

amount of material which passes through; thus permitting us to have some idea as to whether this is sufficient or not to sustain life, and it further enables us to decide for or against operation. I have also demonstrated that all surgical cases present a weight curve resembling the crisis of pneumonia, while all nonsurgical cases present a weight curve resembling the fastigium of typhoid fever.

DR. JOHN ZAHORSKY, St. Louis: I was led astray by the plates in one case. A child about 5 years of age had vomited everything for the last two months; this was the history obtained from the mother. Two or three doctors had treated the child for dyspepsia. On a careful examination I could get little information. I had a roentgenogram made, and it apparently showed a positive obstruction at the ileocecal orifice. Nothing seemed to pass through for hours and hours. I could not explain it. I did not know of any such thing as spasm of the valve. I thought it better to have an exploratory operation. A few days later the child was sent to the hospital. On arriving there, a history was given of a slight spasm. I again examined the cerebrospinal system. I had an eye specialist examine the eyes. It proved to be the beginning of a cerebral tumor.

DR. C. G. KERLEY, New York: The management in these cases consisted largely in the use of massage and gymnastics. In the little baby with the very severe colic, massage was given twice a day. In addition to this, one-half ounce of olive oil was given daily in divided doses. Aromatic cascara in small doses three times a day was given temporarily in a few cases, always after meals.

DR. L. T. LEWALD, New York: The question of so-called ileocecal spasm brings up a whole host of other questions. This question of correct interpretation bothers us all more or less. Either the roentgenologist has to go over the clinical record, or have the most close cooperation with the clinician, such as Dr. Kerley and I have had, otherwise we will go astray.

CARE OF TROOPS ON THE MEXICAN BORDER

FOUR MONTHS' MEDICAL EXPERIENCE WITH
AN ARMY OF ONE HUNDRED AND
FIFTY THOUSAND MEN

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The mobilization of the national guard on the Mexican border has offered unique opportunity for taking stock of our degree of medicomilitary preparedness, and for making a just estimate regarding the advances in military sanitation which have taken place since the last general call on the state troops in 1898. The mobilization of militia organizations began May 10, 1916, when the Texas, New Mexico and Arizona troops were called on and mobilized at San Antonio, Texas, Columbus, N. M., and Douglas, Ariz. The total number of men mustered in was about 5,000. Recruiting to increase the size of these southern organizations was soon undertaken. June 18, 1916, the remainder of the national guard was called out, and began mobilizing at the respective state encampments. June 30, certain northern contingents arrived on the border, and by July 31 the primary southward movement was practically completed, and approximately 110,000 national guardsmen in federal service were encamped along the frontier line from Yuma to Brownsville. Subsequently certain organizations were ordered home for muster out, and were replaced by troops which had been held for training and equipment at the home camps. The number of men sent south during the second and third movement in August and October,

respectively, was about 20,000, making the aggregate of state troops which have served on the border approximately 130,000. The largest number of militia on duty at any one time in the Southern Department has been about 110,600. Sept. 15, 1916, there were 101,684 officers and men present.

Prior to the arrival of the militia on the border, practically all of the regular organizations of the mobile army in the United States had been distributed along the frontier. This force numbered approximately 41,000 men, and was subsequently augmented by about 2,500 coast artillery troops of the regular army, employed in the emergency as infantry. Of the total number of regulars on the border, about 13,000 were employed in General Pershing's expeditionary force in Mexico, which used Columbus, N. M., as a base.

MOBILIZATION OF MILITIA

The mobilization of the militia clearly demonstrated many of the weak features in all branches of our militia system, but only those matters pertaining to the sanitary troops will be referred to here. The first point worthy of note has to do with the physical examination of officers and enlisted men in the national guard. In the regular army a high standard of physical fitness is demanded of both commissioned and enlisted personnel before entry into the military service. As a result of periodic examination, and elimination of the unfit, this high standard is maintained. In the case of the organized militia, the law provided, when a state certified that it conformed to the physical standards of the regular army, that its troops should be mustered into the federal service without physical examination, and that the men should, as soon as practicable thereafter, be examined under the supervision of a medical officer of the regular service. Most of the states reported that they complied with regular army standards, and their organizations were consequently mustered into the service of the United States. On examination by the regular medical officers detailed for the purpose, however, it was found that large numbers of the officers and men were unfitted for the military service because of physical defects, often of long standing. The proportion so disqualified varied greatly in different states, but in several reached from 30 to 40 per cent. of those mustered in. Aside from numerous instances of diseases, such as venereal infections, tuberculosis, nephritis, heart lesions and epilepsy, there were great numbers who were found to be disqualified because of conditions which could have been detected by a cursory examination; such were underheight, underweight, absence of teeth, defective vision and hearing, hernias, flatfeet, obvious deformities, immaturity, senility, etc. As extreme instances, men blind in one eye and wearing glass eyes, and one man with an artificial leg had been accepted. This failure on the part of the national guard to conform to the desired physical standard is due partially to lack of experience, time and care on the part of militia medical officers, and partially to the pressure which is often brought to bear by organization commanders in the interest of men whom they specially desire for one reason or another to enlist in their companies.

Such laxity in physical examination is a fundamental defect in the militia system of many states. A unit which loses at mobilization 15, 25 or 40 per cent. of its personnel because of physical defects is seriously handicapped at the outset by reason of shortage of men, and if it goes into active service still retaining

this defective material, the handicap is still greater; such soldiers will fail under the stress of campaign and become a burden on their comrades and on the sanitary service.

In the case of our recent mobilization, a part of the ineligible were at once discharged from the service at the muster-in camps. In other instances, the regiments were moved to the border before this could be accomplished, and the defectives have been, or are now being, discharged on surgeon's certificate of disability. The government has been put to the expense in each case of equipping a useless man, transporting him to the border, subsisting him while there, and returning him to his home, all through failure of the militia medical officer to maintain a high standard of physical requirements. The number of discharges for disability among the militia in the Southern Department between June 1 and September 30 was 1,174. The records of causes of discharge in June are not now available in the Southern Department, but Table 1 shows numbers discharged during the period from July 1 to Sept. 30, 1916, for both regulars and militia, and the causes which led to their separation from the army. Large numbers of militiamen who did not come up to the required standard still remain in the service, notably those undersized or those having defective vision and hearing, or bad teeth or hernias. Many of the latter have been operated on. Certificates of disability for discharge continue to come in at the rate of about fifteen a day.

