the front within a month. Later, a shell burst near him, and again he was dazed and trembled, and had lapses of memory and general nervousness. Again he was treated in the hospital, with mitigation of his symptoms, and again returned to the front, where, in a few days, he saw a bomb burst some distance away. He immediately began to stammer and to wander about aimlessly. He suffered with marked insomnia, tremor of the legs, arms and head; easy fatigue, continual lassitude, occipital and vertical headaches, and fear of aircraft, crowds, etc.; and frightful dreams kept the patient in constant terror and to a great extent caused the insomnia. Frequent lapsus mentis and aimless wanderings occurred, and also one attack of deaf-mutism. He runs now when he sees aircraft, and is easily startled by noises, with marked fear reaction. The father was an alcoholic addict, very nervous and excitable. The mother was always nervous, and had a bad temper. One sister has nervous prostration. The patient was always more or less moody and was an onychophagist.

This case, like most similar ones, shows not only that the patient, once a sufferer from a severe neurosis, is neuropotentially much weaker than before, but also that each subsequent "shock" need not have the same severity to produce a serious relapse of all the patient's former symptoms. As one patient so aptly said, "I seem to have lost my come back."

From a study of a large number of war neuroses, one comes to the conclusion that the intensity of the "shock" is not measured in terms of trauma, but of individual sensitiveness. This is most beautifully seen in the controls who have suffered most serious somatic traumas, but who showed none of the neurotic symptoms found even in the mildest cases of war neurosis.

CONCLUSIONS

This study of 100 cases of war psychoneuroses and 100 cases of somatic injuries produced on the firing line reveals that:

Cases of war neurosis are very rarely associated with external or somatic wounds. The vast majority of the psychoneurotic cases studied were among soldiers who had a neuropathic or psychopathic soil. In 74 per cent. of these cases a family history of neurotic or psychotic stigmata, including insanity, epilepsy, alcoholism and nervousness, was obtained, while a previous neuropathic constitution in the patient himself was present in 72 per cent.

A gradual psychic shock from long continued fear, together with the sudden change from quiet, peaceful environment to the extraordinary stress and strain of trench fighting, is the chief predisposing cause of war psychoneurosis in soldiers with neuropathic predisposition. In fact, these factors may be the cause of the neurosis per se.

The history of the individual previous to enlistment has an influence on the character and gravity of the symptoms of the neurosis.

Acquired neuroses, with their less severe symptoms, appeared only after excessive fatigue, with the concussion from the high-explosive detonation acting as the exciting factor. On the other hand, in the same abnormal environment, and with the same powerful factors obtaining, wounded soldiers do not suffer from war neuroses except in rare instances. In the wounded soldiers studied, no neuropathic or psychopathic stigmata occurred in the family history.

Previous neuropathic tendencies were found in 10 per cent. of these patients (controls), all of which number presented mild neurasthenic tendencies.

Hysteric manifestations, such as monoplegia in a wounded limb, are occasionally encountered in injured soldiers.

CORRECTABLE DEFECTS AND TUBERCULOSIS IN DRAFTED MEN

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The physical examinations in connection with the selective draft revealed many thousands of cases of early tuberculosis, not previously recognized, and a large number of other correctable defects. The purpose of the examinations was to exclude from the Army all men physically unfit for military service.

The knowledge gained was of a sort to make possible the early treatment and control of a vast number of cases of tuberculosis, and the correction of many disabling physical defects of other sorts. Here was a chance to give to the men rejected for the causes mentioned opportunity to remove their handicaps and to become eligible for the fighting army or more efficient in the industrial army.

TUBERCULOSIS REPORT CARD

A CALIFORNIA STATE BOARD OF HEALTH
BUREAU OF TUBERCULOSIS
Sacramento, California

Report of a Case of Suspected or Known Tuberculosis

Name of person examined.....
Street and number.....
City or town.....
Type of disease { suspected } tuberculosis of lungs, larynx, lymph glands, peritoneum, bones, intestines, meninges, skin.....
Stage of disease: Early, moderate, advanced. (Cross out words which do not apply.)
Place of examination.....
Date of examination.....
.....
Examining surgeon
I request a thorough examination by a tuberculosis expert and advice about the need for treatment and opportunities for receiving it.
.....
Person examined
The signer of the request will be notified when and where to report for examination.

In the absence of a national plan, the California State Board of Health attempted, in the short time available, to organize a system of follow-up examinations, treatment, and supervision for the men rejected during the first draft for tuberculosis and correctable defects. The experience of the board is given here in the hope that it may be of some value to those who will make the better and more comprehensive plans for reclaiming rejected conscripts or discharged soldiers in the future.

