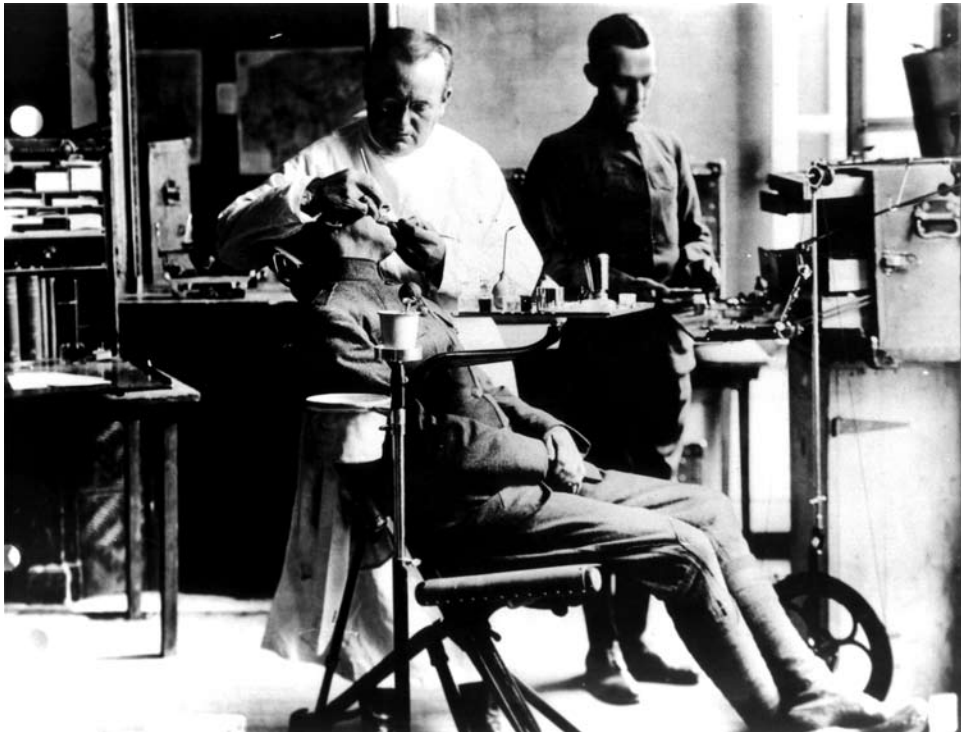
Dental operations at the base sections were different than in units and hospitals. The best example of its type is the office of the surgeon at Base Section No. 1, AEF, established at Saint Nazaire, France, on July 2, 1917, after the arrival of the first convoy of American troops. The office of supervising dental surgeon was established on April 18, 1918, when Colonel George H Casaday, one of the original contract dental surgeons, reported. His duties were to inspect all stations within the base section where troops were located to determine “whether defects exist in the treatment and management of dental work”; to determine the “sufficiency and quality of dental personnel and dental equipment”; to make reports to the

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base surgeon's office with suggestions as to "corrective measures necessary in case of personnel and equipment"; and to "tabulate reports of all work performed by Dental Officers in the Base Section and to make periodical consolidated reports of same to the Chief Surgeon, American E.F."¹⁵⁴

In addition, Casaday was responsible at that time for the supervision of the dental activities for Base Section No. 2, No. 5, and No. 7, which required him to make occasional inspection trips. The scope of the dental work was limited because the organizations going through the ports remained only a short time and each had its own dental surgeons who accompanied it to its training area, where it prepared to enter the line. The number of dental surgeons remaining permanently in the base sections was limited because of the overall shortage of dental officers; consequently, the dental service for the section's assigned personnel was also limited.¹⁵⁴

On December 17, 1918, Lieutenant Colonel Frank P Stone reported for duty as supervising dental surgeon. He immediately began enlarging the scope of the



Captain EE Courtwright, dental surgeon, IV Corps Headquarters, in dental laboratory operating on patient. Toul, France, August 22, 1918. Photograph: Courtesy of US Army Military History Institute. SC 22970.