TABLE 1.—CAUSES OF DISCHARGE FOR DISABILITY IN SOUTHERN DEPARTMENT, JULY 1 TO SEPT. 30, 1916

Causes of Discharge	Number Discharged	
	Regulars	Militia
Pulmonary tuberculosis.....	4	55
Tuberculosis of other parts.....	7	9
Syphilis.....	..	10
Chronic rheumatism.....	1	12
Goiter.....	4	9
Nervous diseases and insanity.....	24	49
Epilepsy.....	8	36
Eye conditions.....	4	81
Ear conditions.....	8	45
Diseases of heart and arteries.....	6	49
Varicose veins and hemorrhoids.....	1	25
Diseases of digestive apparatus.....	4	45
Genito-urinary diseases (nonvenereal).....	7	30
Veneral diseases and complications.....	17	38
Hernia.....	6	114
Diseases of skin.....	3	9
Diseases of bones and joints.....	26	77
Deformities and diseases of feet.....	14	94
Underweight.....	..	23
Respiratory diseases other than tuberculosis...	3	36
Deficient mentality.....	2	5
Miscellaneous.....	2	27
Total.....	151	878

The second weak point which was demonstrated in the militia system had to do with deficient personnel, lack of training and incomplete or improperly cared-for equipment. These defects apply to the combatant branches equally with the sanitary troops, but whereas the combatant branches are likely to be given at least some time in preparation for hostilities, the sanitary troops are allowed no time to prepare to combat disease, because sickness will begin the day the troops are mobilized and is apt to be more marked at the outset, when the troops are unseasoned, than at a later date when they have become inured to the hardships of field service and when the weaklings have been eliminated. Many regiments had insufficient sanitary personnel, and one at least was mustered in without any. The number of ambulance companies and field hospitals was not nearly sufficient to provide for the needs of an offensive campaign. The endless stream of

urgent requisitions for property clearly indicated that many sanitary units had not kept their equipment up to the standard. The situation as regards sanitary equipment and supplies was still further complicated by the appearance, almost coincident with the mobilization, of the 1916 edition of the "Manual for the Medical Department," which radically altered the equipment of sanitary units.

The third weak point in the militia system had to do with typhoid and smallpox prophylaxis. Antityphoid vaccination has never been made compulsory in the national guard, as it has been, since 1912, in the regular army. A few states had inoculated a considerable part of their troops through the voluntary system, but by far the larger number of the militia had to be immunized during the rush of mobilization and physical examination. The difficulty of the procedure was increased by the movement of many regiments to the border before the full course of three inoculations had been completed. This vital procedure has been pushed most vigorously, and now the entire national guard has been immunized, with the possible exception of an occasional straggler. No ill effects have attended the inoculation. The highly satisfactory results which have been attained by typhoid prophylaxis will be discussed at a later time. Fortunately, the Army Medical School in Washington was supplied with the personnel and equipment to produce almost unlimited amounts of typhoid vaccine. Between June 19 and September 30, 745 liters (quarts) of antityphoid vaccine were prepared, and no delay in furnishing it to organizations occurred. The need for smallpox vaccination was well shown by the very high percentage of "takes" in many organizations.

HOSPITAL PREPARATIONS ON THE BORDER

At the time the state troops were mobilized, there were on the border two base hospitals of about 200 beds each, one at San Antonio and one at El Paso; also a temporary hospital at Columbus, N. M., with a capacity of about 150 beds. The state troops brought with them thirty-two field hospitals, and there were also present in the Southern Department six field hospitals of the regular service. The field hospitals, however, were not available for the permanent care of the sick for two reasons; first, they must always be kept mobile so that they may accompany troops if active operations

TABLE 2.—NUMBERS AND PERCENTAGES SICK IN BASE AND CAMP HOSPITALS AT TEN DAY INTERVALS

Date	Sick			Number of Those with Venereal Diseases	Approximate Strength of Command	Percentage of Command in Hospital	Number of Vacant Beds
	Regu-lars	Mili-tia	Total				
Aug. 20	692	1,112	1,804	294	139,000	1.2	467
Aug. 30	832	1,284	2,116	371	151,800	1.4	620
Sept. 10	855	1,306	2,161	323	141,000	1.5	1,188
Sept. 20	899	1,545	2,444	364	146,000	1.7	1,245
Sept. 30	950	1,585	2,535	420	146,000	1.8	1,275
Oct. 10	910	1,478	2,388	434	147,000	1.6	1,686
Oct. 20	989	1,493	2,482	442	147,000	1.7	1,821
Oct. 31	1,016	1,571	2,587	569	142,600	1.8	2,100

begin; and, secondly, field hospitals are not really "hospitals," but merely meagerly equipped shelters for temporary care of the sick and wounded in actual war while they are on the way to the base hospitals at the rear. Consequently the immediate need of greatly increasing the hospital facilities on the border was foreseen, and construction was promptly started. By building temporary pavilion wards at San Antonio and El Paso, the capacity of the existing base hospitals was

increased to 750 and 900 beds, respectively. Base hospitals of 500 beds each were constructed at Brownsville and Eagle Pass, Texas, and Nogales, Ariz., and smaller hospitals, ranging in size from 100 to 350 beds, were built at McAllen, Llano Grande, Del Rio, Fort Clark, Laredo and Marfa, Texas, at Douglas, Ariz., and at Deming, N. M. The amount expended on this construction has been about \$450,000, and the total bed capacity, October 27, was over 4,600. At this date all of these hospitals were practically completed, but they opened up for patients at a much earlier period, some of the new ones receiving a limited number of sick in the latter part of July. Nearly one half of the beds were unoccupied October 27. The movement of sick in the base and camp hospitals since August 20 is shown in Table 2.

For enlarging the permanent base hospitals and for building the new hospitals a uniform type of construction has been used. The standard unit building, whether ward, office, operating suite, nurses' quarters or dining room is a wooden pavilion 100 feet long by 20 feet wide, having ridge ventilation and an 8 foot porch on all four sides. It is completely screened. Such a building when used as a ward has at one end two small rooms, one for property and one for the wardmaster's quarters. These wards accommodate thirty-four beds comfortably, and by crowding, in emergency could shelter forty. Detached shower baths are provided, and all buildings are connected by covered corridors. The pavilions cost from \$1,800 to

outfit heated by gas or coal oil. An excellent Roentgen ray machine is installed. These hospitals, as a rule, are manned by officers of the regular Medical Corps and the Medical Reserve Corps, and by enlisted men of the Medical Department. Female nurses from the Army Nurse Corps are serving at all but three of the hospitals, the three not so supplied being of small capacity. In some of the border hospitals, selected medical officers and enlisted men of the militia formed a part of the personnel and rendered valuable assistance.

LABORATORIES

Prior to the mobilization of the militia, there was at San Antonio a department laboratory under the charge of Major Joseph F. Siler, Medical Corps. On the coming of the state troops, Department Laboratory No. 2 was established at El Paso, Texas, by Major Charles F. Craig, Medical Corps, and Department Laboratory No. 3 at Nogales, Ariz., by Major Edward B. Vedder, Medical Corps. All of these laboratories are prepared to perform every variety of advanced laboratory work. In addition, each hospital has a laboratory equipped for ordinary clinical work. There are also in the Southern Department two field laboratories available to send where needed. One of these has recently been functioning at McAllen, Texas, where there was an outbreak of paratyphoid fever among the New York troops. The work of the laboratories has been of great practical as well as scientific value. But for the laboratories, the presence of para-

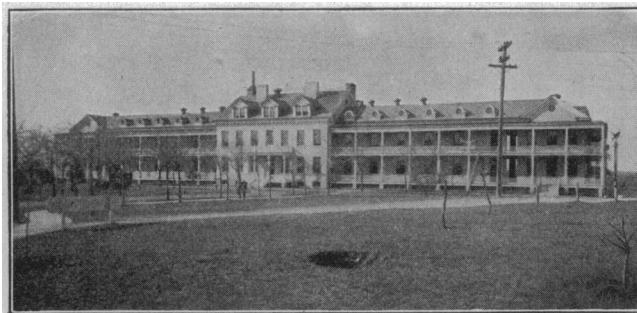


Fig. 1.—Base Hospital 1, Fort Sam Houston, San Antonio, Tex., prior to the construction of the temporary pavilion wards.