The approval of the state board of registration was first obtained for the plan formulated. Then Adjutant-General J. J. Borree, acting under the direction of Governor Stephens, sent a letter to all examining physicians of local exemption boards calling their attention to the fact that the state law required the reporting of tuberculosis to the health authorities. They were instructed to send reports of all cases of tuberculosis and of correctable defects to the state board of health on the very brief forms supplied. The state board of health furnished two forms for the purpose, one for tuberculosis and one for correctable defects, and also

supplied stamped and addressed envelopes. The tuberculosis report card, Card A, is reproduced herewith. The report card for correctable defects, Card B, was similar in general arrangement, and was headed, "Report of a Person Refused Admission to the Army or Navy Because of a Correctable Defect."

A volunteer staff on correctable defects and a volunteer staff of tuberculosis examiners were next organized. The members of the staffs were appointed by the state board of health, but received no salary. Their duties were thus set forth in the letters of appointment:

The duties of the members of the staff on Correctable Defects will be:

1. To make a thorough examination of each person sent to him.

2. To determine whether his defect could be easily corrected.

3. If the defect can easily be corrected, to make the correction without charge for service, or to arrange for the correction elsewhere, or to give appropriate advice about securing proper treatment independently, according to the circumstances of the case. When hospital care is necessary, or when dental materials must be used, the man receiving the treatment can appropriately be required to pay for them, but he should understand this in advance of his treatment. When the man is unable to pay necessary expenses incidental to his treatment, an attempt should be made to interest public-spirited individuals or institutions in securing the necessary funds. In such cases hospitals can appropriately be requested to give special rates. In some instances they may have public funds which are available for the expenses of these patients.

4. To report to the state board of health, on the card furnished, such data as may be required, including the nature of the defect, the advice and treatment given, and the results, together with recommendations to the state board of health relative to further treatment or supervision.

The duties of the tuberculosis examiner will be:

1. To make a thorough examination of the persons sent to him.

2. To advise the patient regarding his condition, the need for any special care or treatment, the precautions against spreading the disease, and the opportunities for obtaining supervision, care and treatment. In order to give the needed advice to those who require assistance, it will be necessary for the examiner to ascertain in advance what public provisions have been made for home or sanatorium care in his part of the state.

3. To report the cases to the state board of health by forwarding the official data cards properly filled out.

4. To enter on the card which will be sent for each patient such data as will be required, including a brief statement of presence or absence of tuberculosis, its extent and location, the advice given the patient, and any recommendations to the state board of health regarding the "follow-up" of the case.

It was stipulated that no compensation was to be received from the patient for the services outlined.

As the report cards were received by the state board of health, they were segregated geographically, and form letters were sent to the men who had signed the request for further examination and advice. In this way, appointments were made for the men with the appropriate specialists on the staffs. Many of the failures to report for these appointments can be explained by the considerable travel and loss of time which would be necessitated by a trip to the specialists, as few of them were located outside the larger cities.

Whenever an appointment was made between a rejected man and a physician, a card was sent to the physician notifying him of the appointment, giving the reason for referring the man to him, and providing

space for his report to the board on the essential data of the case. If the man did not report within fourteen days after the date of his appointment, that fact was to be noted on the record, and the card returned.

RESULTS OF THE WORK

	Number
Reports of correctable defects from exemption boards.....	1,348
Reports of tuberculosis from exemption boards.....	1,313
Reports of tuberculosis from army camps up to Jan. 4, 1918..	1,110
Total reports	3,771

CORRECTABLE DEFECTS

Cards bearing request for examination and advice.....	1,129
Cards without signed request	219
Total reports for correctable defects	1,348
Correctable causes for rejection as reported by examining physicians:	
Defects of vision	89
Defects of hearing	137
Defects of teeth	22
Defects of nose and throat	38
Defects of heart	20
Appendicitis	5
Other defects of digestive tract	3
Displacements of abdominal organs	2
Hernia	563
Hemorrhoids	53
Fistula	19
Typhoid fever, dysentery	3
Syphilis	30
Gonorrhea	36
Varicocele, hydrocele	83
Disease of the kidneys	2
Other defects of genito-urinary tract	13
Diseases of the skin	9
Varicose veins	31
Tumors and cysts	4
Abscesses and sinuses	4
Deformities	69
Defective feet	52
Underweight	45
Bursitis	3
Partial paralysis	2
Unclassified	8
Defect not specified	3
Total	1,348