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dental service and personnel to meet the increased demand caused by the influx of troops awaiting transportation back to the United States. Infirmaries were opened at Camps No. 4 and No. 5, at Camp Montoir, and an additional infirmary was built at Camp No. 1. The billeting areas around Nantes and Angers were supplied with additional dental surgeons and a local dental supervisor was placed in charge of each district. The character of the dental service began to change to meet the needs of the section. Dental officers were on duty at the reception camp and a dental inspection of each soldier preparing for embarkation was a part of the general physical examination. The soldiers were listed in order of the urgency of their dental needs and were sent to the dental clinic according to that list. The main embarkation camp at Camp No. 1 had the best-organized and most well-equipped dental infirmary in France.¹⁵⁴

One unit of dental support overlooked until close to the war's end was the smaller logistical unit that was not authorized to have its own dentists. For example, in August 1918, the intermediate section of the SOS had about 85,000 troops, ex-



*First Lieutenant RM McNulty, dental surgeon, 309th Field Artillery Regiment, 78th Division, with assistant Private JJ Cleveland, operates on a patient just back from the lines, Fey-en-Haye, Meurthe et Moselle, France. September 22, 1918.
Photograph: Courtesy of US Army Military History Institute. SC 33390*

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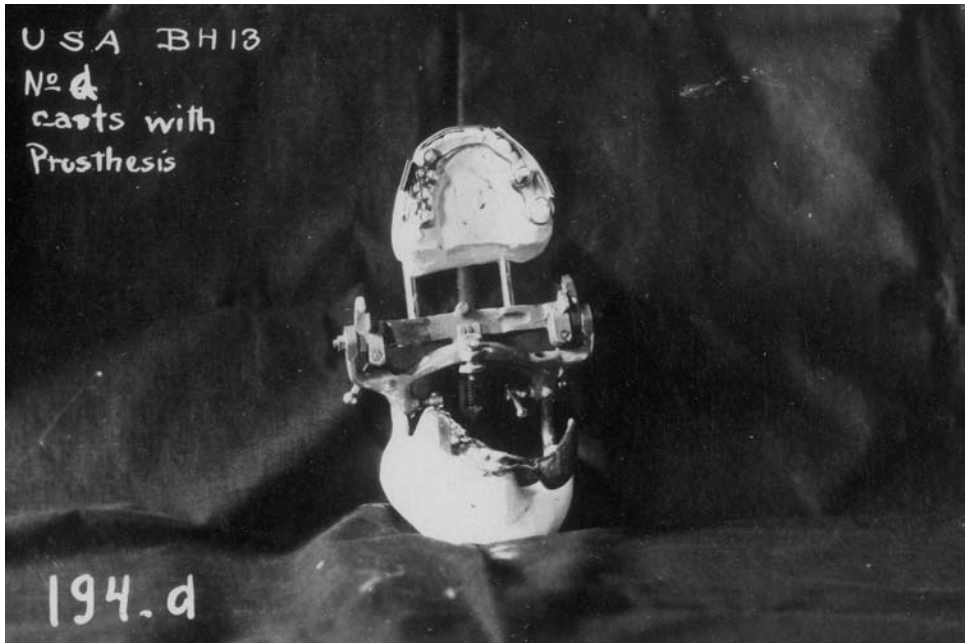
Dental surgeons completing a dental examination of personnel of the 83rd Division at Le Mans, France. October 6, 1918.
Photograph: Courtesy of US Army Military History Institute. SC 26030.

cluding the depot division or replacement battalion troops, and only 40 dental surgeons were not employed with base hospital dental staffs. The units generated many requests for dental treatment and the dental situation had become “acute” in the opinion of the section surgeon. Furthermore, the few dental surgeons available were constantly being taken away and assigned to the Army Sanitary School for instruction and training.¹⁵⁵ On August 22, Oliver agreed to assign two dental surgeons and more “as they become available.”¹⁵⁶ As a result of the continuing shortage of Dental Corps officers in the AEF, this was one of many times Oliver had to juggle his scant resources to provide dental care.