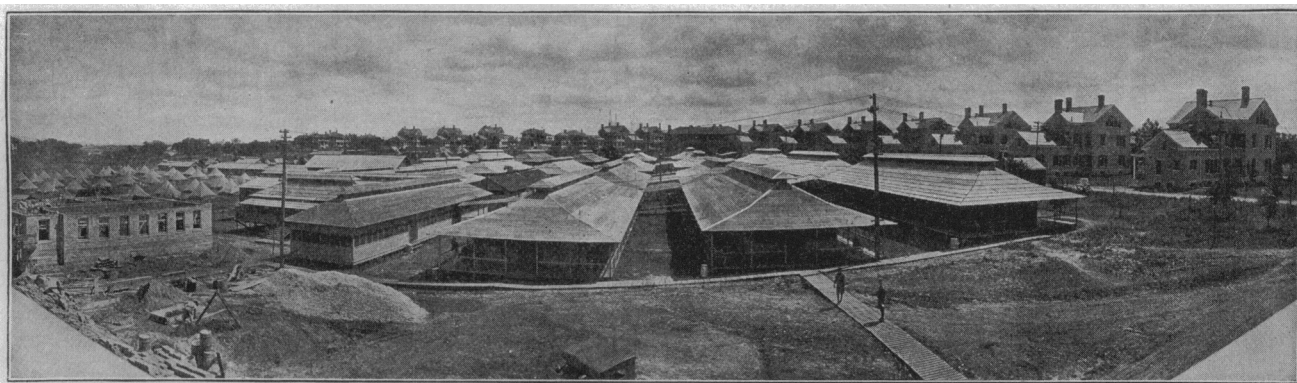


Fig. 2.—Temporary pavilion wards at Base Hospital 1, Fort Sam Houston, San Antonio, Tex. Brick buildings in rear and to right are cavalry officers' quarters. Building under construction on left is the new laboratory for Department Laboratory 1. Tentage on left is a part of Field Hospital Company 6.

\$2,500 each, depending on the local prices for lumber and labor.

The obtaining of equipment for the new hospitals from the large medical supply depots at St. Louis and New York was inaugurated as soon as construction commenced, and the more essential articles were on the ground by the time the first buildings had been sufficiently advanced to receive patients. By the first of September the new hospitals were practically complete in their equipments. Standard white enameled hospital beds with hair mattresses are provided. Each hospital has a well equipped operating room with sterilizing

typhoid fever, nearly all of a mild type, would have been unknown. The reports which will later be rendered on this disease by the heads of the laboratories will undoubtedly be the most extensive productions on this subject ever published in this country.

FIELD HOSPITALS, AMBULANCE COMPANIES AND MOTOR AMBULANCES

There have been in the Southern Department thirty-two militia field hospital companies and twenty-two ambulance companies, besides the six field hospital companies and an equal number of ambulance com-

panies belonging to the regular army. For both the regular and the militia, preparedness demands that more of these important sanitary formations should be organized, until we have ready for immediate service sufficient field hospitals and ambulance companies to provide four of each for every division of troops, this being the minimum necessary for efficiency in campaign. Some progress in this direction is being made by the Militia Bureau.

During the summer, motorization of the field hospitals and ambulance companies has been proceeding. Four of the six regular field hospitals are already motorized, the standard equipment being ten $1\frac{1}{2}$ ton trucks and one touring car. A part of the trucks are

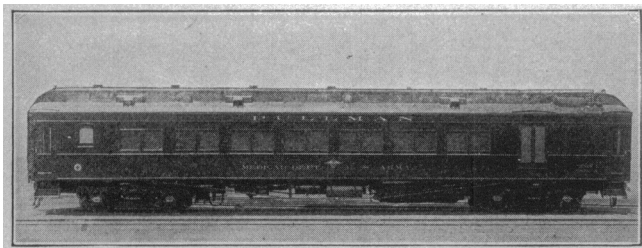


Fig. 3.—Car 4, Hospital Train 1. Note side doors for loading litter patients.

for transporting the enlisted personnel, and the touring car is for the officers. Three of the regular ambulance companies have been motorized, and motor transportation has been found of great use in evacuating sick to the bases from Mexico and on division practice marches. The standard motor equipment for an ambulance company consists of two $1\frac{1}{2}$ ton trucks, one spare-parts truck, and twelve ambulances, two of the latter being specially designed for comfortable transportation of sitting up patients. There are, however, certain military limitations to the use of motor transportation for field hospitals and ambulance companies. In the first place, road conditions will be encountered at times, especially in wet weather, which will preclude the use of automobile ambulances or trucks. Secondly, none of the ambulances at present obtainable are able to keep down to the speed of a marching command (from $2\frac{1}{2}$ to 3 miles an hour) without overheating the engine. There appears, therefore, to be a distinct field of usefulness for the mule-drawn ambulance and army wagon, and the present plan contemplates motorizing three fourths of the independent sanitary units and leaving one fourth equipped with animal transportation. Trailer ambulances have not been found successful over the rough roads in Mexico, but have a limited usefulness on good highways.

September 30, there were 135 motor ambulances in the Southern Department, and many more *en route* or in process of building. Part of those already received were supplied to the ambulance companies, two or more were in use at each of the base and camp hospitals, and the remainder in store awaiting distribution.

HOSPITAL TRAIN

To provide for possible active service in Mexico and to evacuate sick in case of need to general hospitals in the North required the services of a hospital train. This train consists of ten Pullman cars especially reconstructed for the purpose and leased by the War Department. It carries a staff of officers and enlisted men of the Medical Department and seven

female nurses of the Army Nurse Corps, and also cooks and porters. The ward cars accommodate 160 patients. In place of the lower berths, iron bedsteads with springs and hair mattresses are provided. A well equipped operating room occupies a part of one car, and a kitchen is located in another. Doors on the sides and wide corridors allow ready access of litters to every part of the train. In all respects this train is much more complete and luxurious in its appointments than any of those used in the Spanish-American War. The train has already made several trips to the Brownsville District, evacuating sick from the camp hospitals to the base hospital at San Antonio, and has made one trip to evacuate the sick from the latter point to the Army and Navy General Hospital at Hot Springs, Ark.