Number reporting for examination:	
Men who reported for examination	319
Men who failed to report	594
Letters to men returned unclaimed	24
Men not referred, because of no local staff	147
Men referred, but no final report from staff	45
Total number of men requesting examination.....	1,129

Disposal of cases:	
Men advised and treated by staff	78
Men advised and referred to other physicians	13
Men advised who declined treatment	83
Men reported under care of private physicians	26
Men advised but not offered treatment because they claimed exemption on other grounds than their physical condition..	32
Defects as reported by exemption board physician not confirmed	3
Men reported as not unfitted for Army service by defects..	13
Defects reported by staff as not correctable	16
Men not in position to accept treatment at present	34
Men reporting to office of board in person or by letter....	21
Total	319

TUBERCULOSIS

Reports of tuberculous men rejected by exemption boards....	1,313
Cards bearing request for examination and advice.....	1,152
Cards without signed request	161
Reports of tuberculous men discharged from Army camps up to Jan. 4, 1918	1,110
Total reports for tuberculosis	2,423

MEN REJECTED AT TIME OF DRAFT

Number reporting for examination:	
Men who reported to staff for examination and advice.....	420
Men investigated and advised by tuberculosis nurses	142
Men who failed to report and not seen by nurses	457
Men who had left the state before notification	25
Letters to men returned unclaimed	42
Address of men not given on report card	3
Men not referred because of no local staff	28
Men referred, but no final report as yet from staff	196
Total reports of tuberculous rejected men.....	1,313
Disposal of cases:	
Men who reported to staff or seen by tuberculosis nurses..	562
Men reported as under care of private physicians or sanatoriums	118
Men found by staff not to have tuberculosis	21
Cases investigated by visiting nurses and reported to bureau of tuberculosis	142

MEN DISCHARGED FROM ARMY CAMPS ON PACIFIC COAST

Men belonging to California	514
Men belonging to 41 other states and District of Columbia...	596
Total men reported by seven Army posts and the marines up to Jan. 4, 1918	1,110

As soon as this system was well under way, it was decided to extend the tuberculosis work to include the tuberculous men who were not recognized by the examining physician of the local exemption boards, but who were afterward discovered and rejected during the more thorough examination at the camps. It also developed that this follow-up work was needed for men rejected from the National Guard camps. At Camp Lewis in the state of Washington, the medical officers cooperated by reporting the discharged cases in California men. In the California camps, all men discharged or rejected on account of tuberculosis were reported to the board. The bureau of tuberculosis, under the direction of Mrs. E. L. M. Tate-Thompson, in addition to the follow-up work for California men, arranged through correspondence, as far as possible, for the care and supervision of the others in their home states.

The bureau of tuberculosis sent a tuberculosis specialist and a public health nurse into a few communities in which there were no tuberculosis examiners. They held examining clinics for the rejected men. In a number of cities, the duties of the tuberculosis examiners were taken over by the staffs of the clinics of local tuberculosis associations, and the tuberculosis nurses of tuberculosis associations or health departments assisted in the follow-up work. Literature was mailed by the bureau of tuberculosis to all tuberculous rejected men who reported for examination or were seen by the tuberculosis nurses.

To complete the tuberculosis program, there should have been created a tuberculosis camp to which patients with early cases could have been sent and given at least several months of medical supervision and schooling in tuberculosis. As yet such a camp has not been made a reality by either public or private funds. As far as possible the men were brought under the supervision and care of sanatoriums, private physicians, clinics, and the nursing services of health departments.

The results of the work are shown in the accompanying table.

Space will not permit individual mention of the many dentists and physicians who gave their valuable time to this work as tuberculosis examiners or members of the staff on correctable defects, but the complete list is accessible in the January number of the *Monthly Bulletin* of the California State Board of Health.

The staff on correctable defects included six institutions or groups of physicians and seventy-seven additional physicians and dentists. The work for San Francisco and neighboring cities was taken care of by the University of California Medical School, the Leland Stanford Junior University School of Medicine and the University of California Dental School, and was organized by Dr. E. F. Glaser. In Los Angeles, the staff was organized by Dr. Walter V. Brem; in Sacramento, by Dr. F. F. Gundrum; in Stockton, by Dr. William Friedberger and Dr. Linwood Dozier; in Fresno, by Dr. Clifford D. Sweet, and in Chico, by Dr. D. H. Moulton. In San Diego the men were referred to the San Diego Diagnostic Group Clinic, and in Eureka to the Sequoia Hospital staff:

The staff of tuberculosis examiners contained the staffs of eight clinics and forty-three additional physicians. The clinics of the associations for the study and prevention of tuberculosis in San Francisco, Alameda County and Santa Clara County, the Scripps

Diagnostic Clinic in San Diego, the Sacramento Settlement Association, and the Sequoia Hospital staff in Eureka took part.