A Continuing Shortage of Dental Surgeons

Shortages of dental officers persisted at every echelon throughout the war, despite every effort to spread the talent or obtain more personnel. Because of the limitations imposed by AEF policies, the Dental Corps in the AEF never even reached its statutory ratio of one dentist per thousand enlisted personnel. By the time of the armistice in November 1918, there was a shortage of over 300 dental surgeons. The fundamental problem was that organizations under a thousand troops and

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*Base Hospital No. 13. Cast on articulator with dental/facial prosthesis.
Open view. Limoges, France.*

*Photograph: Courtesy of the National Museum of Health and Medicine,
Armed Forces Institute of Pathology. Reeve 012037A.*

casuals arriving in France were not accounted for in the basic allocation of dental surgeons in accordance with the ratio. Soon a shortage occurred for the AEF as a whole, and this was especially true for units, such as engineer and service units, that expanded significantly after their arrival in France.⁶

On August 14, 1918, a frustrated Colonel James L Bevens, chief surgeon at III Corps headquarters, complained that his July 9 letter and July 25, 1918, telegram to the adjutant general, GHQ, for a dental surgeon had gone unanswered. He stated that an increasing number of both officers and enlisted personnel required dental treatment and that the assignment of a dental surgeon with his enlisted assistant and portable dental outfit was "urgently needed." Major General Robert L Bullard, his commander, recommended approval and Captain William Z Carroll, DRC, a 1911 graduate of the Northwestern University Dental School, was assigned as attending dental surgeon.^{21,157-159}

In September 1918 Carroll reported that he was "continually instructing the men who come under my care in the importance of Oral Hygiene." He also complained, "Equipment with which I am working incomplete. Portable dental field equipment which arrived with me at Brest, France, August 7, 1918 has not been received to date." Finally, in October 1918 Carroll received his dental outfit that had been traveling from the New York medical supply depot since about July 25, 1918.^{160,161}

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By then Carroll had sufficient experience with his unit to issue a memorandum on oral hygiene to the corps headquarters commandant:

1. Attention is called to the lack of care given their teeth by the men of this Command and of other organizations coming under my care.
2. It is of great importance under present conditions in the field that the teeth be thoroughly brushed, if possible, after each meal and, in so doing, prevent those diseases of the teeth and gums that are caused directly by food particles left undisturbed from day to day in the many crevices between the teeth and gums.
3. If tooth powder or paste is not available, the use of common salt instead will suffice, if the tooth brush is used two or three times daily.
4. The danger of contagion is greatly lessened in the individual if the mouth is kept clean.¹⁶²

On August 17, 1918, Lieutenant Colonel EP Walser, the commanding officer of the I Corps Artillery Park, complained to the chief surgeon of the III Corps over the lack of dental care for his troops:

At full strength this organization has 1335 officers and men. At present we have over 1200 and we have no dentist either attached or permanently assigned to this organization. The condition of the teeth of many of the men is very bad as they have had no dental attention of any kind since leaving the United States and I urgently request that a dentist be at least temporarily assigned to this organization.¹⁶³

The chief surgeon recommended that the request for a dental officer be approved. The corps commander concurred.¹⁶⁴

Even the dental officers complained about the absence of dental care for the troops. On October 3, 1918, Captain Louis A Haffner, dental surgeon with the 4th Corps Replacement Battalion, sent a memo to his commanding officer. It read:

1. The need of dental treatment in an organization of this kind is greater than the average, for the personnel is ever transient, men arrive daily, after having been enroute several days, the hygienic condition of the mouth is demoralized on account of the lack of cleanliness. A lot of men are evacuated from hospitals and other organizations with temporary fillings in their teeth. Fully fifty per cent of my time is taken up with such work.
2. My records show that I treated forty patients during the first two days of October, which is without a doubt too many for one officer to handle and give the proper attention to each individual. There is ample need of another Dental Officer at this station for operating alone.¹⁶⁵

The deficiencies in dental surgeons for the divisions of the Second Army from November 12 through December 3 indicate the problem for front line units (Table 13-3).¹⁶⁶

