

VOL. XII

NO. 4

UNITED STATES NAVAL MEDICAL BULLETIN

PUBLISHED FOR THE
INFORMATION OF THE MEDICAL
DEPARTMENT OF THE SERVICE

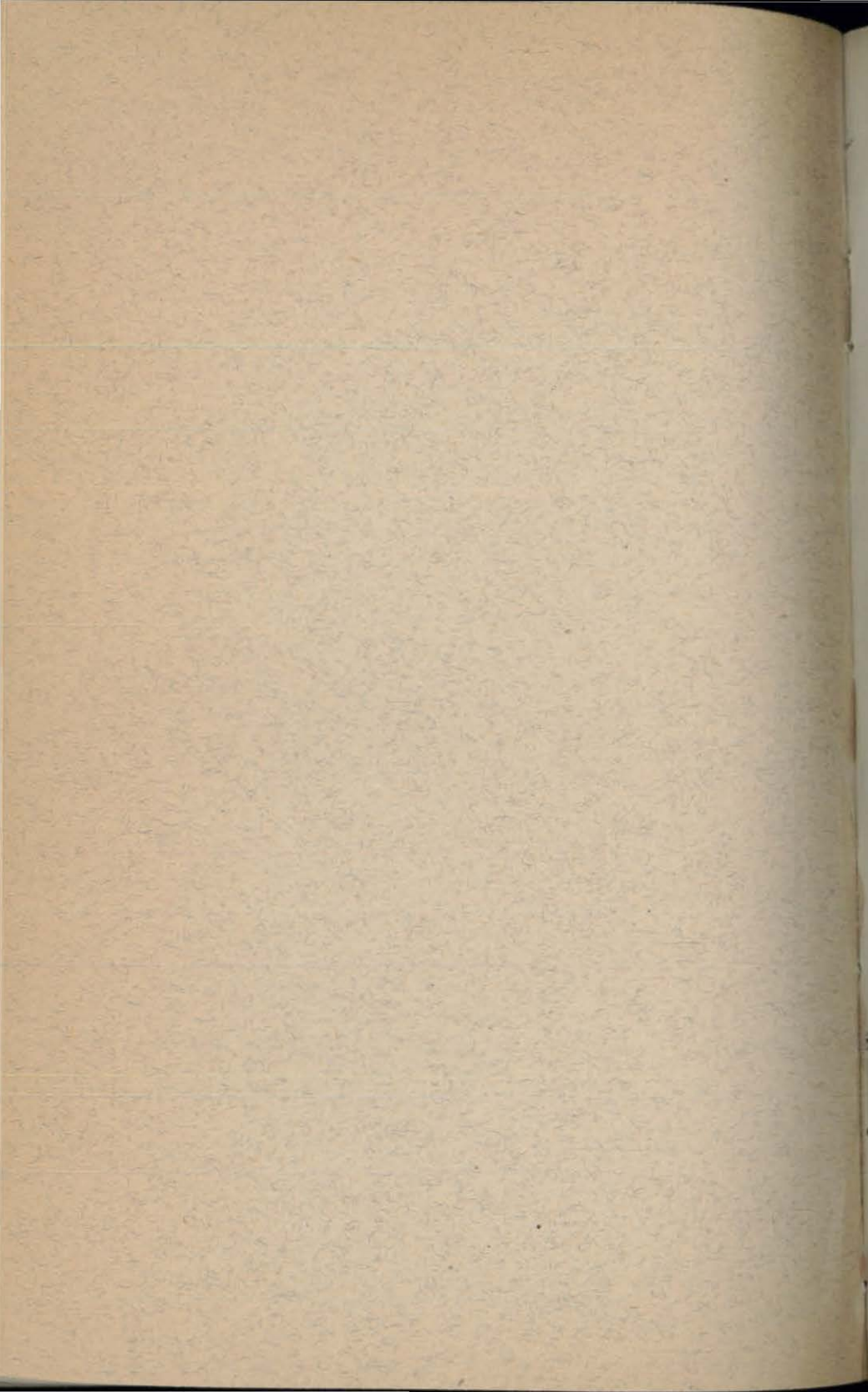
ISSUED BY
THE BUREAU OF MEDICINE AND SURGERY
NAVY DEPARTMENT
DIVISION OF PUBLICATIONS
COMMANDER J. S. TAYLOR, MEDICAL CORPS, U. S. NAVY
IN CHARGE

OCTOBER, 1918

(QUARTERLY)



WASHINGTON
GOVERNMENT PRINTING OFFICE
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NAVY DEPARTMENT,
Washington, March 20, 1907.

This UNITED STATES NAVAL MEDICAL BULLETIN is published by direction of the department for the timely information of the Medical and Hospital Corps of the Navy.

TRUMAN H. NEWBERRY,
Acting Secretary.

NOTE.

Owing to the exhaustion of certain numbers of the BULLETIN and the frequent demands from libraries, etc., for copies to complete their files, the return of any of the following issues will be greatly appreciated:

Volume X, No. 1, January, 1916.

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PREFACE.

The publication and issue of a quarterly bulletin by the Bureau of Medicine and Surgery contemplates the timely distribution of such information as is deemed of value to the personnel of the Medical Department of the Navy in the performance of their duties, with the ultimate object that they may continue to advance in proficiency in respect to all of their responsibilities.

It is proposed that the NAVAL MEDICAL BULLETIN shall embody matters relating to hygiene, tropical and preventive medicine, pathology, laboratory suggestions, chemistry and pharmacy, advanced therapeutics, surgery, dentistry, medical department organization for battle, and all other matters of more or less professional interest and importance under the conditions peculiar to the service and pertaining to the physical welfare of the naval personnel.

It is believed that the corps as a whole should profit, to the good of the service, out of the experience and observations of the individual. There are many excellent special reports and notes beyond the scope of my annual report being sent in from stations and ships, and by communicating the information they contain (either in their entirety or in parts as extracts) throughout the service, not only will they be employed to some purpose as merited, but all medical officers will thus be brought into closer professional intercourse and be offered a means to keep abreast of the times.

Reviews of advances in medical sciences of special professional interest to the service, as published in foreign and home journals, will be given particular attention. While certain medical officers will regularly contribute to this work, it is urged that all others cooperate by submitting such abstracts from the literature as they may at any time deem appropriate.

Information received from all sources will be used, and the bureau extends an invitation to all officers to prepare and forward, with a view to publication, contributions on subjects relating to the profession in any of its allied branches. But it is to be understood that the bureau does not necessarily undertake to indorse all views and opinions expressed in these pages.

W. C. BRAISTED,
Surgeon General United States Navy.

NOTICE

The undersigned has the honor to acknowledge the receipt of your letter of the 14th inst. in relation to the matter mentioned therein, and to inform you that the same has been forwarded to the proper authorities for their consideration.

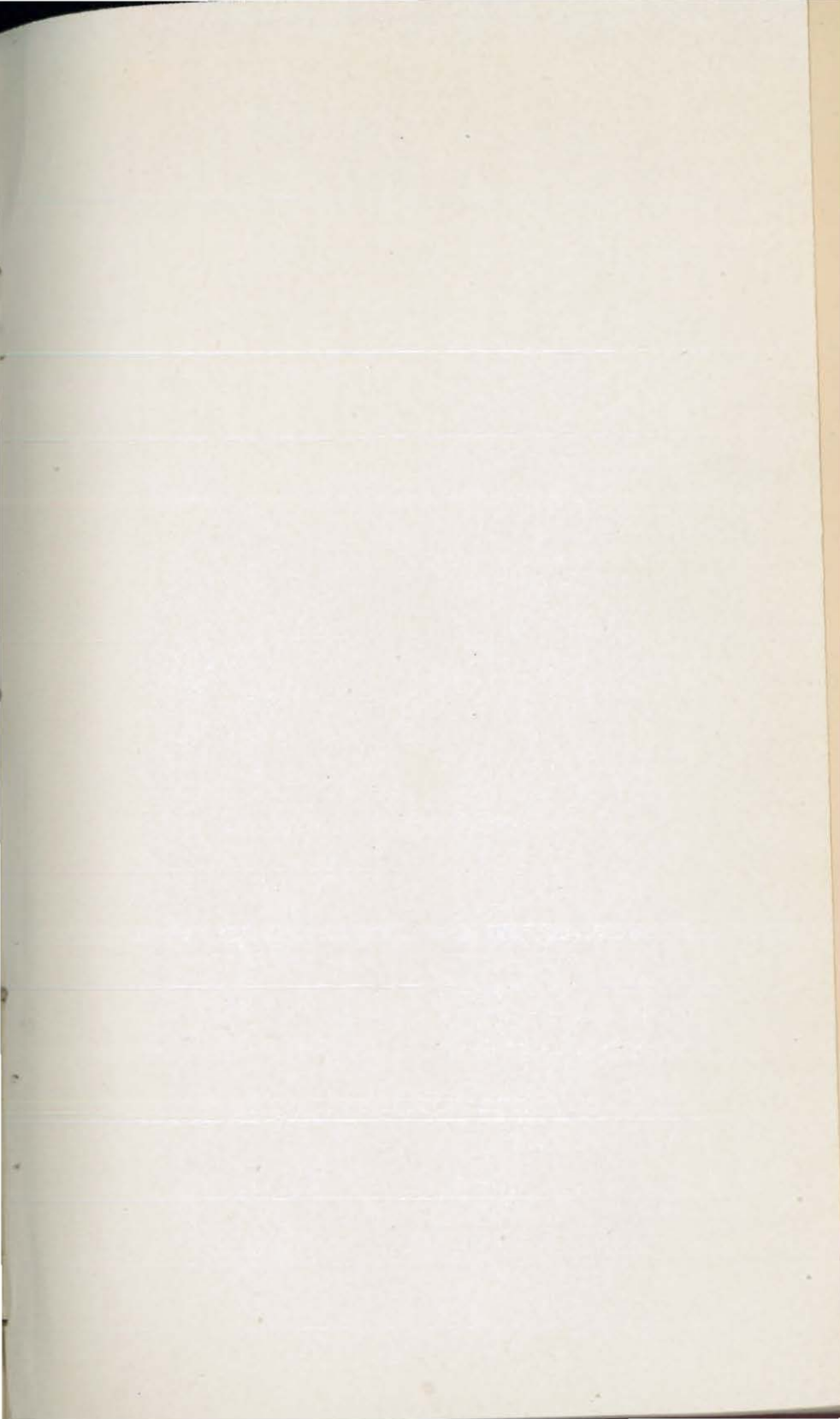
It is requested that you have patience during this interval, and that you will kindly refrain from further communication on this subject until you have received a further reply from the undersigned.

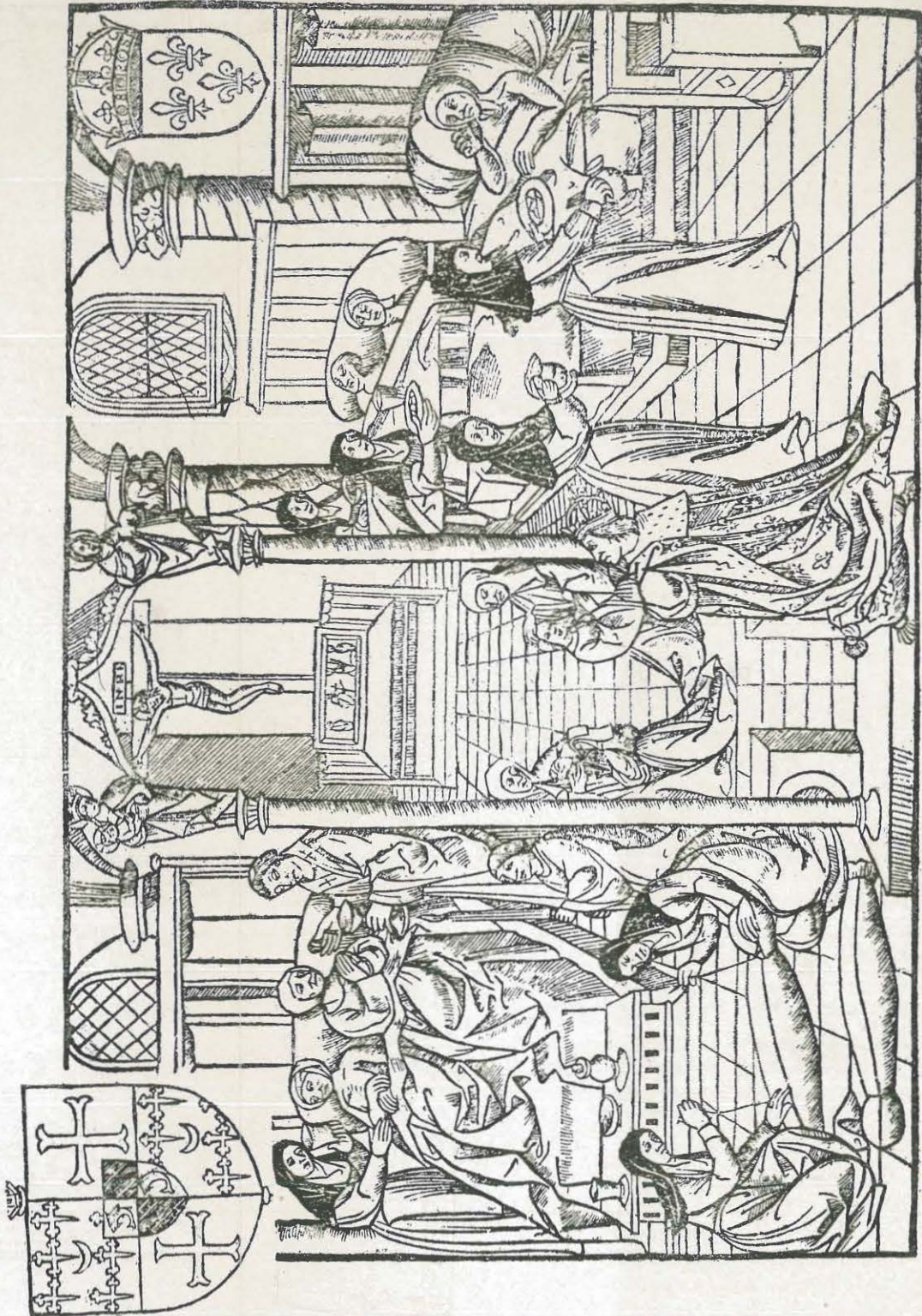
Very respectfully,
W. C. Johnson

W. C. Johnson

W. C. Johnson

W. C. Johnson





INTERIOR VIEW OF A WARD IN THE HÔTEL DIEU OF PARIS IN THE SIXTEENTH CENTURY.

Facsimile of a picture at the head of indulgences sold by the Archbishop of Bourges (1521-1525) for the support of the Hôtel Dieu of Paris.

(Reproduced through the courtesy of H. Champion, 9, Quai Voltaire, Paris.)

U. S. NAVAL MEDICAL BULLETIN.

VOL. XII

OCTOBER, 1918.

No. 4.

SPECIAL ARTICLES.

REPORT ON HEART MURMURS IN RECRUITS.

By J. F. B. CORDEIRO, Lieutenant Commander, M. C., United States Navy (Ret.).

Preliminary.—By the theory of probabilities it is proved that the incidence of any particular event in a sufficiently large number is a fixed quantity. Thus there is a center of American population geographically fixed, an American height and weight, etc., which do not vary over long periods. It was Quetelet, one of the founders of our modern system of life insurance, who showed that in the constant French population the number of even unusual and rare forms of suicide remained constant. The average yearly temperature of any point upon the earth's surface is a constant quantity. This constancy depends upon the fact that the average conditions are the same from year to year. If, however, some average which has remained constant for a long while, begins to change, either rapidly or gradually it must be from some deep-lying or general cause. Thus the incidence of consumption for the total population was some years ago practically constant, while recently it has been showing a continual decrease. This we know to be due to active modern methods for its prevention and cure. Likewise the incidence of heart disease for the total population is gradually increasing, but we do not as yet know the reason.

It has been known for a long time that lesions of the valves of the heart are in the great majority of cases, due to the poisons of certain acute infectious diseases—rheumatic (micrococcus) fever, scarlet fever, typhoid fever, measles, diphtheria, etc.—and almost invariably it is the left heart which is affected—mitral and aortic lesions. It has been the experience and opinion of the profession, until recently shared by the writer, that lesions of the right heart were comparatively rare. Thus Satterthwaite states that lesions of the pulmonary valves are only one-tenth of all valve lesions. He says that his statistics are derived from his personal cases, private and hospital. Such statistics, however, are of little value in giving a clue as to the incidence among the population, since the cases going about their usual vocations and unconscious of any heart affection greatly outnumber those that are obliged to go to a hospital or to consult a physician.

In 1886, the writer was examining one hundred or more men a

day, just as he is doing now, and his experience then was that pulmonary murmurs were rather rare. It is not merely a matter of memory, since the statistics are at hand. He made a compilation of some ten thousand cases, of which possibly he examined a third, where the causes of rejection and the number of such cases were carefully tabulated. The valvular lesions were not separated but all included under the head of valve disease. The proportion of such cases was about the same as that found for endocarditis (left-heart disease) to-day. The incidence of these acute infectious diseases for the total population is the same to-day as it was then, and the proportion of heart complications in these cases is practically constant, as it should be by the theory of probabilities. The probability is therefore strong that the proportion of pulmonary lesions among those tabulated was small. This examination of ten thousand cases was published in the report of the Surgeon General for 1887. In it, the growth curve, both for height and weight, was carefully plotted, and it is with little doubt the normal growth curve for American males between the ages of 14 and 30. It should be used in examinations and permissible deviations should be taken from this curve—not from the present tables.

Pulmonary murmurs.—The writer has recently examined personally some thousands of applicants for the Naval Reserve. It was with some surprise therefore that he found that pulmonary murmurs far outnumbered all other forms of murmurs—perhaps ten to one. When coming upon something out of the ordinary it is necessary to go over the ground very carefully and especially to guard against errors. The ordinary experience of mankind is something like the law of the Medes and Persians which altereth not.

When examining aortic or pulmonic murmurs, careful examiners always do so on full expiration. There are individuals (obese ones) in whom on full inspiration it is impossible to hear any heart sounds at all, and to listen to them it is necessary to require full expiration.

Pulmonic and aortic murmurs are heard louder on expiration than on inspiration, while generally a mitral murmur is heard best at mid inspiration—neither extreme inspiration or expiration. It may happen therefore that an examiner may not hear a pulmonary murmur, but when requested to listen at full expiration, he always finds it very loud and distinct. After finding it he usually has no trouble in following it through the whole respirational cycle, though of course it is fainter at inspiration. The reason for this is that at inspiration the edges of the lungs cover both the pulmonic and aortic valves with a considerable thickness of lung tissue and air cells are poor conductors of sound. Further the "roots" of the lungs are not immobile, but on each inspiration the pulmonary artery with its

right and left branches, is drawn away slightly from the sternum, while on expiration it is pushed forward again. The pulmonary artery is therefore appreciably nearer to the chest wall and the stethoscope on expiration.

As an illustration of this class of pulmonary murmurs let us take the following actual case. An ordinary perfunctory examination (the once over) reveals a distinct pulmonic direct murmur and also, though not so distinct, an aortic direct and a mitral regurgitant. This case is not typical because in most of the cases of pulmonic direct, there are no other murmurs. On expiration the pulmonic murmur is very loud—rough and rasping. It sounds like a saw cutting through a board. The man is asked, "Have you ever done any running?" The question seems absurd, as any one who has done any athletics himself, or been among athletes, would recognize at once his typical greyhound build. The man smiles as well as two friends who have come with him. He proves to be a crack two-miler, well known among the sporting fraternity. There is marked hypertrophy and some dilatation. This is not typical of these cases, since usually hypertrophy is not marked and dilatation may be difficult to detect. This is because the majority of these murmurs are in the initial stage. These murmurs are rough, as direct murmurs usually are; regurgitant murmurs are soft. Fifty sound hearts may pass in review and then another direct pulmonic. This time it is a champion bicycle rider; distance 10 miles and upward. Murmur very much like the other, but not quite so loud; no other valves involved. Case seems like a previous stage of the former. To make sure that these murmurs were facts and not a theory, I referred a number of them to another examiner. He pronounced them all very loud and distinct. It is a fact then that a very appreciable portion of our young men have pulmonic direct murmurs and that these murmurs are perhaps ten times as frequent as all other murmurs combined. The cause of rejection was always noted simply as heart murmur, not heart disease or valve disease. This was because the murmur was a fact, while other things might be a matter of opinion. It happened in a few cases that applicants had already been accepted by the medical examiners of the draft boards and had sought to evade the draft by entering the Naval Reserves. They were very much perturbed and promptly brought certificates from their family physicians that their hearts were sound. These opinions were probably sincere and due to the fact that they had not taken the precaution to listen during expiration. There was one case, however, where a heart specialist wrote to the draft board that his client had heart disease and when the board would not excuse him, gave him a letter for the Naval Reserves, saying that his heart was sound. As a matter of fact he did have heart disease and was rejected.

The possibility of these murmurs being functional was carefully considered. So-called functional murmurs are usually soft and heard over the apex in connection with such conditions as anemia, chlorosis, acute loss of blood, etc. They are fugitive and difficult of detection, two examiners often disagreeing as to their existence. The pulmonary direct murmurs were permanent, as was proved by subsequent examinations. Rejected candidates often insisted that there was nothing the matter with their hearts and sometimes were fortified by physicians' certificates. They insisted that the trouble found was because they were nervous or had been smoking or drinking excessively. It may be remarked that no rejections were made for functional disturbances such as palpitation, bradycardia, etc. Such cases were invited to present themselves for reexamination as often as they wished and the murmur was always found unchanged in character or loudness. Some of the petty officers in charge of substations would send a man rejected for heart murmur a second time, evidently believing it to be something temporary or a fad on the part of the examiner. In every case the applicant was identified more easily and certainly by his heart murmur than he would have been by a finger print. Cases examined three months afterwards were unchanged.

In some individuals it is possible that the pulmonary artery may touch the surface of the sternum on extreme expiration, or even be pressed against it. The mechanical pressure would then explain the murmur. But the murmur could be heard through the complete respirational cycle, fainter, of course, at inspiration, and when the supposed pressure was removed the murmur should have ceased, which was not the case.

The pulmonary artery rises very superficially from the top of the ventricle and is only 2 inches long, sometimes less. It bifurcates into two branches, right and left, which are almost at right angles to each other. In foetal life, when the lungs are solid, the ductus arteriosus shunts the blood from the left pulmonary branch into the descending aorta. Such a thing as a persistent ductus arteriosus or a patent foramen ovale are inconsistent with prolonged life and can not be considered in these cases, but conceivably the remains of the duct might leave a rough tubercle within the left pulmonary branch. The sudden bifurcation of the blood stream and the remains of such a tubercle might conceivably ruffle the current sufficiently to cause a murmur. This, however, would not explain the occurrence of the murmur so preponderatingly among athletes.

The rough rasping sound is carried both up and down from the valve and is not necessarily loudest over the valve. In some cases where the sound is heard only just over this valve, which is the most superficial of all the valves, and is not very loud, I have concluded

that it could be accounted for by the resistance to the current offered by the corpora arantii. Such cases are not rejected. The general impression gained from these sounds is that they are not due to any lesion of the semilunar valves themselves, but rather to a constriction of the ventriculo-arterial orifice which may extend to some distance on both sides of the valve.

The majority of the pulmonic murmurs occur among athletes and I have designated them as athletic murmurs. They are found chiefly among runners, though they occur in all forms of athletics where there is a steady, prolonged grind. If a heart be examined after a Marathon, it will be found to be acutely dilated. Percussion will easily show that the borders of dullness are markedly extended beyond the normal area. The best way to demonstrate this is to mark out the area of dullness with nitrate of silver before the race and directly after. It will be found that it will take several hours before the heart retracts to its old area. The strain of a race is thrown almost wholly upon the right heart. The left heart participates to a much less degree. The call is for blood and air in the lungs and the right heart endeavors to supply a double amount of the former. The pain in the side is a symptom of this abnormal effort. Another subjective symptom is the agonized look on the face of a runner as he does the last 75 yards' sprint after a long race. The Greek word *αγωνία* means both agony and an exhaustive contest. In the ancient Olympian games a foot race or a wrestling bout was called *αγωνία*. It is significant that no man ever wins a Marathon twice because his heart has been permanently injured. The first Marathoner is said to have dropped dead at the finish. It is likewise significant that the career of all runners is usually short. After making their best marks, they rapidly decline and they never "come back."

For various reasons nearly all of the athletes around Boston, both professional and amateur, have sought enlistment in the Naval Reserve. Some said it was because of their great love for the sea; others because they thought it safest. This undoubtedly accounts for the great number of pulmonary murmurs found. Professional coaches, of course, know nothing about the heart and medical athletic advisers are not heart specialists and usually incapable of making a discriminating diagnosis. Otherwise the conditions of which I have written would have been discovered long ago and this report would not have been necessary.

Pathology.—The pathological history of these cases seems to be as follows: At first, after each abnormal dilation, the heart contracts to its normal size, or nearly so. But a physiological hypertrophy accompanies these efforts and the pulmonary orifice, instead of contracting to its former dimensions, eventually overcontracts and becomes slightly narrowed. This may be furthered by the de-

velopment of new muscular tissue about the orifice. In a whole series of cases it is possible to follow the process from beginning to end. The first sign is the development of a pulmonic direct murmur, which, as we have said, is probably due to the contraction of the orifice. This murmur may be slight, though rough, and hypertrophy and dilatation may be difficult to detect. Later the left heart is involved mechanically and we have mitral and aortic murmurs, as in the case of our crack 2-miler. In only two cases was a pulmonary regurgitation found associated with the direct murmur. If veterinarians were capable of ausculting a horse, which usually they are not, precisely similar conditions would be found in race horses. It is a frequent occurrence for horses to drop dead upon the track, both while racing and practicing. Outside of the few cases of aneurism, these deaths are due to the "athletic heart."

These murmurs, while occurring chiefly among runners, were also found in footballers, basket-ball players, boxers, wrestlers, and among rowing men. Baseball players seemed to be least affected. A hammer thrower was found to have a perfectly sound heart. The above were mostly adults, but it must be remembered that every secondary school nowadays considers it necessary to have a complete athletic system of its own, exactly as in a college. If it does not have its track team, its rowing crew, its football team, its baseball team, and its professional coach it is not up to date. But the contagion does not stop there; it spreads to all classes and conditions of boys, even to the slums. Many of these boys, undeveloped and imperfectly developing, without proper food at home, and often without a midday meal; practice assiduously every afternoon on a field. While their anemic systems are struggling with the burden of the rapid growth after puberty, they subject their hearts to the added strain of the track. Of late years it has been a common sight to see a group of half-naked men and boys, mornings and evenings, making their painful way over the streets of our suburbs. Once every year a large part of the population of greater Boston distributes itself over 26 miles of highway to watch the agonized faces of some hundred contestants while they are ruining their hearts.

Lastly, we must speak of another class of pulmonary direct murmurs, which, while indistinguishable clinically from athletic murmurs, have been found less often, and present a picture of their own. It seems that these cases can be attributed to an incoordinated development of the great vessels relatively to other parts of the body.

I have called them, tentatively, hypoplastic murmurs, though, of course, hypoplasia of the great vessels is a condition which can only be diagnosed upon the autopsy table. They occur only among the poorer classes and seem to be clearly the result of insufficient nutri-

tion. There is usually a weedy growth in which the nutrition seems to be expended wholly in increasing the length of the body while the other parts remain stationary—notably the great vessels. The rule in such cases, to which there are of course exceptions, is that the subjects are very much under weight for their height—20 to 40 pounds underweight. Their complexions and skins are pasty and pimply, in marked contrast to the clear skin of health, in which specimens there are never heart murmurs.

Here is a typical picture: Height, 6 feet; weight, 40 or 50 pounds below normal for height; skin, sodden; chest, narrow and barrel-shaped; face, dull and apathetic; intelligence, subnormal; reflexes, slow; thinks and answers slowly; very loud and distinct direct pulmonary murmur; very often, also, teeth and vision are defective. What as to prognosis? These runners usually ask if they have anything very serious. They are told that their condition is not serious unless there is marked hypertrophy or other valves are implicated, but all are always advised to stop running and all gruelling contests. The affection is not considered a lesion of the semilunar valves, which are probably in no way directly affected, but rather a deformation of the orifice. But the murmur is not functional, as the term is usually understood, since it is permanent and probably represents a definite anatomical (pathological) condition. Its direct influence on the duration of life is probably slight unless the causes which produced it are persisted in. But no surgeon, after hearing one of these loud murmurs, would be willing to anaesthetize the subject for an operation "de complaisance," or if he did so, it would be only with the greatest precautions. Where an operation was imperative, the patient would experience a danger which would be nonexistent if his heart were sound.

The importance of the above discussion from a military point of view must be evident. We shall assume that all the points made have been established, but the fullest investigation is desirable and necessary so that all possible doubt and mistakes may be cleared up. Having examined recently a large number of athletes, professional and amateur, the question occurs to the writer whether they are not of distinctly less value from a military point of view than the average normal man. It seems that this must be answered affirmatively.

It may be that one of the reforms springing out of this war will be—not the abolition of athletics, but a revision of our present insane athletic system. Physical exercise from a recreational and hygienic point of view is necessary, but beyond that point is a waste of time and may be injurious. Track athletics among boys is criminal, and among their elders is of no value to the participants or the community, but on the contrary tends to spoil what would otherwise have been good military material. The boxer who remains in a comatose

condition from 5 minutes to an hour, or who suffers a hemorrhage into the brain, does not improve his body or his mind, but in rebuttal it may be said that he usually has so little mind to start with that any alteration is of slight importance. It may be that our institutions of learning, instead of turning out half educated foot-ball heroes will develop mental athletes, and it will be recognized that the mind is of much more importance than the body. Finally the writer would say that he is absolutely without prejudice in these matters. He is not against athletics per se, but only against those foolish and vicious forms which can be clearly proved to be injurious.

PHYSICAL DIAGNOSIS, PREVENTIVE TREATMENT, AND RECONSTRUCTION IN RELATION TO CARDIAC AND TUBERCULAR DISEASE.

By H. S. ANDERS, A. M., M. D., Late Professor of Physical Diagnosis, Medico-Chirurgical College, Philadelphia.

We must recognize the fact, from recent clinical observation and statistical information, that pneumonia is the overwhelming acute disease of modern incidence and prevalence. The rapidity of development of the physical signs, however, renders its diagnosis comparatively easy and confirmatory of its symptomatic onset. The inherent difficulty and seriousness of the diagnosis of incipient signs of heart disease and pulmonary tuberculosis stand out essentially because of the very uncertainty, insidiousness, variety, and obscurity of their earlier manifestations.

The tuberculosis problem is stupendous; its persistence and pervasiveness, like poverty, is ever with us with convex prominence.

Of all the diseases of infection and chronicity it is the most colossal burden both of civilized society and humanized science; accordingly, the lifting of it may confer the most colossal benefits; or its loading down may result in the most colossal blunder in blighting and blemishing the contiguous races of humanity.

It is a paradox, for it is at once simple and complex; simple in the known elements and principles of causation, propagation, morbid processes, recognition, and prevention; complicated immensely in the multitude of facts and the matrix of actions, interactions, influences, and correlations of subtle and inevitable forces; complex factors of heredity and environment, of predisposition, and communicability, of pathology and differential diagnosis, of immunity and climatology, of sociology and therapeutics.

Essentially, tuberculosis represents the pathologic panorama of a tremendous battle, between the tender and tired body and the tubercle bacillus.

The problem is in course of solution. The great world war against Prussianism and Pan-Germanism has added but another phase which may compel factoring and transposing anew; and perforce elevating the contingency to the nth power.

I suppose it will be granted freely and universally that no two organs are so vitally important in the sifting process of physical examination as the heart and lungs. Already the cardio-vascular and tuberculosis commissions have done a large work in the classification and estimation of data pertaining to these organs as examined in registrants for the Army and Navy service.

The principle of the detection of disease in its incipiency presupposes the preparedness of diagnostic acumen and efficiency. This we all know and believe; it is the magnitude and meticulousness of the problem and modes of application that call for a decided emphasis and renewed study in view of the naval and military, as well as economic and industrial, situation and stress of the times. We look for the best fruits and largest benefits of preventive medicine in the preservation of health and vigor, the promotion of reserve and endurance, and the prolongation of life by just this factor of the prompt and positive discovery of early morbidity; of the functional derangement before the organic degeneration and disaster; of predisposition, whether inherited or acquired, before implantation, aggravation, and complication.

While it must be admitted that in the broad approach to diagnosis various aspects of morphology and symptoms must be taken into careful consideration, at the same time it must not be forgotten that no balanced judgment or sufficiency of precision can be attained without a skillful technique and rational interpretation of the physical signs. To quote from the preface of my textbook on Physical Diagnosis, we must constantly avoid doing that which medical students are particularly apt to drift into, namely: "To exhibit a superficial and hasty zeal and endeavor to get at the physical signs somehow, but without methodical and patient procedure and practice; * * * jumping at conclusions from insufficient data and inefficient correlation."

If this article may be assumed to have any suggestive value, it will most probably be in emphasizing therefore the more determining and discriminating physical signs rather than the reviewing and repeating of merely symptomatic salients. In the first place, I should like to advocate the adoption of special examining officers respectively for heart cases and tuberculosis suspects.

The cardiopathies.—Recently we have had a renewal of a very serious discussion concerning the perplexing problems presented to the medical examiners of prospective candidates for the Army and

Navy. Says the editor of *The Journal of the American Medical Association* (Feb. 23, 1918): "What constitutes proof of disqualifying cardiac conditions? Of course, in most instances, the answer is clear; even on closest scrutiny, the heart is free from any sign or symptom of disease, or, on the other hand, the history and examination reveal unmistakable evidence of organic mischief in valve or muscle. The more questionable cases are those in which the rate, rhythm, or size are not according to the generally accepted standard, or those in which an endocardial murmur arrests attention." Symptoms of heart inefficiency should neither be minimized or glossed over, nor, on the other hand, magnified to the point of needless and unjust rejection. "Common sense, experience and a sizing up of conditions in their entirety may here reach the correct conclusion that would be missed were one to rely on the presence or absence of murmur, the pulse pressure, the rhythm, the rate before and after exertion, or the instrumental record."

The recognition of the so-called hemic and accidental murmurs, such as the cardio-respiratory, need not preclude the acceptance of a registrant, other things being equal. We may also agree with Babcock and Mackenzie that not a few clear cases of endocardial murmur of organic valvular origin may be passed into service without any slack in efficiency or endurance. And again, as Fisk has very properly pointed out, there has been such a large percentage of apparently acceptable life-insurance risks that have ended disastrously, that the utmost caution and reserve of clinical judgment should be exercised in the estimation of so-called functional heart signs and seemingly insignificant, single organic heart murmurs. In short, it is a very easy job to detect even the earliest manifestation of *heart failure*; it is a very delicate, difficult, and responsible job to discriminate a *failing heart*.

Quoting again from the sound editorial just referred to: "After all has been said about the relative meaninglessness of certain murmurs and extrasystoles and tachycardias, must we not admit that, given one of these departures from the normal, the burden of proof is with the one who claims their insignificance? Grant that the outdoor life, the regular military drill may benefit a flabby myocardium; grant that the mitral leak may be slight, the secondary changes not manifest even to careful examination; grant that the heart is competent to meet all ordinary demands of civilian life; the question is: Will it be able to stand up under the storm and stress of the Army? Can it meet the sudden emergencies, the exposures, the physical and nervous shock that will come? May it not break down in a few years?"

Says Fisk, also: "It is well to know that organic impairment need not be rapidly progressive. It is equally important to know that, on

the average, it definitely shortens life even in apparently favorable types, and emphasizes the need for hygienic living among those showing persistent heart irregularities or murmurs.

"We may well take heed lest there be turned back into civil life, after the war is over, an unduly large number of damaged men. Men who now show an extra mortality of from 50 to 100 per cent under ordinary life strain are not likely to be improved under war strain, even though at the outset the camp training is temporarily beneficial."

Let me add in this connection that perhaps the Navy in the case of its active personnel is facing a peculiarly grinding strain in the matter of heart and artery endurance. It is well known that emotional strain may be as pernicious in its effects as physical strain. I do not hesitate to affirm that the requirements of sea duty command the expenditure of more prolonged effort, exposure, corrosion of elasticity, infiltration of vitality, in stress of weather and gale, and ceaseless vigilance in scouting, and tension in fighting. Life on a torpedo-boat destroyer might be likened to automobiling over an earthquaking country. A certain monotony of the sea wears; there is lack of scenic variety and interest; quarters for exercise are limited; conditions are artificial; confinement to cabin and limitation of deck space are wearing. Hence the great need for a steady and thorough application of the setting-up exercises, swimming and the like, which are now being practiced by Navy men as a complement to land activities which are naturally, casually, and more or less constantly indulged in while we walk and work, run and climb, and play out of doors without even plan or purpose. A physical environment which thus inherently discriminates against the Navy must be compensated for by a steady and efficient physical supplement, if the highest degree of health, vigor, endurance, efficiency, and cheerful morale are to be developed and sustained.

Cardiac weakness.—Right here the objective examination of the heart by physical methods rules supremely. Whether associated or not with incipient or distinct disorders in the peripheral vascular system, cardiac weakness—difficulty and functional incapacity at the pumping station—is the primary manifestation to diagnose. The initial, innate, and practical importance of the quantitative vitality of the left ventricle can not be overvalued. Its power is essential; its performance must be steadily rhythmical. But the stability and expectancy of life, other things being equal, are not alone dependent on mere ventricular power and vigor, inherent, temperamental or acquired, but (and here is the crux of the matter) on adequate increments and an adhesive permanence of reserve force; staying power; a vital, reinforced concrete sort of endurance; a margin of safety

against the stress, strain, and speed of existence; a surplus as well as cardiac capital to forestall circulatory bankruptcy.

Very often, before the anamnesis is taken, immediate attention to examination of the cardiac region is virtually solicited by the evident emotion of the subject, an irrepressible mark or manner of fear, anxiety, nervousness from introspective thoughts, morbid garrulousness concerning repetitions of palpitation, and general perturbation of conduct.

A medical history of infectious and toxic maladies should make one particularly alert to the discovery of possible injuries to the heart muscle. Conversely, as a proper move in preventive medicine, clear evidences of weakness of heart action should invite close inquiry into past or present injurious influences of bacterial, auto-toxic or nervous origin.

Here the technic of the physical diagnostician, the methods and logical mind of a Sherlock Holmes in synthetic induction must be dominantly and inexorably linked if accuracy and sound judgment are to be attained. *Pari passu* with the examination of the heart a close study of the pulse quality and rhythm as well as frequency is of like essence in the estimation. The varied and vital factors of significance of tachycardia and bradycardia can not be too often renewed and repeated in the memory while the mind is searching for the pathologic resources for deduction.

Rapid heart action should at once suggest first of all a possible condition of bacterial or toxic causation, a streptococcus or tuberculous infection; even Graves' disease or a tonsillar-infiltration. On the other hand, a bradycardia indicates the possibility of chronic tobacco or lead poisoning; the post-infectious consequence of one or more attacks of influenza, pneumonia, or rheumatism; a heart block; premature coronary artery thickening; a neuralgia reflex; a dilated and acidulated stomach.

By palpation and auscultation over the heart the various at least commoner forms of disturbed rhythm are next recognized. However, it is by the study of the apex-beat mainly that cardiac weakness is most positively determined.

Actual weakness of the heart muscle as indicated by a feeble or absent apex-beat can only be inferred if dislocation of the beat (confirmed by percussion) and such extraneous factors are excluded as the following: A rib in front of the beat, emphysema, pericardial or pleural effusion, pneumothorax, tumors, edema of the chest wall. Again, an exaggerated apex-beat may be a weak one, due to a dilated, flabby heart muscle, as proved by the synchronous pulse condition. Also an aneurism behind the heart, or a retracted lung over the heart may afford an exaggerated heart beat that may at the same time be decidedly functionally weak. Finally, it should be

borne in mind that a slowly lifting apex-beat is rather decided evidence of a hypertrophied rather than a failing left ventricle.

Auscultation supplies still more definite, confirmatory or corrective results in the investigation of the intensity of the heart sounds. Here again errors of relative exaggeration and diminution by adjacent conditions must be carefully measured and allowed for. Thus, diminutions in the force of the apex beat go hand in hand with diminutions of the loudness, especially of the first of the two heart sounds. Intensification of the sounds of a weak heart may nevertheless coexist because of the juxtaposition to the heart of a consolidation or large cavity in the left lung.

Pitch, as an attribute of sound is too often neglected in the examination of the heart for abnormal physical signs. Obviously, this must be clearly differentiated from mere loudness. An exaggerated heart action with evidences of hypertrophy is invariably accompanied with elevated pitch of the aortic second sound; whereas mere exaggeration (usually physiological) of heart action has intensification of sound without elevation of pitch. Again, the recognition of a pulmonary valve second sound with pitch as high or higher than that of the aortic second sound is practically always indicative of peripheral resistance in the respiratory organs; in fact, should always awaken suspicion of incipient tuberculosis; or of some thickening of the lung from an incomplete resolution of some prior pneumonic condition.

In my recent experience the sign of ventricular flutter, both palpable and audible in the region of the apex beat and limited to the area bounded above by the third interspace and within by the left parasternal line, has opened a fresh and significant study of failing heart power peculiar, in my judgment, to an increasing proportion of the most strenuous of the world's workers and worriers, fighters, and players of present-day civilization. This fibrillatory disorder of ventricular function is probably one of the best danger signals of a failing heart, not so remote from a rather rapid decline to actual heart failure that postponement of radical measures can be allowed without the pain and pathos of an irreparable result.

The physical examination of the heart must be not only static—with the patient at comparative rest—but likewise and even more critically, dynamic; that is, an objective functional test for capacity is essentially of value. In this connection, as Krehl has pointed out, a labile heart frequency under the influence of such test exercises as forced breathing, stair climbing, body bending and twisting, and flexion and extension of the raised arms, generally points to myocardial weakness (myasthenia cordis) or valvular difficulty or inadequacy. Simultaneous disturbances of rhythm and arterial ten-

sion are correspondingly noted in many instances, the latter being generally diminished rather decidedly when the arms are raised.

Physical evidences of cardiac weakness are not infrequently explained by an antecedent or associated symptom-complex along leading lines which might be designated as the big four A's: Auto-intoxication (including acidosis); athleticism; alcoholism; anxiety. To these should be added as a very live and virulent cause chronic streptococcus infection, however minute and remote or obscure the focus may happen to be.

A final word pertaining to middle-aged men, particularly officers of the Navy, and our specific responsibility in detecting incipient physical signs of the cardiac affections to which they are peculiarly subject. Perhaps no better classification need be considered than that of Le Clercq (Paris Médical, Dec. 22, 1917). He recognizes three heart syndromes, namely, cardio-sclerosis, cardiarteritis, and cardiatheroma. The first condition occurs mostly in the 50's, and is due to dietetic errors, with alcohol as an adjunct, and also to acquired hepatic disease. High blood pressure and cardiac hypertrophy are rather typical of this condition, which later terminates in myocardial failure. Secondly, the sole cause of cardiarteritis is some infection, e. g., la grippe, common measles, scarlatina, typhoid fever, but mainly rheumatism and syphilis. Cardiac insufficiency develops slowly and is recognized particularly by the functional heart tests, along with more or less intermittent periods of mitral insufficiency of myocardial origin. The third group arises through slow intoxication, as by tobacco, lead, or alcohol; very often from sluggish colonic action and intestinal putrefaction. Murmurs, both aortic and mitral, may be detected in these cases; and complications are less prominent, violent, and imminent before senility occurs.

Here arises the concomitant importance of differentiating by physical signs between mitral insufficiency of direct, organic valvular causation and the relative mitral insufficiency of myocardial causation. Also a temporary mitral evidence of insufficiency that may be due to an infectious myocarditis or myocardial poisoning, elimination of which and recovery from which will be signalized by the disappearance of murmur, and therefore must not be confounded with myocardial insufficiency of more prolonged, constant, and profound nature and origin.

Given a history of habitual constipation, dietetic excesses, especially of meats and sweets, intestinal indigestion with colonic inflation, with or without disproportionate bulging and sogginess of the omental structures, a careful and rigid study and test of the cardio-vascular system is indicated. Slight irregularities in force, smoothness, and rhythm of the heart beat, ventricular fibrillatory pulsation and flut-

ter are not infrequent signs of a subtle undercurrent of disintegration of cardio-motor stability. A weakened first sound with marked increase in rapidity on slight muscular effort (tested) shows likewise diminished ventricular capacity and endurance; the pulse is correspondingly soft, small, and volatile.

We are now approaching a sort of balance of attitude relative to the differential effects and benefit or detriment of physical culture or health and physical training for competitive sport in special lines of prowess and excellence to which belong laurels, prize cups, being lionized, publicity, or a share of the gate receipts with secrecy and demoralization.

It is worthy of reminder that many a heart has literally been broken by athletic excesses, especially in those irregularly or severely trained who should earlier have been weeded out. Thus we have seen many prep school boys, raw, tender, immature in fiber and innate capacities of resiliency and reserve, aping their older brothers in college and laying a sandy instead of rocky foundation of cardiac staying power and continuity of developmental vigor.

I have yet to see a habitual or so-called moderate user of alcohol with a likely heart muscle and neuro-motor function. I mean moderation in the lay and insurance acceptation of the term, where the average daily consumption consists of two drinks of two ounces of whiskey. Often this is in the form of a cocktail before dinner or of one or two bottles of beer. Visible intoxication is rare. The damage is in the nagging depression and disorder of function due to the constant narcotization of cellular tissue and the annihilation of thorough or even intermittent elimination. The organs and tissues never get any rest from the alcoholic acceleration and excitation. The man who goes on a spree for a week once or twice a year and in whom a systemic revulsion with complete reaction through drastic excretion ends the metabolic crisis, is better off than the so-called moderate drinker who takes incessantly and inveterately his quotidian "eye-openers," "appetizers," "digesters," and "night-caps," and often between times his sociable "nip" and occasional treats at bar or table, and yet who to the casual observer never seems to be the worse for it.

IN CONCLUSION.

I wish merely to indicate the salient symptomatic lines along which incipient tuberculosis usually insidiously develops and likewise to point out the inherent suggestions toward a careful and precise physical diagnosis in relation thereto.

In a special experience of more than 20 years in tuberculosis work the symptom complex and objective signs dominating the purpose

of pulmonary physical examination might be grouped as the following:

- (1) Bronchitic.
- (2) Pleuritic.
- (3) Laryngitic.
- (4) Anemic.
- (5) Auto-toxemic (metabolic).
- (6) Myasthenic.
- (7) Psychoneurotic.