SANITARY PERSONNEL

With the mobilization of the state troops, a severe strain was thrown on the personnel of the Medical Department of the regular army. The sanitary personnel of the organized militia is not even sufficient to provide fully for the service at the front; that is, the service with regiments, field hospitals and ambulance companies. Consequently, the duty of building and manning new hospitals and hospital trains, of running supply depots, and of providing physical examiners and sanitary inspectors and instructors devolved on the Medical Department of the regular army. Had invasion of Mexico occurred, the strain would have been very much more severe. As was to be expected, the number of medical officers of the regular army allowed by law was found insufficient. All other parts of the United States were stripped of regular medical officers to supply the needs of the Southern Department. Extensive use was made of officers of the Medical

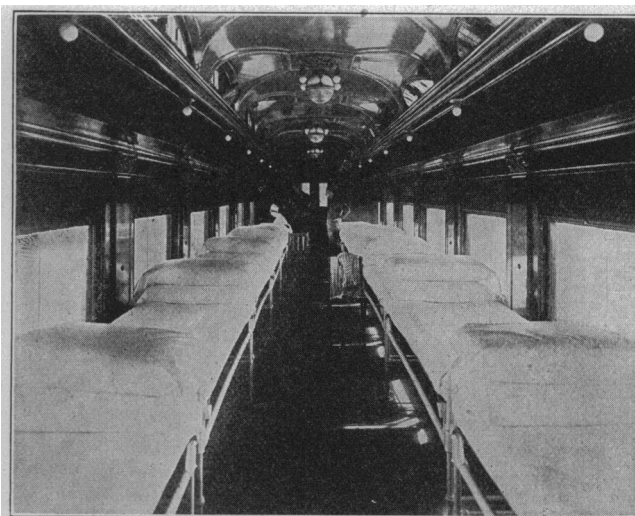


Fig. 4.—Inside view of Car 5, Hospital Train 1. In the other ward cars the upper berths have been retained for less serious cases, while the beds are reserved for the more serious.

Reserve Corps, the Army Directory of Aug. 20, 1916, showing that 340 were then in the active service. Of these, 141 were on duty in the Southern Department, Aug. 31, 1916, the remainder being at the foreign stations and in the North at posts stripped of regular officers. The number of regular officers on duty the same date was 209. It was found necessary to recall medical officers from Panama, Hawaii and the Philippines to supplement the supply available in the

United States. The number of militia medical officers in the Southern Department, Sept. 30, 1916, was about 700. The enlisted men of the Medical Department of the regular army in the Southern Department, Sept. 30, 1916, aggregated over 3,000. There were 197

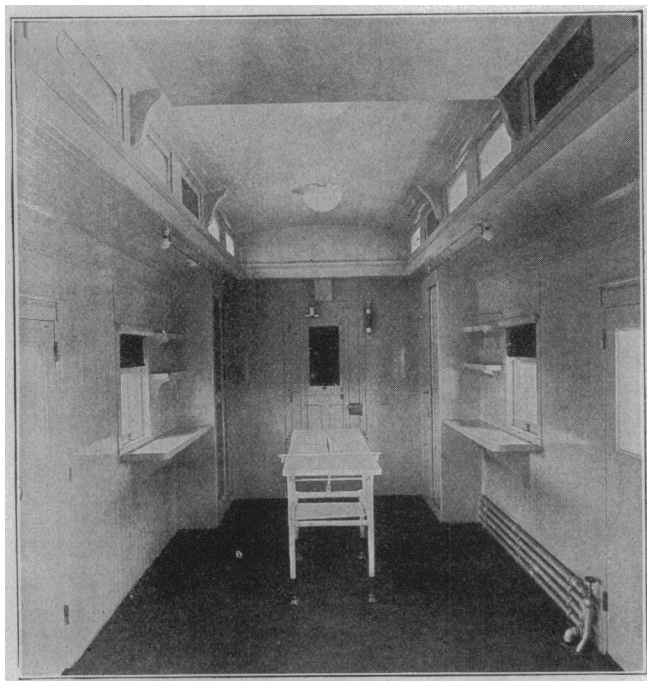


Fig. 5.—Operating room in Hospital Train 1.

female nurses of the Army Nurse Corps, a part of these being nurses on the Red Cross reserve list who were hired by the government. Aug. 31, 1916, there were thirty-nine dental surgeons of the regular army on duty in the Southern Department. They were serving the needs of the regulars and militia alike, a force of 150,000 men. A considerable number of dental surgeons of the militia were appointed in September, but owing to the inability to obtain portable dental outfits promptly from the makers, it has been impossible to provide all of them with the necessary instruments.

The officers of the Medical Reserve Corps responded freely to the call for active duty, in many instances to their great personal disadvantage. The same applies to the medical officers of the militia who are serving on the border, in numerous cases at large financial loss. The result of the insistent calls of family and practice has been the resignation of many officers, both in the Medical Reserve Corps and in the militia. Also, many requests for return to the inactive list are received from members of the Reserve Corps. These losses are especially notable since the prospect of active service in Mexico has become less and less. The work to be done on the border has not diminished, and those who have acquired a certain degree of medicomilitary experience, and then return home, have to be replaced by others who usually have no experience. This feature of the situation constitutes a serious defect in our present system. It has, however, one bright side, which is that it offers a certain amount of medicomilitary training and experience to a considerable number of physicians who would doubtless again volunteer for service with the colors in any real national emergency.

MEDICAL SUPPLIES PROMPTLY FURNISHED

With few minor exceptions, medical property of all kinds has been promptly obtainable by the troops on the border, and no suffering or hardship has resulted from shortage of medical or surgical supplies. To expedite issues, medical supply depots were established at El Paso and San Antonio. Requisitions referred to these depots are usually filled on the day of receipt, and, except in the case of very bulky articles, shipment is made by express or mail. The equipping of the new hospitals, the stocking of the new supply depots and the issuing of thousands of shipments has thrown an amount of work on the supply department which was undreamed of since 1898, and which, fortunately, has been accomplished without the delays and confusion characteristic of that period.

No call has been made on the national Red Cross for furnishing either personnel or supplies. The published statement that Red Cross nurses have been sent to the border is correct only to the extent that the nurses in question were selected from the Red Cross enrolled list of nurses; but these nurses, as soon as their military duties began, were paid, quartered and rationed by the government in exactly the same way as other members of the Army Nurse Corps.

SANITARY INSPECTORS AND INSTRUCTORS

The national guard and the regular army have been grouped along the border for the most part in large camps ranging in size from 4,000 to 15,000 men each. In certain regions there have been small detachments scattered about for special patrol work. The sanitation of the larger camps has presented important problems for solution, and these have been met most successfully, as will be learned from the later remarks on the morbidity and mortality. The natural advantages of the camp locations have varied, but on the



Fig. 6.—Type of motor ambulance being furnished to army; mounted on General Motors, Buick or Service truck chassis; it carries four recumbent or eight sitting patients; the upper litters are supported by the strap slings shown in the photograph illustration.

whole the sites have been least satisfactory in the Brownsville District along the Rio Grande, partly because this region is lower both in latitude and elevation than other sections of the Southern Department, and partly because of the unusual and almost continuous rainfall which has characterized this section during the past summer. To each camp has been assigned one or more experienced regular medical officers to act as camp sanitary inspectors, and when sev-

eral camps are located in one military district, a district sanitary inspector supervises all. The functions of the sanitary inspectors comprise not only the correction of faulty conditions and the giving of expert advice in sanitary matters, but also teaching in all of the duties pertaining to medical department administration in the field. A comprehensive and graded course of instruction in medicomilitary matters has been prepared and is being carried out in the entire Southern Department under the supervision of officers of the regular army. This course applies not only to the officers, but also to the enlisted men of the Medical Department (formerly known as Hospital Corps men).

In addition to the above-mentioned sanitary inspectors, certain selected officers from the Medical Corps of the regular army have been detailed as general sanitary inspectors. It is their duty to visit the camps, investigate sanitary conditions and to report thereon to the adjutant-general of the army. These general sanitary inspectors are authorized to issue, in the name of the commanding general of the department, the necessary orders for the immediate correction of any sanitary defects prejudicial to the health of the troops.