The work in correctable defects in future drafts will in all probability be taken care of by the national plan that is being arranged by the Committee on States Activities of the Medical Section of the Council of National Defense. It has been proposed that the program be operated through national, state and district committees. Even with this arrangement for taking care of correctable defects, the tuberculosis problem will remain one that will concern primarily the state and local boards of health.

Greater use should be made of the information obtained through the physical examinations of drafted men, for the purpose of lessening tuberculosis and increasing the man-power of the nation.

TRENCH FEVER

The following review of the present knowledge of trench fever is taken from a summary in the *Medical Bulletin*, published by the American Red Cross in Paris, December, 1917, 1, No. 2, p. 132:

Fever known among the British troops as P. U. O. (pyrexia of undetermined origin) has greatly increased in the British troops in France during the past year. Under this term, which it is admitted is an unfortunate one, have been included through error of diagnosis cases of paratyphoid fever, of influenza, and especially of trench fever.

During the latter part of the year 1915 and in 1916, in northern France, a disease known as trench fever became gradually recognized as a distinct, specific infection. Cases of this disease were also reported from the armies in Saloniki and Mesopotamia, and apparently a similar affection occurred among the German troops. In some of the armies in northern France, trench fever has caused almost one third of all the sickness. In one division during a year, a monthly average of about 350 cases of this affection were sent to field hospitals. Macgregor and Ramsay have given evidence of individuals who have contracted the disease in England. The disease has occurred particularly in France in those who have been in the trenches or among those who have cared for the sick in the hospitals.

Clinical Features.—The incubation period of trench fever as determined experimentally varies from six to twenty-two days. The disease appears particularly in two clinical types, one in which there is a short, evanescent fever lasting from a few days to a week, and frequently followed after a few days of apyrexia by a single short relapse; and a second in which there is a series of relapses of the fever interrupted by periods of apyrexia. In both forms as a rule the onset is sudden and the affection is characterized by headache, dizziness, pain in the back and particularly in the legs, constipation, and a sharp rise of temperature, usually to 102 or 103. Pains in the shins or muscles of the legs is a very common complaint. It is often very distressing, and renders the patient restless at night. The pain in the legs occurs particularly at the points of insertion of the muscles to the bone, where apparently an actual inflammatory process takes place. The pain does not affect the joints. The face is usually flushed, but the eyes are clear and bright. The conjunctivae are not suffused, as in dengue fever. The tongue is usually coated, and there is anorexia. The pulse is usually in the neighborhood of 100, and the heart is normal in the early stages of the disease. Pulmonary catarrh is absent. There is no albuminuria and no enlargement of the spleen. His, and later Zollenkopf, also reported under the name of "Volhynian fever" the occurrence of a somewhat similar disease in the German troops. However, His states that the spleen is almost always enlarged; and Zollenkopf, that it is usually increased in size and that a rash is present. Jungmann concluded that Volhynian fever was a form of typhus.

In the first form mentioned, after about the third to the sixth day of fever, there is often a drop in the temperature, and the temperature remains in the neighborhood of normal for several days. Then a short relapse of fever, lasting only a day or two, takes place. In the second type there may be several attacks of fever lasting three or four days or longer, in which the temperature may reach as high as 104 or 105. Between the attacks of fever there are periods of apyrexia of about the same length of time. The periods of fever and relapse, however, may vary; for example, in three cases reported by Herringham, the fever lasted seven, ten and thirteen days, respectively, and the periods of apyrexia, five, eight, and eleven days. Houston and McCloy have also described what they call a myalgic type in which there is one period of fever lasting from a few days to a week. After this the temperature falls to normal, but the severe pain in the legs continues. Occasionally a sudden rise of the temperature during this period occurs. They have also described a septicemic type in which the enterococcus was isolated from the blood. Other observers have not reported on the septicemic type. Albuminuria has usually been reported as not present. Mandel, however, states that albumin is frequently present, and that in severe cases hyaline and coarsely granular casts and red blood cells are present, the casts frequently persisting after the albumin has disappeared. Possibly these cases are related to "trench nephritis."