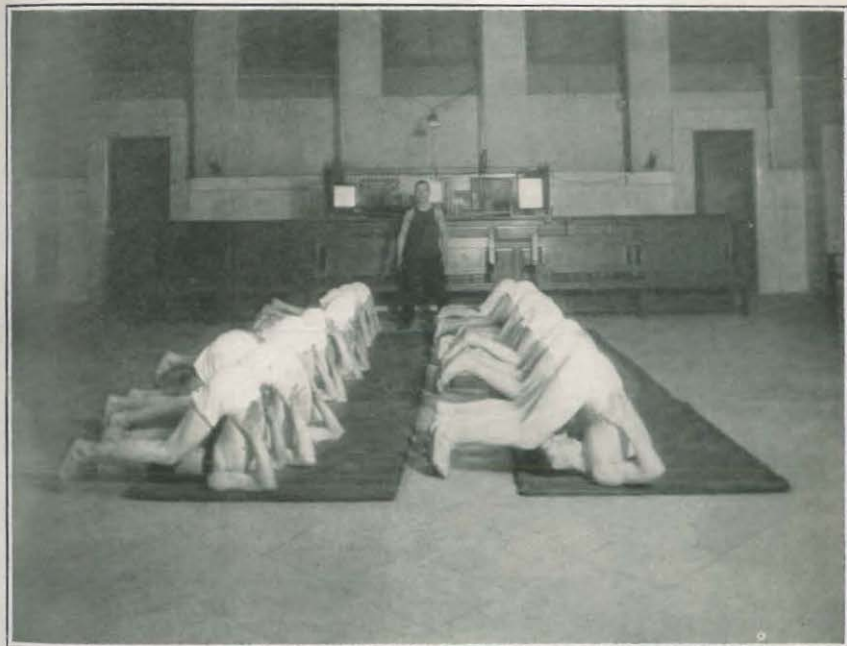
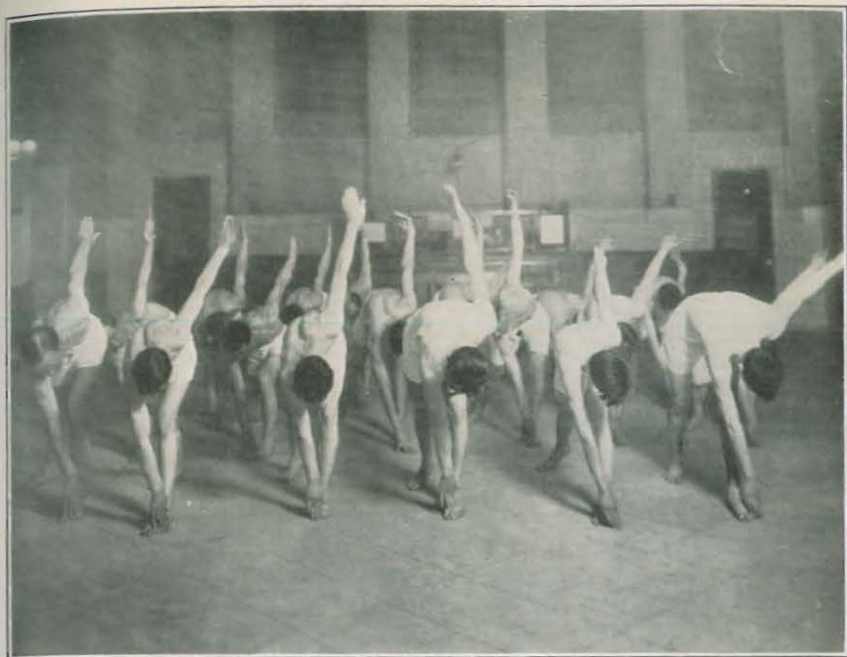
Occasionally, even in early cases of tuberculosis, the only prominent symptoms may have been either gastric or hemoptytic.

ATHLETICS AND THEIR RELATION TO WAR.

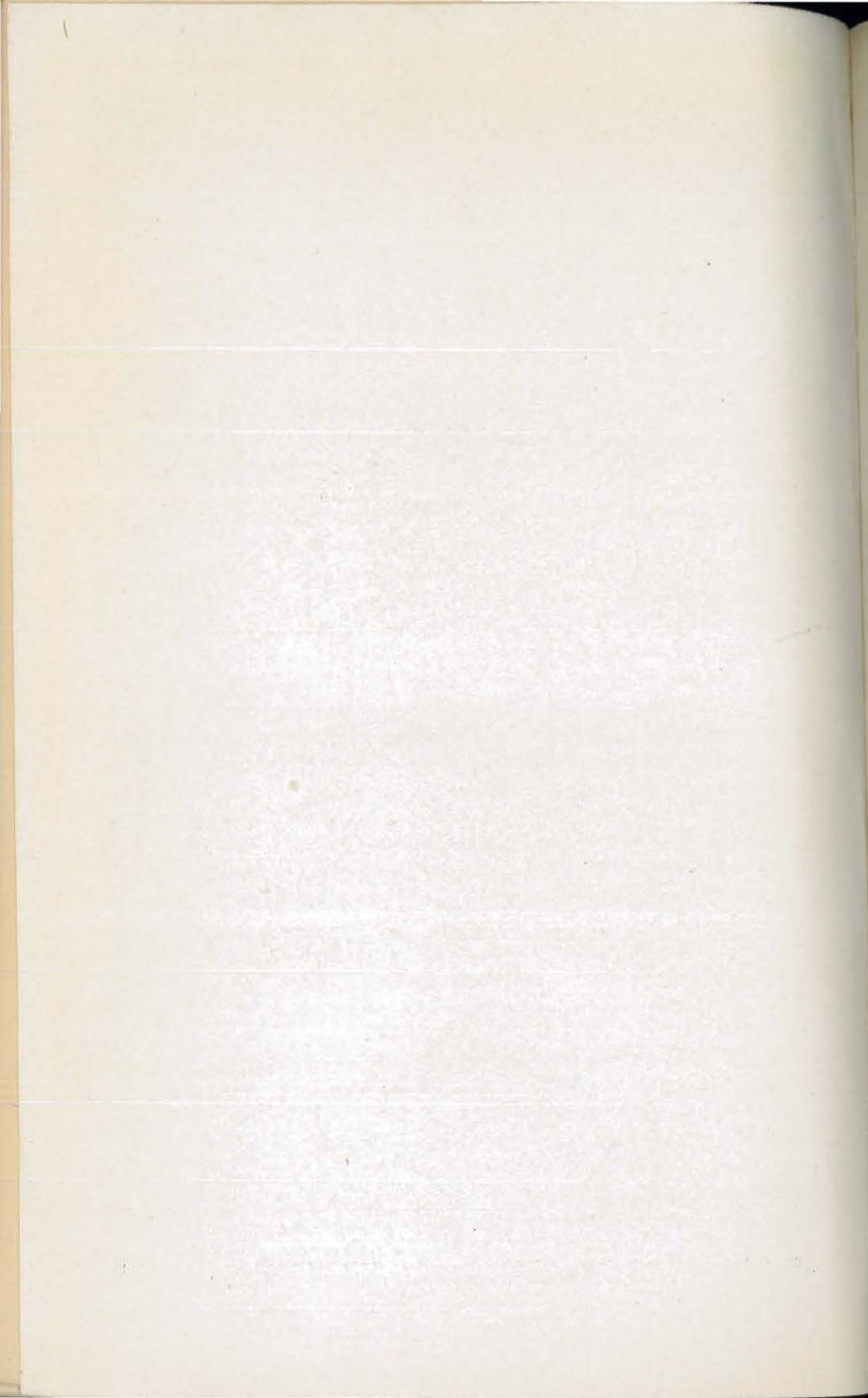
By D. F. LUBY, Lieutenant, M. C., United States Navy.

The withering effect of the great war is felt all over the world. Like a huge plowshare it rips up the traditions of yesterday, turns over the moss and dust which for years have been accumulating within the institutions that are most vital to us and discloses fallacies and false prophets, bringing us face to face with the necessity for radical change in many departments of life.

The American system of athletics may be regarded as one of our national institutions, and through its channels pours the vigor of the Nation, but it is only at a critical time like the present that there can come a general appreciation of the sad fact that for years *athletics in America have existed only for the sake of contests* and that these contests have been developed, not primarily to upbuild the splendid youth of the land, but rather to satisfy the appetite for pleasure of a volatile and somewhat hysterical public. Twenty-five centuries ago a great nation had come to realize the full value of training its youth and was rewarded with victories which gave lasting benefits and led up to a high plane of civilization. For the first time in the history of America we are taught by the penetrating thrust of war the real meaning and the real value of athletics and we have a vision of what they might do for the thousands of boys, eager to strengthen their bodies, that they may give the best to their country. In spite of the time and the money devoted to athletics and the huge interest which this subject provokes now when physical strength and endurance is suddenly needed, we realize that we are not an athletic people, but a people of athletic specialists, and, because of the urgency of the situation, we see our armies attempting a rapid development covering a period of 6 months or a year when the period of development should have covered at least 20 years.



The athletics that count. Free physical training at Cornell Medical School for men rejected by Navy recruiting offices.



It is the purpose of this article to draw attention to the fallacies of our athletic system as developed up to the present time, to point out the uselessness of the object sought, and to assert that there was no gain but rather serious loss to those who participated in athletics in the past. The plea is for a radical change in our methods and our objectives in the athletics of the preparatory school, the college, and the university.

In maintaining that our course has been at a tangent to the line of real athletic development it is necessary to look back over the past 40 years in this country. In the early days there were no gymnasiums, no athletic fields inclosed by wall or fence, and the most strenuous athlete of that period would to-day look with amazement at the Harvard stadium or the Yale bowl, which are nothing but colossal monuments to the present commercialization of athletics. In those days athletics consisted largely of friendly contests in physical strength between one half of the student body with the other half. There was no preliminary training, there was no huge financial budget requiring an adept business manager, there were no uniforms, no spectacular features. At a certain hour of the afternoon, moved by a universal impulse, books were closed, old clothes were donned, and there was a rush into the open to walk, run, jump, to let the physical man have his fling. With time came the development of teams and clubs, organized for the purpose of winning championships, both local and national. Schools and colleges began to taste the sweets of rivalry and to vie with one another in baseball, football, feats of the track, etc. Yale locked horns with Harvard and Princeton, Exeter fought with Andover, and everywhere college paired with college and school with school. The interest in athletics was not confined to the student body. The alumni and the general public soon became equally keen on the subject. Athletic events gradually became one of the dominant features of college life and many times a year the spectacle was presented of thousands and tens of thousands of people clamoring at the gates of our great playing fields, utterly regardless of the cost of admission or the time required and the distance to be traveled in order to participate in these gladiatorial engagements. Wise young managers worked day and night to commercialize sport as winning teams brought prestige and attracted to the college the ambitious and enterprising youth of the land. Even towns and cities where there were no colleges became infected with the spirit of the times and, where local talent did not suffice to guarantee victory, athletes were imported from abroad for the purpose. In every form of athletics the object was the same, "to win," regardless of cost. Professionalism held our country in its grip and it required a crusade on the part of the public and certain of our institutions of learning to purge

our educational institutions of this taint. The restrictions imposed at college and the iron-clad rules about the participants in athletic events seemed to make competition more keen and, as a consequence, new plays of every sort were developed, new thrills crept into the games, athletic feats became more startling in character, and every year saw new records made and broken. By this time there was a need and an insistent demand for trainers and coaches. Athletic associations consulted with presidents, trustees, and faculty, maintaining that an alumnus or some incapacitated member of last year's team was not good enough to serve as coach. If coaches and trainers were to be used, they must be the best. Arguments were found for this in last year's defeats or the phenomenal career of some rival college, more prompt to take advanced ground along this line. And so there came to be a new profession, that of coach and trainer, and now training tables and southern trips and summer camps for preliminary training and expensive equipment and long trips to rival institutions and whole squads of coaches became a necessity. This all grew out of the determination to win, which would have been commendable enough had it not been accompanied by a feeling of utter indifference to those who fell by the wayside, or, in other words, to the thousands of boys and young men who could not be admitted to the arena, whose physical proficiency entitled them only to seats on the bleachers as spectators.

The athlete has now become the real king of the college world. All those who love good sport watch him and follow his example. He feels himself an essential and integral part of the school and trains faithfully, punishes his body, makes every sacrifice, strives with superhuman strength to accomplish the allotted task and retain for as long as possible the halo of respect and admiration which victory brings him. He is too young to realize what the career of college champion involves in the way of disaster to his body, and perhaps would care little for the threat of future disaster, so long as he could stroke the winning crew or, as pitcher of a winning nine, hear the delicious music of applause from a vast assemblage of admirers. Nor does the coach care, nor the student body, nor the college. So long as he is good for a point or a run or a goal, he is applauded. When he fails, his usefulness is over, and he is discarded and forgotten.

One of the most serious faults of our present athletic system, a vicious, pernicious system if ever there was one, is the necessity for haste. Our trainers work feverishly and anxiously to develop a winning team. They must develop such a team at all costs because failure means the loss of a job. A certain Harvard coach has said that coaching a football team is simply a race against time. The coach whose team meets, for preliminary summer training, in August has stolen a march on him whose team does not assemble until September.

The first reform in athletics related to professionalism; later there was a less radical reformation. People began to ask if the college athlete did any studying and passed his examinations. A disposition now appeared to shorten long southern trips, to abbreviate the preliminary training season, to raise the standard of scholastic requirements. In some sections there was a reaction against the coach and the trainer, and every evil that had crept into athletics was laid at the door of these men, when the real fault was within the college walls and could be laid at the door of the faculty and trustees and students themselves, for from all these elements the demand was consistent and unvarying. All clamored alike for a winning team.

It is small wonder that our athletic coaches disregarded the great mass of potential athletic power, allowing it to be idle in the bleachers, and concentrated its efforts on the few who gave promise of unusual accomplishment. I have seen the late Mike Murphy work for hours with his star high jumpers, endeavoring to perfect their scissors-like form that they might add a trifling fraction to their 6-foot 4-inch record. How much more profitable to the country had this greatest of all trainers developed instead five hundred or a thousand young men of moderate athletic ability to jump 4 feet 6 inches. Had he succeeded there would have been that many more men available to go over the top and stand the awful strain of battle after they got over. I have seen Johnny Mack coach his six or seven hurdlers as they skimmed over the 3-foot 6-inch sticks. Again and again would they pass in review before him in the effort to attain that perfect form without which they could not win. How much more advantageous to the country to-day if he had coached six or seven hundred Yale men to hurdle those timbers, even if they did not acquire the form which he so well imparts; and so it is with the coaching in all departments of our college athletics. In the mad rush for victory the mass of the students is neglected for the sake of developing a specialist or group of specialists. The university, like the preparatory school, rewards the efforts of these fortunate men with all the honors at hand, and it is the least that can be given them in return for the real sacrifices they make.

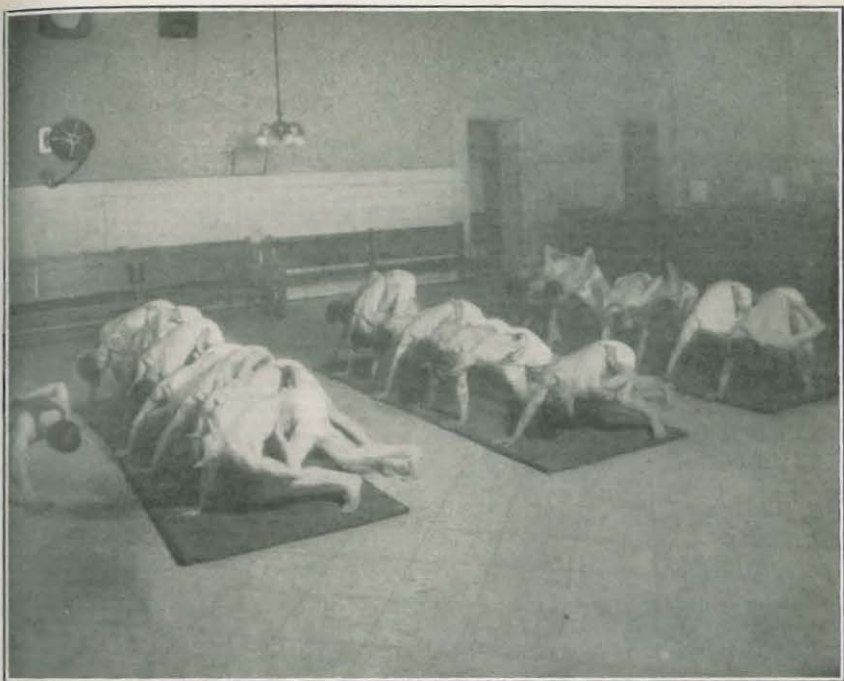
It is a well-known fact that the body accommodates itself quickly to all manner of changes, and this is perfectly true in the case of the boy who, looking forward to a university career, begins to specialize in some line of athletics while still in a high school or grammar school. Thanks to this adaptability he is not conscious of the deleterious effects of strain and has no hint of the brewing trouble during his whole scholastic career, nor when he leaves the university does he appreciate that he should continue to take exercise and, as it were, retrace his steps, along the route already trod, by taking active

physical exercise in slowly diminishing amount for a period of at least five years. Instead of this the bulk of our college graduates become engulfed in the business world and either spend their time at office desks or else enter on a life of luxury very different from their previous Spartan existence. Hence a gradually diminished blood supply to various important organs and tissues, an excessive development of connective tissue, associated with the deposition of fat droplets in and about the muscle cells. Fat begins to gather in omentum, cloudy swelling, and later cicatricial change develops in the kidneys, and the hypertrophied muscles begin to degenerate.

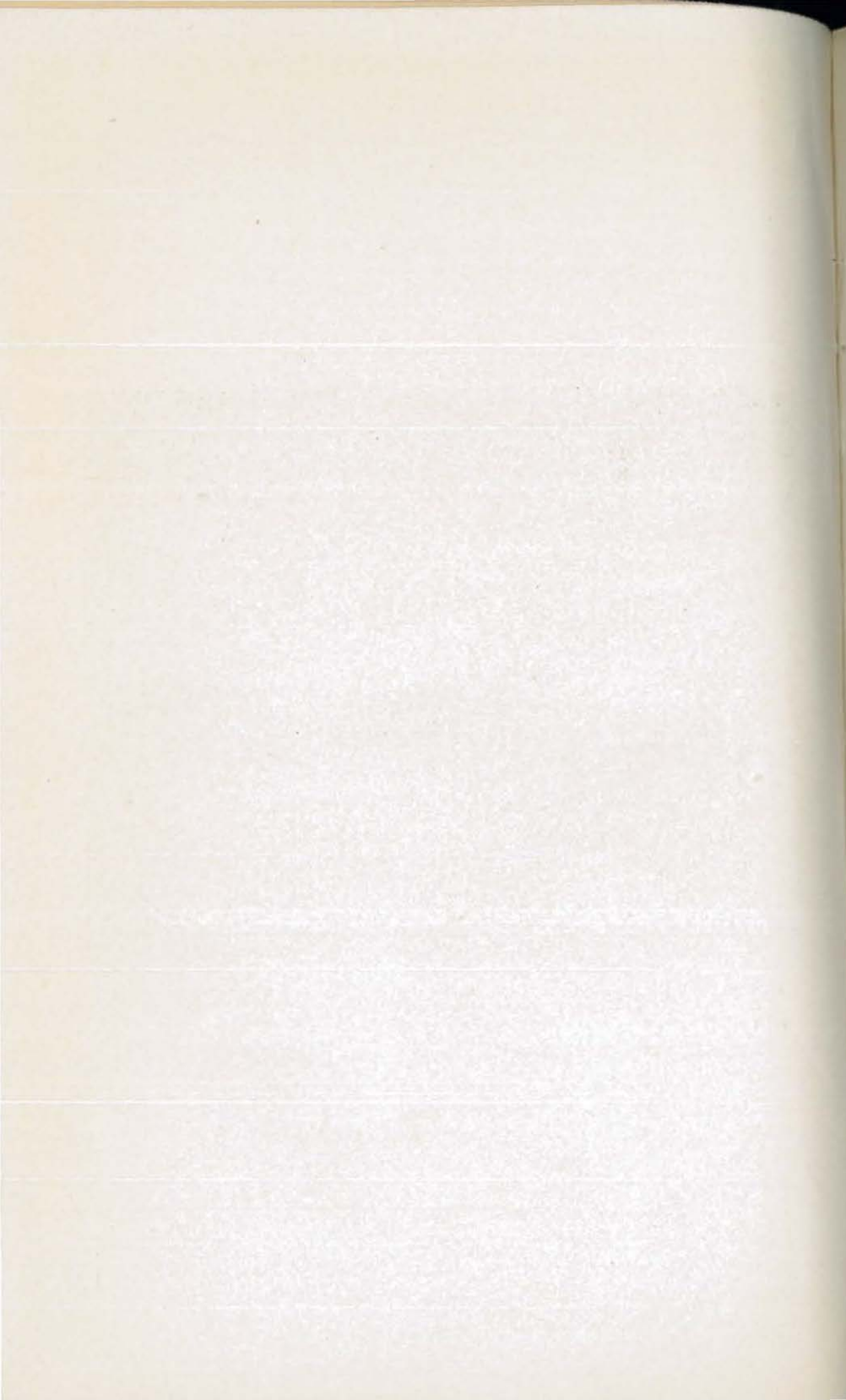
I could name more than one friend or acquaintance who, after a brilliant career as a star athlete, has succumbed to diseases which those with well-developed and well-balanced bodies should successfully resist. I could mention by name more than one ex-champion who has died or broken down following the terrible wear and tear of an athletic career. I could mention more than one man, whose name was well known throughout the country, who is no longer with us because an athletic career left him in what we might call a burned-out condition, with marked lowering of body tone and without that reserve force so necessary to resist bacterial invasion.

Dr. R. E. Coughlin, as early as 1905, called the attention of the medical profession to the high death rate among athletes. He is corroborated by many other writers and students—men like Lee, of Columbia; Abbott, of the University of Pennsylvania; Darlington, of New York; Savage, of Pittsburgh, etc. Surgeon General Charles F. Stokes, United States Navy, in his annual report for 1912, spoke in no uncertain language of the disastrous effect of athleticism upon health. While the number of retirements and deaths for 580 non-athletes in a certain period amounted to 22, there were 21 casualties in about the same number of athletes, despite the fact that the latter are supposed to come from better material. When, however, that group of diseases only was considered to which we would think athletes peculiarly liable there were 6 deaths of athletes to one among the nonathletes. Dr. Stokes said in part:

The immediate hazards of sport are inconsequential as compared with the future effects of overtraining and overstraining for brief periods, to be followed by years of relative physical quietude. The records naturally fail to take into account those whose physical disabilities are of such a character as not to cause their admission to the sick list, yet whose efficiency has been impaired by them. There are many such officers in the service who consult medical officers for cardiac irregularities, obesity, or physical staleness—in other words, for conditions that it appears reasonable to attribute to overtraining and overstraining followed by periods of physical quietude exacted by service conditions. These cases do not become matters of record unless they are of such moment as to render the officers wholly unfit for duty, yet such influences in many instances materially affect the military efficiency of the individual and should be averted if possible.



The athletics that count. Free physical training at Cornell Medical School for men rejected by Navy recruiting offices.



Physical training and athletics should be so tempered as to be beneficial to all. They should produce a supple, agile, all-around, well-developed individual, not a muscle-bound mass of brawn. The man who steps out of a boat, comes off the football field, or leaves the track should feel exhilarated by his exercise. Is it logical to suppose that the man who is lifted out of a boat, collapsed, or is carried off a football field or track in the same condition is not harmed thereby?

It is therefore recommended that athletics in the Navy be so regulated as to avoid these deleterious conditions by the prohibition of endurance contests where the ability to win is largely, if not entirely, dependent upon brute force, and that rather the maximum effort be made to develop a symmetrical, normal physique in the many instead of a highly specialized human machine in a few.

Dr. Harlow Brooks, from an experience of many years of association with athletes and in connection with enlistments for the National Guard, believes that after 10 or 15 years of business life the health of former athletes is far below that of the average man.

Dr. C. R. Bardien, of the University of Wisconsin, has called attention to the greater frequency of acute dilation of the heart in members of athletic teams as compared with the number of students who do not participate in athletics.

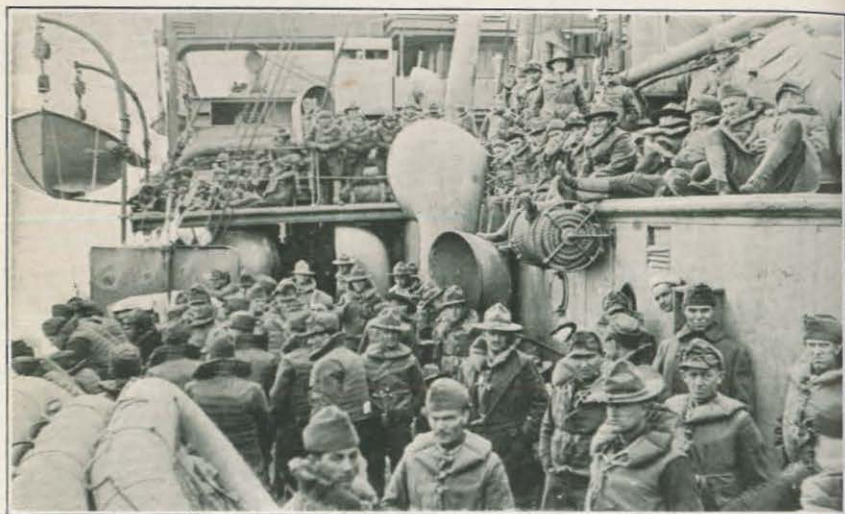
It seems to be generally recognized among medical men and, to a certain extent, among military men, as well, that there is something distinctly wrong with athletics as now conducted in America. If we persist in allowing our boys to follow the pernicious course which begins in the grammar school or preparatory school and ends only with the university, we must be prepared to see them pay the price as their predecessors have done. The question is no longer a personal one, if it ever was. Now, certainly it is manifestly a matter of national importance. It should be patent to all that to neglect the most careful athletic development of our millions of boys is to sap the very roots of strength and vitality in the future material of the Army and Navy, and if, as some of the more conservative and perhaps apprehensive observers declare, the war is to last for five years longer, then the security of the United States will depend more upon the lads who are now 16 and 17 years of age than on the grown men who are over there at present. We hear a good deal of talk just now of universal *military* training for our boys, and, while it is generally admitted that such training has considerable incidental advantages from the point of view of health, it would seem that the first thing to be considered is the universal *physical* training of our boys. In the past, unpreparedness has been our boast and motto, and civilian experts on military affairs have been content to believe that a few months suffice to make good soldiers, but, even if we gave 2 or 3 years to military training and met every condition of military preparation from a technical standpoint, it must be remembered that a strong, symmetrical and healthy body, capable of extreme endurance, is not the result of hothouse growth and intensive training.

There is a real danger lest the effort to bring our soldiers to-day up to a proper physical standard may lead to the adoption of methods similar to those employed by the trainers and coaches of college teams working against time to be ready for a contest on a given day. This danger is particularly menacing just now when the call for men is loud in the land. I have witnessed the intensive training adopted in some of our camps and greatly fear that the enthusiasm of athletic instructors will finish what military leaders have not quite accomplished, namely, the production in many of the men of a state of fag and staleness due to overtraining. While serving on the U. S. S. *President Lincoln* I observed thousands of soldiers at the moment of their embarkation and it was discouraging to note in what a large number of them were to be seen evidences of an overtrained condition—evidences such as deep sunk, hollow eyes, dark rings around the eyes, lassitude, depression, lack of appetite, haggard looks. One can not help wondering what the opsonic index of these men is and to what extent their tissues are overcharged with toxic fatigue substances tending to render them more susceptible to communicable disease, especially in view of the mental depression present due to new environment, leaving home, etc. Fatigue and resistance become matters of prime importance to the soldier when he is assigned to the troop compartment below decks on a huge transport, where air space is reduced to a minimum and overcrowding is inevitable and where he must be subjected to the danger of droplet infection, the danger of contracting pneumonia, meningitis, measles, and other serious ailments.

For a certain period the reports from Gen. Pershing's army showed that the highest mortality from communicable disease was in the National Army and the lowest in the Regular Army. Thus it has been calculated that for a certain period deaths per thousand from pneumonia in the National Army, the National Guard, and the Regular Army were in the proportion of 5.65, 4.80, 4.09. I believe that the variation in susceptibility can be ascribed directly to the variation in the time of preparation and development which these different units have enjoyed, the development of the National Army having been characterized by intensive training and high speed. I believe that the accumulation of fatigue substances from overtraining for lengthy periods without proper attention to the time element brought about, in the soldiers that I saw, a condition analogous to what we see in the stale athlete, and it is not to be wondered at that the overtrained soldier should be particularly liable to pneumonia, scarlet fever, influenza, etc. In order to illustrate my contention I took a number of photographs of the men as they came over the gangway when embarking for Europe, and I invite attention to the expression of the men's faces in these pictures. When



View on American transport. The men are thin and in some cases seem overtrained.



Views on American transport. The men are thin and in some cases seem overtrained.

their features are in repose the expressions are haggard and anxious, and those who are laughing are thin and seem trained "too fine." Many had lost weight and others declared that they had been conscious of a distinct decline of vigor during the last month or two of their training. These statements were particularly frequent and emphatic among the men who came to the sick-bay with different zymotic diseases. During three trips there developed on the *President Lincoln* 50 cases of pneumonia, 34 of scarlet fever, 85 of influenza, 68 of measles, 56 of mumps.

In view of what lies ahead of our men in Europe one can not but feel that they have been brought along too fast and that they are stale before they have begun the game, and yet in the face of the urgent need for men how can the Government do differently? The invalidism and the deaths in our Army that result from epidemic diseases may fairly be laid at the door of military unpreparedness and the lack of a general, properly thought out system of physical training for our young-men, calculated to make them hardy and capable of increased resistance to infections.

The immediate indication is to impress upon physical directors, trainers, and athletic managers in training camps the importance of deliberation and moderation and of working in harmony with the medical officers. In all our training camps, and more particularly at our aviation schools, a carefully regulated diet, plenty of sleep, and the avoidance of alcohol are matters of prime importance. However imperative it may be in this acute and trying situation to resort to short cuts and temporary expedients, the present national emergency should serve not to confirm us in bad practices too long in vogue, but rather to draw us out of our stagnation and indifference to the reform of every abuse. There is a sense in which, no matter how brilliant the victories of our armies, this country will suffer defeat unless self-questioning and self-criticism lead us to mend our ways in regard to the many vital particulars in which we are now at fault.

With the lesson of the hour before us it seems beyond belief that the country should not already have taken steps to improve the physical condition of the sons of this generation, who will be the men of the next and the future protectors of our cherished institutions. It seems to me that one has a right to demand Government supervision of some systematic program for the physical development of the boys of the country. If we are to have athletics following in a general way the old lines then we should eliminate the now essential idea of winning games at any cost. The coaches at the various schools must be forbidden to concentrate their attention on the few specialists to the disregard of thousands of students who now merely stand upon the side-lines. There must be 20 football teams playing on the fields

where now we see but two. Instead of half a dozen men training to jump a broad jump of 22 feet 11 inches we must see 600 boys learning to jump 11 feet 6 inches. The length of races must be reduced and cross-country runs must be reduced both in length and in running time or thrown out altogether unless a slow jog trot is enough. The rowing races must be cut down to the Henley distance as a maximum and then there must be 20 or 30 crews practicing daily instead of 4 or 5.

In a word, all branches of athletics must be reclassified on the basis of their effects upon the heart and other vital organs, and we must discard the old classification based upon popularity and commercial advantage. In the grammar school the form of athletics to which a boy could be assigned or in which he would be permitted to engage in would depend upon (1) his family history; (2) his personal history, having regard especially to previous illnesses endured; (3) his physical status; (4) his particular type, height, weight, etc., in relation to age, etc. Every class would have its specially prescribed athletics, both physical and tactical, and under no circumstances would a lad be allowed to engage in competitive sports assigned to a class above or below his own. A physical examination would mark his entry and exit from a class and he would be marked for development of body and for ability to perform the various tactics. While in the grammar school a chart would be begun for him which would accompany him throughout his educational career.

As the boy passed on to the higher school there would be a reconsideration of his individual record and his family history. A physical examination would take place, and his chart and previous athletic work would be considered. There would be athletic classes and all members of a school or college would participate except when exempted for physical disability. The alert boy, the natural athlete, would have to be held in check, just as the laggard and lethargic would have to be stimulated, in order to maintain for the class an average of efficiency. Outside competitions with other schools would be reduced and the competitive idea find its illustration principally in interclass games. Work in the gymnasium should accompany and parallel the work done in teams and athletic games. Where students show beyond all reasonable doubt a real and permanent improvement in body and an increased ability to participate in various branches of sport they should receive credits at the hands of the college authorities in the same way that credits are given for scholarship. All athletics of the more strenuous type and all those contests which inevitably induce even temporary exhaustion must be abolished. Mass competition, such as that in which a class would participate as a whole, is to be encouraged. New feats of prowess should be introduced. There should be walking contests, well-scal-

ing contests, obstacle raising, hurdling, shorter relay events with increased personnel, more soccer football, shot putting with a lighter shot, etc.

The athletics of to-day must be remolded and their object clearly defined. Athletics can surely have no better purpose than to develop a robust and healthy boy who, though he may not be an inter-scholastic champion or sought after by the larger colleges as likely to increase their fame, will nevertheless enter upon his life work with a symmetrical, fully developed body, capable of resisting disease and of enduring physical strain. For such a young man the training camp, the transport, and the trench will not contain the threat of death from disease before his grapple with the enemy.

MEMORANDA FOR MEDICAL OFFICERS WHEN A SHIP IS COMMISSIONED
AND SUBSEQUENTLY.

By A. FARENHOLT, Captain, M. C., United States Navy.

This list of duties has been compiled primarily for the use of those going to sea for the first time, but may be of service to others as well.

When the ship is fitting out the medical officer shall examine sick bay and spaces under his charge in accordance with article 2101-I.

As soon as possible he shall examine the crew and (1) verify descriptive lists; (2) ascertain if all crew are properly vaccinated, if not vaccinate those needing it when permitted by commanding officer; (3) ascertain if all crew fully qualified physically. (See article 2102 and 3-I; also 2101 to 2131-I, 2901 to 2997-R., 1303-I, 1351-I, 1357-I, 1504-I.)

CLERICAL DUTIES.

The following work should be started and these books commenced:

1. Filing cases established for all letters, indorsements, bills, vouchers, inventories, invoices, copies of returns, and other sick bay work; all classes of paper work are numbered serially beginning with No. 1, July 1.
2. Property record book or file sheets or card index.
3. Book recording receipt of all health records, also forwarding of same; contains names alphabetically arranged and numbered with corresponding number in pencil on health record. This book may advantageously contain also typhoid and smallpox vaccination data.
4. Prescription book; numbers and dates.
5. Linen and laundry book.
6. Sick bay recorders book; this may also be the rough journal and ward book.

7. Venereal prophylaxis book, or binder for holding liberty lists.
8. Memoranda of interesting cases.
9. Book recording articles wanted and articles for which a survey will later be necessary; one side for wants and other for articles for survey.
10. Book recording operations or rough Form P kept.
11. A filing box or boxes for rough Form F cards.
12. Venereal lists made out; copies for executive office and dispensary and for man who has venereal duty.
13. A full supply of blank forms laid in and conveniently stowed.
14. Slips provided for report to commanding officer "not in line of duty"; article 2902-1-R. complied with.

OTHER REQUIREMENTS AND SUGGESTIONS.

1. A pigeon-hole locker having about 30 compartments and locking arrangement for health records.
2. Instruction for Hospital Corps started (see 2642-1-5-I, Vide No. 83); Handy Book for Hospital Corps, 1917, United States Navy; Mason; lectures; dummy operations, paper work and forms; Hospital Corps drill regulations; optional; Instructions for Medical Officers, 26.
3. Arrangements made with paymaster for food for patients in sick bay; diet slips for commissary steward.
4. Liquor, poison lockers examined carefully; also stowage of all stores either in stores or on hand in sick bay and dispensary, 2964-2965-R.
5. Hospital Corps billeted and arranged in beds and lockers; hammocks and mattresses to master at arms.
6. Hospital Corps find their messing arrangements, also method of drawing clothing, small stores, and money, 2130-I.
7. General station and duty bill made out and posted:
 - (1) Sick bay watches.
 - (2) Stations at various drills.
 1. General quarters, Manual Medical Department, Chapter X; 2109-I.
 2. Fire, 2707-5-I.
 3. Abandon ship.
 4. Battalion drill.
 5. Landing party, Manual Medical Department, Chapter X, section 3.
 6. Collision drill, Manual Medical Department, 982.
 - (3) Cleaning stations.
 - (4) Liberty lists and rotation for duty as sick bay recorder.
 - (5) Routine for sick bay and medicine hours, poison antidote list.

8. Operating room inspected; sterilizer tested; instruments and appliances inspected and placed in order; habitually kept coated with cocoa butter, liquid paraffin, or other method to prevent rust. Table, water, lights satisfactory. This room must not be used for bacteriological or other work.

9. Application should be made by letter for microscope and accessories and upon its receipt preparations made for all ordinary work; an incubator may easily be improvised.

10. It is desirable if possible to obtain an ice box; sera, vaccines, certain foods, etc.

11. Metal feeding and dressing trays may be improvised for use across bunk bars; also same for cups and glasses.

12. Do not send officers to hospital without survey.

13. Weekly inspection of holds, storerooms, and living spaces made with first lieutenant and written up in hull book or letter to commanding officer, 2701-4-2702-2-I, 2115-I.

14. Bill of health always secured before leaving port; unless flagship directs otherwise, 2126-1-2-I. Also meet health officer at gangway, Manual for Medical Department, chapter XV.

15. See that Hospital Corps are always in proper uniform, rating marks applied, clothing regulation pattern. If possible have all sick bay attendants wear white washable clothing. See that uniform is sufficient in amount and properly marked according to Uniform Regulations 1913, 70-71-72.

16. Keep smallpox vaccine and such other vaccines and antitoxins as may be necessary on hand. The flagship sometimes has such stores.

17. Purchase as little extra food for use in sick bay as possible.

18. Inspect bumboats constantly (if any); especial care about bottled waters; mosquitoes in bunches of bananas and in shore boats, 2113-2-I, 2618-2-I.

19. Be prepared to examine water from shore for boilers or drinking, the latter is absolutely necessary, 2621-I.

20. Submit memorandum slip in each case in which admission to sick list is not in line of duty; 2902-1-R; Manual Medical Department, 2254.

21. See that all heads are clean; properly flushed; papers; live steam used to clean if possible; basin to wash hands after using heads if such can be arranged.

22. Carefully inspect prisoners; acute, feigned or communicable disease, 1431-R. Fracture of skull possible in those dead drunk, 2114-I.

23. See that medical boat boxes are O. K.; covered with canvas, marked with ship's name and medical department. Also medical packet in regular boat boxes.

24. Arrange battle dressing packets for isolated positions, turrets, etc., fire and engine rooms, steam and motor boats: these may be tin boxes or canvas-covered packages, well marked. Reserve dressings for use after action should be provided in the same way.

25. See that stretchers are instantly ready for use, some permanently fitted about the decks for use in accidents, such as at coaling ship and handling of stores.

26. Keep constantly on hand dressings and appliances for use in case of accidents, such as burns from fireroom or powder, fractures, restoring the apparently drowned, or those overcome from inhalation of poisonous gases.

27. Determine the best method of removing the wounded from the fire and engine rooms, turrets, handling rooms, tops, and all inaccessible places.

28. Observe regulations concerning locking of storerooms, closing of storeroom and other doors at certain times—sundown at sea; drills—keys never to be taken out of the ship. Keys in hands of enlisted men, 2964-R., 1504-2-I.

29. Cotton or other ear protectors furnished all persons on board during times of firing of great guns. Care about ears in swimming in tropical waters.

30. Barber should be instructed in method of keeping his gear in sanitary condition. List furnished him (not posted) of all syphilitics.

31. See that food is O. K. in quality, quantity, cooking. Dishes washed properly, disinfected if necessary. Syphilitics with open sores have special gear. See that those who eat at irregular hours are properly looked out for 2618-2-5, I.

32. See that wash rooms are in a sanitary condition and men do not urinate while under showers.

33. Prohibit use of tube in water breakers, notably in steam launch. See that scuttle butt is working in satisfactory manner and water cooled and aerated.

34. See that men are billeted properly and not in dangerous places and exposed; no sleeping in storerooms or unauthorized places.

35. Have a landing party scheme always worked out and ready to be put into operation. Instructions for Medical Officers, chapter X: Inspected by flagship twice each year. Material to assemble: Instruments, drugs, dressings, diagnosis tags, transportation.

36. Prepare a schedule of routine and incidental returns in order to facilitate such work as per article 5222-5-I.

37. See that ship's laundry is conducted in a sanitary manner; all infected sick-bay wash to be disinfected before leaving sick bay.

38. If ashore see that a proper place is selected. Inspect carefully entire crew, stripped, at intervals, for early, concealed, or unrecog-

nized disease, especially in cases of men whose duties confine them below decks; especially look for T. B., no cases of which may remain on board longer than can be helped. In port land them in hospital; at sea in tent on deck: in some places a tent on the beach.

39. Careful to *retain copies of all correspondence* and paper work; especially invoice of medical outfit and all invoices received subsequently.

40. Keep commanding officer informed concerning dangerous or infectious diseases, deaths, important happenings, sanitary condition of port, 2952-3-4, R.

41. Report to officer deck, deaths, accidents, receipt of stores, and all affairs which should be recorded in the log, 1807-3-(c)I.

42. See "Ship and gun drill United States Navy, 1905" for aid to wounded, page 17; casualties, 104; general quarters, 276; medical department in battle, 279 (same as chapter X, Manual for Medical Department).

See "Landing force and small-arm drill—1912" for first aid, 35-72, esp. 63; tent pitching, 75-83; sinks, 72; urinals, 73; kitchen pits, 73; water supply, 77, 69, 16; position hospital tents, 75; men's equipment clothing; position ambulance party; packing knapsack haversack, 22; at battalion drill, 474; officers' equipment, 19; position staff battalion, 473; ambulance party, 17; position staff regimental, 492.

43. Guard against disease brought by animals from ashore.—c. f. plague by rats; also pets on board ship.

44. Recommend anchorage away from shore in infected ports; flies, mosquitoes from beach, in bunches of bananas, sacking, closed boats; sweep out canopy cover of steam launch; care about breeding places on board for mosquitoes.

45. Guard against lead poisoning, gas poisoning. (See circular letter M. & S. 124713, Mar. 23, 1912, 3327-1-2, I.

46. Guard against infection by syphilis by band instruments, whistles (boatswain mates, officers' deck), all cooks and mess attendants and dentists.

47. Watch for and detect presence of cocaine and other drug habits.

48. Restrict liberty in ports having much sickness; also restrict venereal cases.

49. Swabs and spitkids washed and disinfectants used.

50. Repair at once breaks in surface of linoleum covering of iron decks.

51. Air bedding and contents of bags as often as possible; a maximum of sunlight and fresh air.

52. Cubic capacity of the various spaces in the ship should be known; or know how to determine, for use in case of disinfection.

53. Before a target practice all qualified and acting gun pointers examined as to visual acuity; result entered in gunnery record, 2501-3-I.

54. Surgeon's report at quarters should not be a perfunctory one, but he must have an actual report from the sick bay as to the result of the muster of Hospital Corps and sick.

55. Hospital Corps to have no matches other than of the safety pattern, 2607-15-I.

56. Regulations concerning standing lights in sick bay and spaces must be observed, 2607-2-I.

57. Before going to sea secure sick bay for rolling and collision.

58. Use of harbor water, 2621-I. In infected ports.

59. Formulate scheme for coping with contagious disease; a few cases; many.

60. See that all spaces in ship are ventilated in best possible manner.

61. Manual for Medical Department, page 193, suggests white clothing when thermometer 75 at 8 a. m. Bathing not allowed if water below 70.

62. See that proper awnings are spread in ship's boats and on deck.

63. Mud to be cleaned from anchors and chains when in infected ports. Cleaned overside, not on deck. Instructions Medical Officers, 80-12.

64. Mosquito nets for camping parties in Tropics.

65. Patients suffering from mosquito-borne diseases to be screened.

66. Disinfection of ship, see Manual for Medical Department, page 206.

67. Patients transferred to hospital require—

- | | | |
|---|---|------------------------------------|
| 1. Hospital ticket. | } | From medical department. |
| 2. Clinical card. | | |
| 3. Health record. | | |
| 4. Clothing list made out. | | |
| 5. Efficiency report to Medicine and Surgery. | } | To Bureau of Medicine and Surgery. |
| 6. Card, transfer of hospital corpsmen. | | |
| 7. Conduct report. | } | From Executive and Pay Office. |
| 8. Service record. | | |
| 9. Gunnery record. | | |
| 10. Pay accounts. | | |
| 11. Receipt. | | |

68. Chief pharmacist's mate to keep on hand rubber pillowcase in which to place health records and other valuable official papers in times of danger, abandon ship, fire.

69. No smoking in sick bay, 2625-2-I.

70. Instruct chief pharmacist's mate and other hospital corpsmen just what medicines they are allowed to give and what not without orders from a medical officer. See that they understand fully the danger of cathartics or opiates in cases of beginning appendicitis or other abdominal trouble. See that they understand fulfillment of the various poison conditions and artificial respiration.

71. See that water is not wasted in the sick bay.

72. Isolation ward always ready for service.

73. Hospital Corps instructed as to the proper way to pack knapsack, haversack, blanket, and as to wearing equipment.

74. Designate proper place for stowage of cleaning gear.

75. Medical officer should know if any man aboard has been confined to ship for period longer than 30 days for reasons for which the medical department is cognizant, sickness, venereal; this question asked on admiral's inspection, limit 12 days by art. 3670-R.

76. Marine's "gold medal" cots useful if extra beds are necessary.

77. Mattresses may be dispensed with in isolation ward and parts of sick bay; men using bunks supply their own mattresses and place them on canvas covers over spring bunk frame.

78. Preparations must be made for the safety of insane patients.

79. In case deserters are surrendered on board they must be physically examined and Form 21 made out and sent to executive officer.

80. When enlisted men are condemned by Board of Medical Survey in the United States owing to causes not incident to service their transfer to another station or place for discharge shall not be recommended, 366-R.

81. Health records should be written in ink.

82. If medical officer is president of board of medical examiners he orders the new health record to be made out, 3257-1.

83. Regulations for instruction of officers, 2641-1-3, I; of Ambulance party, 2956-R.; of Hospital Corps, 2642-I. (Vide No. 2.)

84. Care concerning inflammable stores, 2707-1-5, I.

85. Care taken with venereal prophylactic treatment; instruction concerning danger; information circulars, lectures, circulars issued by bureau; posters on bulletin board; punishment for offenders adequate; educational and moral prophylaxis.

86. Use whole (complete) name in official correspondence relating to enlisted men.

87. Keep vaccination of men up until at least three times; no probability of danger. See that all hands have typhoid vaccination.

88. A portable electric lamp is useful in sick bay bed cases, also operating room, also store-rooms. An electric hand torch is useful in bedside work.

89. See red cross instructions, 3861-R., Geneva Convention, Manual Medical Department, chapter 26; Hague Convention, Manual Medical Department, chapter 26.
90. Patients transferred to other than United States Navy Hospitals, 2962-1-5, R.
91. Sick bay sweepings, dressings, etc., taken in bundles to fire rooms and burned. No boxes or anything thrown overboard without permission from officer of deck. Nothing thrown out of ports
92. Ports not to be opened when closed by proper authority (especially at sea) without permission from officer of deck and medical officer.
93. Whenever an officer leaves ship (detached) his room should be carefully cleaned and painted, if mattress is old it should be condemned.
94. A high physical standard for applicants for the various fire-room rates should be held.
95. Be prepared to embalm and bring into port bodies of dead.
96. Great care about "Line of duty" in cases which may possibly become pensionable; safeguard the Government. State all facts very fully.
97. Articles surveyed and ordered to be destroyed should be so destroyed or clearly marked "not on charge." Metal objects marked by file; this to prevent confusion in inventory of articles on charge.
98. Investigate health conditions immediately on arrival in port; also keep posted throughout the ship's stay, safe anchorage, etc.
99. Arrange for the removal of infectious cases to hospitals ashore or tents on beach unless against the best interests of the patient.
100. If scuttle butt has not sanitary terminals keep cup immersed in formaldehyd sol., 1-2500.
101. The United States Public Health Service recognizes as quarantinable diseases cholera, incubation period, 5 days; yellow fever, 5-6 days; smallpox, 14 days; typhus fever, 12 days; plague, 7 days; leprosy, (?) days. State laws impose additional restrictions and quarantine, Manual for Medical Department, chapter XIV.
102. In a port where there is a Marine Hospital (United States Public Health Service and no naval hospital) patients may be sent to the former for treatment by application to authorities in charge; arrangements have been made to that effect by Bureau of Medicine and Surgery, charge 30 cents per day, and at contract rate when hospital is not owned by the United States.
103. Dental work, especially if done by other than commissioned dental surgeons to be carefully supervised, prices, kind of work.
104. Spitting about the decks and ship must be prevented.
105. Visitors must not be permitted to interfere with the work of the sick bay; loafing prevented.