SANITARY PROCEDURES

No new sanitary procedures of importance have been employed, and success in preserving health has depended on the continuous and stringent enforcement of well known sanitary principles. First, and probably most important, has been the rigorous smallpox and antityphoid vaccination. Water supplies, when not in themselves above suspicion, have been for the most part purified by the calcium hypochlorite process, the Lyster bag being used. Kitchen garbage, both solid and liquid, has been disposed of in company incinerators adjacent to the kitchen. Human excreta have been received in pits covered by fly-proof Havard boxes with automatically closing covers. Urinal troughs are swabbed with crude oil daily. In most camps the pits have been burned out daily with crude oil and straw. In some camps spraying of the interior of box and pit with a mixture of coal oil and lamp-black has been practiced. This procedure has proved very successful in keeping flies out of the pits. The latrines are located on the side of the camp most remote from the kitchens. Flies have been combated by prompt incineration of garbage, cleanliness of picket lines, early removal of manure, catching of flies in



Fig. 7.—Interior of temporary pavilion ward of the type used at all the base and camp hospitals on the border. Note ventilating space in ceiling which can be closed when necessary by sliding panels; capacity, thirty-four beds.

TABLE 3.—WEEKLY REPORT OF SICK FOR REGULARS AND MILITIA IN SOUTHERN DEPARTMENT; MEAN STRENGTH OF REGULARS APPROXIMATELY 43,000 AND OF MILITIA APPROXIMATELY 105,000

		Number Sick			Cause of Presence on Sick Report						
		In Hospital	In Quarters	Total	Injury	Diar-rhea	Dysen-tery	Malaria	Para-typhoid	Typhoid	Other Diseases
July 31.....	Regulars.....	660	190	850	188	89	2	13	...	...	558
	Militia.....	428	486	914	76	270	4	4	...	...	560
August 5.....	Regulars.....	455	175	630	146	68	9	3	...	1	403
	Militia.....	506	501	1,007	120	298	13	...	...	1	665
August 12.....	Regulars.....	547	178	725	118	56	6	6	...	2	537
	Militia.....	629	382	1,011	238	62	14	9	...	2	666
August 19.....	Regulars.....	722	296	1,018	185	57	14	16	...	3	743
	Militia.....	928	1,224	2,152	382	209	21	26	5	1	1,514
August 26.....	Regulars.....	762	283	1,045	216	40	20	22	...	3	735
	Militia.....	1,022	1,054	2,076	324	241	14	16	6	2	1,473
September 2.....	Regulars.....	711	290	1,010	185	40	30	39	2	2	712
	Militia.....	1,155	860	2,015	263	202	15	28	35	8	1,464
September 9.....	Regulars.....	863	244	1,107	174	44	19	36	2	1	831
	Militia.....	1,371	722	2,093	271	131	20	53	67	8	1,543
September 16.....	Regulars.....	863	228	1,091	174	49	29	34	1	...	804
	Militia.....	1,351	861	2,212	294	158	32	90	70	4	1,564
September 23.....	Regulars.....	843	385	1,228	193	61	27	37	18	...	892
	Militia.....	1,457	939	2,396	361	118	24	93	69	5	1,726
September 30.....	Regulars.....	994	406	1,400	209	35	30	29	23	3	1,073
	Militia.....	1,564	856	2,420	390	103	16	108	47	11	1,745
October 7.....	Regulars.....	1,150	252	1,402	175	40	10	32	33*	3	1,087
	Militia.....	1,261	579	1,840	282	66	13	63	50	11	1,378
October 14.....	Regulars.....	922	272	1,194	170	20	25	13	53*	2	911
	Militia.....	1,354	593	1,947	252	52	10	49	51	14	1,519
October 21.....	Regulars.....	958	262	1,220	183	33	14	20	62*	1	882
	Militia.....	1,376	693	2,069	284	41	8	56	44	14	1,560
October 27.....	Regulars.....	895	253	1,148	175	20	17	16	21	1	929
	Militia.....	1,306	828	2,134	311	29	10	62	55	16	1,704

* Nearly all of this paratyphoid occurred in Mexico.

traps and fly-paper, and by poisoning them with formaldehyd solution. Kitchens and mess-shacks have been screened as soon as possible, but there has been considerable delay owing to difficulty in obtaining promptly the great amount of netting required. The usual methods for preventing the breeding of mosquitoes have been practiced. Mosquito bars for the entire militia command could not be furnished for a long time, because the Quartermaster Department found it impossible to purchase such large quantities in the United States. A small malarial outbreak in September, at Llano Grande, Texas, was handled by prophylactic use of quinin pending the eradication of mosquitoes and their breeding places. Excellent shower baths were installed as soon as possible in all camps. Venereal prophylaxis has been carried out with the usual protargol injections and calomel-ointment inunctions. Instruction in personal hygiene has been given to all troops.

EXCELLENT HEALTH CONDITIONS ON THE BORDER

The remarkable absence of infectious diseases and of deaths from disease among the troops on the border is a striking demonstration of the progress in military sanitation which has been made since 1898. This is particularly true in regard to typhoid fever, which will be given separate consideration further on. Among the volunteer troops serving within the continental

limits of the United States in 1898, malarial fevers and diarrheal diseases caused a little over one half of the total admissions to sick report. A study of Table 3 will show that in 1916 this group of diseases has been a small factor in the morbidity lists. In 1898 among 85,000 volunteer troops serving in the United States there were 1,986 deaths from disease in the eight months from April 22 to December 31. In 1916, among 105,000 state troops on the border, there have been thirty-eight deaths from disease for the three months from July 1 to September 30. Among 43,000

regulars during the same period, there have been nineteen deaths from disease. Of these deaths, only twelve among the militia and five among the regulars were due to acute infectious diseases.

The rates per thousand on sick report in the different districts of the Southern Department are shown in Table 4 for regulars and militia separately.

It will be noted that in most instances the sick rate is lower for the militia. This should not be taken to mean that the health of the state troops is really better than that of the regular army. The true explanation is as follows: In the regular service a soldier who cannot do his full duty because of a minor disability is placed on sick report, and consequently his illness becomes a matter of official record. This rule is strictly enforced. As a result of the more lax discipline in the state troops, soldiers are frequently excused from duty

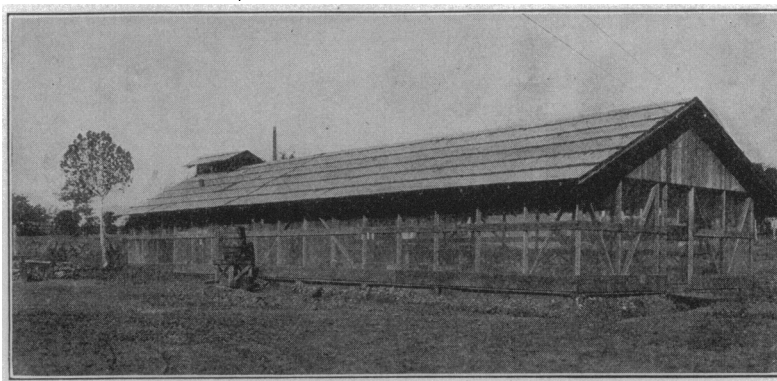


Fig. 8.—Type of screened kitchen and mess-shack for one company; kitchen in far end and dining room in near end. Note garbage incinerator at extreme left.