The blood shows a slight relative increase in the large and small lymphocytes and a reduction in the hemoglobin. A punctate basophilia of the red blood corpuscles is present.

The prognosis is very good, but the condition in the severe form is apt to be followed by a certain amount of debility. The most important sequelae are anemia, which occurs in from 10 to 15 per cent. of the cases, and disordered action of the heart. The latter is very common after the severe cases, and in these tachycardia is also frequent.

The diagnosis is often difficult. The pain in the legs in the neighborhood of the shins is the most constant symptom. The disease may be distinguished from relapsing fever by the absence of the *Spirochaeta recurrentis* from the blood. From influenza it is particularly differentiated by the absence of any catarrhal symptoms and by the lack of prostration in trench fever early in the disease. In dengue fever a rash is usually present and the distribution of pain is different. Trench fever may be distinguished from malaria, undulant fever, and enteric infections by the appropriate blood and serum examinations.

The treatment is entirely symptomatic. Aspirin and morphin relieve the pain, but seem to exert no influence over the course of the disease. Quinin and salicylic acid and intravenous injections of antimony, salvarsan and eusol did not affect the fever. The injection of the serum of convalescents in several instances also has not appeared to shorten the attacks.

The infectious nature of trench fever was demonstrated by McNee, Renshaw, and Brunt, by the transmission of it to healthy men by the subcutaneous injection of blood taken from patients during the active stage of the disease. In this way it was determined that the shortest incubation period was six days and the longest twenty-two. It was not possible to produce the infection with the blood serum of infected individuals unless hemolysis of the red blood cells had taken place. The plasma was also not found to be infective unless hemolysis had occurred, and filtered serum and plasma were also inactive. The red blood corpuscles, however, were found to be capable of causing the disease even after being washed several times in saline solution. The infected agent is not apparently filtrable; if the red cells from the patient are ground up with fine sand and the blood then filtered, the filtrate is quite inactive.

Transmission.—It is commonly believed that transmission of this infection occurs through the louse. Muir, however, opposed this view and stated that in a small percentage of the cases the absence of lice was certain. Davies and Weedon report one case in which one of them was twice bitten by a louse, the first time just after it had been allowed to feed on a case of the disease and a second time twenty-four hours

later. A typical attack of trench fever developed twelve days later in the individual so bitten. Hurst also reports that Captain Urquhart developed the short form of trench fever after allowing lice taken from a patient with this form of the disease to bite him. He also gives some evidence of a soldier who was infected with vermin and who shortly afterward contracted the disease.

Etiology.—Extensive investigations regarding the etiology of the disease have been made, but the organism causing it has apparently not yet been definitely detected by the microscope or the ultramicroscope either in fresh or in stained preparations. Sergeant, and later Renaux, found semilunar bodies in the blood which occurred particularly from two to four hours following each relapse. Houston and McCloy regarded the enterococcus which was isolated from the urine in the majority of cases as the cause of the infection. Dimond has described a protozoon, a hemogregarine, in twelve cases, both in the venous blood and in material obtained by splenic puncture. He states the organism was only discovered after the blood had been drawn in 1.8 per cent. citrate solution and then hemolyzed by the addition of a 0.5 per cent. solution of saponin. The parasite was found after this solution had been centrifuged. This discovery, however, has not been confirmed. Pappenheimer found discoid bodies in blood films and in specimens taken from near the periosteum, and in cultures from the blood and tissues of trench fever patients. He later concluded that these were not of a parasitic nature. Patterson has very recently found spirochetes in the urine in fifteen cases of trench fever. Nankivell and Sundell have also found a spirochete in twelve of fifteen typical cases of trench fever. No work was done regarding the pathogenicity of this organism for man or animals. In eighty control cases, either healthy or suffering with other diseases, spirochetes were not found in the urine. These authors did not succeed in finding the spirochete in the blood in trench fever cases or in cultivating it from the blood stream, as, according to them, Reimer claims to have done. However, Stoddard has also just reported the presence of spirochetes in 33 per cent. of individuals in the examination of specimens taken from the urethra or the urine. Hence the mere presence of a spirochete in the urine in trench fever cases cannot be regarded as conclusive evidence that this organism is the cause of the disease or that it bears any direct relation to it.

In relation to prevention, it appears that at the present time it is most important to determine definitely whether the disease is transmitted through the medium of the louse. This should not be difficult to demonstrate. The parasite causing yellow fever is not yet discovered, but the disease is prevented and its spread controlled by the knowledge of its method of transmission by the mosquito.

R. P. S.

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