106. The executive's office must let medical officer know of all changes of rating. As soon as a man is received on board his name must be sent to the medical officer; name is then entered in health record index book with date of arrival; the health record itself may come later. All persons transferred from the ship must be reported to medical officer for same purpose.

ENDOCRINE MANIFESTATIONS.

By S. G. STRASS, Lieutenant, M. C., United States Navy.

In this day of mechanical supremacy we are unfortunately too prone to forget that the human body is not a machine.

Under the spell of surgical domination the clinician is all too apt to forget that pathologic events, both objective and subjective, are not static events. He is all too apt to forget that ever-changing flow which spells biologic life.

Are we not all too smugly content to regard a case of measles, for example, as a mere succession of nasal catarrh, Koplic spots and an eruption which is characterized by this and that feature? Regarding the case of measles as something definite, clear cut, static, do we often enough consider such a case from the angle of the individual so affected? Do we often enough regard such a case of measles as a particular case belonging to a particular individual? Is it not our habit, too, having become acquainted with definite disease pictures, to attach to those pictures in our practice the individuals who come to us as patients? Do we often enough—do we ever—consider that a particular individual presents to us certain symptoms which in their entirety spell whatever our final diagnosis may be?

In the case of measles we have become too accustomed to the statement "All children have measles at some time." Stop and ask a moment "Do they?" Of course, the answer is a most emphatic "no," but why?

It is going to be my attempt to at least show the need of recognizing with more clarity than has been our custom the individual's part in this pathologic world. We are confronted by the questions: What determines the individual's liability to certain pathologic states, and secondly, how are differences in the course of such pathologic states caused?

Anatomy is not fixed and permanent, nor is physiology, nor environment, nor heredity, nor pathology. By the latter I mean states of illness. Surely every human being differs from his fellow externally and so more surely differs in the forces that have gone to cause apparent differences. It should be our attempt to find how in-

dividuals differ so widely and in that answer lies the answer to the question of the variation in disease states.

If individuals are so unlike physically and mentally, surely their illnesses are quite unlike in occurrence, in character—in all that is basic. How wrong it is of us to talk of a "case of measles." How much further our medical art would have come had we paid more attention to the distinguishing features of each individual who at some time presented the symptom-complex which we, for convenience sake, have labeled "measles." Would we not now be better able to recognize in measles more than a skin eruption, which falls within certain descriptive limits? Would we not now perhaps be able to prophesy where reasonably we should find measles—to prophesy which individual is liable to measles?

Had we paid closer attention to individual differences—had we looked deeper into the reasons for these differences, would we not be better able now to understand the vast army of unlabeled clinical states which we each day in our practice meet, which we curse in our ignorance to-day, using a curse word all our own, "neurotic."

Gradually there has crept into our medical teaching the dictum, "Study the patient" or "treat your patient." This is carried out in a mechanical way. The microscope, the Roentgen ray, and the test tube are king. We must believe but what is printed on the laboratory slip and through these facts we are led to one conclusion—a pathologic anatomic diagnosis—static—whereupon the individual, the patient, is forgotten and the organ treated in a static way.

There is another path which we can follow. The picture that is presented by the cretin is too well known to warrant description here. Likewise, the pictures presented by fully developed cases of exophthalmic goiter and myxedema. We know that the remarkable psychic and physical phenomena manifested by these individuals are the result of a disturbed thyroid gland function. They are completed pictures. Latterly, we are talking a lot of the "Forme Fruste." That is a step forward, but why not look further ahead. Study many cases—well developed—of thyroidal disbalance; note in exact detail the characteristic marks; determine which of these marks are constantly prominent in these cases and then remember them as thyroidal marks, signs of a thyroidal disbalance; no matter where seen or how unexpectedly, for example, the dullness or glossiness of the hair, the dullness or brightness of the eye, the sluggishness or vivacity of the cardiovascular system. Do that in disturbances of all the glands of internal secretion and shortly you will have physical marks dependent on those endocrine glands, which I believe determine to a very great extent the individual's physical marks, his mental marks, and so his life history. In such a way, study your patients.

Reversely, study carefully the history of all your cases with special regard to past infections and so determine the individual's future liability or immunity to the infectious diseases. To make my ideas more tangible, I will illustrate. I shall present a case history analyzed for subjective and objective endocrine factors. Many of these have no experimental proof but rest on a foundation of repeated clinic observation.

Mr. L., married, age 29, a Russian, manager of a large factory, presented himself for examination on December 5, 1917, complaining of "indigestion, constipation, attacks of weakness and dyspnea." He further stated that the attacks of weakness and dyspnea came every four or five weeks, always following a meal, and that the first attack came in September, 1916. The indigestion consisted of a frequent sense of oppression in the epigastrium associated with nausea and tasteless eructations. The constipation, too, dates from September, 1916, being fixed, the bowels acting but once in three days, and then the stool being small and hard. The first significant fact for me in this is the man's career; it means a man of will, and courage, and untiring energy, for having come from Russia a few years ago penniless, he is, at the age of 29, the manager of a factory in New York City. A parallel fact is that feeding guinea pigs adrenal extract makes them more pugnacious. One knows that courage and will and the desire to fight are masculine traits, male sex characteristics in fact, and these male sex characteristics are under the domination of the adrenal system. Is it not fair to assume, then, that the patient is one in whom the adrenal system is prominent?

He gave the history of having been in an accident on May 30, 1916. He was caught between two street cars, thrown to the ground, sustaining a fracture of the left humerus. After his fall he was unconscious for three hours. His convalescence ended August, 1916, with a return to work in September, and shortly thereafter his present symptoms made their appearance. Of course, Crile has shown conclusively the direct damaging influence on the adrenal system which is possessed by mental and physical shock. So we may fairly presume that, whatever other damage the accident sustained by the patient effected, it made it necessary for him to meet an adrenal crisis. This was met successfully for the time being.

Three months later, upon resuming his work, which called for an increase of nervous and physical energy, such energy being made possible by an evenly balanced adrenal system, he developed certain symptoms. These symptoms were at first diagnosed by a general practitioner as "nervous indigestion," and after a period of unsuccessful treatment the patient was referred to a neurologist. The patient might have been transferred to the attentions of a gastroenterologist had the usual custom been followed, which gentleman

would have laid special emphasis on stomach tubes, gastric acidity, and lavage.

It happened that I considered the case one of delayed adrenal insufficiency, the immediate symptoms being explained on the basis of disbalanced splanchnic sympathetic tone, due to a change in the usual adrenal system coefficient.

Facts which lent weight to my hypothesis were brought out by further examination. The patient stated that his father had died at the age of 59 of apoplexy. I think there can be no doubt but that individuals who show high blood pressures and the usually associated degrees of arteriosclerotic vessel changes may be considered as having adrenal systems of unusual activity. So he received an adrenal heritage and through the male side, which emphasized the fault. In my physical examination a number of facts stood out as indicative to me of the patient's adrenal temperament.

I warn the reader that there is no laboratory proof of this, but there is the strength of a continuous repetition behind them. Signs which in many other patients have come to possess an adrenal significance I made out in this instance, and I will point them out.

The patient was a heavy-set, dark-complexioned male. The forehead was narrow and sloped sharply back from the bridge of the nose. I might state here that in most individuals exhibiting the pituitary temperament one usually finds a broad high forehead, due in part to the pituitary effect on bony growth, but I feel that the narrow retreating forehead of the adrenal individual is equally due to the reduced size of the anterior portion of the cerebrum. The hair of his head was black and coarse. It had a low implantation on his forehead in front of his ears and from the nape of his neck, and the hair line was not sharply marked. The eyebrows were heavy and broad, and were joined over the root of the nose by a fairly well-marked hair fringe. In spite of this profuse hair growth over the head that over the body was disproportionately scant and the pubic hair tended to the feminine type. Over the sacrum grew a lot which may be considered a poor prognostic sign. I consider the disproportion between the head hair growth and that on the body very significant, pointing to an adrenal fault. It has been shown by guinea pig feeding that both skin pigment and hair growth can be to a degree controlled by adrenal extract.

The patient's eyes were prominent, the pupils wide and slow in reacting to light. Of course it is known that the intravenous injection of adrenalin into animals causes the same changes in the eye as follow the stimulation of the cervical sympathetic nerve—that is, the retraction of the eyelids, protrusion of the eyeball, and the dilatation of the pupil.

The patient's eyes were pigmented dark brown as was the skin of the entire body. I have found that this pigment is an adrenal sign. The pharynx showed a slight congestion. The ears were somewhat cyanosed, and the complexion, though sallow, was flushed, all facts pointing to a poorly stabilized vasomotor system, which in part is under the control of the adrenal organization. The thyroid gland showed no enlargement.

The vasomotor reaction on the skin, or, in other words, the capillary reaction to a mechanical stimulus, was of very poor quality. In this connection I might say that this reaction is obtained by rapidly drawing a blunt instrument over the skin's surface, exerting slight pressure. In a normal reaction within the limit of five seconds a pink flush appears along the course of this stimulation, which immediately fades into white, carrying along its borders a fine pink halo. The factors which vary are the speed of the appearance of this capillary dilatation and subsequent contraction, the duration of this visible reaction and finally the proportion between the contraction area or white part and the dilatation area or pink part.

It has been my experience to find in normally balanced patients a fairly rapid reaction within 5 seconds, the entire line fading within 20 seconds, the dilatation merging into contraction slowly with no disproportion between the white and pink parts. In subjects who are extremely thyroidial this reaction appears too rapidly, fades too rapidly, and shows an excess of vasomotor dilatation or pink. In adrenal subjects the reaction is slower than normal. There may be no initial dilatation along the course of the stimulant, but immediately one sees a line of contraction surrounded by a pink zone, the white portion, however, being disproportionately prominent. In extreme cases a wheal forms along the course of the instrument used.

In this connection it is interesting to recall the brilliant therapeutic results which are obtained at times in cases of urticaria by the subcutaneous use of adrenalin.

The patient showed a very poor vasomotor reaction, inasmuch as its onset was slow and showed both poor vasomotor contraction and dilatation. Fading took place too quickly. But, after an interval of nearly a minute, the entire phenomenon was repeated but with an entirely different character. This secondary reaction showed a very prominent contraction zone slightly raised above the skin's surface, bordered with a fine dilatation zone. I might say that this is the only time that I have seen such a delayed reaction. I here took it to mean an extremely poor regulation of the vasomotor nerve supply and on account of its final adrenal character I placed the blame on that member. The pulse rate was 60, the rhythm regular, the blood pressure

was 100 systolic, 80 diastolic. This low blood pressure can easily, too, be attributed to some adrenal fault. The heart showed nothing unusual, nor did the lungs. The abdomen was somewhat obese, rather globular in shape. The reflexes were present and equal. The abdominal wall was held rather rigid. No masses were made out. The liver and spleen did not show any enlargement. There was some slight tenderness in the epigastrium. There were no changes in the skin sensibilities of the abdomen. The extremities showed reflexes active within normal limits, and equal on both sides. The hands and feet were somewhat congested, almost cyanotic, and were cold. This fault, too, I took to mean some weakness in the vasomotor regulation.

Subjectively, the patient presented nothing beyond what I have already noted. His words were:

Once in four or five weeks after meals I find I can't catch my breath, and I get weak. I become nauseated but have no vomiting. Such an attack lasts for about two hours. I think that it has in each instance been caused by the ingestion of fried fatty food or shell food. I have no actual pain with it, but feel a great pressure in the center of my abdomen. I have had three attacks in all, but since my accident I have been constantly troubled with much eructation of a tasteless gas, associated with abdominal distress after meals. This distress comes on immediately after meals and lasts approximately an hour. Associated with this has been a positive constipation, my bowels not moving but once in two or three days.

Further questioning revealed no other subjective features.

I analyzed my patient in the way outlined above, disregarding his symptoms. Everywhere I found facts pointing to some disturbance in his adrenal balance, and, still disregarding his complaints, I set myself the task of regulating his adrenal balance, which I felt sure was at fault.

The therapeutics in this case consisted of feeding small quantities of adrenal gland extract twice a day. The amount I used was one one-hundredth of a grain at each feeding, and on January 25 the patient reported to me that he was very much better, that he had had no spells of dizziness, that his appetite was excellent, that his epigastric pressure had gone, that his bowels moved each day, the stool being very well formed, that he felt stronger, that he had no more eructations of gas after meals, that he was sleeping excellently, and that he had gained 2 pounds in weight. The blood pressure had gone up to 120 systolic, 100 diastolic. This was the extent of my therapy, and I feel that the result justifies its unusual character.

Working reversely, I have used adrenal extracts, feeding them to patients who have presented the subjective and objective symptoms characteristic of all degrees of gastric hyperacidity, and have often been rewarded with success.

This paper has been written simply as a plea for a more accurate and thorough study of one's patients' characteristics; those charac-

teristics which separate them from other individuals, which are basic for those individuals. It is a plea for an increase of regard for the factors which have gone to make a patient what he is, and, finally, a plea for the recognition of the importance of correcting faults which tincture the entire organization of the patient. I feel sure that in the correction of such defects we must eliminate the vast majority of subjective symptoms, which in most cases do not depend on any definite organic change.

A CLINICAL STUDY OF 100 CASES OF DENGUE AT ST. THOMAS, V. I.

By F. F. LANE, Lieutenant (J. G.), M. C., United States Navy.

About the latter part of November, 1917, an epidemic of dengue fever suddenly made its appearance among the Americans who had been on this island three to eight months. White and black were affected alike. Up to the present time there have been over 200 cases. One hundred and forty-odd of these have been treated at the Naval Hospital. In looking over the literature of this disease it was found that there were some peculiarities manifested in this epidemic which it might be well to call attention to. One hundred records which had been carefully kept at the bedside were selected as a basis of this article. These represent very well the average run of the disease as seen during this period.

As far as statistics go, dengue has never been much in evidence on these islands. An occasional case was reported by the local health authorities each year, but it was of no moment. However, dengue is probably quite a common disease, especially among the children, but the diagnosis is rarely made because, most likely, it is one of the very numerous fevers which the natives claim to be subject to, known by many various names and usually ascribed to the evil influences of the night air and wind or to "obi," the evil genii of these parts. These patients would rarely come under the doctor's observation. Only an occasional sporadic case in an adult would be seen and diagnosed.

The epidemiology is not very definite where it concerns the source of infection. The first cases appeared in the Marine Corps. At that time there were a number of natives working at the barracks, and it is quite possible that one of them was the source of infection. The other possibility is that one of the enlisted men may have been infected elsewhere by one of the infant cases and thus brought the disease to the barracks. However, stress should be laid on one very important feature in the mode of spreading.

The sanitation of this town is about nil up to the present time in spite of much effort and thought. When the trouble started not a

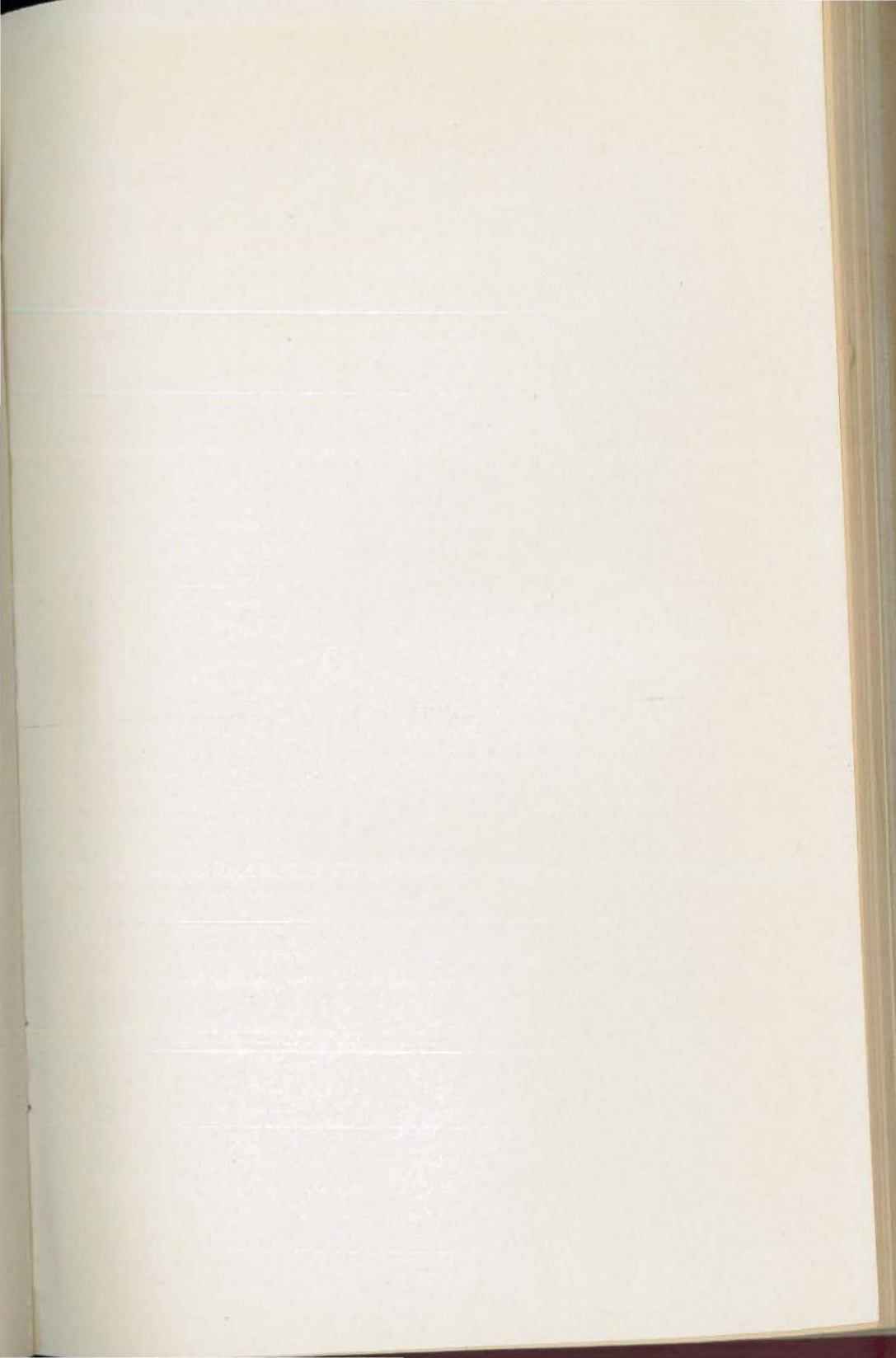
house, cistern, or well had ever been screened. Water stood around in pools. The guttering of the roofs was in bad repair and water collected there. It was indeed a happy hunting ground for the far-famed and pestilent mosquito. Although the hospital had been made as mosquito proof as possible when it was put in commission, yet our neighbors raised enough mosquitoes to supply both themselves and the institution. When the first few cases had been admitted, the other patients, the members of the hospital corps, and doctors commenced to have breaking bones and fever. The spread was very rapid. It is generally understood that the mosquito is the infecting agent. About 99 per cent of all the mosquitoes, both at the barracks and the hospital, are *Stegomyia calopus*. Very occasionally the culex is seen but no anopheles as yet. It is generally understood that the culex is the spreader of dengue. In every case the patient has been exposed either at the barracks or the hospital, and only those that have been at one or the other of these two places have been attacked. The converse is also true. Another point in fastening the blame on the proper carrier is the fact that dengue is a very rapid spreader among nonimmunes. The *stegomyia* bites by day as well as by night, so that no amount of mosquito bars could protect those doing duty unless they were confined to bed. If the mosquito had been a night biter only, the rapid spread might have been checked. All of the foregoing seems to put the blame wholly on the *Stegomyia calopus*, a point which has never been brought out very strongly. The possibility of the *stegomyia* as a spreader of the disease is mentioned by some but never considered seriously.

The incidence of new cases depended very markedly on the rainfall, as does everything else influencing the health of this community. Within 36 to 48 hours after a rain the mosquitoes would increase very rapidly and the new cases develop in almost direct proportion. During a dry spell there might be no new cases for days at a time and the mosquitoes would be conspicuously lacking in proportion.

The incubation period was rather difficult to ascertain, but in three cases it was very definitely placed at four to six days. All three contracted dengue within this period after the arrival from the States.

The symptomatology, in general, was about the same as described elsewhere. The onset was sudden, beginning with the vague pains in the back and legs; headache; malaise; chilliness or an actual mild chill; perhaps constipation or maybe diarrhea; loss of appetite; feverishness and occasionally a flushing of the skin of the face and the neck. These were about the usual findings the first day.

The second day found the primary flush of the face gone and the patient was quite sick. The temperature was between 102 and 105 degrees; the aches and pains in the back and extremities, the head-



CLINICAL CHART

ONE HUNDRED CASES OF DENGUE FEVER

		ANALYSIS BY TYPE						ANALYSIS AS A WHOLE							
Day of disease	Normal	99.	99.5	100.	100.5	101.	101.5	102.	102.5	103.	Rash	Adenitis	Average 100 cases		
		Average 52 cases												Rash	63. %
1								0	0	Adenitis	62.5 %				
2								0	2	Cyanosis	17. %				
3								16	8	Epistaxis	10. %				
4								20	20	Vomiting	8. %				
5								20	16	Hyperaesthesia	3. %				
6								8	6	Diarrhea	2. %				
7								2	0	Jaundice	1. %				
8								2	0	Herpes Labialis	1. %				
		Total -- Rash		68 %						BLOOD WORK					
		Total -- Adenitis		52 %						(average)					
		Average 48 cases												White Blood Cells	4300
1								0	0	Differential count	Polys	59.5 %			
2								0	0		Lymphocytes	30.5 %			
3								10	2		Large Monos	7.8 %			
4								32	30		Transitionals	1.7 %			
5								10	4		Eosinophyles	0.5 %			
6								4	2	W.B.C.s as low as	2800				
7								2	4	Polys as low as	38. %				
8								0	0	Lympho as high as	53. %				
		Total -- Rash		58 %											
		Total -- Adenitis		42 %											

ache and the pain in the eyes were much worse than the day before. However, these symptoms were not, and never became at any time during the disease, as severe as those usually described, especially the bone pains. The interesting feature at this time was the intense pain in the eyes, especially on voluntary motion, accompanied by a congestion of the conjunctivae and the watery condition so often seen in measles. The pain on motion was elicited by having the patient keep the head fixed and the eye follow the finger of the examiner as far upward and to each side as possible. These eye symptoms, the sudden rise of the temperature, and the anorexia were so characteristic and constant that a diagnosis could be made definitely without reference to the previous day's history or the bone symptoms, which I remarked before were almost trivial. Except for these eye pains the patient might have had a severe attack of influenza without any bronchitis. The pulse was quite slow in comparison with the temperature, seldom rising above 90 per minute, usually 75 to 85, with the temperature at 104 F. or 105 F. Those cases that had a blood examination made at this time showed a leucopenia of from 5,000 to 6,000, a slight decrease in the polymorphonuclear leucocytes and a slight increase in the lymphocytes. Instead of the insomnia usually described, all the patients seemed to sleep especially well throughout the entire course of the disease. In fact, the condition was quite the reverse of insomnia, a sort of stupor for the first four days at least. The urine did not show any constant alteration from the normal.

On the third day the temperature fell as suddenly as it rose, seldom, if ever, to normal, but to between 99 F. and 101 F. The mental and physical depression, while still present, was much less, the pains and aches better, and although still weak and tired the men almost invariably stated that they were well and wanted to get out of bed. At this time the disease took on one of the two forms usually described: The "saddleback" and the "nonsaddleback" type. A careful study of the majority of the temperature charts would give a fairly accurate prognostication. It seemed that those doomed for the "saddleback" or second rise of fever would drop about a degree lower than those going on to an uneventful recovery, the "nonsaddleback" (see illustration of the average chart). Some few (13 per cent) would show the beginning of the secondary rash.

The fourth day's chart found those of the "saddleback" type with a rise in temperature of a fraction of a degree and those of the "nonsaddleback" type with a fall of about the same amount. In either case there was the bright red or scarlet rash like that of measles. In the very typical cases this began on the palms of the hands, over the back of the thumb, and over the dorsal surface of the great toe, spread-

ing rapidly over the arms and legs, abdomen, chest, and face. It was most marked on the forearms and lower legs, abdomen, and face. The itching was not as marked as it became some days later. This eruption was present on the fourth day of both types in 26 per cent of the cases. During the third or fourth days, or the period of so-called crisis, 10 per cent of the cases had epistaxis and 8 per cent vomiting. The epistaxis was quite severe when it occurred, lasting from 24 to 72 hours and leaving the patient somewhat exsanguinated in spite of ice, packing, absolute rest, and the other usual forms of treating nosebleed. Diarrhea was present in 2 per cent, herpes labialis in 1 per cent. A blood count late the third day or early the fourth day showed a leucopenia of from 2,000 to 3,500, with a very considerable decrease in the polymorphonuclear leucocytes as low as 38 per cent and an increase in the lymphocytes as high as 53 per cent.

This fourth day was most important from our standpoint, as it marked the beginning of a complication of which very little is said in the literature on the subject; namely, the involvement of the lymphatic glands, amounting to a general lymphadenitis as a rule. In 5 per cent of patients this started on the third day, but in 25 per cent on the fourth day.

The condition was brought very forcefully to our attention in the third or fourth case. The man began to complain very severely of pain, tenderness, and swelling in the glands of both groins. Examination revealed inflamed, swollen, tender, and painful glands in both inguinal regions. This was so very marked that although the man was known to be free of venereal disease (a hospital corpsman who had been with us for eight months) this possibility was carefully looked into and examinations made for the four or five succeeding days. Nothing of a venereal nature was found. The second day after the inguinal glands became involved, the epitrochlear and anterior and posterior cervical glands enlarged but were not painful. This case started the careful notations of this series. All cases that had any history of venereal disease, either active or of old standing, were thrown out as indefinite. In all, this venereal type amounted to about 25 per cent of the total number studied. The glands in all this number were found to be involved, but whether due to dengue or venereal disease could not be determined. In the other 75, 62.7 per cent had lymph gland involvement to a greater or less degree. All were swollen, some were painful or tender, and in the very few cases that we were able to follow up they remained swollen and tender from four to six weeks. (See chart for incidence of adenitis and percentage developing each day of the disease.)

The fifth day invariably told the tale as to whether the case would be of the "saddleback" type or not. Of the cases studied, 52 had the secondary rise of temperature and the other 48 did not. On this

day 15 per cent, including both types, showed the first signs of rash and 10 per cent gave the first signs of the adenitis. Those that had the rise went up one to two degrees and those that did not dropped to normal or a fraction above. The latter type immediately began to pick up strength, both mental and physical, and were usually allowed out of bed.

On the sixth day, the "nonsaddle-back" had no fever and remained so. The rash appeared for the first time in 6 per cent and the adenitis in 4 per cent of the total number. The "saddle-back" type had a fall in temperature to 99 F. or a fraction above. On this day one case developed jaundice. There were two other cases that had an icteroid appearance, but they had a history of having had jaundice at some time previously, due most likely to syphilis, and, therefore, they were not counted in the statistics.

Most of the patients were out of bed on the seventh day. Those that had had the remission of fever were now either normal as to temperature or they had a fraction of a degree and were so restless that a longer stay in bed seemed to be useless. The other type had not had any fever for two days. Some 2 per cent of all cases had the beginning rash and 2 per cent the adenitis. At this time two very interesting skin phenomena started. After being out of bed for a day or less 17 per cent, according to the records that were made at the time (although I am sure that there were almost twice that number in whom the symptom was overlooked in the beginning of the study and charting), commenced to have a very peculiar vasomotor condition. The hands, arms, feet, and legs were quite cyanotic, cold, and very damp. In a few instances this spread to the abdomen and the chest. Pressure on the skin would leave a white mark which very quickly became blue on release of pressure. Rest in bed, elevation of the part, and heat did not seem to have any effect in the relief of this condition. There were no subjective symptoms except that the hands and feet felt cool without real discomfort. The cyanosis gradually faded away in about three days and did not reappear. It did not seem to have any definite relation to either type of the disease. Secondly, there was a very marked hyperæsthesia over the arms, chest, shoulders, and the upper back in three cases. The weight of the clothing was quite painful and if the part was touched the pain was intense. There was no local abnormality of the skin accompanying this. These cases did not have the cyanosis noted above.

All cases were discharged by the end of the eighth day at the latest. None had any fever at this time and all felt fairly strong and ambitious. About 1 per cent had the rash just starting, but no one had the lymph gland involvement beginning this late. About

this time the desquamation of the skin commenced. As far as could be learned practically every one that had had the rash "peeled." This process started with a very fine furfureaceous scale which gradually became coarser as time went on. In fact, where the desquamation involved the horny portions of the skin, such as the soles of the feet and the palms of the hands, the scales consisted of large pieces. In two or three instances there was almost a complete cast of the great toe, some two or three weeks after the fever had subsided. In several instances the desquamation lasted for six or seven weeks, gradually becoming finer as time went on, until it faded out completely. About this time or a little earlier the appetite began to return, but there was a peculiar metallic taste to the food which almost every patient complained of.

Nothing much has ever been said about the after effects of "Dandy fever." As far as could be learned, and in my own case particularly, complete recovery of strength was not attained until two or three weeks after the fever had subsided. It was about the same condition as is experienced during the recovery from a very severe attack of tonsillitis or "quinsy." While under ordinary circumstances the convalescent felt fairly well and strong for the usual tasks, endurance was very low and any amount of exercise in excess was very enervating. Reserve strength was entirely lacking.

DIAGNOSIS.

The absence of any throat, chest, or abdominal symptoms or findings; the history of the sudden onset, in some cases beginning during the night with a chill; the sudden rise of temperature with a comparatively slow pulse; the pains in the back, legs, and eyes, especially the pain on forced motion of the eyeballs; the watery, congested conjunctivæ; chilliness and malaise; anorexia; the low leucocyte count; the fall in the percentage of polys and the increase in the lymphocytes; and the absence of any abnormal findings in the urine would be sufficient to give the diagnosis on the second day, the time at which the great majority of the cases came under observation.

IMMUNITY.

In most cases there seems to be an immunity after one attack. The epidemic began suddenly among the newly arrived population. The American negroes, on duty in the Tropics for the first time, had "breakbone" fever in even a higher percentage than the whites. The native negroes had no increase in the disease. There were six or seven new cases reported by the civilian physicians, but these were among children of white parentage ranging in age from 3 to 6 years. These circumstances only added credence to the assumption

that the natives were immune, due most likely to the fact that they had all had the disease as infants or in early childhood. There were, however, at least 10 cases among the two hundred and odd in the town as a whole that had a recurrence within three to six weeks after a typical first attack. The second was always milder, but similar to the first. Five or six others had had dengue several years before, but had another attack at this time. There were two others who had been through several epidemics without ever having contracted it and considered themselves to be immune. They both had a severe attack.

It would seem, therefore, that one attack usually gives immunity, but about 5 to 8 per cent have a recurrence within a few weeks or within several years.

Treatment.—The treatment of the condition as carried out was entirely symptomatic. The patient was given a bath and a purge and put to bed. The purge was usually a saline (magnesium sulphate) and was sometimes repeated in two days. In those whose bowels were kept well opened there seemed to be a more rapid and complete relief of the symptoms. If the headache was very severe an ice cap was in order. As a rule, 5-grain doses of aspirin t. i. d. or q. d. relieved the aches and pains and seemed to relieve the sensation of fever by inducing a mild sweat, although in many cases the perspiration was spontaneous and profuse. The diet was usually soft, unless, as rarely occurred, the patient retained his appetite. Water was given freely. As a rule, the patient was allowed to do about as he pleased after the temperature had dropped to normal or thereabouts. He had whatever he wished to eat; he was allowed to be in or out of bed according to his inclination, and it was found that none of them stayed up for any length of time, for, although they felt quite strong before getting up, they were very glad to get back into bed within 15 or 20 minutes, at least during the first day or two. This leniency seemed to act for the best in two ways—it satisfied the patient's mental and physical unrest at being laid up with a trifling disease, as he considered it, and it also helped to get his mind off the aches and pains that still existed to some extent. There were no harmful effects observed from this method of treatment, and in fact we thought that it even improved the speed of recovery by hurrying the recuperative power for increased physical exercise. All cases were kept under mosquito bars during the infective stage, supposed to be five days.

Summary.—There are some 10 or a dozen peculiarities of this epidemic. Points that others have only touched lightly upon, or not at all, that I wish to call your attention to are:

First. The immediate source of the infection was unknown and could only be guessed. The important feature, however, was the

agent carrying the infection. The blame can be placed entirely and without hesitation on the *Stegomyia calopus*, practically the only mosquito seen and inhabiting the localities where the disease was most prevalent, and the only place where the mosquito bite seemed to do any damage. I believe that the stegomyia family have been suspected before, but nothing definite has been written as far as I can find in references to the subject.

Second. The mild character of the bone pains was characteristic.

Third. The interesting and previously not definitely reported involvement of the lymph glands. In many cases this was quite severe and was treated with ice. No breaking down nor suppuration subsequently has been noted. In all, 62.7 per cent of the 75 free from venereal infection developed this. A rather high percentage. It was not one set of glands but all the large superficial glands throughout the body.

Fourth. The epistaxis, although it only occurred in 10 per cent of the cases, was very severe and difficult to control.

Fifth. The pain on forced motion of the eyeballs was the principal cause of the symptoms described by the patient as "headache" or "pain in the eyes." Probably this was due to the muscular attachments rather than to the muscles themselves, for the pain was only elicited on extreme motion.

Sixth. The very peculiar and sometimes startling symptom of hyperaesthesia, of a most intense variety, was noted when the shoulder was unconsciously touched by the examiner.

Seventh. The vasomotor phenomena occurred from the sixth to the eighth day, causing a cyanosis and coldness of the arms, hands, lower legs, and feet in about 17 per cent of cases.

Eighth. The disappearance of the eruption was followed in about 24 hours by a quite severe and long-continued desquamation, accompanied by intense itching at times, a sensation as of swelling of the hands and feet, and a continual and profuse sweating of these parts.

Ninth. The blood work did not show on the average the very low leucocyte count and the discrepancy in the differential count usually accredited to dengue, yet these findings were sufficiently marked in a number of cases to accord perfectly with other descriptions. It would seem from a general view that these blood findings depended largely on the severity of the attack.

Tenth. A very disturbing feature in the convalescence, from the patient's standpoint, was the inability to relish food due to the bad metallic taste that everything had, although the appetite was quite keen.

Eleventh. All the ordinary work could be performed without any difficulty, but the least extra strain, such as fast walking or going up hill, brought on an intense weakness and fatigue which had not

been present before the fever and which it took some days and, in many cases, weeks to overcome.

Twelfth. The last feature to which attention is called is the question of immunity. In most cases this seems to hold after one attack, but about 5 to 8 per cent had a recurrence three weeks to several years after the original attack.

The epidemic gradually faded out. About the 1st of March, 1918, with the decrease in rainfall it had almost disappeared. Only an occasional individual who had just arrived would become infected. During the dry season when mosquitoes were very few, dengue was practically absent. Now the rainy season has started and in the last 14 days seven cases have developed, two being recurrences from the last epidemic. The control of the mosquitoes and their breeding places has improved to a slight degree and it is hoped that there will be fewer of the pests, but the inability to obtain screening for the town, the lack of a properly trained corps of sanitary inspectors, and the difficulty in educating the people (natives) does not give much hope of freedom from dengue in the near future.

EPIDIDYMYOTOMY IN MILITARY SURGERY.

By L. HERMAN, Lieutenant (J. G.), M. C., United States Navy.

Surgeons in civil practice have no unanimity of opinion regarding the treatment of acute gonorrhoeal epididymitis. Most surgeons advocate operation in a small percentage of well-selected cases, a few employ it regularly, while the majority of authorities are opposed to all operative forms of treatment and continue to rely entirely upon the topical application of ointments or of various other medications.

Differences of opinion likewise exist among the advocates of routine operation as to the best technical procedure to employ. Some believe with Hagner that the most satisfactory results are to be obtained by free exposure with splitting of the epididymis and drainage; others maintain that a much simpler technique is in all respects preferable in the vast majority of instances. In civil practice, it has been our rule to reserve epididymotomy for the hyperacute cases and largely with the idea of relieving the intense pain that characterizes them. In practice among out-patients in the clinics of large cities these cases are usually ambulant. It has been our experience that while the convalescence time is materially shortened in this class of patients by operation as far as the subsidence of the inflammation is concerned, the total duration of the infection is not influenced by operation. This we now believe may be explained by the failure to confine these patients to bed for a reasonable length of time after operation. In

view of the failure to materially reduce the duration of the disease and because of the probably greater percentage loss of function of the epididymis in operative cases, we had adopted epididymotomy in only a small group of cases in civil practice.

The conditions that obtain in naval surgery are in certain respects different than those in civil practice. In time of war it is doubly important to return the patient to duty in the shortest time possible, and to return him in such condition that he will be no longer a menace to the health of his shipmates. It is equally important to minimize the probabilities of the recurrence of the disease. The problems are most satisfactorily solved by the operation of epididymotomy. We feel that in cases of unilateral epididymitis the small differences in the percentage retention of function gained by the palliative form of treatment is far outweighed by the advantages of rapid relief from pain, rapid and more complete subsidence of the inflammatory reaction, by the much shortened hospital residence of the patient through operation, and finally by minimizing the probabilities of recurrent epididymitis so commonly seen in cases treated palliatively.

Technique of operation.—The operation of epididymotomy employed in Navy Base Hospital No. 5 is a simple procedure. The technique about to be described is applicable to that great majority of cases of acute Neisserian epididymitis in which the major part of the inflammatory process is confined to the globus minor of the epididymis. Infiltration anesthesia, using a solution of cocaine ($\frac{1}{2}$ per cent) is employed, and the operation can be performed painlessly if care is taken in the localization of the injection. A line of infiltration $1\frac{1}{2}$ inches in length is made in the skin of the lower part of the scrotum, just to the side of and parallel with the raphé and over the inflamed globus minor. The scrotum is gently grasped at its base by an assistant who rotates it so that the field of operation is brought conveniently into position. The assistant makes gentle pressure in order to render the skin taut. Unnecessary pressure at this time will cause considerable pain to the patient and accomplish nothing more than will the gentlest handling of the inflamed parts.

An incision about $1\frac{1}{2}$ inches in length is now made through the anesthetized skin and subjacent tissues down to but not through the fibrous sheath covering the epididymis. Care must be exercised in order to define the line of reflexion of the parietal layer of the tunica vaginalis from the point of its reflexion at the junction of the epididymis and body of testis. This differentiation is made by noting the differences in consistency of the tunica above and the epididymis below. The sac of the tunica will be found to be more or less distended with inflammatory fluid constituting a hydrocele which is fluctuant and painless to gentle pressure. The epididymis, on

the contrary, is indurated and exquisitely tender to pressure. Care should be taken not to open the tunica, otherwise the patient's convalescence will in all probably be prolonged through the reformation of a hydrocele which has little tendency to be absorbed and which will necessitate either puncture or radical operation. In cases in which large collections of inflammatory fluid are demonstrable in the sac of the tunica at the time of operation we are in the habit of introducing a small aspirating needle at a point as far removed as possible from the epididymis, but through the operative incision, and removing the fluid. Small inflammatory hydroceles may be disregarded.

The next step in the operation is to thoroughly anesthetize the fibrous sheath of the epididymis in the line of the original skin incision. The sheath will usually be found to be much thickened, especially in cases of long standing. The sheath is then incised, the opening being approximately one-half inch in length, whereupon the epididymis proper, which is usually under considerable tension, will bulge through the wound. The incisional edges in the sheath are then grasped with forceps and if it is desired the opening may be enlarged by exerting traction on the forceps when the sheath will tear in the line of the incision. It is highly important to recognize each anatomical structure in the various steps of the operation. This is easily accomplished if the wound is kept free from blood.

It is now necessary to anesthetize the tubule of the epididymis and the fibrous tissues that connect its various convolutions. This is the least satisfactory step in the operation for the reason that increased tension incident to the injection of the anesthetizing fluid causes pain; this is transitory, however. With a sharp knife, the cutting edge of which is directed away from the testis, a stab wound is made in the epididymis. Not infrequently abscess cavities are opened in long-standing cases and necrosis of the epididymis is found. In this latter group we gently curette the walls of the necrotic area. In the very earliest cases of acute gonorrhoeal epididymitis we sometimes substitute multiple needle punctures for incision of the epididymis. The relief of tension incident to depletion of the vessels promotes absorption of the inflammatory exudate. Experience is necessary, however, in the selection of cases suitable for this procedure, since in improperly selected cases it not only fails to relieve the condition but invites additional inflammatory reaction. In the small group of cases in which it is indicated it undoubtedly helps to restore the patency of the seminal duct and thus avoid sterility. Incision of the epididymis must, it would seem, render the testicle functionless as far as its spermatogenic function is concerned, although we have no definite knowledge that this does actually occur in every instance. A small

quantity of Dichloramin-T is injected through the opening in the epididymis and a piece of rubber tissue rolled into the form of a scroll is then anchored to the depth of the epididymal incision. This step of the operation is much facilitated by using a small sharply curved needle and plain 00 catgut. In some instances bleeding occurs from the incised epididymis and this can best be controlled by the introduction of deep sutures; no attempt should be made to clamp and tie such bleeding vessels. Indeed, it is unnecessary in any stage of the operation to employ ligatures, and a rubber tissue drain is brought out of the lower end of the incision. The latter is closed by means of a few sutures of plain catgut so inserted as to include all areas of the scrotal wall. The application of a dry dressing completes the operation. The scrotum is enveloped in a gauze bandage applied in exactly the same manner as is a scultetus bandage of the head. A T-bandage may be used to advantage.

Post operative treatment.—The patient is confined to bed with elevation of the scrotum until the rubber tissue drain comes away spontaneously. This occurs about the fifth day in the average case. The drainage is seldom profuse and rarely frankly purulent. The wound heals by primary union except in the rarest instances. Bladder irrigations with weak solutions of potassium permanganate are begun after the drain has been removed but only in patients entirely free from acute urethral symptoms. Internal medication may or may not be given at the discretion of the individual surgeon.

Results.—The operation of epididymotomy immediately relieves the pain which is often severe, so that convalescence is practically symptomless. In one case, terminal hematuria followed operation and persisted for 10 days. In the second case a small hydrocele necessitating aspiration, appeared after operation; this patient however was clinically well and ready for duty 19 days after the epididymotomy. In a series of 40 consecutive cases, the average hospital residence of the patients operated upon was 25.3 days; in the mild cases which were not operated upon, it has been 36 days on the average. The operated cases are not returned to duty until the wounds are completely healed, until the urine has entirely cleared and has remained clear for 5 days without treatment, and until the patients have demonstrated their ability to do a full day's duty with the hospital working parties. We have seen only one instance of recurrence of epididymitis following operation in either civil or military experience.

The results of operative treatment are particularly striking in recurrent cases as is illustrated by the following case history:

M. W. H., seaman first class, U. S. S. ———, admitted to Navy Base Hospital No. 5, November 7, 1918, for the treatment of bilateral gonorrhoeal epididymitis of one month's duration. Under palliative

treatment the inflammation subsided but soon recurred on the left side. Repeated attacks of epididymitis on the left side associated with persistent urethritis confined this patient to the hospital for a long period of time so that the question of medical survey for incurable gonorrhoea was discussed. On February 10, the left epididymis was drained; 21 days later he was returned to duty. He now reports to us two months after the operation that he has had no further trouble.

An especially satisfactory result in the operative treatment of acute epididymitis is illustrated by the following case:

P. C., fireman first class, U. S. S. ———, was admitted to the hospital on February 8, 1918, with acute left sided epididymitis. Operation was performed on the day after admission and nine days later he was returned to duty clinically cured.

We feel justified in advocating epididymotomy in all acute cases of gonorrhoeal epididymitis with the possible exception of those cases with a minimum of inflammatory reaction; in all recurrent cases; in all chronic cases where marked thickening with the epididymis associated with tenderness is indicative of the presence of pus. In this latter group of patients, the inflammation persists for a long time unless drainage is provided and later gives rise to neuralgia of the testis often with profound sexual neurasthenia.

EPIDEMIOLOGY OF CEREBRO-SPINAL FEVER AT UNITED STATES NAVAL TRAINING STATION, GREAT LAKES, ILL.

By J. T. SHORT, Lieutenant, M. C., United States Navy.

For many years epidemic cerebro-spinal fever has been considered a communicable disease, which, in military life, appears upon the mobilization of young recruits, and usually in connection with predisposing factors, such as bad weather, crowding, or fatigue. More recently it has been shown that the causative agent is the meningococcus, spread by direct contagion from the naso-pharynx of a patient, a convalescent, or a presumably healthy individual. The corollary which at once suggests itself is that if the "carriers" of the meningococcus can be segregated the danger of an epidemic will be largely overcome.

In order to make clear many of the factors that were operative in the recent epidemic of cerebro-spinal fever at this station it is necessary to describe briefly the general organization of the station and the several phases of training through which the average recruit ordinarily passes, as well as to outline the work on meningitis preceding the epidemic.

On his arrival the recruit is first placed in an incoming detention camp, where he remains 21 days. During this period he is expected

to make the transition from civil to military life and to adapt himself more or less completely to his new environment, to abandon his individual ideas and customs of dress, food, exercise, and recreation, and conform to the manner of living that is prescribed for the majority of his fellows. He must learn to sleep in a hammock, and usually with more than his customary amount of fresh air. He must overcome his homesickness, make new acquaintances, and learn the rudiments of military life and discipline. Meanwhile physical examinations, necessary dental work, vaccination, and typhoid prophylaxis are completed. Following his detention period the recruit is transferred to one of the other camps, where general or special training is continued for a variable period, averaging three to six months. He may then be transferred to the outgoing detention camp, where he remains under observation and is given a number of medical examinations and inspections before leaving the station. In each camp and regiment a certain number of men are held for indeterminate periods to assist in administration, instruction, and the maintenance of public works.

The work of discovering and isolating meningococcus carriers, in conformity to general practice, has been greatly facilitated here by taking advantage of the organization described above. It has been the custom to make naso-pharyngeal cultures of all new men on the station as early as possible in their period of incoming detention, and to isolate those found to be harboring the meningococcus. The men in outgoing detention have been similarly examined, and the carriers detained and isolated.

Whenever a case of cerebro-spinal fever was diagnosed, the following procedure was carried out as a matter of routine. The company of men and the barracks from which the patient came were placed in quarantine and everyone cultured. Additional cultures were made on all possible contacts, such as hospital corpsmen and patients in the regimental sick bay where the man with the disease may have been treated for a short time before transfer to the hospital. Upon completion of a preliminary examination of the cultures, usually twenty-four hours, the men who had yielded organisms resembling the meningococcus in cultural characteristics, morphology and staining reaction were declared to be carrier suspects and were removed and placed in the isolation units or "cubicles," at the disposal of the regimental surgeon. The quarantine was then lifted and the remaining men discharged to duty. Suspects discovered in the detention camps were similarly placed in cubicles. According to the final laboratory report, based on agglutination reactions, the cited case, the potential danger would be the same from all strains

ferred to the meningococcus carrier camp if positive. The types¹ of meningococci were not determined in the routine work, and all men whose organisms gave positive agglutination reactions with Flexner's polyvalent serum were isolated, under the assumption that although all might not give the type corresponding with the associated case, the potential danger would be the same from all strains thus shown to have been pathogenic.

The isolated carriers, from all sources, have been cultured at intervals of five days, and held until four successive negative cultures were obtained. For a time, all hospital patients returned to the station were cultured in a special camp and required to give two successive negative cultures without treatment before discharge to duty, the discharged carriers also going through this group. After three or four months, however, this was discontinued and the hospital (which is under separate management) secured the necessary negative cultures before discharge of patients, while the carriers were returned to duty directly from the carrier camp.