TABLE 4.—REPORTS OF RATES PER THOUSAND ON SICK REPORT IN SOUTHERN DEPARTMENT; STRENGTH OF REGULARS APPROXIMATELY 43,000 AND OF MILITIA APPROXIMATELY 105,000*

		Brownsville District†	New York Division†	Laredo District	Eagle Pass District	Del Rio District	Big Bend District	El Paso District	New Mexico District	Punitive Expedition in Mexico	Arizona District	Nogales District	Camp Wilson, San Antonio, Texas
Approximate strength*	Regulars.....	4,790	None	2,055	3,364	1,980	1,096	5,298	744	12,837	5,370	1,205	2,843
	Militia.....	23,960	17,000	6,627	6,203	None	2,190	20,974	2,370	None	6,408	8,522	10,650
August 19.....	Regulars.....	29	..	11	26	25	18	27	36	21	18	14	..
	Militia.....	32	17	17	27	..	22	15	35	..	15	26	..
August 26.....	Regulars.....	17	..	12	25	25	37	26	34	20	19	22	..
	Militia.....	18	15	17	24	..	43	16	37	..	21	16	..
September 2.....	Regulars.....	28	..	14	23	12	31	27	27	21	21	21	31
	Militia.....	28	..	17	32	..	44	17	18	..	20	17	15
September 9.....	Regulars.....	28	..	13	24	29	34	33	36	17	23	22	32
	Militia.....	20	..	14	18	..	41	18	21	..	26	22	16
September 16.....	Regulars.....	28	..	25	30	34	40	30	30	15	23	23	38
	Militia.....	21	..	15	23	..	30	17	25	..	38	7	23
September 23.....	Regulars.....	26	..	37	32	28	32	29	23	20	22	29	32
	Militia.....	20	26	10	20	..	38	15	25	..	35	16	32‡
September 30.....	Regulars.....	26	..	21	39	34	37	28	26	18	23	35	33
	Militia.....	25	28	12	23	..	43	16	23	..	28	29	33‡
October 7.....	Regulars.....	20	..	17	..	27	36	29	22	19	18	25	36
	Militia.....	25	26	13	..	..	41	23	30	..	25	14	26
October 14.....	Regulars.....	18	..	14	29	30	34	28	19	20	17	17	32
	Militia.....	22	25	14	19	..	39	19	34	..	14	14	21
October 21.....	Regulars.....	20	..	16	29	29	36	25	24	19	23	23	31
	Militia.....	26	26	14	17	..	48	19	11	..	18	18	20

* These figures for strength are only approximate, as they varied materially from week to week. The rates per thousand are based on the actual strength reports for each week, as determined locally by the surgeons rendering the reports.

† The New York Division, though located geographically within the Brownsville District, was not included as a part of that district.

‡ During this period these troops were on a strenuous division march.

to a varying degree without appearing on sick report. This is especially likely to occur in the case of the more common injuries. The tendency to excuse men from duty without putting them on sick report is often favored by the militia surgeons, in the first place, to escape what is considered unnecessary paper work, and in the second place, in many instances, to avoid entering an undesirable "not-in-line-of-duty" record against men who have venereal disease. Since the sick record is the basis for the adjudication of future pension claims, it can readily be seen that failure to record disabilities which interfere with performance of duty is an injustice either to the soldier or to the government, depending on whether the disability is or is not incident to the service.

NUMBERS SICK IN CAMP AND BASE HOSPITALS

In Mexico serious cases have had to be treated for a time, at least, in field hospitals. In other sections of the Southern Department all save the most trivial and ephemeral cases of injury and disease were placed in the base and camp hospitals. The numbers of sick in these hospitals at ten day intervals is shown in Table 2 for regulars and militia separately. The percentage of the total command in these hospitals is

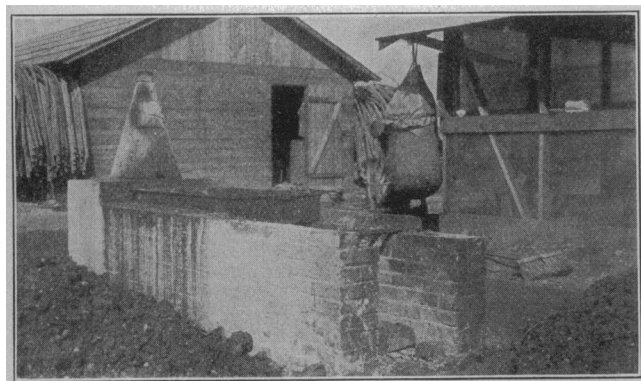


Fig. 9.—Type of kitchen garbage incinerator used in camps on border; it is located close to company kitchen shown on right. Solid garbage is burned in the fire box, and slops are evaporated in the shallow pan on the top. From the corner of the screened kitchen hangs a "Lyster bag," employed in the field for sterilizing water by the use of calcium hypochlorite, put up in proper quantities in sealed glass tubes. Note the spring faucets at bottom of bag.

given, and indicates what an inconsiderable amount of morbidity has existed — always well below 2 per cent. It will be noted that approximately 16 per cent. of the illness has been due to venereal disease. The figures given here by no means represent the entire number of venereal cases, because many with this class of diseases are treated in quarters, or, in the case of the militia, are not put on sick report at all.

EXTREMELY LOW DEATH RATE

Table 5 shows the number of deaths, with causes, for regulars and militia separately during the four month period June to September, inclusive. During this time there were 121 deaths in a command averaging nearly 150,000 men during the latter three months. Of these 121 fatalities, 61 were due to disease, 8 were due to unknown causes, and 52 to external causes such as gun-shot wounds, ordinary injuries, drowning, lightning stroke, etc. Only 17 of these deaths were caused by acute infectious diseases, viz.: 3 from pneumonia, 2 from meningitis, 9 from dysentery, 1 from paratyphoid fever, 1 from scarlet fever, and 1 from enterocolitis.

RARE CASES OF TYPHOID FEVER; NO DEATHS FROM TYPHOID

From May 1, 1916, to Oct. 18, 1916, there have been twenty-four cases of typhoid fever, with no mortality, among the 170,000 troops which have served in the border camps throughout the Southern Department and in Mexico. In 1898 among 147,795 regular and volunteer troops there were 20,926 cases of typhoid, with 2,192 deaths, in about eight months. Most of the cases were contracted within the United States. In 1899, among 105,260 regular and volunteer troops there were 2,184 cases of typhoid with 258 deaths. During the year 1900, among 100,389 regulars and volunteers there were 978 cases of typhoid fever and 164 deaths. The phenomenal improvement which has

TABLE 5.—NUMBER AND CAUSES OF DEATHS IN SOUTHERN DEPARTMENT AMONG APPROXIMATELY 43,000 REGULAR TROOPS AND 105,000 MILITIA; FEW OF THE MILITIA WERE PRESENT IN JUNE *