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TABLE 13-3

DENTAL SURGEON STAFFING IN SECOND ARMY DIVISIONS,
NOVEMBER 12–DECEMBER 3, 1918 (AUTHORIZED STRENGTH: 31)

Division	November 12, 1918	November 19, 1918	November 26, 1918	December 3, 1918
4th Division	18	18	Transferred	No report
7th Division	No report	18	18	18
28th Division	No report	21	21	22
33rd Division	No report	29	29	33
35th Division	No report	No report	22	26
85th Division	22	No report	17	16
88th Division	24	24	25	25
92nd Division	31	31	29	29

Data source: National Archives and Records Administration. Record Group 120. Colonel George H Casaday, chief dental surgeon, Second Army, 12, 19, and 26 November, and 3 December 1918, in File 319.1 "Dental Personnel." Reports. Box 3295. Entry 924.

Even as late as 1919, First Army headquarters was frequently reminded of the shortage of dental surgeons. On January 17, 1919, a plea came in from the captain of a military police battalion on detached service with the provost marshal, advance section, SOS:

Request is made that a dental surgeon be assigned to this organization for a period of six weeks. This organization was on duty at the front, or on the move, from February 17, 1918 until September 20, 1918, and since the latter date has been on duty in the Army area. It has been possible to obtain dental treatment for only the serious cases, and as a result, the teeth of many of the men require attention.¹⁶⁷

The request was approved by Major John G MacDonnell, provost marshal of the First Army, and a dental officer was ordered to report for temporary duty as soon as one was available.¹⁶⁸

The continuing shortage of dental officers presented problems that were only resolved after the armistice, when Oliver adopted what was called "a general plan for equalization." He reduced the dental contingent of each division that was returning to the United States to a skeleton group capable of providing dental services on the voyage, retaining two thirds (approximately 20 or so for a fully staffed division) of the dental personnel in France. He then reassigned the retained personnel to provide dental care for those commands without any dental officers. Oliver's policy partly accounts for the slow drop in the overall numbers of Dental Corps officers in AEF from November 1918 (1,779) through April 1919 (1,537), when he discontinued this equalization plan because the number of American forces had so

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significantly declined that such levels of dental support were no longer necessary. By the end of May 1919, 1,113 dental surgeons remained in the AEF, but by mid-July that number was down to 312 and only 67 remained by mid September.^{6,169,170}

The Medical College, Dental Section, American Expeditionary Forces University, Beaune

In November 1918, shortly after the armistice was signed, educational leaders in the United States and the AEF formulated plans whereby the soldiers could continue their educations if they had been interrupted by the war. In February 1919, after 2 months of planning, they made arrangements to establish the AEF University at Beaune, Cote D'Or, under the leadership of Colonel Ura L Reeves, with Dr John R Erskine of Columbia University as educational director.¹⁷¹

At first, all branches were taught except the medical sciences. Finally it was decided to establish a medical college with departments of medicine, dentistry, veterinary medicine, and pharmacy headed by Colonel Joseph H Ford, MC, and assisted by Colonel Louis Brechimin, Jr.¹⁷¹ On February 28, 1919, the Medical Department issued a memorandum recommending that suitable officers of the Dental and Veterinary Corps be selected and assigned to duty as deans of the Schools of Dentistry and Veterinary Medicine, respectively. Lieutenant Colonel Otis H McDonald, DC, then attached to the V Corps as corps dental surgeon, was selected to command the dental section of the medical college.^{171,172}

The chief difficulty with the school was putting together a competent faculty, scattered as qualified candidates were in France, England, Germany, Italy, and Luxembourg. However, McDonald, an "old-established practitioner," knew the ropes and came up with a competent faculty. It was composed of: Captain J Howard Gaskill (DDS, Pennsylvania College of Dental Surgery), instructor of dental pathology and fractures and splints; First Lieutenant Morris BS Fleischer (DDS, MS, University of Pennsylvania), instructor of bacteriology, pathology, and oral hygiene, adjutant; Captain Frampton W Farmer (DDS, Southern Dental College), instructor of operative dentistry; Captain Alva L Cowart (DDS, Atlanta Dental College), instructor in anesthesia and exodontia; First Lieutenant Raymond R Henry (DDS, University of Minnesota), instructor in operative technique; Captain Edward B Lodge (DDS, University of Michigan), and Captain H Morrow (DDS, University of Iowa), supervisors of dental education. The first lectures were given on March 13, 1919, to students gathered from all over the AEF.¹⁷¹