In taking naso-pharyngeal cultures, the open-swab method has been used exclusively. The men to be cultured come forward in single file, facing the light, and repeat assigned numbers (recorded serially) to the man who swabs. He in turn repeats each number as the swab is passed to me across a table, and a blood-agar Petri dish, already numbered, is immediately touched with the swab and streaked with a sterile wire. By elimination of all unnecessary movements and the assistance of one man on the left to number and dispose of plates and another on the right to flame wires (of which two are used to allow time for cooling), entirely satisfactory cultures may readily be taken at the rate of about 300 men per hour. The plates are kept warm with hot-water bottles at all times except during actual inoculation, are transported to the laboratory by closed motor bus, and at once placed in an incubator.

The methods in use by the laboratory force are briefly as follows: The inoculated peptone-blood-agar plates are incubated at 37 C. from 12 to 18 hours, or until a satisfactory growth has taken place. Colonies with meningococcic characteristics are selected and if the organisms composing them show the morphology and staining reaction of meningococci, subcultures are made on blood-agar slants and a preliminary positive report is given, the remaining plates being regarded as negative. Saline suspensions are made from the subcultures the following day and tubes are set up for microscopic agglutination with Flexner's polyvalent diagnostic serum in dilutions

¹ Gordon: Bacteriological Measures Adopted for Dealing With the Military Outbreak in February, 1915, and Improvement Expected as the Result of Research. Special Report of the Indicated Research Committee on Bacteriological Studies in the Pathology, Prevention, and Control of Cerebro-spinal Fever Among the Forces During 1915 and 1916. London, T. Fisher Unwin, 1917.

of 1 to 50, 1 to 100, and 1 to 200, with controls of horse serum 1 to 50, and physiological saline suspensions of the organisms. These are incubated at 55 C. for 18 hours and the readings then made. Agglutination by the polyvalent antimeningococcic serum in any of the above dilutions, with satisfactory control, has been regarded as indicative of the meningococcus, and the final report is made on this basis. Type agglutinations with Flexner's sera (for "normal," "para," "irregular normal," and "irregular parameningococci") have been done in a few recultures, and will be reported upon completion of the series.

The practice of taking pharyngeal cultures for meningococci was first begun at this station under the direction of Medical Inspector C. M. DeValin, United States Navy, in May, 1917. This was near the close of a cerebro-spinal fever epidemic of 99 cases, distributed as follows: January (1917), 5 cases; February, 9; March, 13; April, 25; May, 35; June, 11; July, 2. The mortality was 31 per cent. No further cases developed until October, when three cases occurred. These were followed by 4 in November and 19 in December. Reference to these latter cases will be made below. It is noteworthy that during the above period the population of the station increased many times, reaching 15,000 in November and 25,000 in December.

The total number of cultures made at this station in 1917 are grouped below under several headings, with the percentages of carriers found in each instance.

	Number.	Per cent.
Cultures in incoming detention.....	19,639	.....
Positive cultures.....	139	0.7
Cultures in outgoing detention.....	14,008	.....
Positive cultures.....	234	1.6
Cultures of cerebro-spinal fever contacts.....	3,660	.....
Positive cultures.....	44	1.2
Cultures of hospital convalescents.....	1,463	.....
Positive cultures.....	39	2.6
Cultures of meningococcus carriers.....	2,716	.....
Positive cultures.....	623	22.9
Total cultures made, exclusive of carriers.....	38,770	.....
Positive cultures, exclusive of carriers.....	456	1.2
Cultures made, unclassified.....	669	.....
Total cultures for station laboratory during 1917.....	42,155	.....
Additional cultures taken on the station for examination by other laboratories.....	7,294	.....

The epidemic.—Although 19 cases of cerebro-spinal fever occurred at this station in December, 1917, the epidemic proper began in January, 1918, with 84 cases. The incidence decreased during the last week, and February concluded the epidemic with 10, in the first three weeks. The mortality has been about 22 per cent, with a

marked decrease since the middle of January. The data obtained in the individual cases, more complete since January, is shown in tables referred to below. The diagnoses of January cases No. 36 and No. 81 have been changed, and reference to them as meningitis cases has been everywhere omitted except in the January table.

A glance at the table of incidence by regiments and barracks, or at a spot map of the station, shows that the great majority of the men developed the disease in Camps Dewey and Perry, in the newest part of the station separated from the other camps by railroad tracks and a highway. The seven regiments in these camps are made up mainly of recruits in their first period of training. It is seen further that of the January incidence in these camps 30 per cent was in the second regiment, where there had been a previous epidemic of bronchitis, influenza, and measles, and which was composed mainly of imperfectly seasoned recruits living under excessive stress, as will be shown later. In contrast the incoming detention camps escaped with one isolated case on January 13 (No. 35), and a second five weeks later February (No. 9). While this camp comprises the newest recruits it will be remembered that they are not yet doing routine work, their limitations are more generally recognized, and their mode of life is very carefully superintended. In addition it has been shown that in this camp there is an allowance of approximately 50 square feet of floor space per man, and indoors the men are segregated into groups of but 24, while in the camps mentioned above 60 to 75 men were living in one room during this period instead of a proportional 40, thus reducing the floor space per man in some instances to almost half of that mentioned above. In the rest of the station, made up of men in administrative or instruction details and those advanced in training, only a few isolated or sporadic cases occurred.

In looking for one or two barracks as foci in the dissemination (such as would be expected were a particularly menacing carrier passed unnoticed), the table of barracks incidence is disappointing because of the inconstant results. Four cases occurred in barracks 521-S, and three in each of the following: 230-N, 231-S, 430-W, 431-W, 721-S, but most of the barracks had only one or two cases. While in a number of instances two men became sick on the same day or within two or three days of each other, the interval in as many instances is found to be 22 days or a month—as in barracks 521-S. Furthermore, in the barracks with several patients the percentage of carriers was not excessive in comparison to that found in other barracks during that particular period.

Almost exactly coincident with the epidemic in the latter part of December and January there was a long-continued period of cold weather. The mean daily temperature was below the freezing point from December 25, 1917, to February 5, 1918, with the minimum

mean temperature reaching -4 F. on January 12, and February 4. As shown by a weather chart there was a tendency, further, for fluctuations in the temperature to be accompanied by a variation in the incidence of cases, the greatest number of which occurred during the coldest week, January 12 to 18.

Notes from various Army camps during the winter show that the cold weather also influenced the meningitis incidence in them. Camp Wheeler mentions on January 25,¹ that the "cold rains" of the week added to their already high sick report, including mumps, pneumonia, and meningitis. A tabulation of cases of meningitis reported in the Army camps each week² shows that the disease was generally most prevalent during December and January with a decline during February, and by March 1 had almost disappeared. Exceptions are to be noted in Camps Bowie, Shelby and Funston, in which the epidemics were a little earlier and Camp Hancock where it was later.

Camp and location.	Number of cases of meningitis at Army camps for weeks ending—													
	Nov. 30, 1917.	Dec. 7, 1917.	Dec. 14, 1917.	Dec. 21, 1917.	Dec. 28, 1917.	Jan. 4, 1918.	Jan. 11, 1918.	Jan. 18, 1918.	Jan. 25, 1918.	Feb. 1, 1918.	Feb. 8, 1918.	Feb. 15, 1918.	Feb. 22, 1918.	Mar. 1, 1918.
McClellan, 29th, Alabama	2	0	1	0	1	4	3	0	5	2	0	0	1	0
Hancock, 28th, Georgia	0	1	1	1	0	1	3	0	2	3	3	4	2	6
Wheeler, 31st, Georgia	2	3	1	1	1	2	0	1	4	0	1	1	0	0
Doniphan, 35th, Oklahoma	1	2	6	10	12	0	10	0	4	3	2	0	1	0
Bowie, 36th, Texas	8	15	9	2	3	2	0	0	0	2	3	1	3	2
Shelby, 38th, Mississippi	6	6	0	0	1	0	0	0	0	1	4	1	2	0
Beauregard, 39th, Louisiana	3	6	3	4	7	26	16	13	9	8	6	5	0	2
Meade, 79th, Maryland	0	0	4	2	3	1	3	4	5	2	4	1	2	0
Jackson, 81st, South Carolina	7	16	30	37	30	15	13	14	23	19	6	4	9	0
Gordon, 82d, Georgia	0	0	1	2	5	11	4	3	6	1	1	4	1	0
Sherman, 83d, Ohio	1	0	5	2	0	2	3	0	1	1	3	0	0	0
Taylor, 84th, Kentucky	0	0	5	3	0	2	2	3	2	2	0	2	0	1
Custer, 85th, Michigan	0	0	2	1	0	0	0	2	7	1	0	0	0	0
Pike, 87th, Arkansas	0	4	2	8	3	4	1	1	2	0	1	0	0	2
Funston, 89th, Fort Riley, Kans.	12	9	6	3	5	4	1	2	5	3	3	2	2	3
Travis, 90th, Texas	0	0	0	4	9	1	1	4	5	4	4	2	2	0
Lewis, 91st, Washington	5	5	1	5	1	1	4	2	1	2	2	0	2	2

In studying the individuals with the disease the well-known incidence among new recruits is at once apparent. In the 94 cases during January and February, 71 men (75 per cent) had been on the station less than seven weeks, or, in other words, had finished their 21-day detention period less than a month previously. The curve showing this fact is equally striking in the absence of cases before the latter part of the third week, which may possibly be accounted

¹ Jour. Am. Med. Assn., Feb. 2, 1918, p. 322.

² Jour. Am. Med. Assn., Dec. 15, 1917, to Mar. 16, 1918.

for on the basis of the more careful housing during that period as pointed out above.¹

By tabulating chronologically the dates of arrival at the station of the men who developed the disease during January, it was further found that 57, or 67 per cent, of them had come to the station between December 2 and December 15. This is also true of the first case occurring in February. These dates are significant in view of the situation on the station at that time. Owing to the ruling which prevented men of conscription age from volunteering their services after December 15, 1917, recruiting offices were crowded and many men enlisted in the Navy. In fact, from approximately 15,000 men on December 1, the population of the station by December 15 had risen to 25,000, where it remained. At this time and subsequently a series of circumstances operated as strong predisposing or determining factors in the incidence of disease among these young recruits, especially of cerebro-spinal fever. Owing to the limited capacity of the incoming detention camps it was necessary to hurriedly outfit a large number of the men and transfer them to an instruction camp *within a week, often within two or three days*. In spite of the skillful manner in which the situation was handled it was inevitable that many men should lose sleep and rest, while the hurried atmosphere in which they were rushed from one place to another to secure various examinations and new equipment made it exceedingly difficult for them to adapt themselves to their new environment.

In the routine tests of these men by the Psychiatric Unit it was found, further, that they were somewhat below the high average intelligence shown by the men enlisted before and after this period. From this it might be inferred that they would adapt themselves to new conditions less readily than the others. This would show itself in such things as failure to properly protect themselves from exposure by the use of overshoes and overcoats, or by the change of wet clothing.

In the camps to which these men went, mainly the first four regiments in camps Dewey and Perry, an effort was made to continue their detention, but it was somewhat less rigid than in the detention camps. There was also considerable crowding, as pointed out above, which brought them into relation with a larger number of people and in much closer contact. The question of proper ventilation, however, may be ruled out, as throughout the station the regimental surgeons make daily recommendations in this respect and each night make inspections to determine that they are in force with satisfactory results.

¹ Mink, O. J.: Points in the Epidemiology of Meningitis, abstr., Jour. Am. Med. Assn., Feb. 23, 1918, p. 563.

Before these new men could much more than get their bearings they were overtaken with very severe and continued cold weather, which began about December 25, as mentioned above. A severe blizzard soon occurred with snow from 3 to 6 feet deep, requiring strenuous effort to keep the roads open, and making any movement about the camps very difficult. Then after a short rest, the process was repeated by the appearance of a second blizzard, with somewhat less snowfall, but more wind and damp cold. Subsequently the huge piles of snow had to be hauled away to avoid later floods. The consequence was that several other factors predisposing to disease were introduced and accentuated, namely, fatigue and exposure to the weather in unaccustomed clothing. The latter contributed to the production of many "colds," an epidemic of which was noted as having preceded the meningitis in the second regiment. A similar high incidence of other acute diseases among new recruits (72 per cent of the pneumonia; 57 per cent of the influenza) was also noted in charts prepared from cases during this period. The summation effect of all these factors is well shown in the comparative freedom from disease of seasoned men in other camps exposed to the same crowding and weather conditions; of the escape of young recruits in the detention camp when tenderly cared for; but the development of meningitis by unseasoned men when hastened to conditions of exposure.

The typhoid prophylaxis and vaccination administered during the detention period frequently caused considerable reaction, with fever and malaise for one to three days. The rôle of this factor must be relatively small, however, since the interval between the prophylaxis and the development of spinal fever was too long. In 79 cases transferred to the Naval Hospital during January and February in which the records of typhoid prophylaxis were available, the time interval between the third injection and date of transfer was in one case three days, in two cases six days, and in three other instances seven days. The intervals in all the others was longer. Schick's test had been performed on nine of the patients transferred during January and February with five positive and four negative reactions. With one exception all of these tests had been made more than a month previously. Only one patient had received Behring's serum, and that was given three days before his transfer to the hospital. His reaction to this serum had not been noticeable. Among 80 men vaccinated against smallpox, 62 or 77 per cent gave a positive reaction.

The age incidence of the patients seems relatively unimportant since the great majority of the men on the station are about the same age. Seventy-five per cent of the January and February patients, however, were between 19 and 24. The oldest patient in this series

was 29, as contrasted with the English report¹ where three men over 36 are mentioned.

Although with the lifting of the 21-day period of detention the young recruits were given liberty and leave, and frequented crowded theaters and street cars in near-by towns, the meningitis in these localities never assumed the proportions that it did on the station, and it is illogical to assume that they would be liable to contract the disease from these sources to the neglect of the much greater danger at home. It was also shown (December table) that as many of the cases occurred among men who had been on the station continuously since their arrival, as among those who had been known to "go ashore." Further, the section of the United States, or the town or city from which the recruit came originally or which he visited on leave, gave inconstant results in the few instances where this information was available.

Pharyngeal cultures previous to the disease had been made of nearly all of the patients, usually during the incoming detention period or as a contact of a case, and sometimes several cultures had been taken. Eighteen men who developed meningitis during December, January, and February had given negative cultures less than a week before their transfer to the hospital, and 15 of these had given negative cultures prior to that. (See cases 2, 9, 13, and 19 in December; 2, 16, 27, 34, 37, 38, 49, 53, 57, 68, 71, 74, 78, in January; 9 in February.) This is in accordance with the experience of Fildes and Baker² who obtained negative cultures from 26 men shortly before they developed the disease.

During December and January six men who had previously been found carriers developed cerebro-spinal fever. The results of their various cultures are shown in a table. The first man (J. C. D.) had been discharged to duty 11 days before developing the disease. The others were in isolation at the time. One carrier had been first discovered in incoming detention, two as hospital convalescents, two in outgoing detention, and one as a meningitis contact. The last man (D. S. B.), who had been negative in incoming detention, was cultured twice as a contact. On the first occasion two patients (Jan. Nos. 13 and 14) had been removed from the opposite end of the barracks from where he lived, and he was found negative. Eight days later another case (Jan. No. 36) developed in the same end of the barracks but the diagnosis was later changed to bronchitis. At that time he was positive and was shortly removed to a carrier barracks

¹ Flack, M.: Report on Cerebro-spinal Fever in the London District, December, 1915-July, 1916. Special Report of the Indicated Research Committee on Bacteriological Studies in the Pathology, Prevention, and Control of Cerebro-spinal fever among the Forces during 1915 and 1916. London, T. Fischer Unwin, 1917.

² Fildes, P., and Baker, S. L., *Lancet*, London, Oct. 20, 1917.

which soon became crowded, and where he developed the disease two weeks later. From the beginning of the work until the last of January, when this case developed, 1,228 carriers had been discovered of whom only 6 or 0.4 per cent developed the disease. Fildes and Baker¹ report that among 485 carriers not one developed cerebro-spinal fever, and they consider it rare among carriers. Capt. Flack¹ mentions five carriers who developed the disease while in isolation, and considers that every patient has been a carrier because the organism can always be recovered from the throat after the disease has made its appearance.

The important features of the epidemic at this station as detailed above may be briefly summarized as follows: The great majority of the men affected were young unseasoned recruits who had been rapidly rushed through the regular incoming detention camp at a time when the station was rapidly expanding, and sent to already crowded camps where they were almost immediately exposed to severe cold, stormy weather and hard work.

It is noteworthy that while with one exception (Feb. case No. 9), the young unseasoned recruits did not develop the disease in the regular detention camp where they were more carefully cared for, they were unable to withstand the combination of circumstances and depressing influences met in the other camps, although these same factors, operating on all alike, did not materially influence the older men on the station.

This same "hardening" process may also be seen in the incidence of meningitis among the several Army groups during this period, as indicated in the following table derived from weekly reports appearing in *The Journal of the American Medical Association*.²

Meningitis at Army camps.

	Annual rate per thousand, week ending—														
	Nov. 30, 1917.	Dec. 7, 1917.	Dec. 14, 1917.	Dec. 21, 1917.	Dec. 28, 1917.	Jan. 4, 1918.	Jan. 11, 1918.	Jan. 18, 1918.	Jan. 25, 1918.	Feb. 1, 1918.	Feb. 8, 1918.	Feb. 15, 1918.	Feb. 22, 1918.	Mar. 1, 1918.	
National Army, all camps.....	3.2	4.1	6.6	8.3	7.4	5.7	4.1	4.9	7.4	4.4	5.4	0.2	9.2	9.1	3.3
National Guards, all camps.....	3.8	5.4	4.2	2.9	4.4	5.4	4.8	3.2	4.3	3.3	3.3	7.3	2.2	2.1	9.7
United States Army, Regulars....	.2	0	0	.4	1.1	1.6	5.4	3.9	4.1	2.9	4.5	3.6	3.5	1.7	5.1
American Expeditionary Forces....	3.8	.....	.....	5.5	5.0	.....	2.6	5.7	.....	.....	1.6	.....	4.2	6.0	.....

The rate for 1916 among United States Army Regulars was 0.29.

It is seen that the highest incidence was in the National Army—that is, among the newest soldiers; and that in the National Guard,

¹ Loc. cit.

² our. Am. Med. Assn., Dec. 15, 1917, to Mar. 16, 1918.

composed generally of older men who had some military experience, it was less than in the National Army, but greater than among the seasoned Regulars. Among the latter the incidence rose when they met the new conditions operative in the overseas forces.

Carriers during the epidemic.—The incidence of meningococcus carriers among several groups before, during, and after the epidemic has been plotted against the incidence of cases, also showing the carrier index as derived from all sources. It will be seen from this curve (based on 32,590 cultures) that the epidemic of cases coincides with remarkable closeness to the cold weather, as indicated; while the increase of carriers does not begin with the cold weather or the cases (certainly does not precede them), but starts about two weeks later. The percentage of carriers remains high for about three weeks after the weather has begun to moderate and the cases have almost stopped, and then rapidly decreases with the advent of mild, fair weather. The incoming group, composed of the newest men, the best housed, and the best protected, shows the lowest rate throughout. The contacts, living under the same conditions as those developing the diseases, and exposed to them, give the highest rate at all times. Outgoing detention, comprising older men from all over the station, gives a somewhat lower percentage of carriers, and is rather comparable to the average curve computed from all cultures taken during each week from all sources.

Because of the very small number of men cultured on two occasions figures in two instances have been discarded as unreliable in making this curve—week January 19–25, detention 24.4 per cent; week February 23–March 1, contacts 26.7 per cent. During the extremely cold weather a charcoal foot warmer was used from January 20 on to facilitate keeping the plates warm, although hot-water bottles were usually found sufficient. On January 14, 15, 19, 21, 24, and February 15 contacts were cultured and the plates examined by medical officers who had formerly been working on carriers alone. Their figures have been generally somewhat higher, but that the new personal equation introduced did not materially affect the curve but rather confirmed it is shown by the fact that they took no cultures from January 24 to February 15, when the curve remained at its height; the figures from other sources rose correspondingly; and since February 18, when they have cultured all the contacts, the percentages obtained have fallen parallel with those before mentioned. The small elevation in all the curves during the middle of December shows the cases and carriers to be synchronous, but on plotting the daily figures the rise in carriers is seen to come a week later, and thus corresponds to the later curve, and gives additional weight to its outline, since the work during that period was very uniform in

character. Further corroboration of the real increase of carriers during this period is shown by the fact that without further variation in technique the curve came down and has remained down. From all of these considerations it seems justifiable to conclude that the incidence of widely distributed carriers came *after* the appearance of cases and not before, and was the result of the epidemic rather than the cause since in the presence of the greatest number of carriers the epidemic stopped.

The comparative harmlessness of these carriers is further shown by the following circumstances. After sending new men to the carrier camp steadily for several months, somewhat in excess of the rate of discharge, the quarters available for them had become nearly filled. Toward the latter part of January the incidence of carriers rose so rapidly that their usual accommodations were completely filled, including the available room in the naval hospital, where some of the more chronic carriers were sent. The carriers who were first isolated as suspects, could not be removed from the regimental cubicles, which became filled so that suspects could no longer be removed from quarantined barracks. Finally, a case of cerebro-spinal fever appeared among the crowded carriers (February, No. 9). About this time, January 28, when the case curve was falling and the carrier curve still rising, a new procedure was introduced by Surgeon O. J. Mink, United States Navy, the senior medical officer of the station, of whose administration, criticisms, and suggestions this report is largely the outcome. This procedure, which affected the last 10 cases shown in the January table and those occurring subsequently, has been substantially as follows: The contacts have been quarantined in their barracks for five days, cultures being taken from everybody but the carriers not removed and no one informed who the carriers might be. During this period, naso-pharyngeal sprays with Dobell's solution have been given three times daily by the regimental surgeon, and at the end of five days the quarantine lifted and all men returned to duty, although at this time public gatherings were interdicted and Y. M. C. A. buildings, etc., closed. The carriers who had already been isolated have been handled as usual, and more recently have been formed into companies, with regular duties on the station in working parties. They are now given one or two evenings liberty in the middle of the week, when the remainder of the men are kept on the station. Incoming detention carriers have been undisturbed. Carriers found by routine cultures made in outgoing detention have been withdrawn from the drafts and held on the station, but otherwise unrestricted. In spite of the more favorable weather conditions during this period, it appears significant that *the case curve continued to fall after the restrictions on carriers had been almost entirely removed.*

That close relationship exists between the patients and the carriers, as reported by some observers, has not been the experience at this station, although in January case No. 84 there was ample opportunity for carrier infection. The patient in this instance had been engaged in swabbing carriers and examining cultures for a month previously, during which time he was associated in the work with a man who at the time of his illness gave a positive meningococcus culture. In culturing many contacts, however, the highest percentage of carriers was frequently found among those least closely associated with the patient, as in the opposite end of the barracks separated by a solid partition with no indoors communication. (See December cases No. 12, 14; January cases No. 12, 13, 14.) D. J. C. (December case No. 14) had been isolated as a carrier, and yet when he developed cerebro-spinal fever 11 days after his return to duty and the whole company was cultured, 8 of the 10 carriers found were living in the opposite end of the barracks and never came in contact with him indoors. When carriers were found in the same end of the barracks, they were sometimes men who had been sleeping in the hammock next the patient, but just as often in the second, third, or fourth hammock distant.

A plot made of the sleeping arrangement of two barracks (426-E, 428-W) showed carriers scattered about without any obvious relation to the patients.

BARRACKS 426-W.

EAST.	
F. M. W. F. W. Y.	C. A. K. G. P. K. L. A. L.
O. E. T. W. E. M. B. S. V. A. M. ¹ F. E. B.	C. S. L. T. O. L. B. D. V. E. C. T. N. A. L.
H. K. T. R. M. S. W. H. R. ¹ W. E. R.	W. L. M. C. C. M. F. R. C. E. W.
G. J. R. ¹ J. R. R. A. T. P. ¹	J. E. P. B. A. M. E. P. ² N. G. S. L. J. P.
C. L. P. C. J. P. J. M. P.	P. O. J. R. C. R. S. ¹ M. O.
W. E. O. J. C. O. O. R. S. W. E. M. F. B. S.	J. O. N. A. J. S. G. W. V. H. W. P.
R. R. P. J. W. P. J. R. S. O. R. L.	J. A. P. D. A. L. ¹ R. E. S. L. A. S. N. R. L.
N. G. M. W. F. N.	V. S. P. J. C. L. S. H. L.
WEST.	

NORTH.

SOUTH.

¹ Carriers found January 29, 1918.² January 28, cerebro-spinal fever.

Perhaps the success in tracing relationship of carriers reported by Capt. Flack¹ was due to the method of determining that a man was in close relationship before culturing him, whereas in the culturing done here all the men in the general vicinity of the patient were regarded as contacts and were cultured, while the degree of contact was disregarded until the carriers had been found.

Further discrepancies in the carrier proposition were discovered in a few instances in which a patient was transferred to the hospital with the diagnosis of cerebro-spinal fever and his contacts cultured, when the case finally proved to be some other disease. In spite of the small number of cultures, the results were similar to those obtained in bona fide cases of spinal fever.

Carriers among "contacts" of cases not cerebro-spinal fever.

Date.	Number of cultures.	Carriers.	Per cent.	Name of case.	Diagnosis.
1917. Dec. 19	50	2	4.0	P. B. H. (main brig)...	Acute tonsillitis.
1918. Jan. 1	165	7	4.1	J. A. C., 3 C. P. J.....	Meningitis, streptococ- cic.
Jan. 7	105	1	.9	T. G. B., 322.....	Epilepsy.
Jan. 11	129	2	1.5	No case, 425.....	Mistaken number.
Jan. 28	52	1	1.9	E. R. H., 122-N.....	Not spinal.
Feb. 4	57	7	12.5	C. W. M., 255.....	Acute pharyngitis.
Feb. 4	60	11	18.3	D. W. A., 231.....	Pneumonia.
Feb. 19	Dr. C. 96	12	12.5	L. F. N., 124.....	Measles.
Feb. 3	50	9	18.0	E. H. H., 529-N.....	Influenza.
Feb. 3	47	5	10.6	G. H. G., 231-N.....	Tonsillitis.
Mar. 8	Dr. C. 55	1	1.8	H. H. G., 330.....	Influenza.

When these few instances are plotted by weeks the curve that results conforms in a general way to the carrier index of the station for that period. (See chart.)

Somewhat similar results were obtained when the occupants of a barracks were recultured. On January 14, case No. 39 was removed from Barracks 421-W and case No. 53 was taken from the same barracks three days later. There being no available space for carriers all men were left in quarantine together without treatment while cultures were made on January 16, 18, and 22, after which carriers were isolated. On February 15, all available men originally present were again sought out, wherever their location, and the cultures repeated. This was again done on March 4. All plates were made and examined by the same technique.

¹ Loc. cit.

Repeated cultures in Barracks 421-W.

[Pos.=Positive by agglutination. 0=Negative (no characteristic colonies, or agglutination negative)
Blank space=No culture made. *=Isolated as carrier Jan. 25 to Feb. 9, 1918, and discharged after one
negative culture. 1=Isolated Jan. 25; positive culture Feb. 9, 1918; and still isolated Feb. 15, 1918.]

Patient.	Jan. 16.	Jan. 18.	Jan. 22.	Jan. 25- Feb. 9.	Feb. 15.	Mar. 4.
H. F. K.	Pos.	0	Pos.	*	0	0
E. A. K.	0	Pos.	0	*	0	0
D. L. ¹	0	0	Pos.	*	0	0
W. J. L.			Pos.	*	0	0
J. E. L.	0	0	0		Pos.	0
H. J. M.	0	0	Pos.	1	0	0
M. M. M.	Pos.	0	Pos.	1	0	
F. M.	0	0	Pos.	*	0	
L. F. M.	0	0	Pos.	*	0	0
L. F. M.	Pos.	Pos.	0	1	0	0
D. D. P.	Pos.	0	Pos.	1	0	0
W. E. P.	Pos.	0	0	1	0	0
F. H. R.	0	Pos.	0	1	0	0
F. W. R.	0	0	Pos.	*	0	0
F. R. R.	Pos.	0	0	1	0	0
F. W. R.	Pos.	Pos.	0	(²)		0
P. L. R.	Pos.	0	0	1	0	0
F. J. S.	0	0	Pos.	*	0	0
D. E. S.	Pos.	0	0	*	0	0
T. E. S.	0	Pos.	0	1	0	0
R. F. S.	0	0	Pos.	*	0	0
C. R. W.	Pos.	0	0	1	0	0
E. J. W.	Pos.	0	0	1	Pos.	0
R. P. W.	Pos.	0	0	1	0	0
C. W.	Pos.	0	0	*	0	0
Additional men negative.	33	33	33		28	27

¹ A carrier Dec. 7, 1917. Pos.; 4 successive negatives; Dec. 29, 1917 to duty.

² Furlough.

	Percent.
Positive by agglutination Jan. 16, 1918.	22
Positive by agglutination Jan. 18, 1918.	9
Positive by agglutination Jan. 22, 1918.	19
Positive by agglutination in first three cultures of all men.	43
Positive by agglutination Feb. 15, 1918.	3.8
Positive by agglutination Mar. 4, 1918.	0

It will be seen that during the first week while 22 per cent was the highest percentage of positive cultures found on any of the three occasions, that 43 per cent of all men present were found to be carriers once or twice within that time. A month later 3.8 per cent were found positive, and two and one-half weeks after that, when the carrier index of the station was approaching the figures that preceded the epidemic, no carriers were found in this group. No new cases had meanwhile developed in that barracks.

After the occurrence of a case barracks were often cultured and carriers removed, when within a few days another case would make its appearance, both when the percentage of carriers had been high (see January cases Nos. 44, 50, 55, 73, 75) and when they had been low or zero (see January cases Nos. 6, 10, 12, 29, 31, 60). On the other

hand, in numerous instances new cases failed to develop not only when carriers were removed, but also when they were not removed regardless of whether the percentage was low (see February cases Nos. 8, 7) or high (see January cases Nos. 39, 83, 86, February Nos. 3, 6, 9, and 10). In this connection may be mentioned also the development of cerebro-spinal fever in a draft for an Eastern port in December, 1917. All had given negative cultures three days before leaving. Nevertheless one man developed the disease en route.

The more glaring defects and failures of the carrier segregation plan at this station may be briefly enumerated as follows:

(1) The nearly ideal application of the system failed to prevent or appreciably affect an epidemic, which ran its course and subsided with the cold weather after general hygienic measures had been instituted. The subsidence of the epidemic was unaffected, moreover, by the removal of restrictions on carriers, whose increase was the result rather than the cause of the epidemic.

(2) All of the real carriers present are never discovered at any one time, even with the most careful technique. This is best shown in the routine culture of chronic carriers, where it is seldom possible to get more than 50 per cent of cultures positive. Furthermore, during the 24 to 72 hours covering the investigation, some of the men held to be carriers may have lost the organism, and of those passed as negative a few may directly pick it up in a crowded barracks, Y. M. C. A., street car, or town (cf. table of repeated cultures in barracks 421-W).

(3) Carriers can not be traced in relation to new cases, except in a very few instances and they are not always closely associated with the old ones. In fact the greatest number of carriers has often been found among those least associated. Finally new cases occur or fail to occur without apparent reference to carriers who remain or are taken away.

(4) It has been found in general by most observers, with few exceptions, that the segregation and treatment of carriers does not give satisfactory results in hastening the disappearance of the organism. It does not seem logical to segregate men who have picked up the organism during chance contact with presumably only a few carriers, and expect that they will lose it while isolated in closer contact with many carriers, while to isolate each carrier in a single room is usually impossible.

(5) During the past nine months 1,363 carriers have been found on this station, and 120 cases of cerebro-spinal fever have developed. During one month only has the number of cases exceeded 20 but from 200 to 400 men have been in isolation constantly. When the efficiency of the general measure is not clearly evident it does not seem consistent with military economy to deprive the organization of 10

men continuously for every one whom it is hoped will be protected from a temporary disability.

That the ineffectiveness of this method is not a new experience is shown by the abstracted report of Meyer, Voltmann, Furst & Griebert¹ which is here quoted:

They found 1.73 per cent of meningococcus carriers in over 9,111 healthy soldiers in the Munich garrison at a time when no cerebro-spinal fever was present. One examination was made of each man. One thousand nine hundred and eleven healthy persons were examined many, many times with the result that 2.46 per cent were found to be meningococcus carriers. Of the total of 11,022 healthy persons, about 2 per cent examined contained the meningococcus in their throats. Isolation of the carriers had no influence on the incidence of the disease, and epidemiologically they found only exceptional relationship between the carriers and the sick. In one of the years during this study numerous clinical cases occurred; in another year none, although the number of carriers remained the same both years. The authors conclude that extreme painstaking cultural detection of meningococcus carriers is unnecessary in combating the spread of cerebro-spinal meningitis; that the practical benefits do not justify the care and time necessary for such work. They believe that the chief foci, aside from factors not understood in the spread of this disease, seem to be the sick and especially mild cases.

In order to summarize the various clinical types of meningococcus infection that have been described, a classification might be made according to the degree of invasion by the meningococcus. Presumably the least degree of invasion would amount to merely a contamination of an individual's throat, a transient affair measured in hours. In increasing degree the following types would occur: Temporary carriers, measured in days, and chronic or persistent carriers measured in weeks or months; local infections of the pharynx, producing "sore throats,"² general infections, either of low grade and passing for influenza, etcetera,³ or outspoken sepsis,⁴ with a variety of metastatic involvements including meningitis itself. In accounting for variations in the type of disease Thompson & Wulff⁵ conclude that meningococci vary in virulence at different periods, and that the virulence is enhanced by repeated passage through one naso-pharynx after another. They thus explain why chronic carriers rarely take or give the disease, but point out that during an epidemic of "colds," the organism is passed along, and becoming more virulent produces mild cases to be followed, perhaps, by an epidemic of the fulminating type.

¹ Meyer, Voltmann, Furst & Griebert, *Munchen Med. Wechschr.*, 1910, No. 30, July 26, abstracted in "Preventive Medicine & Hygiene," by M. J. Rosenau.

² Medlar, E. M.: Epidemic cerebro-spinal meningitis, at Camp McClellan, *Jour. Am. Med. Assn.*, Feb. 16, 1918, p. 458.

³ Thompson, O.; Wulff, F.: Meningococcus infection and meningitis, *Hospitalstidende*, Copenhagen, Dec. 6, 1917, p. 1192; abstr., *Jour. Am. Med. Assn.*, Feb. 16, 1918, p. 498.

⁴ Herrick, W. W.: Epidemic of Meningitis at Camp Jackson, *Jour. Am. Med. Assn.*, Jan. 26, 1918, p. 227.

Granting the wide distribution of the meningococcus and its dissemination by carriers and patients as the basis of both propositions, the alternative explanation of the variable incidence and type of disease would obviously be that of a variation in the susceptibility and immunity of individuals themselves, as by the factors already discussed. Since control of the carrier is so inexact, and of doubtful efficiency, while harboring of the organism is of itself insufficient to produce the disease, it appears wiser to concentrate attention on the more general measures of proved value and easy application.

In addition to the avoidance of haste, crowding, exposure, and exhaustion in training recruits, all considerations of the utmost importance, other hygienic and sanitary measures available to combat epidemic meningitis may be briefly outlined as follows: The men who have been in indoor contact with a cerebro-spinal fever patient should be quarantined in as small groups as possible in commodious barracks with good ventilation and ready access of available sunshine. A nasopharyngeal spray with an antiseptic solution should be given at regular intervals to combat the organisms in the throat if possible, but more especially to accompany those which leave the throat in talking, sneezing, and coughing. Special attention and treatment should be given to men with "colds" and coughs, including instruction in properly screening others from an unavoidable shower of saliva. Curtains or screens may be placed between the hammocks or beds at night, as has already been instituted at this station by Dr. Mink. Light exercise may be taken outdoors, with proper clothing and protection from the weather, the danger of carriers being practically negligible in the open air. After a period of five days or a week, when the temporary carriers will probably have cleared up, and the chronic carriers become relatively harmless, the whole group may be discharged to duty. During an epidemic large and promiscuous gatherings, as in Y. M. C. A.'s or theaters, should be prohibited.

During a quarantine cultures may be taken and repeated at pleasure, with a preceding temporary suspension of antiseptics, and as a middle course during an epidemic the chronic carriers might be segregated to the extent of preventing contact with other men indoors.

It is unnecessary to call attention to the usual precautions in handling the patients, who should be isolated through illness and convalescence, and the desirability of masks for the attendants.¹ The recognition and prompt treatment of the mild and previously unrecognized cases will undoubtedly do much to prevent outbreaks.

¹ Weaver, G. H.: The value of the face mask and other measures, *Jour. Am. Med. Assn.*, Jan. 12, 1918, p. 76.

CONCLUSIONS.

1. Epidemic cerebro-spinal fever is a disease caused by the meningococcus, which is spread for the most part by direct contagion from patients and healthy individuals. In military organizations the meningococcus has a predilection for young recruits, but is usually inert in the absence of depressing or resistance-lowering factors.

2. The arguments for isolating meningococcus carriers to prevent the disease are not convincing, since consistent practice on that basis has proved not only extravagant and against military efficiency, but also impracticable and noneffective.

3. The search for meningococcus carriers and their disposition should not cause neglect of the more generally effective and easily controlled measures of hygiene, of which the following are of the greatest importance: The prevention of crowding among young recruits; the allowance of ample time for their "hardening" and "seasoning;" protection from weather, overwork, and fatigue; and the use of all measures that will promote the general health of the camp.

The laboratory work reported here was done under Surgeon O. J. Mink's direction by Assistant Surgeons C. W. Barrier, W. E. Morse, R. M. Choisser, and D. R. Higbee, United States Navy, and Assistant Surgeon C. Koenigsberger, United States Naval Reserve Force. Valuable data were contributed by Assistant Surgeon R. R. Spencer, United States Public Health Service, while accuracy in the number and distribution of the cases was promoted to a great degree by the work of Assistant Surgeon C. J. Robertson, United States Naval Reserve Force, in checking up transfers to the Naval Hospital and following the diagnoses established there.

SPINAL FLUID IN RELATION TO ACUTE INFECTIOUS DISEASES OF THE
CENTRAL NERVOUS SYSTEM.

By D. R. HIGBEE, Lieutenant, M. C., United States Navy.

So variable have become the manifestations of disease of the central nervous system that it may almost be said as a clinical axiom that no obscure case with nervous symptoms is completely surveyed without examination of the spinal fluid.

Previous to the year 1891 the cerebro-spinal fluid had been the subject of much speculation among physiologists, chemists, and pathologists. Many, indeed, were the theories advanced as to its origin, its analysis, and its functional relation to the anatomy of the brain and cord. In the year 1891 Heinrich Irenaeus Quincke, a German physician, invented a trocar and cannula for the purpose

of puncturing the spinal dura and obtaining fluid from the spinal canal.

Since that time both normal and pathologically changed spinal fluids have been subjected to the study of cytologists, chemists, pathologists, physiologists, and bacteriologists with a resultant massive accumulation of data which have been correlated with diseased states.

As a result of the very extensive examinations and researches which have been carried out it is now possible for the clinician and the technician to arrive at certain definite diagnoses and probable prognoses in diseases of the central nervous system and also to receive indications for certain methods of treatment.

It is only by a complete laboratory examination of the fluid that a correct interpretation of the pathologic processes developing within the central nervous system may be revealed. The lack of cooperation between clinician and technician has too often led to gross error in diagnosis, treatment, and prognosis.

Since the entrance of our forces into the war the assembling of large groups of men has kept us on the alert for the early detection of all contagious diseases, particularly meningitis. As a result much that is new has been disclosed and much that was formerly considered of little significance has come into its proper recognition. This advance has been made largely through the spirit of mutual helpfulness and cooperation which abounds in the military service. The laboratory worker has familiarized himself with the clinical aspects of this disease and has even been permitted to take charge of the wards where these cases are segregated. The clinician has also profited by visiting the laboratory and observing the methods followed for the detection of evidence of disease.

For example a new meaning has been given the term *clear fluid*. It has been shown that a water-clear fluid by actual count may contain any number up to 800 cells per c. mm. Consequently we no longer wait for a fluid to be definitely cloudy or under marked pressure before we consider the case one of meningitis or administer therapeutic serum.

Lumbar puncture as a procedure has in times past been regarded as altogether too serious a manipulation, and I believe in times present is much too lightly regarded. There should be definite indications for it when done and it should never be performed as a short cut to a diagnostic end. By so doing we depreciate our powers of observation and fail in conscientious physical examinations. I propose now to describe a detail in the technique of the operation which may be of service to those who work in the field where there is little opportunity to render the hands surgically clean. Select the exact

spot where it is proposed to insert the needle and touch this with the tip of an applicator immersed in iodine 10 per cent solution. Allow this to dry and then with the broad surface of the applicator paint the field of operation up to and including the edges of the small site selected for puncture. This small area will remain sharply defined. The first two fingers of one hand are widely spanned across this area, stretching the skin and holding it firmly against the spinous processes to prevent motion. The palm of the hand should rest on the back of the patient. The needle is engaged with the other hand only by the hilt and directed through the center of the small area selected. In this technique no gloves are required, and the operator's hands need not be specially prepared.

Every operation should be attended by the most careful consideration for the patient. It is only a matter of decency and an obligation that rests upon every operator to render the procedure as painless as possible. This can be easily and quickly done by needling along the line of the proposed puncture and infiltrating with any of the local anesthetics in 1 to 2 per cent sterile solution.

The fluid is usually collected in two sterile test tubes, because it so frequently happens that the first few c. c. are blood tinged. This first portion can be used for a Wassermann test after being cleared by centrifuging. For the cell count, the bacteriological culture, and the colloidal gold test, pure spinal fluid is required and the second portion is used. If the fluid is not blood tinged there is no difference to be noted and it may all be taken in one tube.

Inasmuch as the determination to do a puncture on a given case is based largely upon physical signs it is, of course, essential that the physician should acquaint himself with all the classical signs indicative of cerebral and spinal irritation. Physical signs are so intimately related to the anatomy of the parts that each sign elicited can generally be correlated with the localization of the process. For example, the Kernig sign when positive indicates an irritation of the lumbar region of the cord. When the leg is straightened out upon a flexed thigh the lumbar region of the cord and the plexus issuing upon it is put on a stretch and pain and inhibition by contraction of the extensor muscles will be elicited if there is irritation in the region. So also the Brudzinski neck sign is, when positive, an indication of abnormal tenderness in the cervical region. There is an inhibition shown by spasticity of the muscles of the neck and an attempt to overcome the stretching of the cord by flexing the thighs.

A sign which has hitherto been undescribed and so far as I am able to learn has never before been elicited will now be described. The arm of the patient is placed at the side of the body and a firm, steady pull is exerted at the wrist in the direction of the long axis of

the arm. This may also be modified by placing a soft but resistant roll in the axilla and finally pushing the abducted arm against the side. These manipulations stretch the large plexus issuing from the cervical cord. The sign is positive if the muscles of the shoulder and forearm inhibit the action and pain is produced in the back of the neck and head.

The first phenomenon generally noticed as evidence of an abnormal condition within the spinal meninges is that of increased pressure. The fluid is forced out in a stream and runs out in continuous flow. When under normal pressure the fluid comes out in a succession of distinct drops, and enough should always be withdrawn to reduce the pressure to this state whether or not serum is to be introduced, except in those instances in which the patient's heart action or respiration is seriously disturbed. Increased pressure usually occurs in all disturbances and diseases of the central nervous system, but is not of itself pathognomonic of any one condition.

The next evidence of an abnormal fluid is opacity. A normal fluid is water clear. The opacity is due to inflammatory products and cellular elements of the blood and endothelial lining of the canal. The opacity is of variable degree, and is only an indication of a serious lesion within the central nervous system usually an acute infectious process. But the fluid is not always turbid or even cloudy when such a process is present. Typically the fluid of tuberculous meningitis is water clear and under increased pressure. As stated above the term water clear is only a provisional description applied to that physical characteristic of the fluid. There may be as many as 800 cells to the c. mm. before any degree of opacity is perceptible. So in the early stages of any of the acute infections which typically yield a cloudy fluid at a later period, the fluid appears as perfectly clear. A microscopical examination for the exact cell count is the only reliable practicable way of determining whether a fluid has increased cells or not.

From time to time, usually following epidemics of certain infectious diseases of the nervous systems, articles have appeared in our medical journals detailing the results of a large series of cell counts and in substance tending to show that a differential diagnosis could be made by this method. One such instance in particular followed in the wake of the epidemic of poliomyelitis in New York City in 1916. The author attempted to differentiate poliomyelitis from spinal meningitis on the basis of a cell count. Nothing in medicine is less scientific. Any one who has a knowledge of the progressive tendencies of inflammation will readily appreciate that a high or relatively low cell count is a fairer index as to the stage and the acuteness of the process than of its particular identity or etiology. This rule, of course, would

not embrace those very virulent infections which are called fulminant and produce death before a reaction can occur.

Considerable attention must be given to the morphology of the cells found. This is especially true in dealing with the so-called clear fluids. There is infinitely more of diagnostic value in the morphology of the cells present than in the number. It is perfectly conceivable that a puncture may be performed at a time when the number of cells would disclose no information whatever and be within the limits of the cell count of any one of the disease processes to which the nervous system is subject. If the cells are found to be mononuclear our minds travel very different paths of thought than if they are polynuclear. In the former instance we think of noninfectious irritations, tuberculous meningitis, syphilis of the central nervous system. In the latter instance we are concerned with the various infectious meningitides which run a relatively short and severe course.

For the identification of bacteria cultural methods should be employed. It frequently happens that a reasonably certain diagnosis can be made by centrifuging the fluid and making stained smears from the sediment for microscopical examination. The sediment from a centrifuged sterile specimen should be heavily inoculated into a rich slant medium. First only a small area about the fluid of condensation is inoculated to instigate a good initial growth. Four hours later the entire slant is inoculated. The culture may be examined at 18 to 24 hours and subinoculations then performed with various sugar media to determine its fermentation reactions and with whole blood agar plates to determine the nature of its reaction with the erythrocytes.

The chemical analysis of the cerebro-spinal fluid is for all practical purposes limited to the detection of increased amounts of sugar and protein. Very complete chemical analyses have been made with so great a lack of uniform results that little value can at present be attached to them. Furthermore the methods are complex and the amount of fluid required is excessive.

There are several very reliable tests for the detection of an increase in protein. The Pandy, Noguchi, and Ross-Jones methods are all simple and are preferred by the writer. There is much to be said in favor of selecting one method and adhering to it. The accumulation of experience with a method is not the least important phase of the deductions which may be made from its results.

The protein in the normal cerebro-spinal fluid is derived from the blood by filtration through the choroid plexus and from the cellular excretion of the glandular cells. Whatever influences the greater permeability of this plexus and stimulates secretion will consequently increase the amount of protein. Such an increase, then, must always

be regarded as indicative of abnormal conditions. The etiology may be either traumatic, infectious, or toxic. The only deduction to be made is that there is irritation present. The amount of increase of the protein may be regarded as a rough index of the severity of the process. There is naturally a more marked reaction to an acute infectious disease with its toxic, irritating, and paralyzing powers and to an injury so severe as to create gross anatomical lesions than to a slowly progressing chronic process.

There is contained in normal spinal fluid about 0.4 to 0.6 gram of dextrose per 1,000 c. c. This is sufficient quantity to give a positive reduction of copper in the solutions of Fehling or Benedict. Benedict's qualitative solution is a little more sensitive than that of either Fehling or Haynes and the quantitative solution is a reliable reagent to use for measurement of the volume.

The sugar content in the changed fluids of meningitis cases is reduced. Several explanations of this phenomenon have been given. None of them are satisfactory. It has been claimed that the cellular elements increased in the fluid to so marked an extent absorb the sugar. The theory has also been advanced that the bacteria present use up a portion of the sugar in their metabolism. Very pertinent objections can be advanced against both of these statements. The cerebro-spinal fluid normally is not a satisfactory medium for the growth of organisms. It becomes much more nutritive and favorable to growth when the changed conditions which are present in infectious irritations prevail, viz., increase of protein. If the cellular elements absorbed the sugar present, then the centrifuged macerated sediment should disclose this fact when the test for copper reduction is made.