Causes of Death	Number of Deaths								Total
	June		July		August		September		
	Regu-lars	Mil-itia	Regu-lars	Mil-itia	Regu-lars	Mil-itia	Regu-lars	Mil-itia	
Gunshot wounds...	11	1	3	..	..	..	4	2	21
Injury.....	3	..	1	1	3	..	2	3	13
Suicide.....	1	..	3	..	1	1	2	2	10
Drowning.....	..	..	..	2	2	..	..	3	7
Diseases of the heart.....	..	..	..	..	1	1	4	1	6
Pneumonia.....	..	..	..	1	1	..	..	1	3
Appendicitis and peritonitis.....	..	..	1	1	2	5	..	6	15
Meningitis, tuber-culous.....	..	..	..	1	..	..	1	..	2
Meningitis, acute...	..	..	1	..	1	..	..	..	2
Diabetes.....	..	..	..	..	..	..	..	1	1
Gonorrheal septi-cemia.....	..	..	..	1	..	..	..	..	1
Perforating gas-tric ulcer.....	..	..	..	..	..	..	1	1	2
Dysentery.....	..	..	..	..	..	4	1	4	9
Cerebral tumor.....	..	..	..	..	..	..	..	1	1
Abscess of liver.....	..	..	..	..	..	..	1	..	1
Intestinal obstruc-tion.....	..	..	..	..	..	..	..	1	1
Enterocolitis.....	..	..	..	..	..	..	1	..	1
Diseases of kidney..	2	..	1	1	..	..	1	..	5
Pemphigus ecn-tagiosus.....	..	..	..	..	..	1	..	..	1
Paratyphoid fever.....	..	..	..	..	..	..	..	1	1
Scarlet fever.....	..	..	..	..	..	..	..	1	1
Tuberculosis, type unknown.....	..	..	..	..	..	2	..	..	2
Septicemia.....	..	..	1	..	..	1	..	..	2
Cerebral hemor-rhage.....	..	..	..	..	1	..	..	..	1
Sunstroke.....	..	..	1	..	..	..	..	..	1
Tertiary syphilis.....	2	..	..	..	..	..	..	..	2
Toxemia, cause not stated.....	..	..	..	..	..	1	..	..	1
Undetermined.....	..	..	2	..	3	3	..	..	8
Total.....	19	1	14	8	14	19	18	28	121

* For mortality in October, see *Our Troops on the Border*, News Department, this issue.

characterized the present mobilization, as compared with the mobilizations of 1898, 1899 and 1900, may be attributed in part to betterment of general sanitary conditions, but much more largely to a specific measure, namely, the compulsory administration of antityphoid vaccine. This is evidenced by the fact that, although typhoid is endemic in this section, there have been but twenty-four cases of this disease among the troops, while there have been very much greater numbers of paratyphoid and dysentery infections, both of which are preventable by the same general sanitary precautions which are efficacious in limiting the spread of typhoid. It is the specific sanitary procedure, antityphoid inoculation, which has safeguarded the troops from the ravages of typhoid fever.

Table 6 shows the status and date of the typhoid vaccination in the case of those soldiers who developed the disease. It will be noted that no regular soldier

has contracted typhoid fever who had been vaccinated within a period of three years. Among the 130,000 militia, fourteen cases have occurred in men presum-

TABLE 6.—ANTITYPHOID VACCINATION STATUS OF PERSONS WHO DEVELOPED TYPHOID FEVER IN THE SOUTHERN DEPARTMENT, MAY 1 TO OCT. 18, 1916

Date of Typhoid Vaccination	Number of Cases of Typhoid Developing in		
	Regular Army	Militia Troops	Civilians Connected with Army*
Vaccinated in 1916.....	...	9†	
Vaccinated in 1915.....	...	31	
Vaccinated in 1914.....	...	21	
Vaccinated in 1913.....	1	1	
Vaccinated in 1912.....	2		
Vaccinated in 1911.....	1		
Vaccination incomplete at onset of disease.....	...	2§	
Never vaccinated.....	2	...	5*
Unknown; probably not vaccinated.....	...	1	3*
Total.....	6	18	8*

* Civilians employed by the army are supposed to be vaccinated in the same manner as soldiers, but many escape vaccination as a result of various causes. Two of these cases of typhoid were in children of soldiers.

† Three of these are known to have received vaccine other than the army product. Others may have.

‡ One of these is known to have received vaccine other than the army product.

§ Only one dose had been given when these two men developed typhoid.

ably vaccinated within three years. Nine of them, according to the records, were vaccinated during the mobilization. The exact facts in regard to these cases will, perhaps, never be ascertained. It is known that in some instances vaccination of militia was performed with vaccine other than the standard army preparation, which has given such remarkable results in the regular army. It is also possible, as a result of haste, lax methods and faulty records, that some of these fourteen men referred to above may have failed to receive

TABLE 7.—SOURCES OF INFECTION

	No. of Cases		No. of Cases
Fort McIntosh, Texas.....	1	Brownsville, Texas.....	3
San Antonio, Texas.....	4	Pharr, Texas.....	2
McAllen, Texas.....	3	Mission, Texas.....	1
El Paso, Texas.....	4	Mexico.....	4
Marfa, Texas.....	1	Kentucky.....	1

the inoculation or may not have received the full course of three doses which is required. All that can be said at present is that the records indicate that they had been vaccinated within three years.

How scattered among the soldiers these twenty-four cases of typhoid were is shown in Table 7.

CASES OF PARATYPHOID FEVER

This disease, which has been found to be a factor of importance among the European armies, has also

TABLE 8.—DISTRIBUTION OF PARATYPHOID A

	No. of Cases		No. of Cases
Fort Ringgold, Texas.....	1	San Benito, Texas.....	1
McAllen, Texas.....	41	Marfa, Texas.....	1
Mission, Texas.....	109	El Paso, Texas.....	4
Donna, Texas.....	4	Fort Huachuca, Ariz.	2
Pharr, Texas.....	4	Douglas, Ariz.	11
Llano Grande, Texas.....	6	Columbus, N. M.	2
Brownsville, Texas.....	7	San Antonio, Texas.....	1
Laredo, Texas.....	4	Mexico.....	46

occurred in a considerable number of instances on the Mexican border. From May 1 to October 7 there have been 250 cases diagnosed by blood culture, and

undoubtedly there were other cases which remained incorrectly diagnosed as a result of not submitting specimens for laboratory examination. About 600 negative blood cultures have been made in cases of indefinite fevers. In general, the cases of paratyphoid have been very mild and often of brief duration. A few patients have been extremely ill and have shown hemorrhages and a typhoid condition. Rose spots have been plentiful. There has been one death attributed to paratyphoid, but the diagnosis is not certain, as the blood specimen, through error in labeling, was not submitted to cultural test. All but five of the paratyphoid infections have been caused by *Bacillus paratyphosus A*. There was a sharp epidemic of paratyphoid among the New York troops at Mission, Texas. This was combated by stringent sanitary precautions, and has been suppressed. In the week ending October 7 there were but seven new cases of paratyphoid in the entire department. Antiparatyphoid inoculation with a mixed A and B vaccine has been begun among the New York troops and in some other portions of the department, but it is too early to report on the extent and results of this prophylactic measure.