The dental section had an aggregation of 85 students, representing 54 different colleges and universities, and 12 had DDS degrees. Nine students had 3 years of dental school, and 18 had between 1 and 2 years of dental school.¹⁷⁰ The dental course was designed to prepare two types of students: those contemplating entering dental college, and dental undergraduates who were in need of review in order to qualify for admission to dental schools certified by the National Association of Dental Faculties. The course consisted of didactic lectures and laboratory instruction in anatomy, bacteriology, biology, chemistry, histology, metallurgy, microscopy, pathology, physiology, and clinical operative, oral surgery, and prosthetic dentistry. The dental course ran for 12 weeks and was taught by dental

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officers. The medical subjects were taught by the medical faculty in conjunction with the medical students. Captain Trueman J Slade, DC, was in charge of the clinical department.¹⁷³

By March 6, 1919, a seven-chair dental clinic became operational. All AEF personnel, including civilians, were eligible for treatment according to Army Regulations. Treatment was rendered by commissioned dental officers only. Prior to closing in June 1919, the clinic accepted only emergency cases and those that could be completed in one sitting.¹⁷⁴

The dental school closed on June 7, 1919, so that the dental officers could rejoin their units and render treatment to their personnel en route to the United States. They moved out with their enlisted assistants and portable dental outfits. However, the school had accomplished its mission by giving the students "an idea of the studies they elected, the difficulties that are most often encountered, and the interesting features of such studies." Each student received a certificate of attendance.^{171,175} The closing of Beaune marked the termination of a remarkably effective wartime schooling system created in a very little time with few resources.

Postwar Dental Examination and Treatment

The pressure for dentists only abated when units began to return to the United States in the spring of 1919. Early in the embarkation from France, Oliver's office decided to classify the returning troops as follows:

- (1) Class "A," mouth in hygienic condition.
- (2) Class "E," dental work needed, but not immediately.
- (3) Class "C," immediate dental work required. This included teeth to be extracted, large cavities to be filled, "pyorrhea" and Vincent's Angina.¹⁷⁶

The dental surgeons on duty at the transient camps requested (in writing) that their commanding officer send 15 class "C" patients daily for treatment. When all the class "C" cases were completed, the class "E" should be substituted, so that all appointment time was utilized. Upon completion of the work, the commanding officer was expected to file a report to that effect to the office of the sanitary inspector.

Apparently, complaints were received in the surgeon general's office in Washington, DC, that some officers and enlisted soldiers returning from overseas were unable to get dental care while on board the transports. Lieutenant Colonel Frank LK LaFlamme at the surgeon general's office ordered that steps be taken to correct this problem by having dental officers "with the necessary portable equipment" on duty to take care of any emergencies that might arise on board.¹⁷⁷

Oliver responded that a trimmed-down dental service consisting of eight dental surgeons was authorized to return with each division to render emergency treatment during the voyage home. In addition, each dental officer leaving France was to take with him one full and complete dental portable outfit to be carried as "extra baggage" on authority granted by SOS headquarters. This method was ad-

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vocated as a means of both ensuring adequate professional service while traveling and transporting a large amount of portable equipment to the United States for retention in the service.¹⁷⁸

To the Front

Robert Oliver's unremitting work to organize, equip, train, and supply the AEF's dental surgeons was aimed at one thing: providing the best possible oral and dental care for the American soldier, whether in the rear areas or the front line trenches. Of the 42 divisions that eventually reached France, 30 saw active combat operations or long stretches in the trenches. Accompanying the soldiers into combat as well as treating them in rear area hospitals, Dental Corps officers conclusively proved their value to the Army and Medical Department on the battlefields of France.

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