I believe that the natural law of physics can be successfully invoked for the correct explanation of this fact. Sugar is a dialyzable substance and normally penetrates the choroid plexus, but in the conditions where increased pressure prevails the tension is against this dialysis. Consequently the sugar content of the fluid is less than normal. This explanation may be correlated satisfactorily with the diseased conditions presented. The diseases which incite the greatest amount of increased pressure show the least sugar, often the total absence of sugar, e. g., cerebro-spinal fever and pneumococcic and streptococcic meningitis. The diseases which cause a less marked increase of pressure show a less marked reduction of the volume of sugar, e. g., paresis, tuberculosis meningitis, cerebro-spinal syphilis.

Further evidence in favor of this explanation is revealed in the examination of spinal fluids in patients suffering from systemic diseases which do not increase the pressure within the spinal canal.

In diabetes mellitus the sugar content of the spinal fluid is greatly increased and in renal insufficiency especially attended by high blood pressure the salt content is abnormally high.

SUMMARY.

A lumbar puncture should be done on every obscure case with symptoms relating to the nervous system.

This procedure should never be employed until a thorough physical examination has been made.

Every specimen of fluid should be subjected to a complete laboratory examination.

A clear fluid may contain as many as 800 cells per c. mm.

The number of cells present in the fluid depends upon the stage of the diseased process and its intensity. It is of no diagnostic value.

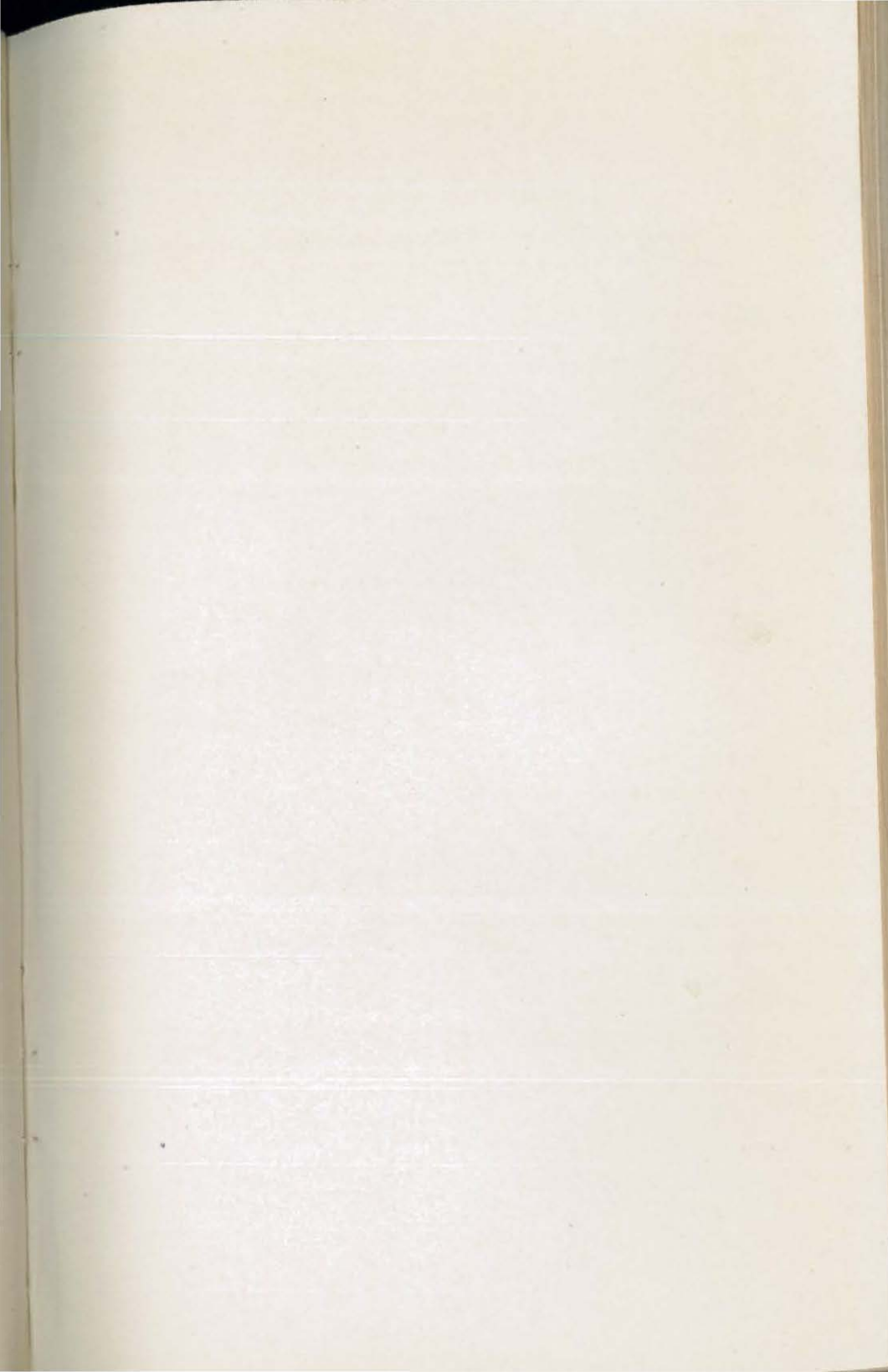
The differential cell count is of considerable diagnostic value.

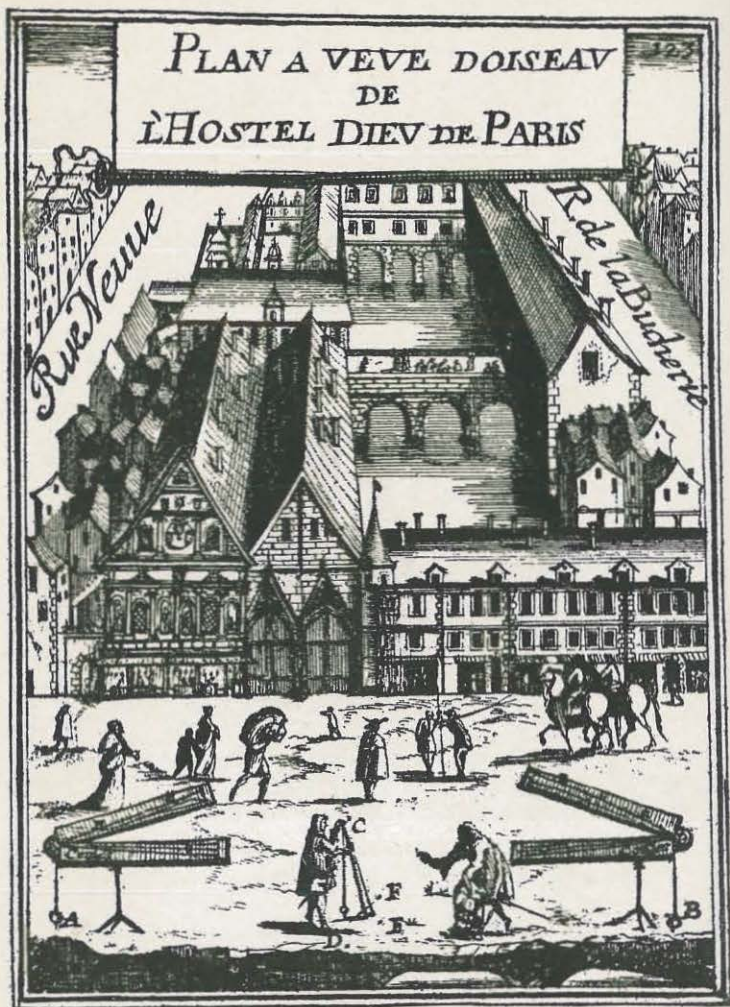
No single finding except the recovery and recognition of a microorganism is pathognomonic.

A new physical sign to be elicited in cases of meningitis has been described.

An explanation of the decreased sugar content of the spinal fluid in meningitis is offered, based upon the physical law of osmosis.

The laboratory findings in the changed spinal fluid can be correlated with the stages of disease in the acute infectious meningitides.





BIRD'S-EYE VIEW OF THE HÔTEL DIEU, PARIS, IN THE SEVENTEENTH CENTURY.

E. Lacroisnier and Babé, Paris

HISTORICAL.

THE HÔTEL DIEU OF PARIS.

Rome possesses in the Santo Spirito Hospital¹ the lineal successor of the largest institution of its kind erected in the middle ages. As Wylie² has suggested, the Ospedal Grande of Milan (founded in 1456 A. D.) furnished the model for our older type of block and corridor hospital. Lyons owed to Childeric, son of Clovis, and to Ultrogothe, his wife, a hospital founded in 549 A. D., which survived up to the fifteenth century. It is generally conceded, however, that the Hôtel Dieu of Paris is the oldest of the hospitals of Europe which have a history of unbroken service up to the present time.³ Certainly no institution extant in Europe to-day has had a more varied and checkered career or been more closely associated with the fortunes of the people who resorted to it in their indigence and distress or patronized and supported it in their affluence.

Having its origin in the benevolent enterprises of the national church, being through many centuries under the direct control of the cathedral chapter of Notre Dame, and at the same time the special object of royal munificence and parliamentary legislation; because its doors were open to rich and poor, Jew and gentile, Christian and heathen, bond or free, and its ministrations to no race or creed confined; because its resources were derived from all classes of society—nobles of the court, wealthy burghers, the very beggars on the street—and, finally, because it was so intimately connected with the many vicissitudes of religious and social life through which the city passed, the Hôtel Dieu of Paris is to-day an object of affection and veneration to citizens of every type.

It is common to regard the modern hospital as an essentially Christian institution and as one which has its origin with the foundation of Christianity, but this idea is not altogether accurate. There is

¹The institution comprises a hospital for every kind of disease, with 1,650 beds in ordinary times and double this capacity at need; a lunatic asylum with a capacity of 500 inmates; a foundling asylum through which some 3,000 foundlings pass annually.

²Hospitals, Their History, Organization, and Construction, by W. Gill Wylie, M. D., D. Appleton & Co., New York, 1877.

³The Hospice of Mont Cenis (A. D. 825) and the Hospice of St. Bernard (A. D. 980) were not hospitals in the ordinary sense. Baas, Hist. of Medicine.

reason to believe that long before the Christian era facilities for caring for the sick existed in Egypt and in Greece in connection with certain temples and the medical schools attached to them. In India hospitals were numerous and extensive fully three centuries before Christ, and it was not until the time of Constantine, three centuries after Christ, that the Christians themselves began to found institutions of this character. Nor is there any ground for the claim that Harun al Rashid and his Mohammedan successors were consciously imitating the Christian example when they started institutions of this kind in Arabia.

On the other hand, eleemosynary enterprises and charitable institutions, being typical of the Christian spirit, became more and more general with the spread of Christianity. The necessity for isolating the lepers, of whom there were many thousands in Europe, and the fear inspired by the contagious diseases brought back from Asia Minor by the crusaders caused lazarettos and hospitals to be constructed in large numbers. The proclivity of members of the religious orders to study measures of relief for sickness and wounds made monasteries and convents centers of medical aid and nursing, and the rules of hospitality which they practiced, the need for places of shelter at night when the prevailing disorder of the times rendered travel dangerous made it natural for the conduct of hospitals and kindred establishments to fall to the lot of the church, which took up the task more and more readily as its own organization was perfected and it acquired the authority and the funds necessary for the prosecution of all kinds of business. And so while in many cases hospitals were founded by bishops and other clergy, the Hospital of the Holy Spirit in Rome owes its origin in 1198 to no less a personage than a pope, and to one of the ablest that ever occupied the chair of Saint Peter, Innocent III. It was this Innocent who completed the work of Gregory VII, who made himself protector of Italy against foreign aggression and thus consolidated the temporal power of the church; who laid an interdict upon England and threatened England's king with a crusade; who compelled a King of France to take back the wife he had cast aside, and who interfered with the marriages of two Kings of Spain.

To-day we lavish money on marble, brass, tiling, and cement to make our hospitals fireproof buildings, capable of being maintained in the highest degree of cleanliness. The ordinary cleanliness of the housewife and the more minute cleanliness of the surgeon are the principal objects sought. Our poor and our sick who are sheltered by bare, undecorated, but sanitary walls are the objects of the same kind of love and charity which moved the people of the Middle Ages, when asepsis was unknown, to surround patients with objects of artistic beauty and to subject them to spiritual and religious

influences to lead them to God. Of hygiene, of bacteriology, of disinfection, the people of the olden time knew little or nothing, but of what they had they gave freely. Thus, in Pistoia in Tuscany, the Ospedale del Ceppo, built in the thirteenth century and remodeled in the fifteenth, has exterior decorations of rare beauty in colored terra cotta and enamel. Above the open arcade there is a series of groups representing the Seven Works of Mercy, the figures making a frieze rich in color and light and shade effects. The Hall of the Sick in the hospital at Tonnerre is a beautiful timber-roofed apartment dating from the thirteenth century, and now used as a chapel, Margaret of Burgundy, wife of Charles of Anjou, the foundress of the hospital, and Louvois, war minister of Louis XIV, being buried in it. Beaune, most widely known for its wine, boasts a hospital so well constructed that, though mainly of wood, it is still in good preservation after nearly five centuries of existence. Its high-pitched roofs, dormer windows, and elaborate gables, its council chamber, its tapestries, and the mural paintings and altar pieces must have delighted the eyes of the beauty-loving people who went there to be cured at a time when our country was but one vast Indian territory. In the days gone by, pleasure was believed to contribute to convalescence, and pious patron, architect, and builder were trying to benefit the sick as well as to gratify their own instincts, when they enriched the hospital ward and the hospital chapel with carvings and pictures. In Santo Spirito, Rome, the wards were frescoed with scenes from the life of Innocent III and of Sixtus IV. Platina, the distinguished humanist, the papal biographer, the custodian of the Vatican library under Sixtus IV, composed the inscriptions for the pictures. The belfry of its church is one of the most beautiful and graceful towers produced by the early Renaissance. Its altar boasts one of the few works of Palladio extant in Rome.

In the spring of 1914 I spent many a pleasant hour wandering about the streets of old Paris, but grieving to observe at every corner how fast old landmarks were disappearing, for the straightening of streets and the frenzy of sanitary reform in Paris did not end with Baron Haussmann and the Second Empire. That part of the left bank of the Seine between the Petit Pont and the Pont au Double has a peculiar charm and interest for the sight-seer who is a doctor, for not only did Paris' great hospital, the Hôtel Dieu, occupy this site as well as part of the bridges just named and a large area of the island known as Ile de la Cité, but here was located the School of Medicine and this section of the town was the habitat and resort of medical students and their teachers. Dante in the tenth canto of his *Paradise* refers to the Rue du Fouarre or Street of the Straw. We

see in this name a reference to the straw on which students sat during lectures at their near-by school. Here is a congerie of queer old streets—Rue Dante, Rue du Rat, Rue des Anglais, Rue de la Bûcherie, Rue du Haut Pavé, Rue de la Juiverie, Rue St. Séverin—many of which are doomed to disappear as have so many others already. I searched in vain amid builders' high wooden fences for the ruins of the wall of Philippe Augustus, looked in for a moment at the Church of Saint Julian the Poor, which Baedeker says was once the chapel of the old Hôtel Dieu, and then sauntered down the street of the Hôtel Colbert, a building in the shape of a rotunda, used as a lecture room by the faculty of medicine for a trifling matter of 300 years and then as a school of anatomy. It is not far to the Medical School, with its museums and laboratories, and to the famous Hôtel de Cluny, where Mary Tudor, the "White Queen," enjoyed her merry sports and pastimes in that endless round of pleasure which brought her elderly husband, Louis XII, to the grave.

The Hôtel Dieu of modern Paris stands near but not on the precise site it originally occupied, having been reerected between 1868 and 1878 on the side of the great cathedral square opposite instead of adjacent to the small branch of the river. The buildings are thus lacking in those examples of mural decoration, of plastic art, of architectural charm found in establishments of older construction, though much of the original structure erected by Eudes of Montreuil, builder for Louis IX, remained unchanged almost to our own time.

The Hôtel Dieu of Paris was founded by Saint Landry, twenty-eighth bishop of the city, about the middle of the seventh century, when he assumed responsibility for the support of many poor people who sought asylum in his palace. He disposed of many treasures of the Church in order to meet these obligations and the year 660 has been assigned as the exact date of the selection of a special building for the case of the sick. It had been occupied previously by the nuns who had charge of the treasures and linen of the Cathedral of Notre Dame, and from its connection with the chapel of that name the hospital was first known as the Hôtel Saint Christophe.

Erchinoald, Mayor of the Palace and styled Count of Paris who died in 641, bequeathed land on which stood his palace and chapel for hospital purposes. (Felibien History of the City of Paris, 1725, Vol. 1.) In 829 this building was torn down and the first building intended specifically for the Hôtel Dieu was erected. This is not accepted by Chevalier,¹ who believes that when the bones of Saint Christopher were moved from Toledo, Spain, to Saint Denis, in 640,

¹ Alexis Chevalier in "L'Hôtel Dieu de Paris et Les Soeurs Augustines." H. Champion, Paris, 1901.

they were deposited in a chapel named for him, and that when under the patronage of Bishop Landry a hospital was founded here, the nuns from a convent near-by were persuaded to undertake the nursing of the sick therein. The institution was known as Saint Christopher's Hospital up to the eleventh century, though there is a manuscript extant, dated 1164, which alludes to the tearing down of the hospital and its reconstruction on the north shore of the smaller arm of the Seine.

The original name of the institution was *Domus Dei*, or House of God, and its motto was "*Medicus et Hospes*," or Healer and Host.

The primitive hospital consisted of four wards or halls capable of accommodating a total of eight or nine hundred patients. Of these, the St. Denis ward, to which were assigned those desperately ill, was erected through the munificence of Philippe Augustus. The *Infirmierie*, and the St. Thomas ward for convalescents were equipped largely by the contributions of Queen Blanche, mother of Louis IX (1210 A. D.). The new ward was for women. The basement of the latter was for maternity cases. The unfortunate situation of this ward rendered it damp and unhealthy, but the women awaiting confinement had to stay there, except perhaps the few lucky individuals who might be detailed to help with sewing in the linen room. There was a feeling that pregnant women were unsightly and so could be stowed away in an out-of-the-way place with the utmost propriety.

The location on the river had advantages and disadvantages. The stream certainly prevented other buildings from springing up in too close proximity to the hospital, thus reducing the light and the circulation of air in its vicinity, and it served as a sewer. The water-closets were located directly over the river and for a long time were connected with it by gravity alone.¹ The journey thither from some parts of the hospital was considerable and involved no little trouble for the patients and their attendants.

When a sick person passed the porter's lodge, was admitted as a patient and assigned by the sister, who presided at the entrance, to the proper ward, he confessed to a priest, surrendered his clothes to a caretaker, who saw that they were washed and cleaned, and carefully stowed away to be returned to him on recovery or sold at auction in case of death. He was then put to bed naked except for a nightcap, and it was a rare and unusual thing for the newcomer to enjoy a bed to himself. Usually the patients slept two and three in a bed and in time of famine or pestilence, when the wards were crowded, it was often necessary for six or eight persons to sleep together. The beds were large, four-poster beds, fitted out with one

¹ In the same way in the *Hôtel Dieu* at Amiens and in other houses of that city built on the Somme the water-closets overhung the river corbelwise.

or two feather pillows, huge bolsters and straw mattresses resting on cords in lieu of springs. These mattresses were made over three times a year. The supply of linen was plentiful, a thousand sheets being the allowance per week in wards, with a reserve of a thousand in the linen presses. There were gray quilts for use in cold winter weather. They were lined with fur from dog, cat, sheep, squirrel, or fox, several kinds to a quilt. The work of renovating the beds was done by nuns, novices, and convalescent patients and the completion of this huge task was invariably celebrated by a banquet.

Crude as were many of the provisions for the sick, we must remember that they were in harmony with the times and analogous to what patients had been used to in their own homes. It was not till very late in the Middle Ages that a traveler could expect a bed to himself at an inn,¹ and certainly among the middle and lower classes any special nightdress was a thing undreamed of. If a person did not choose to sleep in his clothes he slept without them. It was, however, a real hardship for the delicate and infirm to have to turn out at night and make long pilgrimages to the toilet, especially in winter, and with their clothes locked up. Each ward, therefore, had a supply of cloaks or dressing gowns and slippers, and the old records and chronicles contain frequent reference to the night nurses' specific duty of assisting the sick or the old on these expeditions.

The fact that no diagnosis was made on entrance and that patients were sent where there was most room meant that a madman, a man with a broken limb, or a case of smallpox might find themselves not only inmates of the same room, but actual bedfellows. Until Francis I, in 1535, founded a special hospital for children there were always from fifty to a hundred in the Hôtel Dieu, though there was no provision for them. Usually they were not sick, but accompanied their sick mothers because they had no other place to go. While we can condone lack of ventilation and limited heating facilities, it is terrible to think of children occupying a bed with the syphilitic or the insane.

Syphiliphobia became rampant during the last years of the fifteenth century, as the contagion had become very general in France and more particularly in Paris with the return of Charles VIII's army from its disastrous sojourn in Naples. Very strenuous efforts were made in Paris to segregate the victims of the disease, special houses being assigned them. One of these was in close proximity to the dwelling of the canons of Notre Dame, but these reverend gentlemen naturally took alarm and, following their vociferous representations, the patients were removed from that locality. Remarkable to relate, the general scare about syphilis died down before anything

¹ A stained-glass window in the church at Triel, Canton of Poissy, Department of Seine et Oise, shows three travelers in bed together at an inn, looking comfortable and happy.

definite had been accomplished in suppressing the disease and there has continued to be any number of cases of syphilis in Paris from that day to this, so that one does not have to go to Naples to acquire it. It is certainly interesting to note that the one class of unfortunates against whom the portals of the Hôtel Dieu remained ever closed was that of the lepers, the country being liberally provided with asylums for them.¹

Primitive as were the arrangements of the Hôtel Dieu up to the beginning of the eighteenth century, it must have accomplished an incredible amount of good. Not only did it receive the sick but the poor and the destitute resorted thither for free lodging, beggars sometimes received alms there, and in time of war it sheltered also refugees and soldiers. Even when cured the poor patient was allowed to remain for another week, a well-meant regulation which unfortunately did not always bring good to the beneficiary, since it was quite common for convalescents to pick up some new disease on the verge of their departure.

There was progressive improvement in the installation and management and internal discipline of the hospital up to the fourteenth century, and from this time dates the most flourishing period of its existence. Patients were regularly admitted from 6 a. m. to 6 p. m., but in emergencies could gain admission at any time. During the eleventh and twelfth centuries there appears to have been no surgeon or physician regularly attached to the hospital, attendance being given by priests who had some notions of medicine or by sisters. The patients were fed twice a day—at 11 a. m. and at 6 p. m. Beside each bed was a rack or table for the earthenware wine bowl, the drinking cup, the wooden bowl, and wooden spoon provided each patient. There were three fast days a week for all hands. Mutton was the commonest variety of meat served. Beef was rare, and veal, lamb, or pork was only to be had on special holidays and feast days, perhaps ten times a year in all. The dietary included soups, eggs, fresh-water and salt-water fish, figs, grapes, sugar, oatmeal, cheese, and tarts. There was a definite allowance of milk for each ward daily. The dietary for fast days included cured and smoked herrings and onions preserved in oil, etc. Patients who were seriously ill received the best wine and fowl of all kinds—spring chickens, goslings, pigeons, and capons. If they had no stomach for meat, broths and jellies were prepared for them, but sometimes they could be made to eat it when it was served as a roast. For the milder cases, cod and whiting were good enough, but those who were very ill could have special dishes of

¹ In 1226 there were at least 2,000 lazarettos in France and ten times that number in Europe for the segregation of lepers and later for the separation of cholera and smallpox cases due to the crusades. The French leper homes were abolished in the reign of Louis XIV. Baas, *History of Medicine*.

small, delicate fried fish. Bread was baked in the hospital four times a week, and it was of three grades—ordinary bread, fine white bread, and brown bread. Other bread was bought outside or sent in as a charity. It was customary for the master bakers of Paris to make an annual visit to the hospital, upon which occasion they were expected to make a gift of six dozen loaves and an equal weight of pastry.

On holidays and fêtes herbs and flowers were strewn everywhere and counterpanes of bright color and "storied carpets" were put on the beds. There was a special room for such hangings and draperies and they were brought out but four or five times a year. Meanwhile the altars in Notre Dame were decorated and all the statues of altar or chapel were crowned with chaplets of roses. The holiday would end with a banquet, when there would be an extra allowance of wine and ample store of pigeons, goslings, and tarts. The fragments were carried to the poor, who were never forgotten. As it is a matter of record that the brothers and sisters looked forward eagerly to such holidays, it may be inferred that the lion's share of the banquet went to the worthy priests and pious sisters who ministered to the wants of the sick, and we can see no harm in this, for the laborer is worthy of his hire, and surely it would have been killing them with kindness to line the lean paunches of dying beggars with fat capons. Whenever the corporation of drapers assembled it was their custom to send to each patient in the Hôtel Dieu a measure of wine, a roll, and a piece of beef or pork, while each occupant of the lying-in ward received a plateful of food. The master grocers, bakers, and spice merchants were equally kind. Members of certain trades, seeking promotion from apprentice to master, were required to produce and exhibit before their judges a sample of their handiwork. Thus, the pastry cooks, when qualified, sent their masterpieces to the Hôtel Dieu after they had been inspected by the judges. The greatest windfall of the year was the annual banquet given by the rich guild of jewelers. It came at Easter. Each patient received a bowl of soup, a roll, a measure of wine, two eggs, a portion of roast veal, a cracknel, and a generous purse of money.

On leaving the hospital cured (or, as sometimes happened, merely disgusted) each patient got back his clothes, mended and cleaned, often with a shirt added and an extra penny or two in the pocket, and he was furnished with a certificate that he had been a patient in the Hôtel Dieu, which entitled him at need to receive further aid from the Hospital of the Holy Spirit of Paris (throughout the middle ages Holy Spirit was a favorite designation for hospitals). But auctions of the effects of the deceased were very frequent, as the

mortality was high. The dead were buried in a common trench of vast proportions, which was dug once a year and filled in a little at a time as sad occasion demanded. The still-born babies of the Hôtel Dieu and vicinity were disposed off in a peculiar way. Connected with the hospital was a tower, called the Tower of Limbo, having a central chamber filled with quicklime. One sister was specially designated as the custodian of the key to this chamber. Hers was the duty of throwing the little bodies into the lime "that they might be quickly consumed."

The munificence of some of the French monarchs did much to insure the permanence of the Hôtel Dieu, and in times of financial distress or when the demands upon the institution called for unusual expenditures an appeal to the king always brought relief. Philippe Augustus, Louis IX, Queen Blanche, his mother; Henry of Navarre and his son Louis XIII, even Louises XIV, XV, and XVI, were conspicuous for their interest and practical help.

In 1209 a royal order assigned to the Hôtel Dieu the straw of the king's room and of his palace during the monarch's absence from the city. Reference has already been made to the architectural construction carried on under Philippe Augustus, Louis IX and his mother, to the generous contributions of various guilds, to the legacies of the canons of the cathedral. Saint Louis assigned a portion of the taxes to the Hôtel Dieu and exempted it from paying tolls on provisions brought to it by land or water. Under this ruler the custom of giving money and food (grain and herrings) to the poor of hospitals and lazarettos during the Lenten period was sanctioned by law. These ordinances were duly confirmed by Philippe V and Charles IV. A definite amount of wood went annually to the Hôtel Dieu from the royal forests, and officers and purveyors of the royal household were prohibited from commandeering for temporary use, as was done in case of private individuals, the horses, oxen, or carts belonging to the hospital. In return for the gift of wood the brothers and sisters of the hospital were responsible for carrying the sacred relics of the Sainte Chapelle to wherever the king might be when absent from the capital, provided the distance was not greater than 34 leagues, nor could this duty be imposed oftener than four times a year.

Philippe VI, founder of the House of Valois, and whose claims to the crown were contested by Edward III of England, leading to the Hundred Years' War, was a patron of the Hôtel Dieu. He initiated the practice of letting the hospital send its herd of hogs to feed in the royal forests, merely limiting the number of animals to 200 a year.

It became the fashion for the queen to visit the Hôtel Dieu every Good Friday, and, of course, a visit at such a time meant liberal dona-

tions from members of her court as well as from the monarch. In time, too, the custom sprang up of presenting to the hospital each royal cradle and of buying it back at a fancy price when needed, while on the death of a queen the furniture of her apartment was given to the hospital.

In the twelfth century the cathedral chapter passed an ordinance by which every canon was required to bequeath to the Hôtel Dieu his feather bed and sheets. Likewise, every canon who received a promotion had to make a similar offering. As we turn over the records of the hospital we come in the course of time to mention of a lawsuit before the Court of Parliament of Paris, brought by the Government commissioners of the Hôtel Dieu against the heirs of a certain canon, the complaint being that said heirs had turned over to the Hôtel Dieu the feather bed, bolster, and sheets belonging to the deceased, but no covering, tester, or curtains. The lawyer for the defense replied that the sisters no longer tended the canons when they were sick and so did not deserve liberal alms and legacies. The Procurator General, however, considered this countercharge irrelevant, approved the contention of the Hôtel Dieu, and ordered the deficiency to be supplied:

The revenue from all these sources, however, was relatively insignificant and not to be compared with that derived from the fines imposed and the confiscations made by civic officials of Paris. As the kings themselves often set the bad example of issuing a debased coinage, it was to be expected that the use of false weights and measures should be very general. Whenever the fraud was detected the foods and stores involved became the property of the hospital, which was largely supplied with candles in this way. During one period of the city's history the executioner was empowered to turn over to the hospital all stray hogs captured in the streets, and, though he only received a few cents for each animal apprehended, the annual gains from this bloodless duty were considerable. In 1418 Capeluche made quite a neat sum in this way.

One gets a striking sidelight on the critical situation of France just before the mission of Joan of Ark was accomplished and when two kings claimed the sovereignty and were actually acknowledged by different factions, from the record of two gifts made to the Hôtel Dieu. While the wife of Charles VII, the rightful ruler, sent 4 livres, the Duchess of Bedford, whose husband represented Henry VI of England, the rival claimant, sent a matter of 80 livres.

Henry of Navarre built two hospitals in the suburbs of Paris for syphilitic and contagious cases, thus carrying out plans made long before his day. More than this, he rebuilt the Saint Thomas and Saint Denis wards, his architect, Claude Vellefaux, substituting a

single arch for the previous double groin, a modification which helped to emphasize the passing of the Gothic style. Vellefaux was followed by his pupil, Gamard or Gamart, who constructed the Pont au Double and on this erected the Rosary Building, a two-story structure opening on the Rue de la Bûcherie. Even before coming to the throne, while still engaged in the terrible struggle which had reduced France to poverty and starvation, Henry of Navarre had shown an interest in the inmates of the Hôtel Dieu. It is not hard to believe that genuine sympathy as well as shrewd policy prompted him to send relief to the unfortunate patients of this establishment while he was actually besieging the city. We read that in 1591, while occupying Chartres, called the granary of Paris, he dispatched liberal provisions of wine and wheat to the Hôtel Dieu. It was by such acts as this that he prepared the way through men's hearts to the throne, and many a Parisian burgher would have welcomed him to it even before the hated heretic had removed the last obstacle in his path by abjuring his faith. Throughout his reign the Vert Galant showed himself a lavish patron of the hospital and his example was, of course, followed by the court, whose members vied with each other in their display of generosity. It became the fashion to give and to give liberally.

During the declining years of Louis XIV the financial administration of the Hôtel Dieu became heavily involved and royal sanction was obtained for converting into cash a considerable part of the real estate owned by the institution. A huge lottery was also organized in this reign, the king being one of the chief promoters of the scheme and buying a thousand tickets. The tickets were on sale all over France, and the lottery netted a very large sum to the hospital. Under Louis XIV a statute was enacted, though not enforced until the time of his grandson, Louis XV, by which a levy was made on all money paid for admission to public shows and entertainments. Thus one-ninth of the price paid for tickets to opera or comedy in Paris went to benefit the inmates of the Hôtel Dieu. Still so dire was the need of increased revenue that these measures did not suffice, and, in addition to the collections taken in all the churches of Paris, a house to house visitation was undertaken to raise further sums and charitable women banded themselves together to contribute to the comfort and welfare of the patients.

From its very foundation the hospital had derived a very large part of its income from the legacies of devout or charitable persons. The Hôtel Dieu was beloved of Parisians and Frenchmen and there are scores and scores of documents extant which show how universal was the practice of bequeathing to the hospital clothing, furniture, money, lands, and houses. From the earliest times it had been a

pious custom to mention the hospital in one's will, and if, with the decay of earnest religious belief, pious custom changed to society's fashion the material gain of the beneficiary was not reduced. Everybody left something to the Hôtel Dieu, from the king to the humblest artisan in his dominion. The Dukes and Duchesses of Berry, Brittany, Artois and Anjou, and the king's barber and his wife, the seller of parchment, the prosperous fish monger, the Captain of the Bastille remembered the Hôtel Dieu when they came to die. Out of 48 wills filed for probate before the Parliament of Paris in the reign of Charles VI, 40 contained clauses in favor of the great hospital.

Cardinal Mazarin contributed huge sums to the Hôtel Dieu and heartily desired to have a special hospital built for convalescents in connection with it. He arranged for the suppression of the ancient priory of Saint Julian the Poor, which was falling into ruins. All its rights, rentals, and privileges were to accrue to the Hôtel Dieu and the ground and buildings were to be assigned to convalescents. Unfortunately the great cardinal's wishes could not be executed and the plan fell through owing to legal complications connected with the transfer of the property, but the great bulk of the testators, unlike cardinals, left wife or child whose support had to be considered, and so we find that a very large proportion of the legacies gave a life interest in the transferred property to wife, sister or cousin. It is interesting to read the records of these transactions because on each page we get a fresh glimmer of light on the history of Paris itself.

Among the earliest papers we find a brief and businesslike statement that Renaud Crest and Joan, his wife, on the point of starting for Jerusalem, relinquish in favor of the Hôtel Dieu their part of the inheritance of Agnes Battle, their aunt, in case they never return from the Crusade (February, 1225 A. D.).¹ Many legal documents are concerned with the rental of property deeded to the hospital. In 1190 the brothers of the Hôtel Dieu of Paris rented a house for a stated sum to one Bencelin and Sedilie, his wife, the Hôtel Dieu obligating itself furthermore to lend to Bencelin during his lifetime four mattresses and some pillows. About the same time one Renaud de Mello presented to the Hôtel Dieu a house situated near St. Landry. It was doubtless to enhance the rental value of this building that Philippe Augustus decreed that its occupants should be subject only to trial by the king except in cases of murder, homicide, theft, treason, and rape. It was the common practice also to assign to the Hôtel Dieu a definite proportion of the yield of certain vineyards, wheat fields, forests, and farm lands. One Simon, occupation not given,

¹ Archives de l'Hôtel Dieu de Paris (1157-1300) : Bryèle, Imprimerie Nationale. Paris, 1894.

but styled *Vir Nobilis*, presents the Hôtel Dieu with a barn located not far from where the Hôtel de Cluny now stands. Adam, former king's clerk, presents to the Hôtel Dieu a house in a certain street, another in a certain alley on condition that a portion of the revenue from these houses shall be employed every year on the anniversary of the death of the giver to supply the patients at the Hôtel Dieu with whatever they may demand to eat. There was Perrenelle, who in her lifetime gave to the Hôtel Dieu a vineyard, exacting in return for it one hogshead of the wine made from its product for her own use. Among the humble benefactors of the great and popular institution we find harness makers, saddlers, blacksmiths, tick makers, weavers, pewterers, mustard makers, locksmiths, butlers, barbers, dyers, pastry cooks, and old-clothes men. A little higher in the social scale comes the sergeant of the schools of Paris, a king's cook, a beadle, a church warden, a knight, a librarian, an abbot, a grand chamberlain.

The names of the streets referred to in the various deeds are interesting. There was a rue des Anglais, des Peintres, de la Juiverie, like the old Jewry of London, the Street of the Harp, the Street of the Fishing Cat, Straw Street, Butcher Shop Street, and others which survive to our own time. In 1229 A. D. Herbert the Sempster, at Brie, brought suit against the Hôtel Dieu because from a house owned by it all sorts of things were constantly falling on his own house. He had to pay the costs and was told that he could remedy the situation by adding stories to his residence until it dominated the source of trouble. One broad-minded individual divided his estate between the Hôtel Dieu and four poor students of Paris to be selected annually by properly constituted authority. Unremembered for face or figure, Alice,¹ washerwoman to the Bishop of Paris, has her small niche in the hall of fame, because she bequeathed her accumulated savings to the great hospital for the poor.

During the middle ages a very large revenue was derived from the sale of pardons and indulgences or their bestowal on generous benefactors of the hospital. Each year the master of the hospital solicited from the Pope the necessary bull authorizing the practice. When it was received the churches of the city would be crowded and likewise the chapel and buildings of the Hôtel Dieu. On the day of the pardon high mass was said at Notre Dame while the cathedral bells

¹ In turning over the archives of the Hôtel Dieu, of Paris, from 1157 to 1300 one is struck by the unusual character of the women's names in vogue during that period. Few of the names that follow are in use to-day, and the majority of them had disappeared by the sixteenth century:

Allx	Douce	Fauque	Lislarde	Sancellne
Amellne	Edellne	Gille	Offenge	Sedille
Assellne	Eliend	Havoie	Odellne	Thece
Avoie	Erchenoud	Hersende	Perrenelle	Theophanie
Avellne	Erembourg	Hessellne	Rance	Tiphaine
Bastle	Eudellne	Mahaut	Richeut	

pealed. Fifty priests were on hand in Notre Dame to hear the confessions of strangers. Pardons were likewise published throughout the provinces, preachers selected for their eloquence being dispatched to the provinces to stimulate interest, and they were accompanied by brothers from the hospital who attended to the actual sale of the indulgences.

By a decree of Parliament passed in 1552 the care of all foundlings had been assigned to the Bishop of Paris, and there existed in the Cité, hard by the cathedral and episcopal palace, a house known as the *Couche*, where these unfortunate creatures were received and cared for. In 1634 a widow woman assisted by two servants, under the surveillance of one of the directors of the *Hôtel Dieu*, did all the work necessary for the care of the foundlings. The pay of these women and the expenses of the *Couche* were defrayed by alms received at the portals of Notre Dame. "There, under the porch, on the left-hand side, it was customary on holidays to set out a wooden trundle-bed in which were deposited a few foundlings to excite the people to contribute to their support. The nurses stood near, pointing them out to the passers-by and to those going into the church and repeating this prayer: 'Do good to these poor children, worthy people.'"

The available funds for this work were scant while the number of foundlings to be cared for steadily increased. "Nearly all these poor little creatures died." The servants took little care of them; administered narcotics to make them sleep; sold them to beggars, to bargees, to persons who wanted to use them in connection with magic and necromancy. Fortunately M. Vincent de Paul got some of the *Dames de Charité* to inspect the place, and, as he had anticipated, they came away horrified, with the result that a small number were at once adopted and removed from the *Couche*, and in a few years the entire care of the foundlings of the *Hôtel Dieu* was assumed by this worthy society.

Thus the *Hôtel Dieu* participated in the general improvement of conditions which characterized the reign of Henry IV under the able directorship of his prime minister, Sully. As stated above, the first Bourbon made it the fashion for one's charities to center around a hospital. It would appear that the enthusiasm and zeal of some of the noble women who took to visiting the *Hôtel Dieu* passed the bounds of moderation, for we find the hospital authorities inviting them to come and watch the distribution of food, to observe the details of treatment, and satisfy themselves as to the care the patients were receiving, but while they were urged to require the sisters scrupulously to perform their duties, the lady visitors were earnestly requested not to take any of them upon themselves. Indiscreet

then as now, the worthy dames and misses soon required the imposition of still further restrictions. Thus in April, 1612, the hospital board strictly forbade the sisters to receive gifts of bread, wine, and meat, which bring more discomfort than profit to the patients in the long run and entail "much confusion." In the same year we find the authorities becoming aroused (perhaps through the agency of the lady visitors) to the annoyance that might come to the occupant of a double bed by the inconsiderateness of his bedfellow—as in dying overnight. It was ordered that every ward should have a couple of spare beds to which patients could be moved temporarily when it became evident that those sleeping beside them were about to die.

The winter of 1709 was long and rigorous. It was a bad time for France and especially for the poor and the sick. Louis XIV sent his gold plate to the mint and the Cardinal de Noailles, Archbishop of Paris, melted up his silver that they might devote the proceeds to the poor. There were 240 cases of scurvy at one time in the Hôtel Dieu. Patients lay four and six in a bed and on the floors, and many beds had been set up out of doors. By September the deficiencies in the hospital funds amounted to 349,000 livres and during the course of the year 4,500 patients, among whom 600 cases of scurvy, had been transferred from the Hôtel Dieu to the Hôpital Saint Louis.

Dueling was at this time a universal practice. On the most frivolous pretext swords flashed from their scabbards and through the most fine-spun notions of honor hundreds of noblemen lost their lives each year. In 1609 Henry IV had promulgated an edict on the subject, assigning all fines and confiscations, in connection with the suppression of dueling, to the benefit of the Hôtel Dieu.

The period from the middle of the fourteenth to the end of the fifteenth century was apparently that of the Hôtel Dieu's greatest prosperity. Absolute cleanliness prevailed in the wards. In a single year as many as 1,300 brooms were used in the buildings. Every morning the floors were washed by valets and there was a grand annual scraping and whitewashing before Easter. It is remarkable that about the beginning of this period running water was available for use in the wards, being piped to them from huge overhead tanks on the roof. Such an equipment naturally resulted in great economy of time and labor for the employees.

Though the records of the Hôtel Dieu abound in interesting details regarding the architectural structure, internal arrangement, and administration, and though there is a considerable literature dealing with the administration of this great asylum for the suffering and needy, though all the different phases of its career as a church institution whose purpose was to confer spiritual blessings as well as relief

to bodily ailment are handed down to us in detail, the references to the purely medical features are few and meager. There would perhaps have been ample time to record the doings of the doctors and surgeons had there been a feeling that such a record would have value, but apparently the professional men played but a small part in the life of the Hôtel Dieu and there seems to have been no regular medical staff connected with the hospital before the eleventh or twelfth century, the priests and nuns giving the required treatment as best they could. Still, there is some gratification and comfort in the silence of history regarding the doctors, since not a few of the names most conspicuously emblazoned on the history of the Hôtel Dieu are there held up to the obloquy of posterity.

With the beginning of the thirteenth century the master of the Hôtel Dieu made a definite agreement by which the services of a doctor and a surgeon were retained for the patients of that establishment. In 1221 a certain Hubert agrees to give his professional services gratuitously to the hospital. To this same epoch belongs Vincent des Bois, who not only offered his services free, but made a gift to the hospital of 40 pounds parisis. In spite of these worthy dispositions the affairs of des Bois did not prosper and penury overtook him in old age, when the master, in recognition of past services, granted him a small annuity from the funds of the hospital.

From the thirteenth century on the Hôtel Dieu was an integral part of medical instruction in Paris, and graduates in medicine were required to receive the master's robe either at the Hôtel Dieu or at the Mathurins.

By the fourteenth century the professional service at the Hôtel Dieu stood on still firmer basis. It was intrusted to two surgeons, who were required to take a solemn oath at the Châtelet before undertaking the "king's service" at the Hôtel Dieu.

During the Middle Ages there was no pharmacy in the modern sense at the Hôtel Dieu. The master bought from the spicers and grocers of the neighborhood the drugs and medicinal plants required. The concoction of simple draughts and the preparation of ointments fell to the lot of the nursing sisters, and it would seem that the earlier physicians relied largely upon very simple remedies, baths, exercise, and modifications of diet. Special provision was made for the bathing of patients. Stationary baths were not employed until very recent times, as it was found sufficiently easy and convenient to use portable copper tubs, which could be rolled into the ward and to the bedside as occasion demanded. The baths were hot, of course, and the water for them was heated in huge cauldrons intended for that special purpose. The lying-in department was managed by a nursing sister, the specific services necessary being rendered by a midwife with one assistant. The ob-

stretcher service was an important feature of the hospital and although from 60 to 100 children were present there at all times, some of whom had been abandoned on the steps of the building, while others had been brought there by sick mothers who had no place to leave them, but one wet nurse was permanently employed for the children at the breast.

The sanitary features of the hospital have already been alluded to, but it should be said that they varied considerably in different periods of the hospital's history. At one time we find it stated that there were huge fireplaces in each ward where fires could be lit in winter, and that in very cold weather it was customary to draw up and down through the wards iron wagons full of glowing coals. On the other hand, we find a worthy prioress complaining of the parsimonious administration of affairs and telling of how she had to burn the straw from mattresses in order to save patients from freezing, and there is a record of a joint complaint made by patients in regard to the quality of the food served and the temperature of the wards. It is impossible to read the history of the *Hôtel Dieu*, full of the petty strife of rival aspirants for control of the institution, full of the bickerings of envious factions among the nuns, full of the bitter struggle between the lay authorities of the Government and the ecclesiastical officers, without realizing how little human nature changes from age to age. Now, as in the past, the sick patiently endure pain, are the victims of dubious treatment and extortionate bills, and endure humiliations of all sorts without a murmur, but complain bitterly and promptly of insufficient heat and poor food, whether in an expensive room in a private infirmary or in the free wards of a charity hospital.

High up under the roof were windows which by means of cords and pulleys could be opened in summer time to improve ventilation. In the seventeenth century a supply of juniper wood was kept on hand, and a little of it was burned from time to time in the wards to drive away bad smells. The glass was stained so as to soften the light. At night the wards were in darkness except for miserable rush lights between the beds. It is noteworthy that within a space of 10 years' time in the latter part of the fifteenth century at least two donations were made to the *Hôtel Dieu* to provide lights for the toilets that overhung the river and for lighting the approaches to them. The site of the hospital on both banks of the smaller branch of the river and on two bridges favored dampness. Owing to its location in the basement, the lying-in ward was particularly bad in this respect. Worse still was the main washroom or laundry, where a number of the novices were employed all day in washing the hos-

pital linen.¹ When the river was high the laundry was often flooded, and it was considered a wise precaution to have a boat moored there and provide the boatman with a boat hook so that he could salvage laundress and linen if the tide threatened to bear them off.

The good nursing sisters had a passion for linen. It was abundant and of fine quality. Closets, shelves, bureaus, wardrobes, dressers, chests in hall and linen room, in ward and corridor were filled to overflowing. Once a month the prioress went to market. Early in the morning a cart would be hitched up, and accompanied by a brother and one or two sisters the prioress would start for St. Denis, her chaplain following on horseback. She returned late in the evening and next day the new linen would go to the laundry, the dyer, or the sewing room. The itinerant linen merchants passing through Paris never failed to go to the Hôtel Dieu to offer their wares, because they could often dispose of the entire lot there. The February and June fairs were occasions of great moment and many a hard bargain was driven at them. All the year around four sisters were busy from morning till night repairing, sewing, hemming, or cutting up bedspreads, bolster covers, sheets, and pillowcases. The big laundry and the small laundry between them occupied the whole time of nine sisters and six novices. They worked near what we might call the tradesmen's entrance, where boats made fast to deliver the butcher's supplies and the provisions and stores from the farms belonging to the Hôtel Dieu. It was here, too, that brothers embarked when going to visit remote estates to inspect the crops, collect rents, etc. When the clothes were all washed they were hung along the balconies to dry, but often so great was the quantity of linen there was no place outside and much of it had to be brought in and hung in the wards. Patients often complained of the dampness that resulted.

Mention has been made of the syphilitic patients who swarmed in Paris at the time of the Italian wars and of the wholly inadequate measures for their segregation. It is equally terrible to read how the place was overrun during the prevalence of the pestilence, and that by putting the beds close together they could accommodate 12 to 15 in each; and yet, but a few years before, the papal legate, Cardinal Duprat, had generously endeavored to provide the additional accommodations so greatly needed by purchasing two buildings in the vicinity for use until such time as another ward could be added. The buildings in question were known as the Chef St. Quentin and the Fishing Cat. When the new ward was finished it was known as the Legate's Ward and it held a hundred beds.