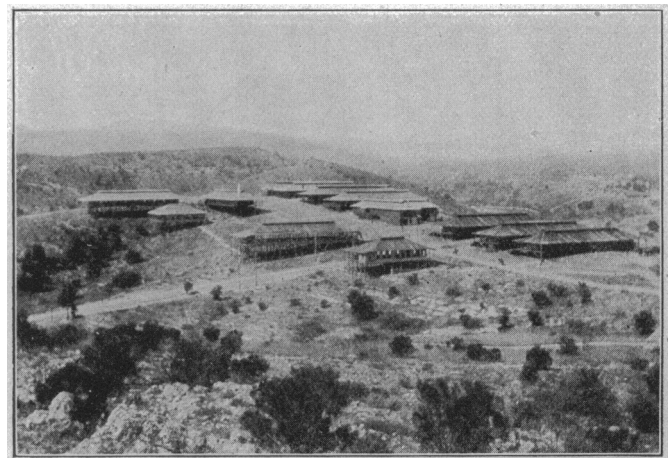


Fig. 10.—Base Hospital No. 5, Nogales, Ariz. Construction typical of other camp and base hospitals along the border. Picture taken Aug. 27, 1916. When all construction is completed, capacity will be 500 beds.

The distribution of the diagnosed cases of paratyphoid A is shown in Table 8. By far the larger number of cases originated in Mexico and in the lower Rio Grande valley. McAllen, Mission, Donna, Pharr and Llano Grande are all close together, and located between 25 and 50 miles west of Brownsville, Texas.

Three of the paratyphoid B infections occurred at San Antonio, one at El Paso and one in Mexico.

DYSENTERY

Sporadic cases of dysentery have appeared in various regions in the Southern Department, and there have been eight deaths among the militia from this disease. A small epidemic of dysentery occurred during the summer in the expeditionary force in Mexico, both the bacillary and the amebic varieties being encountered. The disease appears to be of a milder type than that found in the Philippines. There has been but one death from this cause in Mexico. In the Mexican expedition, owing to the strenuous service, the poor roads and the absence of rail communication, the dietary conditions have at times been unsatisfactory, and the appliances for the more complicated sanitary procedures have not been at hand. Dysentery

has now been almost entirely eliminated from the expedition. That the health conditions among the forces in Mexico are satisfactory is shown by the report from the chief surgeon of the expedition for the month of September (Table 9).

TABLE 9.—AVERAGE SICK RATES PER THOUSAND AMONG TROOPS IN MEXICO DURING SEPTEMBER, 1916

Absent sick	13.8
Present sick:	
Venereal diseases	2.2
Intestinal diseases	2.7
Fevers	3.1
All other diseases	10.6
	18.6
Total sick per thousand.....	32.4

SOME OF THE LESSONS LEARNED FROM THE MOBILIZATION

1. The physical standards of the regular army should be strictly applied to the members of the national guard.

2. All members of the national guard should be immunized against smallpox, typhoid and perhaps the two paratyphoids, at time of enlistment. The former two procedures should be repeated in three or four years. The length of time the paratyphoid vaccination will protect remains to be worked out.

3. The states should organize sufficient ambulance companies and field hospitals to bring the allowance of each unit up to at least four for every authorized division of state troops. All sanitary equipment should be kept complete, serviceable and up to date.

4. The medical corps of the regular army (even when it reaches after four years the recently authorized allowance of seven per thousand of strength in the army) will be insufficient to provide adequately for the needs of any such force as would be required in a war of the first magnitude.

5. Consequently, adequate medicomilitary training should be given to the militia sanitary organizations and to the Medical Reserve Corps.

6. The Medical Reserve Corps should be greatly increased in size — to 10,000, or perhaps 20,000. There were approximately 1,600 men in the corps last summer, and from these it has been difficult to get 350 for active service. Few wish to remain long on active duty.

7. Typhoid fever need no longer be dreaded as a scourge to armies.

8. State troops can be maintained indefinitely in camps in the South, and at the same time remain in

excellent health, provided certain simple sanitary precautions are continuously and rigidly enforced. These precautions will not be continuously and rigidly enforced unless alert and experienced sanitary inspectors are placed in charge and vested with sufficient powers to enable them to compel the prompt correction of sanitary defects.

Fort Sam Houston.

SHINGUARD TYPE OR LICHEN PLANUS OCCEAFORMIS

A CONTRIBUTION TO THE RARER FORMS OF LICHEN PLANUS*

DAVID LIEBERTHAL, M.D.

CHICAGO

In the majority of cases of lichen planus the diagnosis offers no great difficulty, while there are aberrant types which require considerable skill in their interpretation. To these belongs the case here presented,

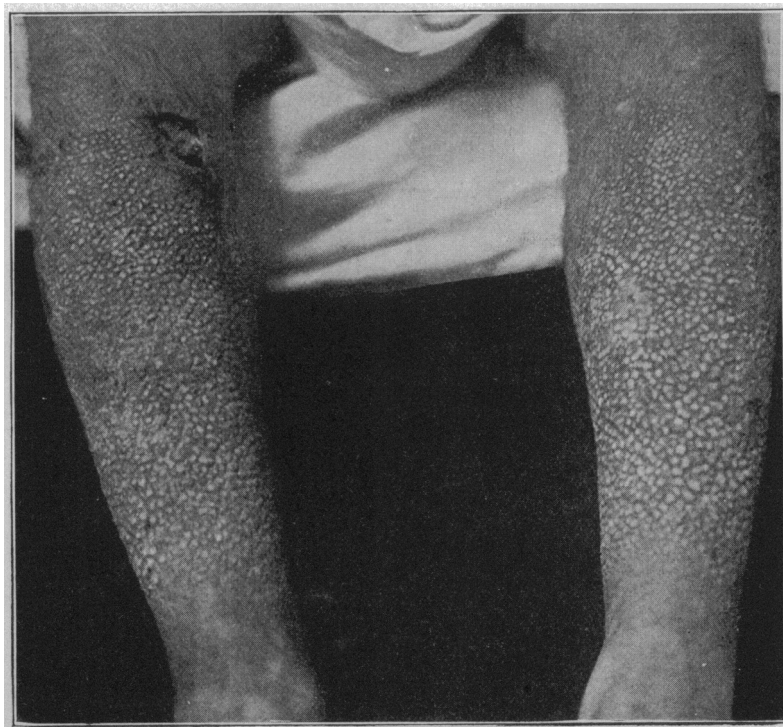


Fig. 1.—Anterior view of legs.

which is of extreme rarity, no duplicate of it ever having been recorded. For this reason its demonstration before the Chicago Dermatological Society, and later at the clinical session of the American Dermatological Association in Chicago, 1914, elicited very interesting discussion.¹ And while some difference of opinion existed, yet the majority of the members accepted the diagnosis — lichen planus.

History.—The patient was admitted to the hospital, Jan. 12, 1913, and the following account of his illness was secured: He was a Russian, aged 63, glazier, married, and the father of two healthy children. He has always been of temperate habits, has had no venereal or skin disease, and knows of none of his relatives having been afflicted with such. He had no recollection of having passed through any serious illness otherwise. The present condition began about a year and a half before this examination, with intensive burning of both shins. It was completely relieved by treatment in a short time. Six months later the burning recurred, and with no apparent change of the skin, lasted for five months, when numerous small blisters appeared on the legs, causing severe itching. On scratching, the blisters were ruptured. Very soon thereafter pimples began to develop, and the itching and burning became gradually less severe. He was afflicted with habitual constipation.

* From the Dermatological Department of the Michael Reese Hospital.

* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Lieberthal, David: Jour. Cutan. Dis., 1915, p. 395.