¹ "Let us realize how many girls there are at the Hôtel Dieu who all next winter will stand in the waters of the Seine, frozen up to their knees, in order to wash the clothes of the poor," said Gerson, preaching in the presence of Charles VI.

At this time provision was made for some 50 additional capes for the convenience of patients who had to get out of bed.

There have been many gross exaggerations about the number of patients lodged in the hospital at different times. Up to the beginning of the Bourbon dynasty the maximum of the Hôtel Dieu was probably between seven and nine hundred inmates, with three or four hundred as an average number in times of prosperity and peace. It is positively known that on the 14th of April, 1417, there were but 96 patients in the institution. It speaks well for the humanity of the times that when the plague invaded Paris in 1545 all infected prisoners from the Conciergerie were transferred to the Hôtel Dieu for treatment, and it was strictly enjoined that they should not be discharged on recovery without due notice to the jailer of the prison.

It is not until the seventeenth century that we obtain definite documentary evidence of measures instituted to insure the adequate professional care of the patients of the Hôtel Dieu. From now on, in addition to the two physicians attached to the hospital, there is a master surgeon with five apprentices. The minutes of the meeting of the hospital board on July 18, 1629, contain this entry:

The said Millot, having been received as master surgeon at the said Hôtel Dieu and being fed, paid, and lodged, shall himself be on hand to exercise his functions with great assiduity in person and shall have under him five experienced and capable apprentice surgeons, also fed at the charges of the hospital. The apprentice surgeons shall not absent themselves without the authority of their master, nor shall they go out except when at least two remain for constant service in the wards and two shall sleep in the said Hôtel Dieu—that is to say, one shall be on hand to examine the sick who present themselves at the entrance and another to stand by in case of accidents.

On April 22, 1644, the medical, and surgical staff of the Hôtel Dieu reported that within a period of a few days three lithotomies had been successfully performed and stated that in order to obtain uniformly satisfactory results special facilities should be afforded them for caring for this class of patients. After due deliberation the governors, recognizing the justice of the demand, directed that the new ward, previously destined for the sick members of the personnel of the institution, should be assigned to the lithotomy cases. From then on, in conjunction with the faculty of the School of Medicine of Paris, the Hôtel Dieu gave marked attention to this operation. During the year 1692 operations for stone were performed at the Hôtel Dieu 104 times with 18 deaths, a mortality of 17.3 per cent. In recognition of the signal success of the surgeons who had operated on and cared for these cases the management of the hospital voted them a special honorarium as a reward for what they had done and an encouragement for further effort. The chief operator received

200 livres, the second operator 150 livres, and the surgeon who looked after dressing the cases 60 livres. During the year 1708 operation for lithotomy was performed 97 times in this hospital, with a mortality of 21.63 per cent.

The Hôtel Dieu had always been a great center for instruction in midwifery and foreigners had been constant in their attendance, but in time this began to be regarded as a nuisance and was made the subject of a report by the prioress, the sister in charge of the lying-in ward and the head midwife, the women coming in person to the management and stating that "while formerly no surgeons from the outside were allowed in the lying-in ward and only within the past 10 years had the privilege been accorded to a few in the hope that they would behave with great dignity and prudence; now, not only do the women show extreme repugnance to being delivered by men; but it was observed with regret that some of the surgeons admitted to the lying-in ward abuse this privilege and indulge in licentious conversation and unseemly behavior, the mere description of which is forbidden by modesty, so that much scandal has been created and complaints arose, followed by reprimands, which produced no effect. Furthermore, inasmuch as it is indecent for men to be employed at deliveries except in cases of unavoidable necessity, when the senior surgeon of the establishment ought to be called and, in lieu of him, his senior assistant, the management is urged to grant no further admission to strangers." The hospital board, on December 31, 1720, issued an order forbidding the entrance of an outsider for any reason whatever, but it was found easier to deliberate and make rules than to carry them out. Exceptions were made in favor of certain English physicians, and they were permitted for three successive years to attend the obstetric clinics of the Hôtel Dieu. This was apparently done as an act of courtesy to the King of England. In 1725 the attendant of the Queen of Denmark was allowed access to the sacred precincts of the lying-in room.

We have given above one of the two unfavorable comments extant upon the behavior of medical men at the hospital. It is to be noted, on the other hand, that the doctors were not always satisfied with the conduct of the nursing sisters, and in the sixteenth century period of demoralization, marked by religious exercises and neglect of work, the charge was made that when the doctors gave orders for blisters, cuppings, and bleedings, their directions were not always carried out.

As we survey the 13 centuries of the Hôtel Dieu's existence the most prejudiced observer can not fail to testify to the devoted service and loving care bestowed by the nursing sisters upon their patients, and they were in the main generously backed up by the people of Paris and the civic functionaries and clergy of the city. There were

frequent disturbances and occasionally bitter contests, due to ambition and the struggle for control of the institution. Laymen were prompt to decry the management of the clergy, and the clergy were often jealous of outside influence, though always welcoming outside assistance. Politics often had a disastrous effect on the efforts to improve the hospital service made by participants in each side of the argument; but while the petty weaknesses and evil passions of human nature often checked for a moment they could not wholly arrest the progress of this noble institution nor check the better impulses of self-sacrifice and devotion of the bulk of the sisters.

The following extract, a sort of panegyric on the nursing sisters, is from the *Livre de Vie Active*, a manuscript of the second half of the fifteenth century, whose author, a canon of Notre Dame, was for years one of the proviseurs or commissioners of the *Hôtel Dieu*:

Consider, oh thou of delicate appetite, while before this door, what sauce thou hast for thy meal at the sisters' table, coming as thou dost from the wards of the sick laden with the odor of poor, needy humanity. How can they relish flesh in their refectory when they come straight from the sick and tidying them up after nature's humblest functions? Others have stood by, candle in hand, to give the dying Godspeed, or have on their lips a bit of thread left from sewing up a shroud, as the bell rang for breakfast. Oh, thou of dainty tastes, how couldest thou be hungry, coming direct from the wretched sick who could not eat, but forced down morsels without appetite? The moving services our sisters render before they are called to refecton and the sorrows they have witnessed in the ward move them rather to pious tears than to pleasant hunger.

At the outbreak of the French Revolution the affairs of the *Hôtel Dieu* were at a low ebb. Not only had all sorts of abuses crept into the administration, but the buildings had become the scene of dirt and wretchedness. Dr. John Jones, of New York, whose labors contributed to the foundation of the New York Hospital, went to Europe in 1772 to study the subject of hospitals and buy medical and surgical apparatus under authority of the governors of King's College (now Columbia University, New York). He wrote:

The *Hôtel Dieu*—a vast building situated in the middle of the city—receives about 22,000 persons annually, one-fifth of whom die every year. It is impossible for a man of any humanity to walk through the long wards of this crowded hospital without feeling a mixture of horror and commiseration at the sad spectacle which presents itself. The beds are placed in triple rows, with four and six patients in each bed, and I have more than once in the morning rounds found the dead lying with the living; for, notwithstanding the great assiduity and tenderness of the nurses, some of whom are women of family and take the veil and piously devote themselves to that office, it is almost impossible, from the vast number of patients, to bestow timely assistance upon each individual.¹

¹ Hospitals, Their History, Organization, and Construction, by W. Gill Wylie, M. D. D. Appleton & Co., New York, 1877.

The people in authority during this stormy period sought to reduce to a minimum the influence of the religious orders, but the sisters of the Hôtel Dieu were permitted to continue their noble function as nurses, provided they worked only as so many charitable and well-disposed individuals, no official recognition being given to their relation to the church.

By 1816 the Hôtel Dieu was again in excellent order, if we may trust the report of a capable and critical English physician¹ of that day, who, after a tour of Continental hospitals, said of it:

I thought that the hospital was much better kept than the greater number of private houses in great cities on the Continent.

There were 30 spacious wards, some containing as many as 90 beds. The buildings were well ventilated and as neat as could be expected. The bed-clothes and curtains were clean and white and, the beds were good, though not made of iron. The provisions were plentiful and wholesome, the kitchen in good order, and the patients were found to be quite as neat as the patients of London hospitals. The visiting staff of the hospital consisted at this time of 10 physicians and 2 surgeons, with an ample number of assistants.

Almost from its foundation the Hôtel Dieu exercised a pronounced and beneficial influence on the other hospitals of the country, and we find requests from out-of-town hospitals, such as the Hôtel Dieu of Orleans, or Bourges or Blois, for the loan of a nursing sister to instruct in the methods employed in the great mother institution of the metropolis. Again, the provincial hospitals were in the habit of asking permission to send their own nurses to Paris to observe the routine of the great Paris hospital. In Paris itself the nursing sisters of the Hôtel Dieu were always in great demand to nurse private cases in the homes of noble and affluent families. This practice was the subject of endless debate between the sisters themselves and the supreme authorities, the latter claiming that these outside undertakings detracted from the interest and the energy available for the legitimate work in the wards of the Hôtel Dieu; that jealousy was apt to be engendered; that the strict discipline of the Augustinians was interfered with. The prioress, on the other hand, held herself to be the best judge of how to utilize the services of the sisters under her control and was loathe to abolish a custom which undoubtedly made for contentment among the sisters by giving them occasionally a refreshing change from the hard, unvarying monotony of the wards. Besides all this the outside nursing did much to popularize the hospital and the order, thus bringing in large returns for the benefit of the poor and many welcome gifts to the sisters themselves.

¹ Carter, H. W., M. D., F. R. S. (Edinburgh). *A Short Account of Some of the Principal Hospitals of France, Italy, Switzerland, and the Netherlands.* Thomas and Underwood, London, 1819.

But the nurses of the olden time were prone, like those of to-day, to gossip and tell tales, and on at least one occasion serious trouble resulted. Perrenelle la Vertjuse had gone to nurse the wife of the King's commissioner at the Châtelet. Either during or after the course of her ministrations Perrenelle indulged in rather scandalous talk about the commissioner's mother and a serious row followed. Perrenelle's punishment was to stay in the hospital for one year without going out and to eat her meals off the floor every Friday until the All Saints' Day following the commission of her offense.

In the year 1368 a fierce contest developed between the prioress, one Philippa du Bois, and Stephen Fouchier, the master, over a question of authority. Eustachie de Provins, one of the nursing sisters, had asked permission of the prioress to leave the Hôtel Dieu and been refused. She complained to the master, who authorized her leave of absence in defiance of the prioress's refusal. At a meeting of the cathedral chapter on December 13, 1368, the prioress lodged a formal complaint against the master, charging him with usurpation of her authority and setting forth her case with great clearness and vigor. Thinking, doubtless, to conclude her argument by a telling blow, Sister Philippa closed her appeal by a caustic reference to the dangers arising from any association of the master with the sisters and cited the case of Marguerite de Chiele, a sister of the Hôtel Dieu, who for 14 years had been confined in the prison belonging to the cathedral chapter, in expiation of the crime of infanticide proved against her. The inference from the prioress's attack was that a former master of the Hôtel Dieu had been copartner with Marguerite in sin. Whether Philippa's *argumentum ad hominem* was inspired by the pitiful case of Marguerite or by desire to leave no stone unturned to prejudice the chapter against the master in authority in her own day, the documents do not reveal, but one happy consequence of the reference to the poor prisoner was that she was forthwith liberated from her dungeon and restored to duty in the hospital, though suffering the degradation of being forbidden to wear the veil like the other sisters, being compelled to lose her old place at the table, and reduced to the humblest position in the establishment. The main contention of the prioress was not sustained, and she, herself, was, by order of the King, removed from the Hôtel Dieu.

This incident is memorable because it marks the beginning of long and acrimonious controversy between the sisters, represented by the prioress, and other authority, usually that vested in the master. It is interesting, too, because it contains one of the two, and only two, distinct references to immoral conduct on the part of the sisters afforded by the documentary history of more than a thousand years.

The second incident is briefly referred to in the minutes of the meeting of February 8, 1409, in the following language:

Because Brother John L——, member of the religious order of the Hôtel Dieu, and Sister Jane, of the above-named Hôtel Dieu, were discovered in sin it is ordained that the said sister shall leave the Hôtel Dieu for a period of two months. As to the brother, he is deprived forever of any duty in the Hôtel Dieu and shall be sent to jail for a period of one year.

Though ignorant of the circumstances which attended the "sin" in question, this example of fifteenth century justice attracts attention because, for once, the male sinner seems to have borne the brunt of the unpleasant consequences.

While the records of the medical service are scant, the documents relating to the organization and administration of the hospital, as a whole, are abundant and interesting. From them we learn that the responsibility for the conduct of the institution passed from the bishops of Paris to the cathedral chapter when the Hôtel Dieu moved to the north bank of the smaller arm of the Seine and became a part of the group of ecclesiastical buildings which occupied the bulk of the Ile de la Cité. Two members of the chapter were selected to act as overseers or proviseurs and exercise authority through the medium of a master chosen from the Augustinian Brothers. It was the master's special function to victual the hospital with the supplies coming from the country and to attend to the real estate in the city. He had charge of the farms and vineyards belonging to the institution, was responsible for the chapel service, the cellar, the bakery, the alms, the benefices, and accountability and returns of the great establishment.

The master and proviseurs together selected from the nursing sisters a prioress or mistress. Though the sisters were supposed to vote in the matter and record and length of service might give a certain sister prior claims, the master and the proviseurs were bound to appoint the person that they considered most capable and most worthy for the maintenance of charitable work and strict discipline.

The male members of the Augustinian order at the Hôtel Dieu were few in number and, in time, ceased to function, but the sisters have been associated with the venerable institution down to our own times. The brothers, for the most part laymen, never exceeded 30, and rarely reached that number, and by the sixteenth century had dropped to 6. The brothers and sisters lived as two separate establishments under the monastic rules and restrictions as to conduct which were common to all the religious orders. The sisters numbered 25 at first and by the twelfth century had increased to 40. In the seventeenth century they numbered 120. They began their career in the hospital service in a lay capacity and were styled Filles Blanches, or White Daughters, in reference to their costume, which

consisted of a white gown, a white cape and veil, a white surplice, and a guimpe. In the "Book of Active Life," already referred to, we read that "The dress had as little fit as a bag. One might have said it would fit one sister as well as another, and the first one up in the morning could don any one of the dresses and wear it as comfortably as any of the rest." At one period of their history it was proposed by the chapter to change the headdress of sisters and novices in the hospital. The civilian administrators objected, in view of the fact that no special object would be gained by altering a style that had prevailed from remote times and that had never been criticized by young or old before. "As for the headdress of the sisters, it is not only well adapted to them but a necessity, because, as it is more or less closed in and projected in front of the face, it does them good service when they communicate, as their profession requires, with the well and the sick, preventing these people from getting too near and really keeping them far away when they talk together. Then, being starched and fastened, the headdress keeps its shape so that the sisters can have their heads quickly dressed and undressed and the covering does not need to be laundried but once in three months, for all of which reasons a great deal of time is saved and made available for more useful occupations. As for the headdresses of the girls, if they are not ornamental to the face they are adapted to ease in the performance of the service which they are required to render the sick and to other duties flowing therefrom, because they are tight fitting in front, the pad being placed well back so that nothing interferes with working and moving freely, whatever they have to do."

Girls were eligible for the work of the White Daughters between the ages of 12 and 20, and after five or six years' service in this capacity could become full sisters, provided they served at least a year as novices prior to taking the vows. The death of a sister caused a vacancy, which could be filled by the election of a novice. The sisters remained on duty for the period of their natural lifetime unless disabled through physical weakness, in which case they could be cared for at the Hôtel Dieu. It usually took from 30 to 40 years to become a prioress. Their costume differed from that of the daughters in that they wore black surplices, capes, and veils.

By the thirteenth century the hospital organization was perfected. The bishops who met in council at Paris in 1212 demonstrated their wisdom and foresight by limiting the nursing staff to the smallest number of individuals compatible with a reasonably efficient service to the patients. They expressed themselves as unwilling to foster unduly the development of a monastic institution whose support would be derived from funds primarily intended for the benefit of the poor and the sick. The precaution of not concentrating too many members of a religious order in a single hospital was often forgotten

in the middle ages and the history of the Hôtel Dieu of Paris illustrates how readily abuses arise when the main purpose of an institution is obscured. The worthy brothers and sisters were always in danger of letting their religious piety and devotion draw them away from practical ministrations to the sick. It is remarkable that in 1636 we find the hospital board compelled to remind them that while it was a good thing to pray the principal function of nurses was to succor the needy, and the novices and White Daughters were told that if they stayed up until 11 o'clock at night for spiritual exercises they would be too tired and sleepy on the morrow to do good work in the wards. A peril of an opposite nature, the decay of vital religious feeling, was likely to produce equally unfortunate results to the patient by destroying the sisters' motive for enduring burdensome and repulsive duties and by inclining them to self-indulgence.

That these fears were not imaginary is shown by regulations passed in 1559 forbidding master, prioress, brothers, sisters, or White Daughters from gadding about town without special permission. At the same time strangers were not to enter the building or to talk, eat, or drink with the sisters. Priests and choristers were not to talk with sisters and White Daughters except about affairs connected with the patients and then only in public places frequented by all. Likewise it became necessary to forbid the employment of private servants when their number had gradually increased to a hundred, and all persons were forbidden to give or send or cause to be taken out of the hospital buildings bread, wine, money, or any other thing.

Though the prioress had specific charge of the nursing, yet in 1525 it was established that the master must see to it that all sisters and daughters in the hospital were thoroughly trained in "all the arts of caring for the sick." It was the prioress who regulated the coming and going of sisters and daughters, who behind closed doors imparted corporal punishment to those who had misbehaved, who cared for the linen room and the laundry, who looked to the general cleanliness of the institution, and supervised the sick and poor within its walls.

The brothers and sisters arose at 5 a. m. in summer and at 6 a. m. in winter, and after their ablutions betook themselves to services in the hospital chapel while the prioress made a rapid tour of inspection. This inspection was repeated several times a day and made at least once during the night. Matins over, men and women hurried to their posts in laundry, linen room, cellar, wards, etc. Night lights were extinguished and preparations were made for the work of the day. As one by one the patients woke up, the sisters appeared with basins and towels to wash faces and hands and clean finger nails. Patients who needed refreshment received something to drink. Then

the beds were made. Such of the sick as were able got up for a while, others being moved for a change to unoccupied beds. At 11 o'clock the first meal was served throughout the hospital. While some of the attendants remained to distribute food in the wards the rest trooped to the refectories, one for male, one for female workers. The two apartments were identical. The master in one, the mistress in the other sat alone at one end. The subordinates were ranged along the sides. Though the tables were spread with linen cloths, the tableware was of tin. A reader in each room read aloud during meals from some book of devotion. Brief prayers were said in the chapel and then work was resumed. During the afternoon patients saw visitors, and at 6 came supper. An hour later the master inspected his domain and caused all doors to be locked. Then the night nurses came on duty.

There were three so-called dormitories, but in reality only the quarters of the White Daughters merited the title of dormitory, for the rest each had a room to him or her self, simply but commodiously furnished. All the doors were locked by the same key.

From 1337 on, the night nurses received an extra measure of wine, thanks to the provisions of the will of a certain thoughtful canon, Eudes of Sens, who surely must have had some personal knowledge of how hungry watchmen and night nurses can become. Several times during the night the prioress could be seen making her rounds through the wards by the flickering light of a torch.

At the time of the row between Philippa du Bois, prioress, and Stephen Fouchier, master, feeling had run so high that the Provost of Paris summoned the contestants before the tribunal at the Châtelet, and finally Charles V, to quiet the unseemly disturbance, appointed a special committee of the canons to take cognizance of the affair and wind it up. Internal dissensions continued to interfere with the work of the hospital, and during the reign of Louis XI (1461-1483) public attention was again drawn to the irregularities that obtained there. The White Daughters became mutinous when transferred from the care of one sister to another. Nuns came and went as they pleased and slept outside the hospital when they saw fit. They quarreled violently or became unduly intimate with the priests, and in various ways a situation was produced with which the canons felt themselves unable to cope. They appealed to the municipality, and Louis XII in 1505 appointed 12 notable burgesses of the city as a bureau of administration for the hospital.

From this time dates the struggle for control of the Hôtel Dieu waged between the religious and civil authorities, which has continued down to our own time and thrown into the shade all lesser dissensions. That these dissensions had been far from insignificant, however, is shown by the account of the events connected with the

career of one John Lefèvre, master of the Hôtel Dieu in 1497, against whom suit before the Parliament of Paris was brought by the hospital authorities, charging him with various irregularities of administration. In the course of the trial the sisters and daughters, joined by a few of the younger brothers, made an attack on the room occupied by Lawrence Laisné, a priest who had been appointed bursar, whom they believed to be friendly to Lefèvre. Knives and axes were brandished, and cries of "Judas," "traitor," "robber" resounded through the building, greatly to the terror and discomfort of the sick. Poor Brother Lawrence was prostrated with terror as the door of his room fell to pieces under the shower of blows.

"What do you want?" he asked.

"You will know soon enough," said one of the sisters, brandishing an ax over his head.

There is no knowing what might have happened but for the resourcefulness of a sister nicknamed "The Cake," who, feeling that some crime would be committed, diverted the crowd from further violence by making Brother Lawrence promise that he would go and bring to the spot the hated Lefèvre. Later in the day—when the dean of the chapter and the proviseurs betook themselves to the hospital to remind the sisters of their duties to the sick, who were being wholly neglected—both male and female members of the order broke into open mutiny. They were joined by 20 or 30 of the patients, who jumped from their beds, and, in concert with the domestics of the institution, became so insulting and threatening to the canons that they had to withdraw and only just succeeded in escaping by the wicket gate.

The bureau of administration founded by King Louis was not a success. It held solemn assemblies and issued orders to which no one paid the least attention. Then, appeals would be made to the King, and everyone knows that while merry monarchs may bestow generous sums in charity they oftentimes seem disinclined to worry their heads about the fine points of other people's concerns. For 15 years John Lefèvre had managed the hospital to suit himself and made no pretense of keeping any accounts of his financial administration. Everything was in confusion and disorder. The burghers naturally could not immediately produce system out of chaos, and yet results and accurate reports were wanted at once. The new commission, charged with the reform of the entire service, showed itself dissatisfied with the conduct of religious affairs in the hospital and with the care given the sick by the brothers and sisters, whom they distrusted. They accordingly introduced from Flanders the Gray Sisters in the hope that they would be an inspiration and example for a renewal of energy and devotion in the wards of the Hôtel Dieu. This was a daring innovation and generally regarded as of

grave import. At first they were but 11 in number and did not carry sufficient weight to make any material changes or dominate the hostility and malice of the older section. Later, they were increased to 30.

Any serious reform of morals, however, was forgotten or laid aside, owing to the continued wrangling of the chapter of canons, the committee of the burghers, and the Paris Parliament, who were all at cross-purposes with each other and never got beyond mutual recrimination. The crying need was for an ironclad system of accountability and legible bookkeeping. This state of affairs lasted for 10 years or more.

Meanwhile complaints were being constantly registered by the patients. The sisters laid the blame for the deteriorated service on the greatly increased number of sick and the lack of accommodation for them. They claimed that they had no chance to attend to their legitimate work and at the same time prosecute their spiritual duties. This was offered as an excuse for the maintenance of over 200 convalescents to do the work of the wards. These convalescents misappropriated food by way of wages, and the nuns themselves were accused of stealing sugar from the dispensary. The sisters retaliated by accusing the proviseurs and masters, blaming them for the lack of heat in the wards, and declaring that the patients starved or froze to death. They were directed to be more patient and more painstaking with the sick, while the master was reminded that it was his duty to oversee the behavior of the sisters and to provide competent persons to instruct them in the art of nursing. Nothing came of this, and in 1526 we find the personnel of the Hôtel Dieu making common cause with the cathedral chapter against the Government administrators. In vain the doctors were directed to report the number of discharged and convalescent patients who remained in the hospital after they had pronounced them cured. The convalescents kept out of the way of the doctors and could not be found. When the prioress was questioned on the matter she stood on her dignity and asserted that she could not remember.

Francis I found time in 1535 to occupy himself for a moment with the Hôtel Dieu, and appointed a committee to investigate and report. This committee recommended the discharge of the master, John Petit and his confederate in peccation, Brother Julian Lucas, these worthies having apparently lived on the fat of the land, unbeknown to the chapter and contrary to their vows. This vigorous committee also removed the prioress and her understudy and replaced them by other women. The decisions were badly received by both brothers and sisters, and one of the latter became so noisy in her manifestations of disapproval that it was necessary to lock her up immediately.

Discouraged by the tumult and by the general situation of the hospital the chairman of the committee, Archdeacon Louis du Bellay, resigned his position, and in consequence a new investigation was ordered by the court of Parliament. The patients were called on and they testified loudly about the lack of heat in the wards and the poor quality of the food. Sister Joan de Costes, the assistant prioress recently appointed by the reformers, having been 14 years a member of the nursing order, testified that, moved by the pitiable condition of the patients, she often had been constrained to buy whiting and flounders to fry for the hungry in order to keep them alive, and that she had begged money for the purpose from relatives and others. She declared that during the two previous winters she had been constrained to burn the straw from the mattresses of the beds in order to be able to properly dry the sheets intended for the sick. She told how she complained one day to one of the governors, when he came into the St. Denis ward, that the poor had but one small herring a day to eat. To this he replied in these words: "When I am offered herring at the table I always take one of the smallest."

Sister Joan went on to relate how one day a poor townsman brought in two fish for his wife and a sick woman lying next to her. Having no fire with which to cook them she told the poor man so, and he, wild with anger, rushed out of the building by the gate opening on Little Bridge, crying: "Those big rascals, the women at the hospital, let the poor die of hunger, and if you take in food for the patients those women won't cook it even." On the morrow she went to the office of the governors of the hospital and related the above happenings and they said in answer: "Let them go to their houses and have their stuff cooked. We are not required to do it here."

Apparently the early years of the seventeenth century constituted a period of great deterioration in the character of the service rendered to patients. In 1634 a certain prioress, questioned about her authority, said that she had the same powers as ever to command but was now no longer well obeyed, as the daughters and novices attached more importance to the directions received from the sister assigned as their spiritual mother or guide than to the prioress' orders for service with the patients. "These girls," she said, "disdain to wait on the sick because of the spiritual exercises which the said mother lays upon them daily and which they find sweeter. They no longer care to occupy themselves with washing clothes, cleaning the poor, cutting their hair, paring their nails, and doing other necessary things, so that as a rule the head nurses have to get in women from the outside to help them."

A lady, deeply interested in the sick of the Hôtel Dieu and who worked hard in their behalf during the trying period of civil wars

between Henry III and Henry of Navarre, wrote in 1635 to the administrators of the hospital, complaining of the shortage of beds for the sick owing to the large number of poor people who were in the habit of going each year to the Hôtel Dieu to spend the winter. She asserted that the first ward could readily hold 24 additional beds and that the carpenter and mates attached to the institution could easily provide these beds in 6 or 7 weeks by working steadily. This worthy investigator found that often the night lamps were without oil, that the window-panes were broken, and the stoves inadequate. Only a fortnight before her complaint the door of the lying-in ward was left open and 3 soldiers came in and some ladies who happened to be at the Hôtel Dieu talked to them, contrary to order. Had the door been closed according to the ordinance of the managers such a thing could not have happened, to the great scandal of the Hôtel Dieu.

It was at this period that the porters were directed to stop the patients from going out of the building for the purpose of asking alms and returning at meal hours or bedtime. Likewise, under penalty of a whipping the doorkeepers were not to receive tips from the patients as they came or went. The sisters were not allowed to draw their rations of raw or cooked meat at the kitchen individually, as this made it easier for them to sell their rations and live off the food assigned to patients. The custodian of the patients' clothers was expressly forbidden to sell them lest on their recovery the poor should have to go out of the hospital naked. It was found necessary to put up in the laundry a sort of wooden passageway, regulated by lock and key, to prevent clothes, linen, or food from being smuggled out of the hospital by this route.

When a sister went to nurse a case in a private house notice was to be given by the master to the baker, the cellar master, and others, so that they might stop the issue of rations until her return. It was likewise the duty of the master to know the length of her absence and the house to which she went, so that he could ascertain the exact amount of money she had earned for the institution. Another wise and businesslike measure was the order to determine how much wine there was in the cellar and then decide, by the number of patients present, the amount to be issued to each one. The orders for the wine ration were to be signed every day by the physicians and surgeons of the hospital and sent to the cellar master to serve as vouchers in making up his accounts.¹

Amid all these sordid details of human weakness the history of the hospital is illumined by the beautiful life and noble deeds of a

¹ Notes sur L'Ancien Hôtel Dieu de Paris, by A. Rousselet. E. Lecrosnier & Babé, Paris, 1888.

member of its nursing staff. Geneviève Bouquet, the daughter of a rich jeweler, was sent to court at an early age and entered the service of Marguerite of Valois. It is to be hoped that her contact with this dissipated daughter of Catherine de Medici and divorced wife of Henry of Navarre did not occur until after the queen's supposed conversion to the paths of rectitude, until the period when she was under the worthy influence of her almoner, the pious Vincent de Paul. At the age of 22 Geneviève entered the Hôtel Dieu, and for 15 years served as a White Daughter before becoming a sister. After a varied service in the pharmacy, the lying-in ward, and the other wards she was elected prioress, and continued to be a model of piety and practical charity until her death at the age of 74.

The founding of the society of the Dames de Charité, or Ladies of Charity, is commonly ascribed to Vincent de Paul, though as a matter of fact he actually opposed the scheme in the beginning. The idea originated with Mlle. Le Gas (Louise de Marillac), and the outline of the project was laid before M. Vincent by Geneviève Goussault, née Fayet, a rich woman of the better middle class in Anjou, widow of A. de Sauvigny, president of the Court of Accounts.

Vincent de Paul, who was prudence and discretion itself, hesitated to interfere, and put these worthy women off with the assurance that the able and wise persons, whose duty it was to administer the hospital, would take all the necessary measures and needed no help from without; but Mme. Goussault appreciated the benefit which would accrue not only to the patients but to the ladies themselves from an active participation in hospital work, and did not allow herself to become discouraged by the reverend gentleman's rebuff. When she realized that her continued appeals to Vincent de Paul were vain she boldly turned to the archbishop of Paris, Mgr. de Gondi, who saw at once the exceeding merit of the proposition and assured Vincent de Paul that he would be glad to have the undertaking carried out. Accordingly, the latter called a meeting of five ladies known to be interested in the hospital, and they agreed to associate themselves together for the purpose of visiting the Hôtel Dieu. On the Monday following, after communion, 10 people met to initiate the society, the noble mother of Fouquet, the minister of finance, being among the number. M. Vincent made a tactful speech, in which he explained that, as the visits of the ladies and their practical interest in the workings of the hospital might be expected to make public some deficiencies in the administration of the Hôtel Dieu, they would undoubtedly provoke some hostility. Accordingly, he urged his hearers to be more than careful in their attitude toward the sisters. They appreciated the point at once and displayed so much tact and grace in their work that they won the affection and esteem of the prioress and those under her from the start.

In 1634 the Association of the Ladies of Charity began its work. In trying to comfort the sick they did not limit themselves to words. They decided to provide for the patients a light meal between dinner and supper, and, accordingly, began their operations by hiring a room in the vicinity, where they prepared or stored provisions, fruits, dishes, linen, and useful utensils. About 3 p. m. each day bread, biscuits, jelly, preserves, fruits, either stewed or baked, were given out to the patients, the members of another society, the Daughters of Charity, founded by Mlle. Le Gras, assisting in the distribution. In the course of time this elaborate menu was somewhat modified, owing to the necessity for economy. Each day four or five women, simply garbed and wearing aprons, went from bed to bed through the wards carrying little gifts for the sick and the poor. It was their aim to minister to both physical and spiritual needs. They cultivated an humble bearing and tried to feel and to show sympathy for the ills of mind and body. In accordance with the wise directions of Vincent de Paul, they forbore to talk about themselves and tried to avoid the appearance of preaching. He urged upon the members of the two charitable societies the importance of wearing the simplest garb when employed on such a mission, so that, without any pretense of poverty on their part, at least they would not seem so far removed from those they sought to succor, and would not sadden them by the conspicuous contrast of their respective stations in the world.

It is not surprising that under such wise guidance the Dames de Charité soon had a membership of a hundred women, one-fourth of whom were members of the nobility. Two years after its organization it was deemed expedient to divide the work at the Hôtel Dieu in such a way that some of the ladies occupied themselves wholly with rendering spiritual aid while others devoted themselves to relieving physical distress. The pestilence of 1636 found both the Dames and the Filles de Charité at their posts, nor did considerations of personal safety interfere with their good works until they were required by their spiritual director to stop, two of the older women and one of the younger ones having died from exposure to the epidemic at the Hôtel Dieu.

In the minutes of the meeting of the board of directors of the Hôtel Dieu, under the date of August 26, 1705, we read that it was voted to continue to Master Petit, surgeon, his annual appointments, by way of testimonial and favor, so as to relieve the needs and infirmities of his great age. And in the deliberations of August 22, 1708, we read:

Master Petit, former chief surgeon of the Hôtel Dieu, being sick unto death, has sent to petition the board that after his decease his body may be buried in the church of the Hôtel Dieu, the which petition has been granted by the assembly in consideration of the services which the aforesaid Master Petit has rendered to the poor during a service of more than 60 years.

Other striking examples of heroism and devotion are furnished by the record of the great fire which on the night of December 29, 1772, destroyed a great part of the Hôtel Dieu. The fire originated in the chandlery of the hospital, and in a few moments flames were seen bursting from the windows of the Legate ward, the Saint Augustin ward, or Yellow ward, and Saint Jean ward. As the dean of the chapter and other functionaries were hurrying across the cathedral close to reach the scene of the disaster they beheld countless women, half undressed and weeping in terror, their natural alarm being heightened by the loud alarm which pealed forth high above their heads from the bells of Notre Dame. Forthwith the doors of the cathedral were thrown open, the nave was lighted up, and the refugees were directed to betake themselves thither. The fire having reached the dormitories of the novices, they were assembled and counted, and when it was found that no one of them was missing they were sent in haste to the cathedral, and in less than an hour they had prepared beds there with mattresses, pillows, and feather beds for the accommodation of the sick and injured.

Meanwhile sentries had been stationed at the portals of the church to prevent the entrance of all unauthorized persons, and valorous efforts were made to save as much property as possible from the burning building. From the chapel of the hospital the sacred vessels, cross, chandeliers, and various ornaments and vestments were removed to the treasure house of Notre Dame, as well as the birth registries and the records of burials and funerals. At the first rumor of the fire the procurator general, the president of Parliament, the lieutenant general of police, the head of the criminal court, the king's prosecutor, and other functionaries arrived, one by one. The doors of the hospital were ordered opened, but at that moment the chief night nurse, who had the keys, was busy elsewhere rescuing the sick and could not be found. An attempt was made to break the locks and so, when the keys were finally brought, they were of no use. The doors had to be battered down, and owing to their great strength this took a long time. Before the task was completed the firemen had arrived, accompanied by city watchmen and numerous friars of various orders. About 3 o'clock in the morning the archbishop arrived and, after observing the flames, entered the cathedral and visited the sick. He immediately took steps to furnish broth and wine for them. The dean of the chapter toward 7 o'clock in the morning received as his guests the sisters and novices and arranged for them to have something to eat. At 8 o'clock mass was said as usual and then the canons met to deliberate on what should be done to relieve the situation.

All day the fire continued to burn and lively fears were entertained lest the dispensary, the wine cellar with its store of wines and

liquors and barrels of oil should go up in flames. The city officials, however, by their promptness in isolating these portions of the hospital and by covering the cellars with fragments of old plaster work and other noncombustible material, succeeded in preventing further extension of the flames. All this time it was necessary to operate the pumps, which was done with difficulty on account of the great cold. By 4 o'clock on the afternoon of Thursday, December 31, the fire was completely extinguished and patients were carried back from the cathedral to such portions of the hospital as were still standing, as it was ardently desired to clear the church and prepare it for the customary religious services appropriate to the new year. That evening after their dinner the sisters to the number of 90 and the novices, 26 in number, passed from the large hall of the archbishop's palace to his audience room, and, having thanked him for his hospitality, fell on their knees and invoked his blessing.

During the two days that the patients of the Hôtel Dieu were lodged in the cathedral one woman gave birth to a child and 12 patients died. Owing to the cold, numerous braziers had been set up in the nave and lamps had been lighted all over the church in order to facilitate the work of the nurses in caring for the sick. Many were the wild stories afloat in Paris about the occurrences at the fire. Of the 500 patients in the wards that burned, not one, said rumor, escaped. Indeed, popular report claimed more deaths than the entire number of patients in the institution. The facts revealed by the legal investigation held on the spot established clearly that only 12 bodies were found amid the ruins, while a fireman and one of the city's militiamen were killed and 19 persons were wounded. One of the nursing sisters, alone and unaided, rescued and carried to safety 15 patients. The loss resulting from the fire was estimated at over a million livres.

It was in the reign of Louis XVI, under the able direction of Baron Necker, minister of finance, who was himself inspired by the counsels of his wife, an indefatigable hospital worker, that the reconstruction of the Hôtel Dieu was begun. When political intrigue had caused the fall of the great financier, the work went on without interruption according to the wise plans formulated by him.

By the eighteenth century the professional staff of the hospital appears to have been organized on modern lines. It consisted of seven doctors, one of whom was specially delegated to treat the priests, sisters, White Daughters, and novices. The others were assigned to various wards, serving in turn for four months in each. They made their rounds between 8 and 10 a. m. daily. Each was accompanied by an apothecary or surgeon to take down in a book the prescriptions ordered for the patients. These books were later taken to the dispensary, where the apothecaries and surgeons came to con-

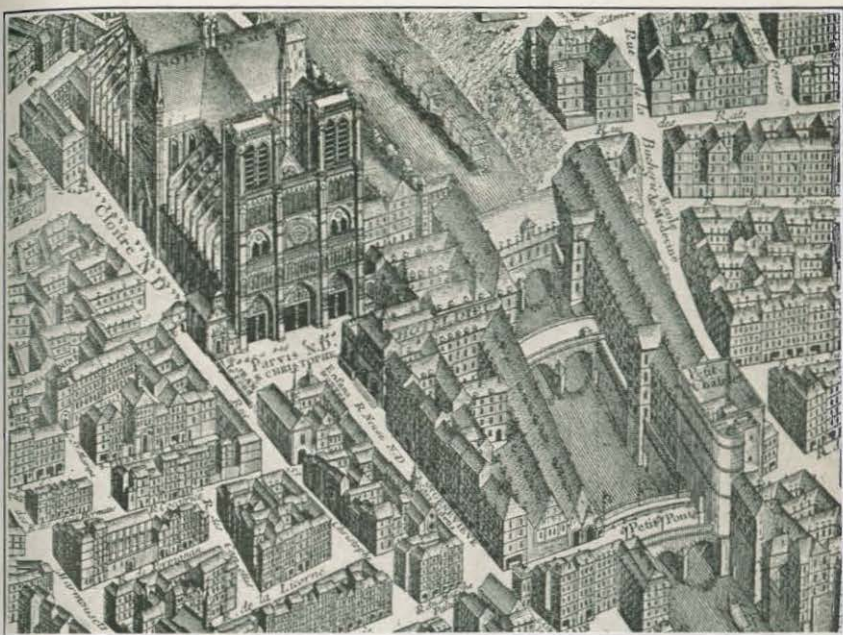
sult them for precise directions. The dispensary was in charge of a special sister, who gave out the necessary drugs and materials wherewith the apothecaries could make up sirups, plasters, ointments, etc.

The surgeons were of several classes. First, there was the chief surgeon, who was overseer of the surgery and surgeons of the Hôtel Dieu. He was lodged and subsisted and paid 600 livres in wages yearly. Under him was a first associate surgeon, with a salary of 100 livres and board and lodging in the Hôtel Dieu. Twelve other associate surgeons were lodged and fed in the building, but received no salary. The 12 associate surgeons were assigned to various wards and had under them externes to bleed patients, blister them, and perform other operations of minor surgery. Of these associate surgeons two were always on duty, day and night, to attend emergency cases, both of the hospital and dispensary type, and they slept in what was called the guardroom, so that they could be notified readily by the night nurses when they were wanted. At this time there were 21 wards, with a capacity of 880 beds.

It is interesting to compare the salaries of the medical officers of the Hôtel Dieu with that of the head midwife of the institution at this time. In the year 1737 we find Miss Langlois, head midwife of the Hôtel Dieu, reporting to the board of directors that she had always considered it a duty, during her long period of service, to develop a suitable understudy, capable of replacing her in need; that one Edmée Gouet, having shown herself throughout a period of 12 years in every way capable, devoted, and entirely fit to conduct the lying-in ward, is recommended to the place the present incumbent must soon vacate owing to age and weariness from long service. The board accordingly voted a salary of 200 livres a year to the said Edmée Gouet, to be increased to 400 livres after the death of Miss Langlois. Meanwhile the said Langlois was to be lodged and fed and supplied with heat and light and laundry service and was to receive 200 livres annually as salary in view of the good service which she had so long rendered to the poor, thereby wrecking her health and strength.

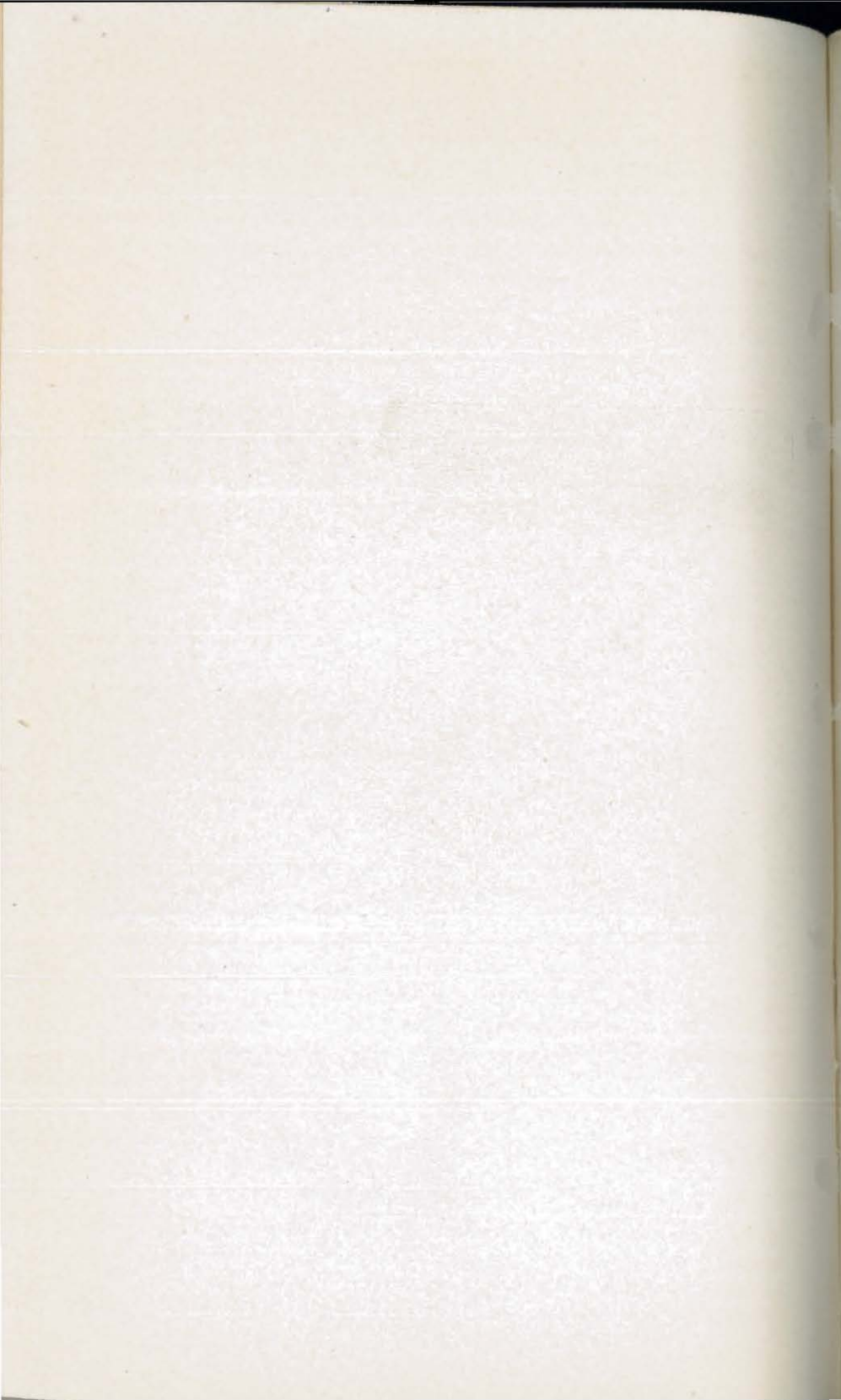
There are no statistics showing the maternal and infant mortality in the lying-in ward, but we know that the birth rate of the Hôtel Dieu rose from 1,264 in 1732 to 1,508 births in 1757.

About this time serious complaints began to gain circulation in regard to the professional ability and behavior of the doctors of the hospital staff. It was reported that instead of coming at 7 o'clock in summer and at 8 in winter to make rounds among their patients, they often did not come till 9, 10, or 11 o'clock in the forenoon, this to the great interference with the proper hospital care of the patients. Their rounds should last at least two hours, but instead were often



View of the Hôtel Dieu of Paris and surroundings in 1734.

Courtesy of H. Champion, 9, Quai Voltaire, Paris.



made in half an hour, a quarter of an hour, or less. This indecent precipitation was not deemed compatible with a thorough study and treatment of their cases. Furthermore, it was alleged that the attending and other physicians constantly absented themselves on unauthorized and on unduly protracted leave. Maladministration and waste of funds were charged in connection with the dispensary, and the apprentice surgeons were believed to be engaged in petty pilfering of drugs, etc.

The minutes of the board's meeting of December 20, 1746, contain this horrifying entry:

Three associate surgeons introduced some girls into the night-duty room and spent the night with them, and, having become intoxicated, committed all sorts of excesses. * * * Similar disorders are but too frequent. Instead of sleeping in the hospital, as they are required to do, the associate surgeons often get externes without experience or ability to take their places at night in the guard room or night-duty room, these substitutes being quite unfit to render the required aid to the sick.

These random notes on the history of the Hôtel Dieu would be incomplete without a brief reference to the efforts of the Jansenists to gain possession of the institution. The well-known sect of the Jansenists represented a struggle on the part of a portion of the Catholic Church to return to more evangelical standards and to invest worship and life with increased spirituality. It was in no sense a movement toward Protestantism, and its founder stoutly held to the Roman Church. The hostility of the Jesuits and the eventual condemnation of the movement by various popes, from Innocent X to Clement XI, and the determined and fanatical opposition of Louis XIV sealed its doom, though for a time the adherence of influential men and women at court, of prelates like the Cardinal de Noailles, Archbishop of Paris, of thinking men like Blaise Pascal, excited widespread attention and interest in the movement, which unfortunately degenerated to something not unlike some of the revivalist movements of our own time. The miraculous cures supposed to have been worked at the tomb of one François de Paris, a Jansenist of beautiful and holy life, led to the closing of the cemetery by the Government. It was this incident which occasioned the famous epigram:

De par le roi, défense à Dieu
De faire miracle en ce lieu;

which we may translate as follows:

No miracle or wonder raising thing
May God do here. By order of the King.

While the Jansenist doctrines were warmly championed by five or six of the canons of the cathedral, who deluged the public with Jansenist writings and songs and satires against the papal bull, *Unigenitus*, our interest here chiefly centers around the piquant

personality of a young girl. Marie Louise Claire des Tournelles, daughter of William Charpentier, Lord of Lunaisi des Tournelles and of Louise Marie d'Aubonne, was born on the 2d of February, 1679, grew up at the court of the Duchess of Maine, and constantly attended the balls and festivals at the royal court of Louis XIV until she was 22 years of age. Whether suddenly "converted" in true Jansenist style or acting on convictions gradually formed by the contrast between her inward thoughts and the worldly, licentious surroundings of court life we do not know, but on a certain day we find her getting up from her knees after long and earnest prayer in Notre Dame and hurrying into the presence of the prioress of the Hôtel Dieu to beg admission into the order of nursing sisters. We can picture the scene and readily appreciate the astonishment, almost horror, of the prioress when this fashionably attired young lady made her sudden appearance within the sombre walls of the hospital. Her lips were rouged; on her cheeks were black patches; in her hair aigrettes. The prioress expresses her surprise at a demand so unusual from one decked out in all the livery of worldly vanities. Mlle. Des Tournelles appreciates the incongruity of the situation, but says:

Mother, harken to me and raise no objection to receiving me as I am, for I assure you that if you were once to let me out I might never come back to offer my services.

Then the eager postulant for admission begs that a message be sent to M. Lenoir, canon of Notre Dame, who knows her and will vouch for her. This is done, and on the prelate's strong recommendation she is admitted to the Hôtel Dieu to begin her apprenticeship as a Fille de Charité. On the 25th of June, 1707, Mlle. des Tournelles took the vows, adopting the name of Mother of Mercy.

Her relationship to the Marchioness de Montmorency and the frequent visits and communications received by her from members of this and other noble families and her close alliance with Canon Lenoir gave to Marie Louise a position of considerable importance in the Hôtel Dieu, and as the years go by we find her using her increasing influence to attempt a change in the very constitution of the order. Associated with her in the enterprise were Mother of Saint Gertrude, who had been selected prioress, though but 15 out of 80 sisters voted for her for that position, and other members of the order, her devoted friends and admirers. From this revolutionary enterprise sprang a long investigation and much discord. Under the régime of the Duke of Orleans, acting as regent during the minority of Louis XV, a board of inquiry deliberated at the Hôtel Dieu and called before it the prioress, and then, after some discussion, the Mother of Mercy and her following, consisting of some 19 or 20

devoted nuns. There had been much discord between the prioress and the Mère de la Misericorde, and it is doubtful if the breach was ever really healed, but the King's commissioner succeeded in making things smooth on the surface, and Jansenism in the person of Louise des Tournelles was thoroughly suppressed at the Hôtel Dieu.

Our authority sniffs at the temerity of Marie Louise in living and dying a Jansenist, and quotes from the horrified account given by Canon Le Gendre, a model of orthodoxy, of what the reformer tried to do in the Hôtel Dieu. Poor Marie Louise, who had discarded rouge and black patches and fine feathers to embrace a life of sacrifice and toil, must have had some prophetic vision of the organized charities, the hospitals, the settlement work of to-day, for, by the constitution which she and the Mother of Saint Gertrude advocated, "nuns would no longer have been nuns at all but merely members of an organization, leading an ordinary life, unfettered by rules, voluntarily associated together to care for the poor."

EDITORIAL.

A CAREER.

"My dear Surgeon General," writes many a young medical officer, while others who never come to the point of actually putting the words on paper plan night after night to do so as they lie awake in their novel and unaccustomed surroundings speculating and wondering, "I feel that I have a special gift for surgery and desire more opportunity for perfecting myself in this branch than is afforded me on this ship. I would like to be sent to our largest hospital and allowed to specialize in surgery, for which I feel myself peculiarly fitted. I have been very successful in surgery prior to joining the naval service and fear that my talents would be wasted on this ship, as there have been none but dispensary cases and medical cases during the month I have been on it."

Oh the glamour of surgery, the fascination of the title "surgeon"—whether naval, military, or civilian! All that history, fiction, or a fervid imagination has pictured flashes before the mind's eye and one is compelled to regard these young enthusiasts with tender sympathy. Who has not thrilled at the description of the surgeon working imperturbably, swiftly, skillfully, amid shot and shell, as Zola has described him, as he is reported in the chronicles of the Napoleonic wars? We recall the brilliant operators of the French school and the marvelous manual dexterity with which they amputated by transfixion, we realize what our leading operators do to-day and are not surprised that the definite and conspicuous results of surgery should entrance the tyro and that he should feel the challenge of a calling that offers daily chances of brilliant success or damning failure.

Even the grotesque figures drawn by Smollet and Marryat do not disillusion or daunt the aspirant for renown who enters the medical service of the Navy. He argues that all the portraits were drawn on the same scale; that admirals, captains, and first lieutenants were portrayed in the same ludicrous guise as the medical men, and if the former were heroes in spite of their foibles then the amazing creatures who sailed with them as surgeons were probably clever handicraftsmen.

Nor is it a misnomer for the naval medical officer to be called a surgeon. Surgery is an essential part of his work. No medical officer while available for general service and on cruising ships can abjure surgery as can the medical practitioner ashore, who politely refers cases to the surgical confrère on the next block.

However, the young man who enters the service with the idea that he will find there a large field for *specializing* in surgery is laboring

under a misapprehension and doomed to disappointment unless he can find gratification for his ambition along other lines. If he holds to his surgery, the sooner he leaves the service the better it will be for all concerned. The operator who tries to see how many hernias or appendices or gall bladders he can operate on between one cruise and another is simply depriving other men in the hospital with him of an opportunity to acquire that reasonable competency which *all* officers should possess in order that he may speak of the hundreds of operations he has done. Surgery should not be held out as an inducement to candidates for the Medical Corps, nor should individual preferences for special types of work be given undue weight in assigning to duty young medical officers still in a formative stage with ideas likely to undergo serious modification as they advance in knowledge of men and things.

There is no desire to argue anyone out of his tastes and predilections, but it is an indisputable fact that if a man confines himself to surgery and will condescend to deploy his energy, talent, and interest in no other line of work, he will in the long run be of infinitely less benefit to the personnel of the service than the good all-around medical man, competent at a pinch to do a little emergency surgery. He will remove the occasional appendix, enucleate the occasional eye, perform the occasional amputation, but the fever cases, the pneumonias, the contagious diseases, the venereal cases, the heart and kidney cases call for a volume of work exceeding the surgery a hundred to one, and medicine and surgery is not all. There is the ever-broadening field of sanitation, there is the military side of life, the pedagogic side, the constant call for administrative and constructive ability.

It is high time for the service conception of the medical officer and for the popular conception of the Navy doctor to be recast. We ourselves, after a survey of the past and a consideration of the future, must take account of stock and be prepared to adapt ourselves to altered conditions, discarding what is worn out, holding fast to that which is good. In order that the public may understand our comprehensive aims and the broad scope of our work, the Medical Corps, itself, must have a clear understanding of its opportunities and obligations. There can not be a reasonable degree of contentment among medical officers if on the one hand they are struggling toward ends impossible of achievement, and if, on the other hand, as capable and ambitious men, they fail to appreciate the diversified and ample range open to intelligent effort. Because preconceived notions of the naval service must be modified or surrendered, it must not be assumed that the service is without incentive to work or rewards for accomplishment.

If the attraction of the service resides in its military features alone, then, it should be entered by but one door—the Naval Academy.

In the next place no man should feel that by entering the Navy Medical Corps he is giving up the prospect of successful achievement along definite and specific lines to become a jack-of-all-trades and good at none. This view is entertained in some quarters. It is a very unfortunate view and is calculated to do harm to the service and to the individual, whether the individual is a patient or a doctor. The service will tend to expect less of men so regarded, to trust them less, to honor them less, and the individual medical officer who consents to be placed in this class is unconsciously sealing his own doom by consenting to mediocrity and inertia.

The line officer considers his life work a highly specialized profession and advertises it as such, and he is right. He may be less well informed about explosives than the chemist or even than the intelligent foreman of some large powder plant, but he knows the practical application of explosives for purposes of naval warfare. He may not be as deeply versed in the subject of engines as the man who designs and builds them ashore, and in other departments of knowledge he may have less expert ability than many civilians, but he will stand high in his profession if he successfully brings to bear experience as organizer and disciplinarian with skill as navigator, engineer, and artilleryman on the training and development of man-of-war's men and the upkeep of battleship, submarine, or destroyer against the possible day of battle. The fact that on the eve of battle help may be received from civilian chemist, engineer, electrical expert, inventor, and scientist of every kind does not reduce the merit or glory of the officer of the line whose general knowledge embraces the whole field of naval endeavor, coopting, harmonizing, and blending its various features into a great offensive and defensive agency.

It should be made clear to the young man who contemplates entering the Navy Medical Corps that he, too, is selecting a distinct and peculiar calling and one essentially different from that of the civilian practitioner or of any practitioner on shore, a real career different in its aims and requirements and essentially different in its rewards. He must not be allowed to think of himself as renouncing ambition, compromising with fortune or sacrificing high purposes of noble endeavor in exchange for guaranteed subsistence and freedom from anxiety in the years of declining vigor.

The physician who dons for life the naval uniform (and there is no possibility of contentment and peace of mind unless a man does take it up as a life work, one to which he is committed for better or worse) becomes part of an organization, living largely apart, peculiar to itself, little understood, a highly specialized, differentiated body of men. Their physical surroundings, their physical needs, and the physical details of their everyday life are complicated and peculiar. The function of the medical officer is to study the physical conditions

and requirements of naval life, to ameliorate them, to minister to them. The variety of the subjects within his scope is only hinted at when we mention the proper illumination of an officer's room, the working ration of an aviator, the medical aspects of deep-sea diving, the handling of an epidemic, emergency surgery, the training of a hospital corps, the sanitation of a recruit camp. The beau ideal of a medical officer not only knows well the subjects of medicine, surgery, therapeutics, chemistry, ophthalmology, genito-urinary diseases, dermatology, obstetrics, bacteriology, and hygiene, but is especially good in one or more of these branches, and has the power to set forth his views clearly and convincingly by tongue or pen. He is a man of wide reading and much general information. He has the tact and patience and intelligence which enable him to secure from superiors favorable attention for his recommendations and to win the confidence and affection of his juniors, to command the respect of all in the close juxtaposition and the trying intimate relations imposed by the conditions of life at sea. From the rising of the sun till the going down of the same and into the silent night watches everything that bears on the life of a sailor has an interest for him and furnishes him with food for thought and investigation.

In a word, the Navy surgeon is a specialist, and he has a very peculiar specialty. One of its anomalies is the fact that few appreciate the distinctive features of his calling. To a large number of people ashore a naval surgeon is an agreeable fellow of some education, perhaps culture, with a hearty, jolly manner, and plenty of time on his hands. The popular conception of the Navy line officer has until recently been equally inaccurate and unfair. With the passing of the wooden ship have gone forever the days of elegant leisure, the long stays at Villefranche and Yokohama. The warship of this generation is a workshop and all hands are busy.

Just as it would be wrong to compare a line officer with Edison or Maxim, so it is wrong to measure the attainments of the Navy doctor by those of men eminent in a single, limited field of professional work.

Dr. Hide's opinion on some obscure disease of the skin may be worth \$20, but how many years have passed since he set a fracture or attended a case of pneumonia? Dr. Cutter's fame as a surgeon has been greatly enhanced of late by his wonderful success in removing tumors of the brain. He would doubtless turn aside from his hobby and do a very neat appendectomy for you for a matter of a thousand dollars, and if you talked poor when the bill came in he might knock off a couple of hundred, but would you trust to his judgment in diagnosing some tropical malady or conducting a campaign against an epidemic on shipboard? The great Prof. Iris is known the world over for his cataract operation, but he has not

treated a case of gonorrhoea since he had it himself as a medical student.

These men are invaluable ashore because there are enough of them to supplement each other and make up for individual deficiencies, but would it not be truly a hardship for officers and men starting on a long cruise if they were restricted to the professional ministrations and tender mercies of but a single one of this learned assemblage? The public, most generously and sympathetically disposed just now under the stimulus of war conditions, probably holds that the country's brave defenders at sea, in order to be adequately treated when sick, should have with them as many experts as there are specialties in medicine. Fortunately the sailor knows that if the sick bay were stocked with a complete outfit of these people the ship would be dangerously down by the head. It is impractical, ridiculous to think of providing a whole faculty. What can be furnished and is furnished is the man of reasonable competence in a preponderance of the problems which may arise. The naval surgeon is not the equal of the most eminent operators ashore, but he is superior to them in medical knowledge. He is not the equal of the distinguished internist ashore, but he is capable of doing good emergency surgery, whereas his superior in internal medicine would undoubtedly fight shy of a bistoury. His knowledge of the eye, ear, and throat are limited, but he appreciates his limitations. It is his ambition and constant aim to be as good as he can along as many different lines as possible.

This conception of the naval medical officer may well stimulate the ablest, the best equipped, the most ambitious man. To the one with a leaning for surgery, a period of temporary inactivity along this line will but give opportunity for brushing up on the eye or skin or nervous diseases. The man whose passion or diversion is bacteriology will, when sent to recruiting duty, have an opportunity to come in contact again with men and to reinforce his previous studies of human nature by fresh observation of its vagaries.

With a due appreciation of the nature of his career, of its opportunities and duties clearly fixed in his mind, the medical officer will be able constantly to relegate petty vexations and disappointments to the subordinate place where they belong. He will have no time to brood over wounded sensibilities and worthy motives misunderstood. Dissatisfaction because a given suggestion was not acted on will be brushed aside by the lively consciousness of the infinite number of things to be learned if a medical officer is to be up to date, well informed, ready with sound, expert advice when it is called for and urgently needed.

FUNCTIONAL AND ORGANIC LESIONS.

A prolific source of mistakes in the examination of recruits, especially when conducted by civilian physicians or by young medical

officers without practical experience of service conditions, is the failure to distinguish between the candidate's expectation of life and legitimate grounds for the expectation that he will be a useful member of the military body he seeks to enter. It is not enough to be able to say that in all probability a candidate will live for 20 years. The examiner must have a reasonable assurance that the candidate will be able to give from 8 to 12 years of satisfactory service in return for the Government's outlay in feeding, clothing, and training him.

A candidate for enlistment will often say with perfect truth of some disability which the examining surgeon has discovered: "It never bothered me." The vital consideration then is, will this disability bother him under the peculiar conditions which will surround him in the service, conditions entirely different from any he has previously known. It not infrequently happens that a disability accounted trifling by a man working in a store or factory assumes considerable real or imagined importance after enlistment. When an enlisted man has to be carried on the sick list for purposes of observation, when frequent examinations and consultations are necessary in his case, when the defect which "never bothered him" gradually leads to disinclination to work or dissatisfaction with the duty assigned him, such a man becomes a poor asset to the service, and, if he loudly and persistently points to his defect and maintains that it *does* bother him now, his ultimate discharge from the service is almost a matter of certainty. The time and energy devoted to training this man has been wasted just as truly as if he had been a sufferer from a physical defect which should have caused his rejection at the recruiting office.

The expert civilian physician constantly assures candidates for enlistment and their medical examiners that this or that physical defect is merely functional and so negligible, but medical officers of experience know only too well how often these negligible defects utterly invalidate a man's eventual usefulness in the service of his country. Every medical officer who has served at sea can testify to the frequency with which the medical survey and discharge of a man leads to requests for discharge from a large number of others; from men who have become disgruntled or dissatisfied when the glamour of sailing has worn off. The effect of a medical survey and discharge is peculiarly demoralizing when it is occasioned by some defect which was assumed to be trifling at the time of enlistment.

In the majority of cases an experience of service conditions has demonstrated that while there is a vast difference between functional and organic lesions (of the heart for example), so far as concerns expectation of life, the *undesirability* of a candidate for enlistment

is about the same whether his lesion be organic or functional. The subject of a functional cardiac disorder is not apt to be a cheerful, indefatigable worker, and, whenever he wishes to avoid any arduous or disagreeable effort, his slight disability provides him with a way of escape. Such a man creates around himself an atmosphere of sympathy that will often seriously embarrass the solitary medical officer embarked with him, no longer backed up by the testimony of eminent specialists and open to criticism on many counts.

WHERE THE PSYCHIATRIST FAILS.

If the remarkable and astounding activities, the profound agitation going on in many branches of business, if the countless enterprises recently undertaken in this country were all in one place and could be expressed by word of mouth, there would be a pandemonium of sound as disconcerting as the drum fire of the war zone. Happily, a great deal of the disturbance becomes relatively harmless by being committed to the written or printed page and soon flows silently to the waste-paper basket. Washington is the storm center of this fever of reform and change. Suggestions, requests, orders, threats, ultimatums, hints, prayers, tears, pelt the Government like hailstones.

The trifling matter of reforming human nature and stopping illicit sexual indulgence, the extermination of venereal disease, the liquor question, the tuberculosis problem, the matter of tobacco and drug addictions are but a few of the questions more or less connected with medicine for which solutions have been found by well-meaning and even well-informed persons, willing, without profit or renown, to bequeath their ideas to the Government.

One of the earliest subjects to receive attention was the enlistment of the mentally unfit. The Medical Department of the Navy has been engaged on this problem for some years, and, even before our active participation in the present war, social and industrial workers, philanthropists, psychopaths, and those educators particularly concerned with juvenile defectives and delinquents began to call attention to the importance of keeping the mental defectives out of the ranks of our fighting forces.

Divested of form and ceremony the offers of service said in essence:

Give me the task of keeping out the unfit. I will select a staff of assistants from among those trained by me, conforming to my views, and personally known to me. I will rid you of these pests with the thoroughness of the cockroach king who will not tell what his remedy is but comes aboard and guarantees to stamp out every form of vermin.

It was recognized that there was great danger of taking in unawares weaklings unable to endure the asperities of a campaign and that the menace of the unfit was more to be dreaded than ever under the emotional stress of war time. And so an effort has been made to supply our training camps with a sufficient force of psychiatrists to examine the recruits with systematic care. The results have been satisfactory to the extent that a large number of men have been discharged who were presumably not possessed of the stable mental balance necessary for war endurance, and out of the number discovered by our 30 odd psychiatrists doubtless a certain per cent would not have been discovered so early and therefore been removed so promptly from the service.

This is good as far as it goes, but there is a problem of wider scope whose solution would bring large returns to the Government. Whether the solution has been seriously attempted is not known, but no answers have been sent in as yet. Now that the expert examiners referred to have had a reasonable opportunity to become familiar with the conditions of naval life, it must be clear to them that there is no permanent demand for any considerable number of psychiatrists in the Medical Department on a peace footing. This statement is no disparagement to them, for, as a matter of fact, the recruiting office and training station examinations for the detection of mental defectives hardly offer scope for a life work. While the younger specialists in this branch might be glad to put in a year or so employed in such routine work, the ambitious and able alienist will in time find this field monotonous and restricted. When the war ends and the country releases these experts from the patriotic duty of service with the colors, the Medical Corps of the Navy should be in a position to continue the active protective efforts now employed. We ask, therefore, of the psychiatrists associated with us the elaboration of a brief, comprehensive method of procedure capable of being used by every medical officer for detecting the defectives. That examinations conducted by the general practitioners of the Navy will be productive of results as satisfactory as those obtained by specialists we do not claim, but, once a proper routine method of testing is agreed upon, our recruiting surgeons can certainly perfect themselves in its use, and the knowledge they acquire in this way will have permanent value for them.

If, on the other hand, the psychiatrist should not be able to settle upon a practical method capable of successful employment by some one other than an expert, he fails to meet the demand laid on him.

The best things in science, in art, in medicine are for the many, and the practical helper has always said, "I will show you how to do this," which is considerably better than saying, "That is my secret. I am the only person who can successfully operate the device."

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Fig. 1.—Dislocation of left semilunar bone and normal right wrist.

CLINICAL NOTES.

DISLOCATION OF CARPAL SEMILUNAR BONE.

By R. E. HOTT, Commander, M. C., United States Navy.

Case, J. G., private Marine, 58 years old, 22 years' service in Cavalry and Marine Corps, and famous for a prolonged alcoholic record, fell into an excavation while on liberty, striking on his face and outstretched left hand, which, according to the very hazy recollection of the patient, was bent forcibly backward.

On admission to the United States Naval Hospital, Puget Sound, the wrist was found considerably swollen, very tender to the touch, and exceedingly painful on attempted motion, which was limited. Fluoroscopic examination, confined chiefly to the lower ends of the radius and ulna, failed to show any fracture.

Two days later X-ray plates showing antero-posterior and lateral views of the wrist were taken and from these, especially from the lateral view (fig. 1), the characteristic picture of dislocation of the semilunar bone was obtained.

This case emphasizes the importance of very careful X-ray examination of all lesions involving the wrist joint. Disregarding the common Colle's fracture, which, as a rule, is diagnosed without any special difficulty and the rare condition of dislocation of the wrist as a whole, most of the less definite abnormalities about the wrist following injuries or falls, and having as their signs and symptoms, pain, swelling, and limitation of motion, are classed under the head of "sprains." The X-ray has been most valuable in these obscure cases and has enabled us to correct the indefinite blanket diagnosis of "sprain" and to realize the comparative frequency of carpal injuries.

The three methods of treating a dislocated semilunar are: First, forcible reduction by manipulation under an anæsthetic; second, reduction by manipulation through an anterior incision; third, in case these methods are unsuccessful, removal of the bone, through an anterior incision. Owing to the swelling of surrounding tissues and encroachment of the other carpal bones on the space formally occupied by the semilunar, it becomes an exceedingly difficult matter to replace the latter bone even after cutting down upon it. In cases of

complete dislocation, such as shown in this case, the reposition is practically impossible without extensive injury to the wrist, which is not justifiable, considering the fact that a good functional result usually follows the removal of the bone.

After unsuccessful attempts at reposition by the first two methods mentioned, the bone was removed through an anterior incision. Recovery was uneventful and a good functional result obtained. A picture was taken several months after the patient had been restored to duty, and figure 2 shows the condition of the wrist at that time.

ANEURYSM AND RUPTURE OF THE LEFT POSTERIOR CEREBRAL ARTERY.

By J. J. A. McMULLIN, Lieutenant Commander, M. C., United States Navy.

This case is reported because it has points of medical, surgical, and medico-legal interest.

J. R. O., a carpenter in the navy yard, Cavite, P. I., 54 years of age, entered the hospital at 2.30 p. m., May 11, 1918, in a deeply comatose condition. According to the history the patient was much addicted to native gin; had a remarkable tolerance for alcohol; was apparently never much affected by his imbibitions. It was also learned that 12 hours prior to admission he stumbled to the floor while walking about in the dark, and that he struck his head and immediately became unconscious. He was seen by a physician several hours later and pronounced under the influence of alcohol.

Physical examination.—Large, well-developed man, presenting marks of external violence about head. The palpebral tissues of both eyes swollen and ecchymotic; lips cut and swollen; ecchymosis, hematoma, and swelling in left parietal region.

Lungs: Coarse bubbling râles throughout both lungs. No dullness.

Heart sounds: Weak; obscured by stertorous breathing and râles.

Blood pressure: systolic, 125; diastolic, 85.

Liver: No enlargement.

Spleen: Palpable.

Roentgenogram of skull did not show fracture. No motor paralysis could be made out. Patient moved arms and legs and there was no evidence of facial paralysis.

Pupils regular, equal, contracted, and fixed. Biceps cremasteric and patellar reflexes absent. Babinski well marked on both sides.

Lumbar puncture showed fluid under pressure; 40 mils of homogeneously bloody fluid were withdrawn, after which patient breathed more quietly and less frequently.

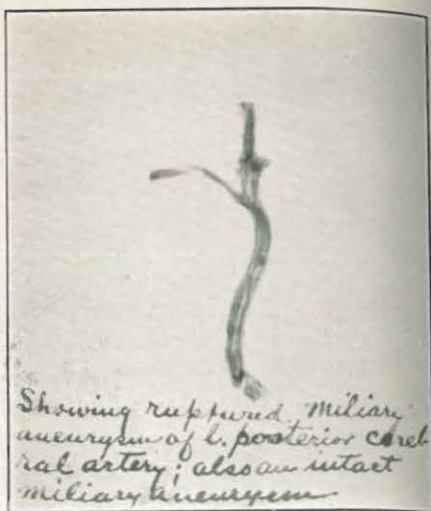
Specimen of urine obtained by catheterization showed heavy trace of albumin, no casts, and many pus cells.



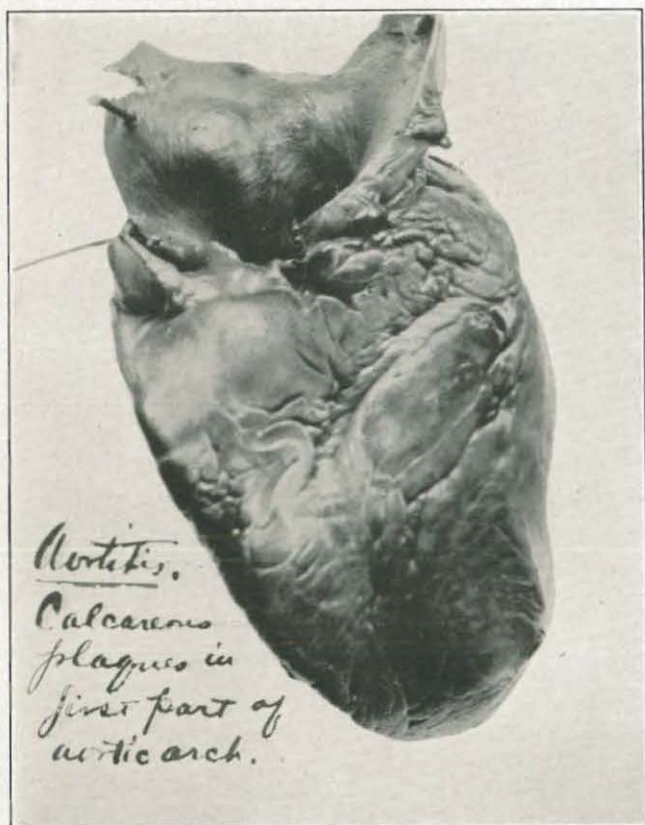
Fig. 2.—Left wrist several months after operation.



Ruptured left posterior cerebral artery.



Showing ruptured, miliary aneurysm of l. posterior cerebral artery; also an intact miliary aneurysm.



Aortitis.
Calcareous plaques in first part of aortic arch.

The question of diagnosis in this case was complicated, as it frequently is, by factors which pointed to alcoholism, uremia, and intracranial pressure from fracture, rupture of a meningeal vessel, or cerebral hemorrhage.

In this case there was a general suspicion of "foul play," and the marks of external violence about the head seemed to bear out the suspicion. Did the patient have a fracture of the skull? Did he have meningeal hemorrhage without fracture? Did he have cerebral hemorrhage? Or did he have none of these things and the coma result from uremia?

The evidence in favor of intra-cranial hemorrhage led us to believe that the signs and symptoms were due mainly to that cause. The probability of kidney damage in a gin drinker 54 years old seemed great. But the absence of casts in the urine, the low blood pressure, the absence of urinous odor on the patient's breath, and the history of the onset of the attack inclined us to the opinion that the coma was complicated slightly, if at all, by uremia.

Although there were no localizing symptoms, a decompression operation seemed indicated, considering the evidence of external violence and intra-cranial hemorrhage. The decompression was done in the left parietal region over the site of injury. No anæsthetic was necessary. The skull was trephined with Hudson's drill and the opening enlarged with rongeur forceps. The site of the hemorrhage could not be located. A cigarette drain was inserted and the patient returned to bed as rapidly as possible. The pulse gradually became weaker and more rapid and respiration more shallow, and the patient quietly passed out six hours later.

Autopsy findings.—Heart: No gross lesions. Aortitis, calcareous plaques in first part of arch of aorta.

Lungs: Passive congestion.

Liver: No gross lesions.

Kidneys: Apparently normal. Microscopic section showed cloudy swelling and passive congestion.

Stomach and intestines: Nothing except adhesions between great omentum and colon. Appendix showed evidence of past inflammation with many adhesions.

Spleen: Enlarged; extended 3 inches below costal border.

Bladder: Chronic inflammation. Contained 20 mils purulent urine, also three small calculi.

Prostate: Not enlarged. Normal in appearance.

Brain: Showed evidence of extensive hemorrhage under arachnoid. Firm clot investing medulla and pons and extending over the surface of the cerebellum. Fluid in ventricles bloody.

The left posterior cerebral artery showed a ruptured miliary aneurysm and close thereto an intact miliary aneurysm. These are shown in the accompanying illustration.

The elimination of uremia and alcoholism was correct and the diagnosis of intra-cranial hemorrhage was correct. Localizing symptoms being absent, the location of the bleeding vessel was a matter of speculation, but decompression was justifiable since we had evidence of head injury and intra-cranial hemorrhage.

The cerebro-spinal fluid withdrawn before, but examined after, death gave a completely positive Nogouchi reaction. This completed the picture of syphilitic aortitis, arterio-sclerosis, and aneurysm and rupture of the posterior cerebral artery. The injury to the head was incidental and probably did not cause the rupture of the artery, but causes leading up to the head injury raised the blood pressure sufficiently to rupture the damaged wall of the vessel.

It is not likely that both eyes, upper and lower lips, and the left parietal region would be injured by a man stumbling and falling to the floor. The chances are that the patient was engaged in an affray of some sort and that the history given was willfully misleading. In this instance the authorities inclined to this opinion and arrested a man with whom the patient was alleged to have fought. Subsequent investigation showed this surmise to be correct.

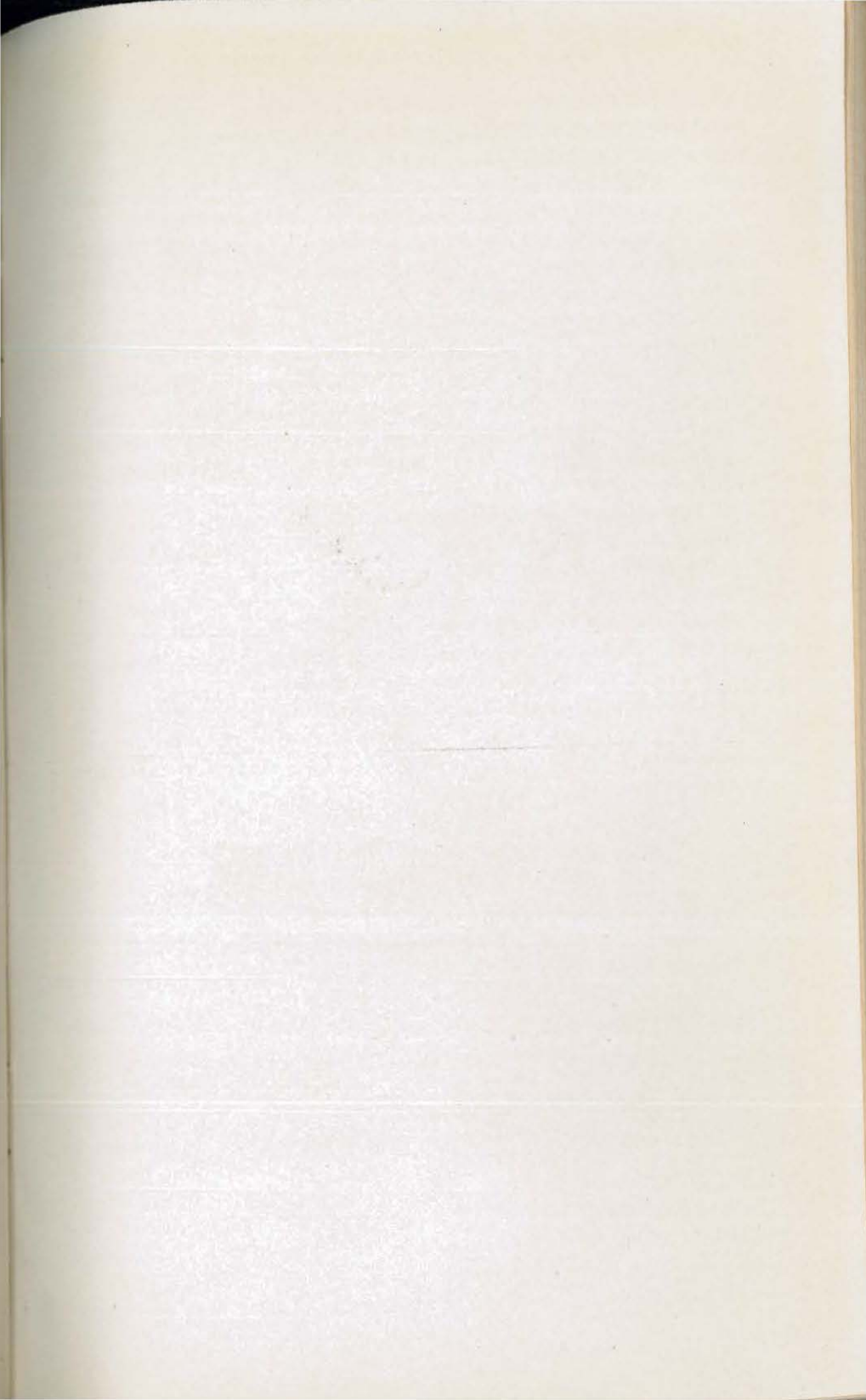
It is readily conceivable that a conviction for murder or manslaughter might be made in a case with circumstances similar to this, provided syphilis was not sought for, and the aneurysm and rupture of the artery overlooked.

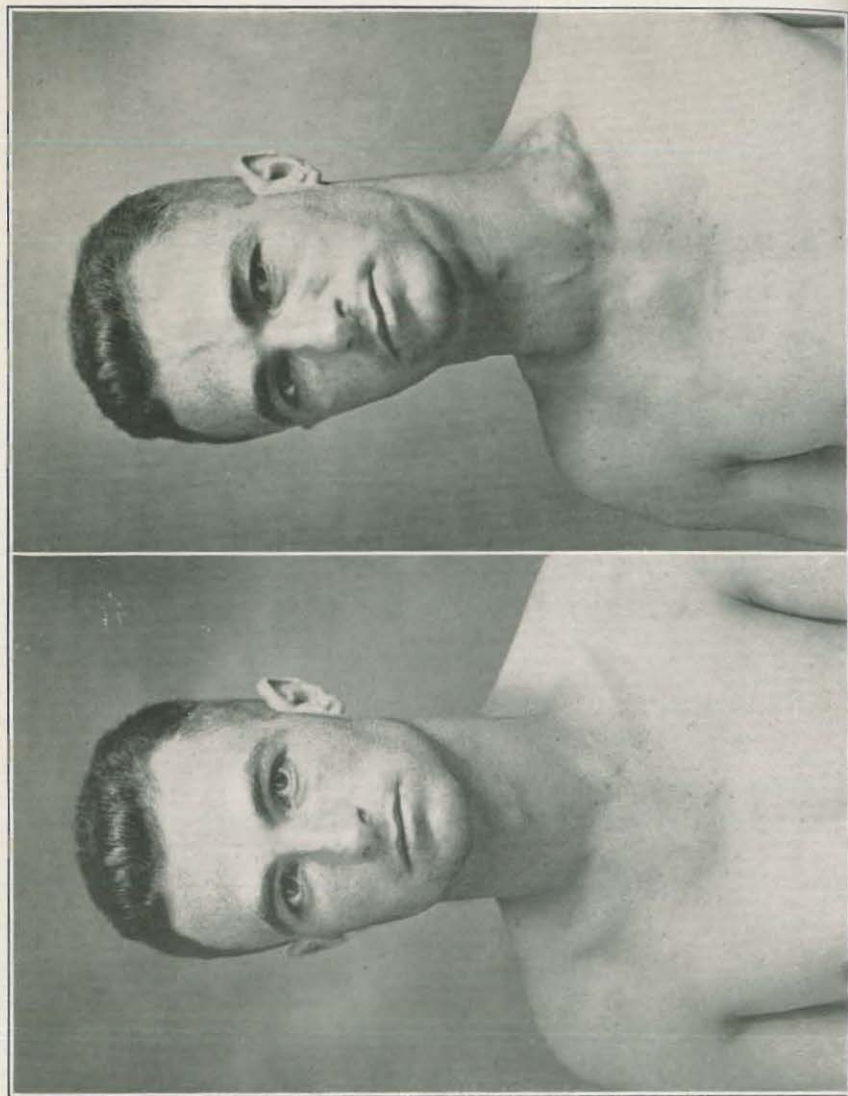
REPORT OF A CASE OF CAVERNOUS HAEMANGIOMA.

By C. W. SMITH, Lieutenant Commander, M. C., United States Navy.

Virchow has observed but one pure case of cavernous haemangioma. The following case of cavernous haemangioma of the supraclavicular region would therefore seem sufficiently interesting and unusual to be made the subject of a report and placed on record.

J. R. R., SC-3, age 23 years, enlisted in the United States Navy May 24, 1917, and has been admitted as a meningococcus carrier and with mumps, but there is no record of anyone having observed a well-marked tumor in the left supraclavicular region. This young man first came under observation when he appeared before the commanding officer for discharge from the service, at which time the commanding officer noticed a swelling in the neck and referred him to the medical officer for examination. Except for the ordinary diseases of childhood he has never been ill. His family and personal history are negative. He states that in 1911 he received a slight injury in the region of the tumor and later in the same year was burned





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Cavernous hemangioma (2) and (1).

in this region by the discharge of a Roman candle. At about this time he first noticed a small, soft swelling, which has intermittently been larger and smaller up to the present time, but he believes that the swelling is considerably larger now than when he first noticed it. He states that the wearing of a collar causes him discomfort, and that when he exercises the tumor becomes tense and causes him slight discomfort and pain. Since he has been in the Navy he has performed all the duties of his rating without any discomfort, except a "tight" feeling and slight pain when required to make any unusual physical effort.

Examination of the patient reveals a soft, irregularly shaped tumor, which, when distended, extends from the sternal head of the sternomastoid muscle to a point $1\frac{1}{2}$ inches from the anterior border of the trapezius, and $1\frac{3}{4}$ inches above the clavicle. The tumor projects in front of the sternomastoid muscle and also comes to the surface between the clavicular and sternal heads of the muscle. (See fig. 1.) When the patient is relaxed and sitting quietly at rest the tumor is hardly visible. (See fig. 2.) On palpation there are irregular projections similar in nature to large varicosities, but no pulsations can be seen or felt. On percussion a flat note is elicited. Auscultation reveals no bruit or breath sounds. The overlying skin is not discolored and not adherent to the deeper tissues. The most striking symptom was the enormous increase in size produced when the chest and neck muscles were contracted and expiratory effort made after full inspiration with the mouth and nose closed, in contrast with almost complete disappearance of the tumor while the patient was sitting quietly at rest. (See figs. 1 and 2.)

The diagnosis of intermuscular cavernous haemangioma was confirmed by Surgeon J. Chalmers DaCosta, United States Naval Reserve Force, who made a careful examination of this case. He stated that in his opinion the tumor probably extended into the superior mediastinum and its removal therefore would involve great surgical risk. He believes that the only indications for operation would be imminent rupture or severe pressure symptoms. Dr. Francis T. Stewart, Jefferson Medical College, Philadelphia, agreed with Surgeon DaCosta as to the diagnosis and surgical prognosis.

Radiographic examination was made by Passed Assistant Surgeon G. M. Neuberger, United States Naval Reserve Force, League Island Naval Hospital, Philadelphia, and his interpretation of the radiograph is here quoted: "Dense shadow in left apex extending down lower border first rib. Heart unusually large and displaced into right chest." These findings would tend to confirm the opinion that the growth extends within the chest cavity.

Cavernous haemangioma is a vascular tumor consisting of large intercommunicating blood spaces lined with endothelium. Connect-

ing tissue framework varies in quantity and in this case there seems to be very little. Blood circulates through the tumor and is supplied in most cases by the venous system. The tumor occurs in the skin, subcutaneous tissues, intermuscular tissues, bones, and viscera. It is most commonly found in the liver. The etiology is obscure. Some authorities claim that trauma has an important bearing, others that the condition is almost always congenital and that the tumor may enlarge later in life. Cavernous hæmangioma of the neck should be distinguished from the following conditions: Aerocele, hernia of the lung, vascular goiter, fibroma, lipoma, cold abscess, and aneurysm. In this case the flat note on percussion, the absence of breath sounds or bruit, the rapid distension and relaxation of the tumor, and the sensation imparted on palpation as of an accumulation of fluid under slight tension, made the diagnosis clear. Sutter states that there are on record 51 cases of cavernous and telangiectatic angiomas, and only 11 of these are of the pure cavernous type. Their distribution in the body is as follows: Lower extremity, 19; upper extremity, 15; back and neck, 12; abdomen, 3; breast, 1; head, 1. J. B. Carnett reports two cases of cervical subcutaneous cavernous hæmangioma. He states that these tumors were rather easily removed after a long dissection with no unusual loss of blood as they were situated high in the neck and surgical approach was comparatively easy. The diagnosis in these cases was confirmed by laboratory examination.

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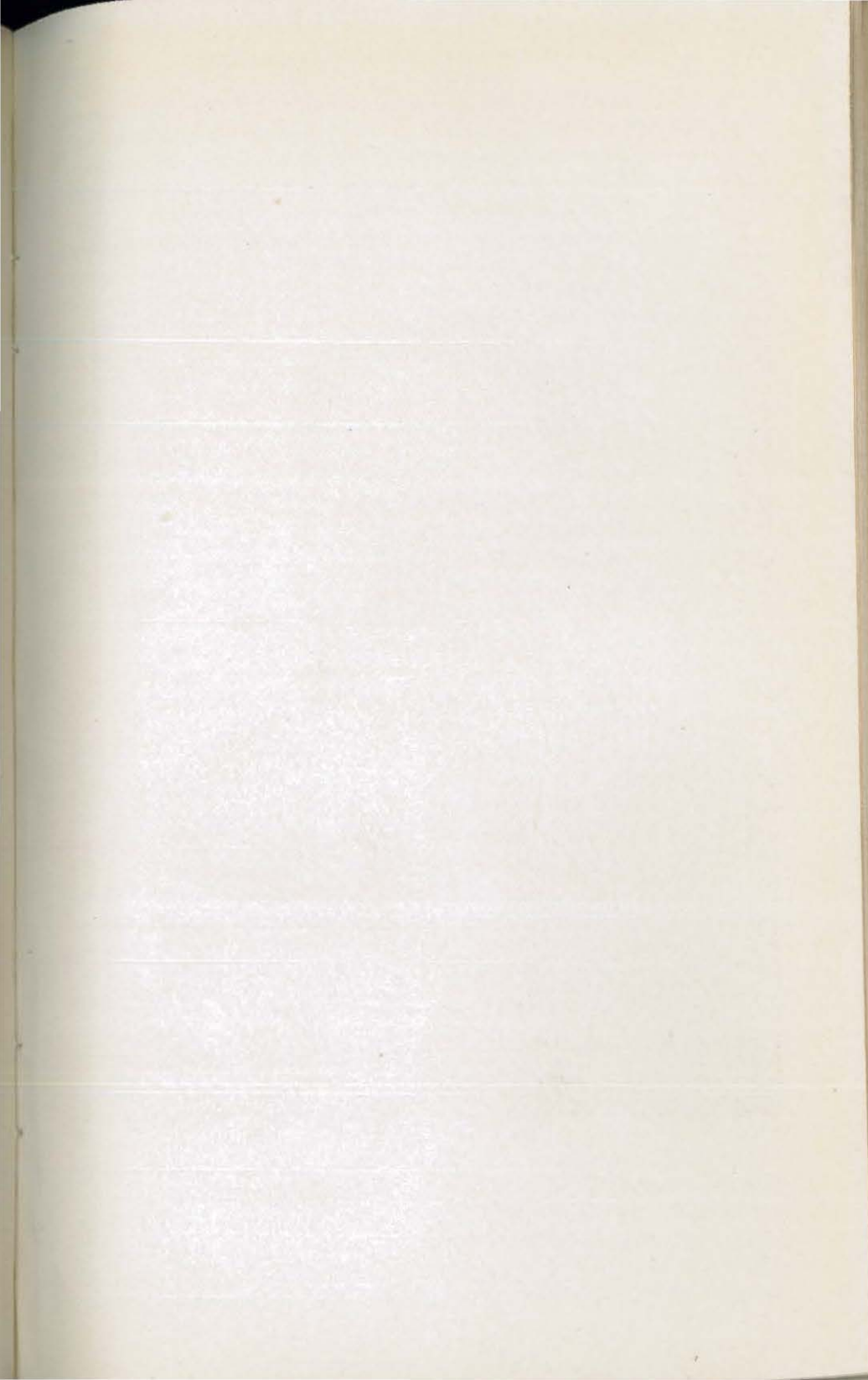
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REPORT OF A CASE OF ACUTE BILATERAL DACRYOADENITIS.

By J. V. CONSOLE, Lieutenant (J. G.), M. C., United States Navy.

Dacryoadenitis, or inflammation of the lacrimal gland, may be acute or chronic; unilateral or bilateral; suppurative or nonsuppurative. Weeks, in considering all forms of dacryoadenitis, states that it occurs once in ten thousand eye cases. Acute bilateral inflammation of the lacrimal gland is very rare and has for its chief symptom the disfigurement of the face, occasioned by the swelling of the lids. Resolution usually occurs after a short mild course and the function of the glands is not altered.

Rider, in 1872, reported a case of acute bilateral inflammation of the lacrimal glands, occurring in epidemic parotitis, in which metas-





Bilateral dacryoadenitis.

tasis to the testicle took place as the parotid swelling disappeared. The swelling of the lacrimal glands was observed as the testicular swelling subsided. A similar case has been observed by V. Schroeder.²

Gordon Norrie,³ in 1889, observed in a girl of 11 years a bilateral swelling of the lacrimal glands which was followed two days later by epidemic parotitis. Sendral⁴ reports a similar case. In 1890, Hirschberg⁵ described two cases of bilateral subacute, nonsuppurative dacryoadenitis, which he called "mumps of the lacrimal glands" on account of its analogy to bilateral parotitis. Giani,⁶ in 1907, described a case of acute bilateral dacryoadenitis occurring during the course of acute urethritis.

J. G. R., S-2, was admitted to the United States Naval Hospital, League Island, Pa., complaining that for the past three days he had had dull, pounding headache, though not suffering enough to prevent sleep. Anorexia and pains in limbs and trunk were present. About two days ago, the eyelids began to swell and become red until the appearance was that shown in accompanying illustration. Family and personal history have no bearing on the case. No history of exposure to any acute infection or mumps. Venereal infection denied. Physical examination as follows:

Well-nourished white male of 23 years. Head and neck negative except for the condition of eyes. Heart and lungs negative. Abdomen presents scar of appendectomy in lower right quadrant. Upper and lower limbs negative. Genitals negative and present no evidence of venereal disease. Glandular system negative except the bilateral swelling of lacrimal glands. Examination of eyes: Vision right eye 18/20; vision left eye 16/20, upper and lower lids of each side markedly swollen and slightly red; mechanical ptosis to the extent of covering upper half of each pupil. Palpation of temporal side of each upper lid reveals enlarged lacrimal glands, which are not tender. Lacrimal secretion not increased; conjunctiva of fornices slightly injected; chemosis of temporal quarter of bulbar conjunctivæ of each side. Examination of anterior segments, media, and eye grounds of both eyes negative.

Temperature on admission 100.6 F., which gradually subsided until normal was reached in four days. The swelling of the lids and glands and the redness of lids gradually disappeared in five days. Function of the glands is not altered. Blood examination, including Wassermann negative. Urine examination negative. Smears from eyes showed few Gram positive diplococci. Cultures showed scanty growth of pneumococci. The features of interest in this case are the unusual occurrence of the condition and the question of etiology. In view of the fact that although no history of exposure was obtained, epidemic parotitis was prevalent in this locality at the time

and since the literature has shown that acute bilateral inflammation of the lacrimal glands occurs as the complication of mumps or preceding the swelling of the parotids, there is a possibility that the causative agent of the latter may be the etiologic factor in this case.

On the other hand, the finding of pneumococci presents the possibility of its being the cause. This is given additional weight by the fact that several cases of pneumococcic conjunctivitis were treated at about this time at this hospital.

Treatment was eliminative combined with the employment of warm applications of normal salt solution.

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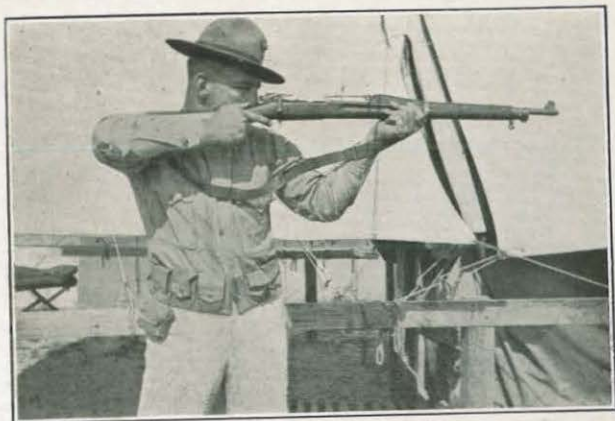
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PARALYSIS OF MUSCULOSPIRAL NERVE FROM PRESSURE OF RIFLE STRAP WHILE FIRING.

By J. C. ADAMS, Lieutenant, M. C., United States Navy.

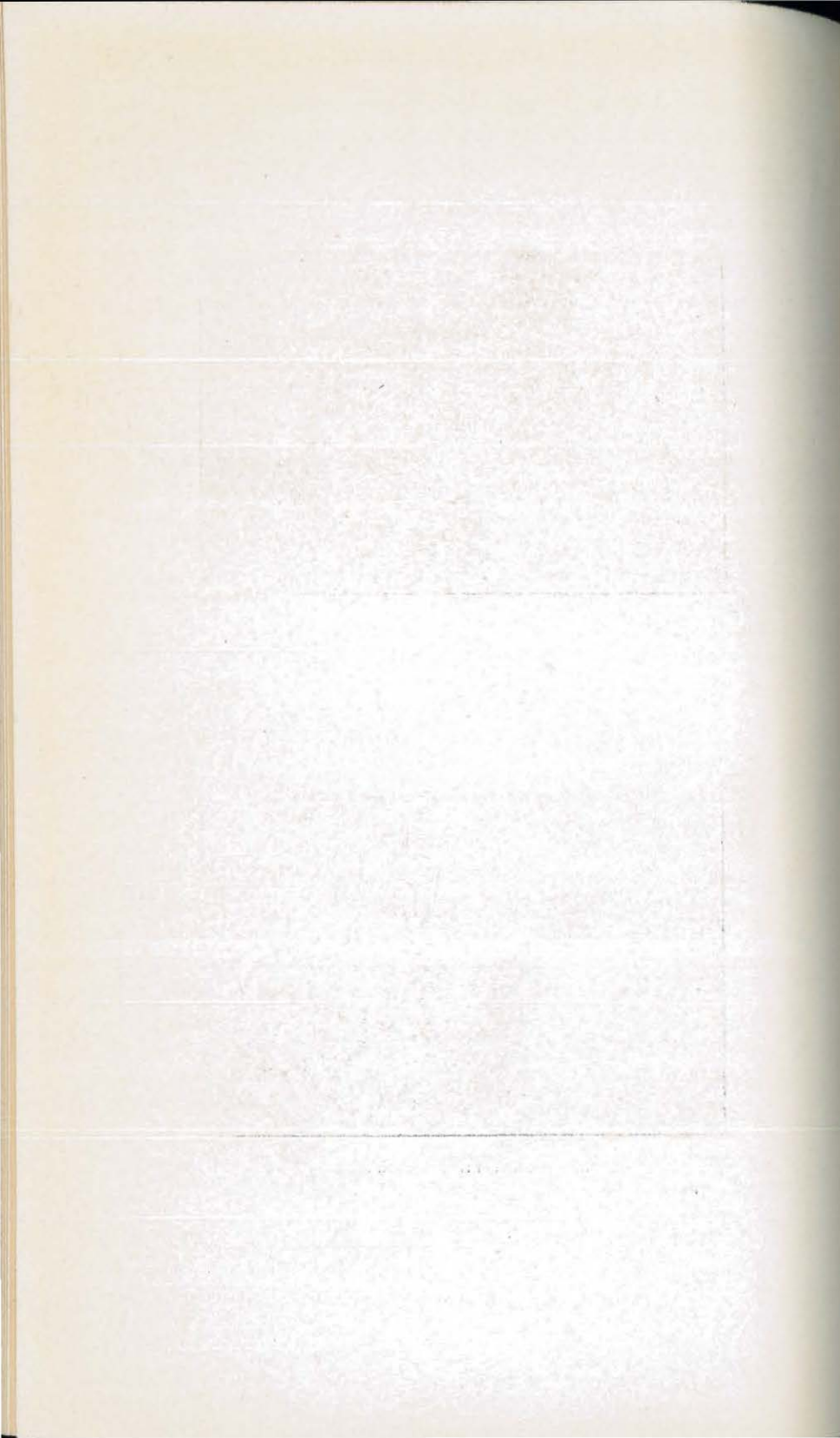
While traumatic paralysis of the musculospiral nerve is by no means an uncommon condition, yet the following case is reported because of the unusual way in which it was caused and the ease with which a condition of this kind might occur again under the same circumstances.

L—, J. R., private, United States Marine Corps, age 21, was admitted to the sick list June 5, 1918, complaining of loss of sensation and function of the left forearm. According to his own statement, disability commenced while firing a course on the range the previous afternoon and eventually forced him to cease firing. Examination of the arm showed a complete loss of sensation over the area supplied by the superficial branch (Radial N.), while wrist drop, inability to extend the wrist and fairly complete paralysis of the extensors of the hand showed the involvement of the muscular or deep branch (Posterior Interosseous N.). By the use of massage, strychnine and mild counterirritation the patient was returned to duty in four days.



Showing position of rifle strap on the arm.

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The pictures show fairly well the rifle strap in the firing position and the manner in which the greater part of the pressure from the strap is exerted over the musculospiral nerve as it curves round the humerus.

CUTANEOUS DIPHThERIA OF THE FOOT.

By J. J. KEEGAN, Lieutenant (J. G.), M. C., United States Navy.

An unusual case of cutaneous diphtheria was recently observed at the United States Naval Hospital, Chelsea, Mass. The patient was received for treatment of a gangrenous ulcer, 12 centimeters long and 7 centimeters wide, occurring over the external malleolus of the right foot. The ulcerated surface was covered with a grayish-white membrane and surrounded by an elevated indurated border. The posterior and lateral surface of the leg, extending as high as the knee, showed marked induration, redness, and tenderness.

Smears made from the covering membrane or exudate showed predominating numbers of gram positive bacilli with typical morphology and staining qualities of diphtheria bacilli with methylene blue and Neisser's stains. There were also considerable numbers of Gram positive cocci and diplococci, which proved on culture to be staphylococci and streptococci. Cultures on Loeffler's blood serum gave a very positive growth of diphtheria bacilli of typical morphology and staining qualities.

A slight huskiness of the patient's voice was noted, although no special soreness of the throat was complained of. The tonsils and posterior pharyngeal wall were dark red and rather rough. There was no membrane over the tonsils but a few areas of grayish-white fibrinous exudate were noted on the posterior pharyngeal wall. Cultures from these on Loeffler's blood serum gave a pure growth of diphtheria bacilli.

The preadmission history of the case records a small pressure sore from a tight shoe, about seven days ago, which spread very rapidly, as a large bleb and was opened three days before admission and found to contain a large amount of rather thick grayish-yellow pus. This was treated with sterile dressings, but resulted in a large superficial slough, increase in size of the ulcer, and marked inflammatory extension into the surrounding tissue. The patient gave no history of special throat symptoms. The huskiness of the voice had been present two days before admission.

The clinical history was negative. The temperature was about 99° and the pulse 80 to 90 for a few days. The ulcer was treated first with a dressing moistened with diphtheria antitoxin and 9,000

units of diphtheria antitoxin were injected intramuscularly. Beef serum dressings were applied daily thereafter. The surrounding inflammation subsided rapidly and healthy granulation tissue filled the floor of the ulcer. Twenty-one days after admission the ulcer had reduced in size from 12 cms. by 7 cms. to 8 cms. by 5 cms. Throat cultures were positive for diphtheria bacilli nine days after admission and ulcer cultures positive only two days.

The literature records many instances of cutaneous infection with the diphtheria bacillus, which, however, are rare when the great number of cases of diphtheria are considered. These are chiefly cases of extension from the oral mucosa to the face, to the surface of wounds, or to the female genitals. Authentic cases of cutaneous diphtheria without evidence of clinical diphtheria are very rare. It is necessary to prove these cases by guinea-pig inoculation of cultures of the organism to demonstrate its virulence and identity as a true diphtheria bacillus.

The present case is interpreted as a probable primary pharyngeal infection with the diphtheria bacillus, with mild symptoms, and the transmission of this to the skin abrasion on the foot, resulting in extensive abscess and ulcer. There was undoubtedly a secondary streptococcus infection of the ulcerated surface, causing in large part the wide surrounding erysipelatous inflammation.

The cases similar to the present reported case, with abscess, gangrenous ulceration, and surrounding erysipelatous inflammation, are not numerous. Williams (*Jour. Med. Res.*, 1902, viii, 83) and Abel (*Cblt. f. Bakt.*, 1894, xvi, 455), isolated virulent diphtheria bacilli from a lesion on a finger of a patient with clinical diphtheria. Todd (*The Lancet*, London, 1898, i, 458) briefly records the finding of diphtheria bacilli in two pustules of the foot, complicating cases of diphtheria. Heelis (*Brit. Med. Jour.*, i, 556) discovered virulent diphtheria bacilli in two cases of ulceration of the foot, thought to be due to chilblains. Leary (*Med. Surg. Rep.*, Boston City Hosp., 1896, 129) found a pure culture of virulent diphtheria bacilli in an abscess which developed about a hair follicle two days after an autopsy on a case of diphtheria. The abscess remained local.

LARGE CALCULUS REMOVED FROM COMMON DUCT.

By R. G. LECONTE, Lieutenant Commander, M. C., United States Navy.

R. B. L., Filipino, cabin steward, age 26 years, admitted March 26, 1918, to the medical service. When he entered the hospital, he complained of right-sided abdominal pain which, according to his statement, had begun four days previously, or on March 22. His pain was knifelike and, at times, radiated to back and right shoulder and his abdomen showed the scar of a rectus incision beginning in

the right hypochondrium, cholecystostomy having been performed previously.

On March 28, fluoroscopic and skiagraphic examinations showed a "projection below margin of liver at middle anterior edge." On the same day a gastric analysis showed that there was, after a "fasting stomach, small quantity of subacid content. No obstruction. Sixty-minute digesting stomach, subacid catarrhal gastritis, mucus greatly increased, but no bleeding."

March 29, patient had definite gall-stone colic, jaundice of sclerae and 10,350 leucocyte count. March 30, leucocyte count was 10,000. On March 31 two trifaceted gall stones were recovered in the stool. On April 2 two more faceted stones were seen in feces.

A conference was held and, although surgical interference was decided upon, it was deemed advisable to wait for quiescence of acute inflammatory symptoms. Transferred to surgical service.

On April 9, at 9.30 a. m. the patient was operated upon under chloroform-ether anæsthesia. Incision just to right of median line, 5 inches long, above umbilicus. At its lower end incision was prolonged transversely across whole body of rectus. Omental adhesions surrounded gall bladder and lower surface of liver. Omentum adherent to anterior abdominal wall. These adhesions were broken up and the omental hemorrhage controlled by catgut ligatures. Anterior wall of stomach near pylorus also adherent in mass. While separating these adhesions the gall bladder was torn from anterior abdominal wall. It was large, thick-walled, and filled with currant-jelly clot without visible bile. The head of the pancreas was hard and common duct greatly dilated; on opening the latter it was found filled with currant-jelly clot. A large faceted stone, perhaps 1½ inches in its diameter, was removed from the common duct, together with several smaller stones. The ampulla of Vater was free from stones. The hepatic duct, although greatly dilated, seemed empty. After emptying the gall bladder and common duct of clots, a thick, altered bile with sandy flakes appeared. A large drainage tube was fastened in common duct with a catgut suture and gall bladder drained in a similar way. Peritoneal cavity drained with cigarette drain and a split rubber tube.

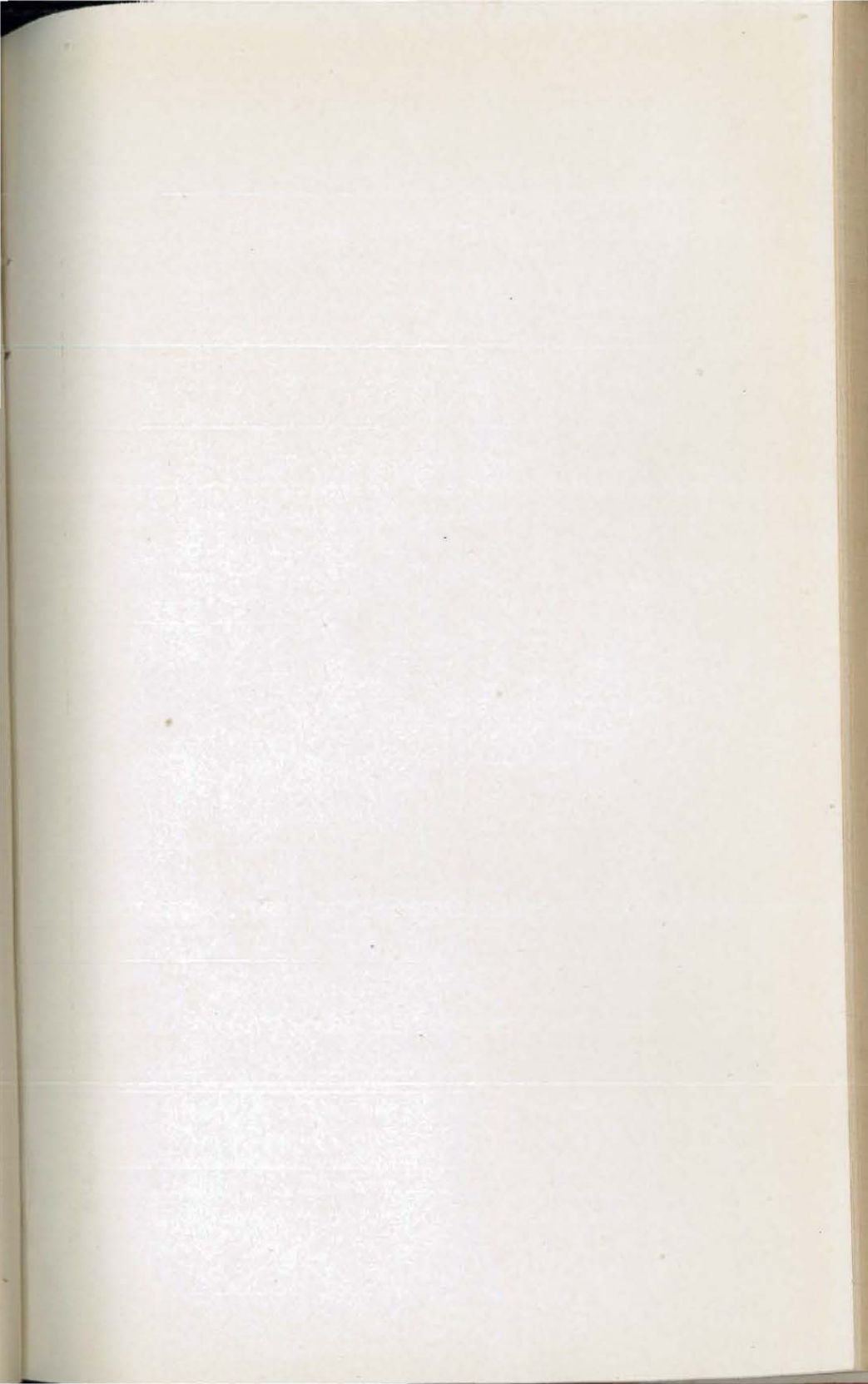
Returned from operation at 10.45 a. m. in good condition. Patient redressed at 4 p. m. when gall bladder and common duct were connected with two bottles by means of rubber tubes. Patient drained 120 c. c. of bile during first 12 hours and thereafter quite freely. On April 11, rubber tube removed from peritoneal cavity. April 12, cigarette drain removed. Rubber tubes, draining gall bladder and common duct, removed April 14.

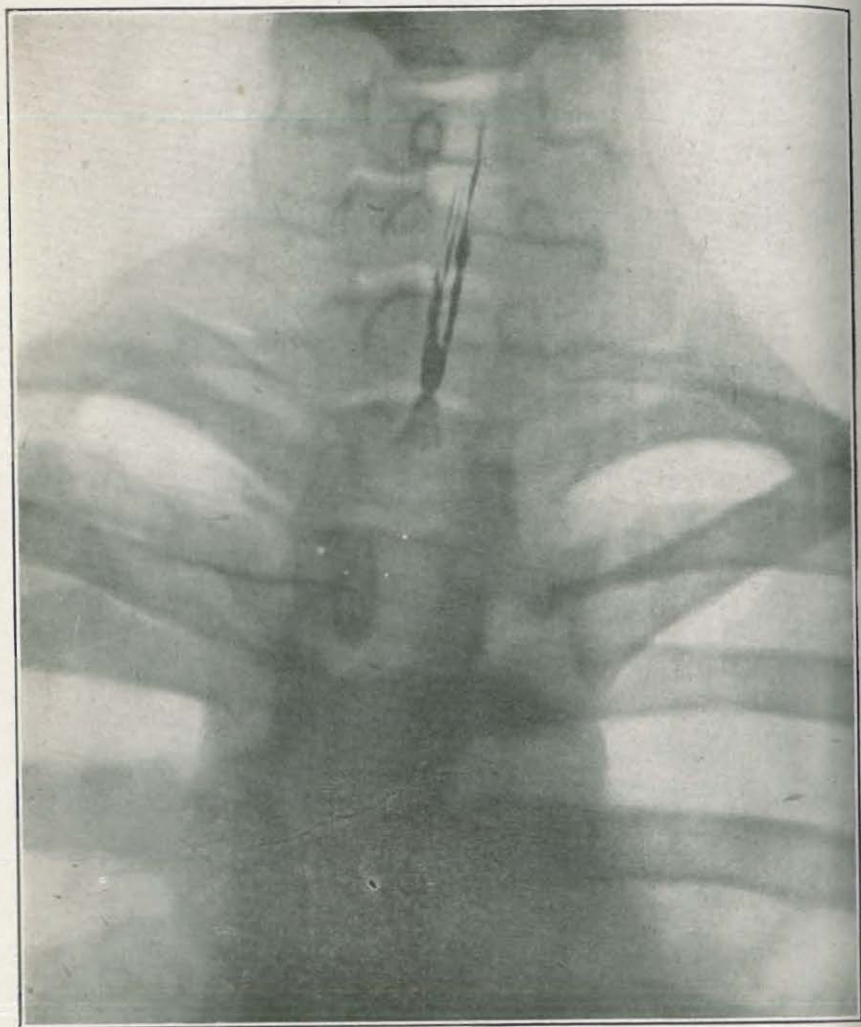
CIRCUMCISION IN THE PRESENCE OF CHANCROIDS.

By J. S. VAN WINKLE, Lieutenant (J. G.), M. C., United States Navy.

Surgical operation on the penis in the presence of chancroidal ulceration is generally conceded to be inadvisable. Operative treatment in these cases has been limited either to simple cauterization, to the incisional relief of a complicating paraphimosis, or to dorsal splitting of the prepuce in cases of phimosis for the purpose of exposing and treating concealed lesions. Circumcision, as a primary operative procedure in chancroidal cases, has usually resulted in generalized infection of the line of incision with spreading ulceration and prolonged convalescence, and often with marked ultimate deformity of the penis. In the less virulent cases of penile chancroids without complications, local treatment should be adhered to since in these mild cases the operation of circumcision neither hastens the cure nor contributes to the patient's safety or comfort. In the virulent cases with serpigenuous forms of ulceration, often complicated by marked edema of the prepuce and phimosis, we have lately substituted primary circumcision for the usual procedure of dorsal or lateral splits. We have found that primary circumcision can be performed with safety in these cases and with the full expectation of primary union of the wound in practically all instances except where the line of incision actually traverses the ulcerated areas. Even in this latter group there is a marked reduction in the convalescence time over the old methods of treatment if the technique described below is rigidly followed.

Technique.—Conduction anesthesia is produced in the dorsal nerves of the penis by injections of cocaine solution ($\frac{1}{2}$ per cent). A circular skin incision is then made just back of the coronal line, and the preputial skin flap thus outlined is dissected forward until the reflected mucosal layer covering the glans of the penis is well exposed. Thus far the dissection has been made through healthy tissue, but in order to prevent future contamination the denuded area is sprayed with dichloramin-T solution (7 per cent). A small vertical slit is now made in the reflected layer of the prepuce near the coronal margin, and through this opening the preputial sac is thoroughly irrigated with the dichloramin solution. With a pair of curved scissors introduced through the small slit in the mucosa, the latter is excised in the usual manner, thus permitting the removal en bloc of the prepuce from behind forward. This dissection is made entirely outside of the ulcerated area except in cases where the coronal sulcus is involved in the destructive process. The same technique is followed in the latter group of cases with the addition of thorough cauterization of the remaining areas of ulceration.





Persistence of the thyroglossal duct.

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Results.—We have followed this technique since January 1, 1918, in 28 cases. Of these, 24 (86 per cent) healed primarily; delayed primary healing occurred in 3 cases (10 per cent), while complete breaking down of the wound occurred in only 1 case (less than 4 per cent).

PERSISTENCE OF THE THYROGLOSSAL DUCT.

By B. D. PARISH, Lieutenant, M. C., United States Navy.

Congenital cervical fistulæ require radical treatment when they give rise to much inflammation or to cystic tumors or for cosmetic effect. Cervical fistulæ may be lateral or median; when lateral they are known as branchial fistulæ due to failure of closure of one of the branchial clefts; when median the fistula is the result of the non-obliteration of the thyroglossal duct.

Congenital fistulæ do not always cause symptoms and may not be discovered until adult life or until some distention and irritation by mucous-hyaline or muco-purulent discharge has called attention to them. The term "duct" is rather misleading as the thyroglossal duct has no such function, being merely the unobliterated canal lined with epithelium through which the thyroid sinks from the base of the tongue to its final resting place in embryo.

From the dissections of Moragni, and later Minot, it appears that the thyroid sinks from its original position on the dorsum of the tongue, normally obliterating its tract. In some mammals, Woelfler, Meuron and Van Bemmelen found that the thyroid sometimes sank as low as the arch of the aorta, but never below the top of the sternum. Unobliterated portions of the descending canal with a lining of epithelium form congenital thyroglossal tracts.

This congenital malformation is better appreciated if the manner of development of the thyroid gland is clearly understood. In early embryonic life, the gland consists of three parts, two of which are situated laterally and derived from endodermic linings of the fourth visceral furrows on each side, while the third one, which forms the central portion of the gland, is an outgrowth from the ventral wall of the pharynx, about the position of the second visceral arch, which outgrowth, known as the thyroglossal duct, or canal of His, grows downward through the hyoid bone and joins the lateral portions. Normally this outgrowth of glandular tissue should lose its connection with the pharynx, and the connecting band become obliterated by the eighth week of fetal life, its origin being represented in the normal individual by the foramen caecum at the base of the tongue.

If glandular tissue persists in the whole or any portion of the duct course, we have in the remaining tissue a nucleus for the development of a pathological condition which may assume one of several forms. These forms are solid tumors of thyroid tissue at the base of the tongue (1), cysts or solid tumors of thyroid tissue in the hyoid bone, or between it and the tongue (2), or below the hyoid bone, between it and the thyroid gland. Sometimes the whole duct persists as a canal lined with epithelium, although it is said usually to be interrupted at the thyro-hyoid ligament (3).

The following case is interesting because of the misleading history of the presence of a foreign body and the rather rare condition of a persistent thyroglossal duct.

W. C. J., seaman, second class, age 18 years, was admitted to the Naval Hospital, League Island, Pa., November 28, 1917, with the following history: For about one year he had pain and a discharging sinus just above the suprasternal notch in the midline of the neck. He was of the opinion that there must still be a foreign body somewhere in his neck, as about three years ago a piece of metal about the size of a pin was expressed from the neck at the opening of the sinus. With this history it was thought best to study the case first by means of the X-ray. These plates were taken by Passed Assistant Surgeon Neuberger, United States Naval Reserve Force, one to determine the presence of a foreign body, one with a segmented opaque probe inserted, and one after injection with bismuth paste. No foreign body being found, the duct was then dissected out under ether anaesthesia. It extended from just about the suprasternal notch to the hyoid bone, along the anterior surface of the trachea, where it ended in a broad fan-like aponeurosis. No extension above the hyoid could be found or outlet at the base of the tongue. The wound was closed by metal clamps, and healed by first intention. No recurrence of the condition has been reported up to the present time.

It would appear that the history of a pin being extracted was true, the probability being that it was placed in the duct during childhood and forgotten till it expelled itself.

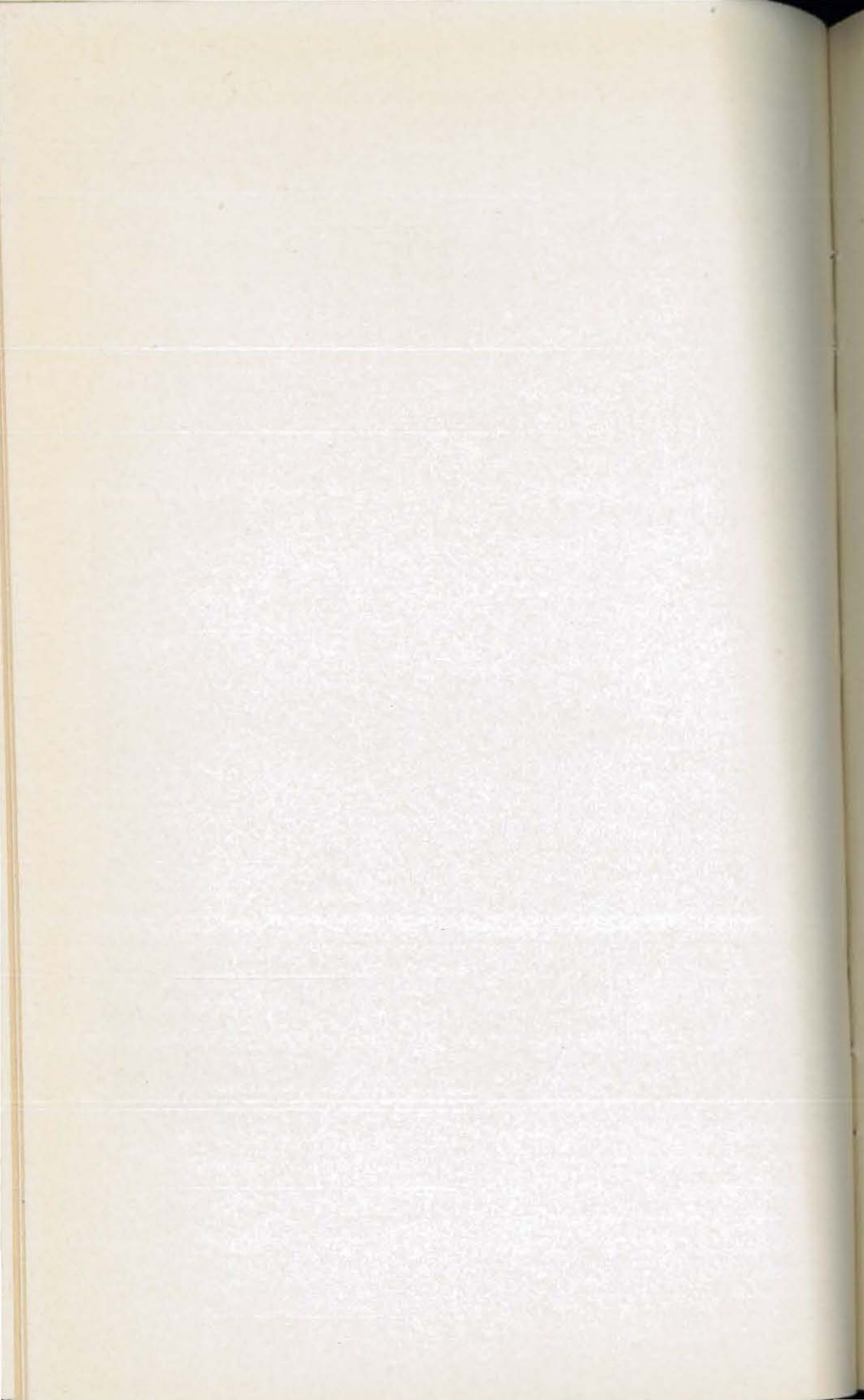
Any swelling or sinus of more than transient duration situated in the median line of the neck, or in the floor of the mouth or at the base of the tongue should be carefully examined to exclude the presence of a thyroglossal duct.

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Persistence of the thyroglossal duct.



RUPTURE OF POPLITEAL ANEURYSM FOLLOWING THE ADMINISTRATION
OF SALVARSAN.

By F. J. DEVER, Lieutenant, M. C., and R. S. BOLES, Lieutenant, M. C., United States Navy.

The following case is reported in order to illustrate the harmful result that may follow the administration of the arsphenamins in syphilis of the cardio-vascular system.

R. H. A., fireman second class, 47 years old, was admitted to the United States Naval Hospital, League Island, Pa., November 30, 1917. He complained of a small mass of four weeks' duration in the right popliteal space, causing little discomfort aside from occasional aching following unusual exertion. From the time it was first noticed it did not increase in size to any appreciable extent. The patient believed the mass resulted from riding a slice bar. He has been a fireman for four months, prior to which time he was a bookkeeper. While a fireman he almost constantly rode the slice bar.

The patient states he had a chancre 25 years ago. He was under treatment for same for two and a half years, receiving mercury and iodides. Secondary symptoms were never observed.

Family history was negative. He is unmarried and has never indulged excessively in alcohol or tobacco.

On admission physical examination revealed normal station and gait, except for slight limping of right leg. Pupils were equal and regular and reacted to light and accommodation. No thyroid enlargement. Pulse of increased tension; rhythm regular; normal rate. Vessels hardened. The area of cardiac dullness was normal. There was slight accentuation of the aortic second sound and no audible murmurs. Lungs were negative. Liver and spleen were not enlarged. Knee jerks normal. No abnormalities detected in upper extremities.

There was a tender, pulsating, expansile mass about the size of a hen's egg in the right popliteal space and over this mass could be heard a distinct bruit. A pulse of equal volume was felt over either dorsalis pedis. There was an appreciable difference in the size of the two legs, the right calf measuring 1 inch larger than the left. The right foot was slightly swollen. The circumference of the left knee was $14\frac{1}{2}$ inches and of the right knee $15\frac{1}{2}$ inches. There was no difference in the surface temperature of the two legs.

Blood examination revealed 4+ Wassermann and normal coagulation time. Systolic blood pressure was 140 mm., and diastolic 85 mm. Urine was negative.

The patient was confined to bed. Ten grains of potassium iodide were administered t. i. d. and mercurial treatment by inunction was given in the usual manner. Continuous digital pressure was ex-

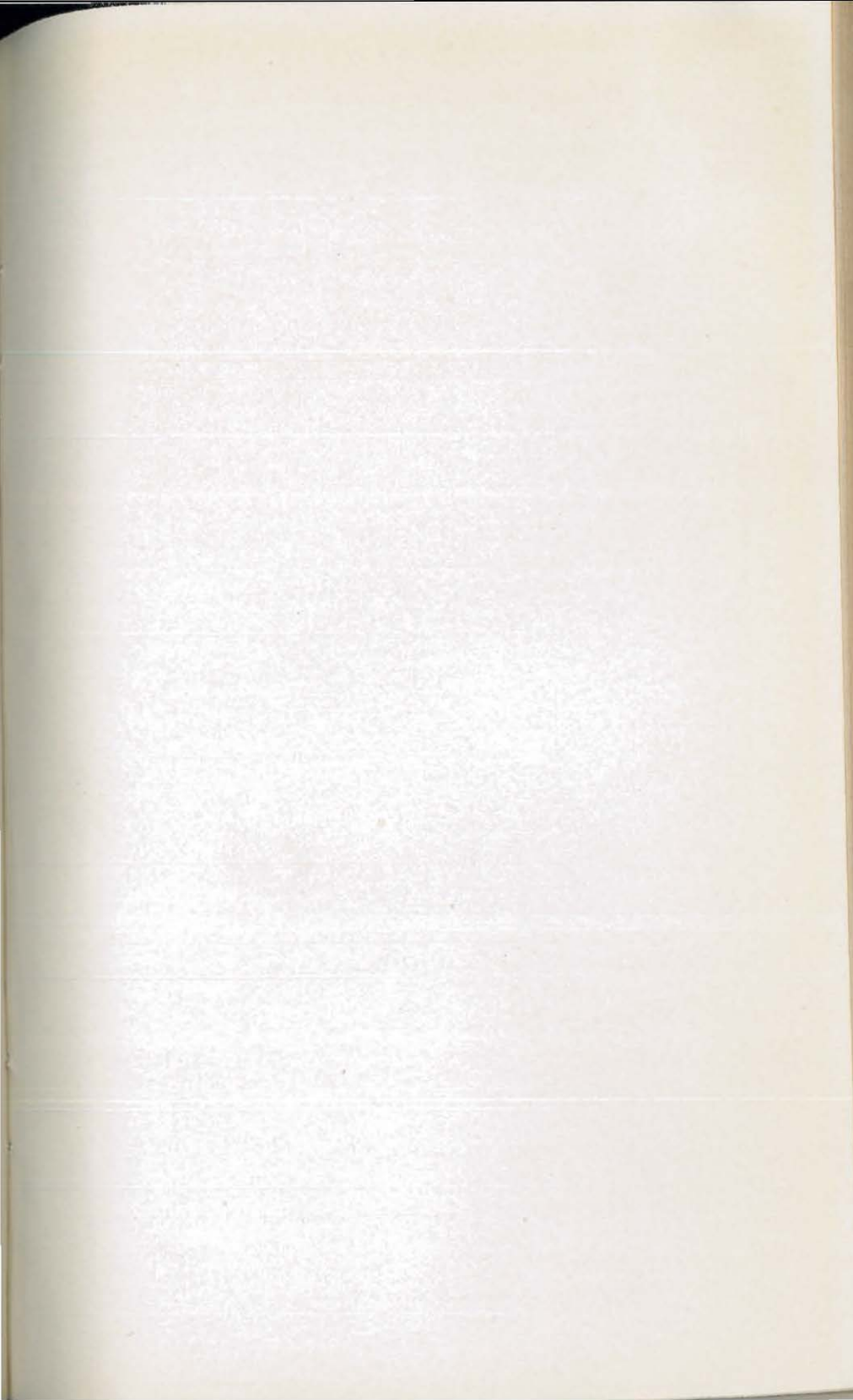
erted over the right femoral artery for 48 hours, at the end of which time the pulsation over the aneurysm was distinctly less violent, although the size remained unchanged. Ten days after admission 0.4 gm. salvarsan in 100 cc. solution was given intravenously. The drug was properly dissolved and neutralized and the solution was free from sediment. Following the injection the systolic blood pressure was 5 mm. higher and the diastolic blood pressure 5 mm. lower than immediately before. There was no constitutional reaction following the administration of the drug.

Within 48 hours after the injection, the patient complained of severe pain over the aneurysm which became so intense at the end of 96 hours that morphine was required. The mass was observed to be distinctly larger, practically filling the popliteal space. During the next 10 days the mass became progressively larger and more painful and extended about 4 inches down the calf of the leg. The edge was not clearly defined. The circumference of the right knee at this time was $17\frac{1}{4}$ inches and the left knee $14\frac{1}{4}$ inches. Because of the rapid extension of the mass and the great increase of pain with total disability, the leg was amputated at the junction of the upper and middle thirds of the thigh. This was followed by an uneventful convalescence.

Dissection of the leg following amputation revealed a ruptured saccular aneurysm of the popliteal artery occupying the entire popliteal space. The skin over the aneurysm showed considerable pressure atrophy and discoloration. The wall of the aneurysm was very thin, softened and inflamed and had ruptured through its lower aspect. As a result, the outline of the aneurysm merged indefinitely with an extravasation of blood into the subcutaneous tissue extending about 4 inches down the leg. The aneurysm itself contained a soft loose clot.

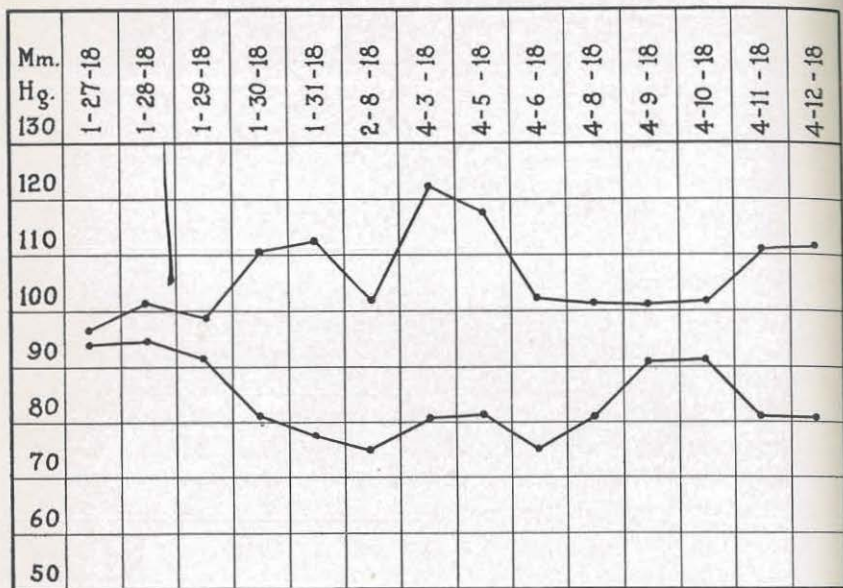
In our opinion, the rupture of the aneurysm may be attributed directly to the action of the salvarsan on the wall of the sac. Subsequent to the injection of salvarsan in a case of tertiary syphilis presenting large, indolent incrustated ulcers, there resulted active inflammation and softening of the ulcers. Their edges became markedly swollen and they were surrounded with a distinct area of redness. It is very probable that the same sequence of events took place in the affected tissue of the aneurysmal sac, sufficient softening occurring to cause the rupture. It was most unlikely that the rupture was due to the fluid injected, as the solution was injected slowly and caused a rise of but 5 mm. in blood pressure. Furthermore, the rupture did not occur until at least 48 hours after the injection.

In view of the results obtained in this case, it is important to emphasize the danger of the administration of the arsphenamins in syphilis of the cardio-vascular system.



BLOOD PRESSURE CHART

Fig. 2



Upper line represents the systolic, lower one the diastolic pressure.

PERICARDIAL EFFUSION.¹

By J. M. PERRET, Lieutenant (J. G.), M. C., United States Navy.

Pericardial effusion is a comparatively rare disease; thus in the annual report of the Surgeon General, United States Navy, for the year 1916, in which are tabulated 39,094 cases of diseases, there was only one case of pericarditis. In the same report we find 4,092 cases of acute follicular tonsillitis, 81 of chronic tonsillitis, 219 of hypertrophied tonsils, 212 of acute rheumatism, and 72 of subacute rheumatic fever. Osler found 6 per cent of his cases of acute rheumatic fever to be complicated with pericarditis.

The rarity of pericarditis in the Navy is striking, when we consider the large number of cases of tonsillitis and rheumatism.

We do not yet fully realize the value of the X-rays in helping us to follow the progress of diseased conditions. We are too prone to be content with a single radiographic examination. A series of X-ray pictures would often give us very valuable information. What would we think of the clinician who would lay aside his stethoscope after his first examination of a heart or lung case? Let us use the X-rays more often to study the progress of our cases.

S. G. W., age 31, was admitted to the hospital on January 1, 1918, complaining of painful joints. Past history is irrelevant except that in February and August, 1917, he had very mild attacks of tonsillitis, without any complications.

Present illness dates back to six days previous to admission. The onset was gradual, with pain and swelling of both ankles. Several days later the left knee became involved. He had slight fever.

Physical examination was negative except that both ankles and left knee joint were painful, red, hot, and swollen. The hip joints were also painful. Temperature 100 F.

Laboratory findings: White count, 18,000; Neutrophils, 85 per cent; prostatic smear, negative; urine, negative.

The fever was moderate and ranged between 99° and 100 F., until January 7, when it took a sudden jump to 104 F. This marked the onset of a pneumococcic lobar pneumonia, which affected the left lower lobe and terminated by crisis on the seventh day. During the pneumonia the joints were normal. A week after recovering from his pulmonary complication the patient began to complain of a feeling of fullness under the upper part of his sternum. A pleuro-pericardial murmur was then heard in left mammary space, just at the edge of the heart. Ten days later the temperature rose to 100 F.

¹ Case report from the United States Naval Hospital, ensacola, Fla.

Physical examination now revealed a bulging of precardium. The apex beat could neither be seen nor felt. There was dullness on both sides of the sternum in first and second intercostal spaces, an increase of cardiac dullness to the left, and a well-marked obtuse cardio-hepatic angle. (Rotch's sign.) The heart sounds could not be heard at the mitral and tricuspid areas and were very faint at the base. The breathing was labored. The pulse was very weak, 130, irregular. The diagnosis of pericardial effusion was obvious. Skiagraph made on 1-28-18 showed the extent of the effusion.

The blood-pressure chart, figure 2, shows that during the period of greatest effusion there was hardly any pulse pressure.

Treatment was simple. The fluids were restricted and the bowels kept open with salines. An ice cap was kept over precardium. Sodium salicylate and sodium bicarbonate were given. Stimulants in the shape of tr. of digitalis and strychnine sulphate were administered by hypodermic. At the suggestion of Medical Director Smith a fly blister was applied to precardium.

Present condition of patient: It is now nine weeks since signs of pericardial effusion were detected. Symptomatically patient is well. The pulse is just a trifle fast, but is regular and of good volume and does not get abnormally fast after exertion. The apex beat is still invisible and can not be felt. The cardiac dullness is approaching normal.

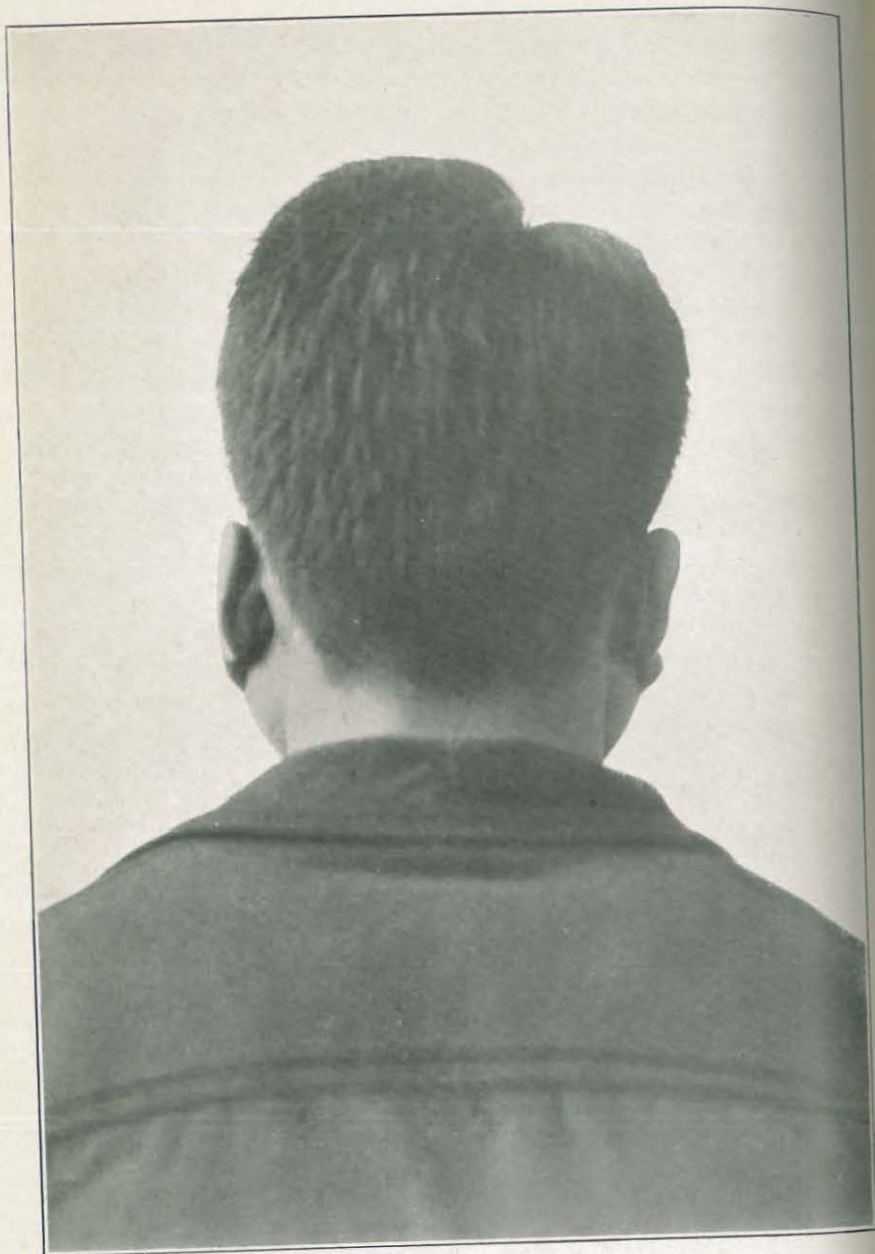
The patient was surveyed out of the service because it was not deemed likely that his heart could stand the arduous work of a seafaring life. If he can secure employment in civil life which will not demand too much muscular exertion, his prospects of getting along seem fairly good. It is well to recall the old paradox: "Persons rarely die of the disease with which they suffer."

Table of heart measurements from skiagraphs showing transverse diameters of heart. (fig. 3)

	Jan. 28, 1918.	Feb. 18, 1918.	Apr. 5, 1918.
First intercostal space.....	10.6	8.7	7.5
Second intercostal space.....	15	11.8	10.6
Third intercostal space.....	18	16.2	15
Fourth rib.....	18.7	16.8	15
Fifth intercostal space.....	17.5	15	15



Symmetrical enlargement of salivary glands.



Symmetrical enlargement of salivary glands.

REPORT OF A CASE OF SYMMETRICAL ENLARGEMENT OF THE SALIVARY GLANDS.

By R. S. BOLES, Lieutenant, M. C., United States Navy.

Symmetrical enlargement of the salivary and lacrimal glands was first described by Von Mikulicz in 1888.¹ Since that time the condition has been known as Mikulicz's disease. According to Riesman,² it is a "chronic inflammation affecting the lacrimal and salivary glands, but there are cases, evidently of the same nature, in which the salivary glands alone are affected." Some authorities believe the enlargement of the salivary glands is due chiefly to a diffuse lymphoid hyperplasia and not to the hypertrophy of the parenchyma proper. The etiology of the disease is unknown. Riesman classifies the cases into two main groups, namely, those with and those without blood changes. Among those without blood changes, there is a group presenting symmetrical enlargement of the salivary glands alone.

Filipino, age 27 years, wardroom steward, admitted to the United States Naval Hospital, League Island, Pa., with chief complaint that for three and a half years he had been troubled with a swelling below and in front of either ear. He states that the swellings first appeared in November, 1914, without any apparent cause. They quickly became the size of a lemon and have so remained. They occasioned no pain or discomfort. They appeared simultaneously and enlarged symmetrically and synchronously. His general health has been unimpaired. He believes that he had mumps at 7 years of age, but no swelling was ever observed after this.

He has never suffered from any disturbance of the salivary or lacrimal secretions. The family history is negative as regards tuberculosis and syphilis and no other member of the family has ever been known to suffer from a condition similar to his. The patient has been in the Navy three years and eleven months and taught school in the Philippine Islands prior to this. He does not recollect ever having had any parasitic infection or tropical disease and is not addicted to alcohol or tobacco.

The physical examination is as follows: The patient apparently enjoys good health. His station and gait are normal. The pupils react to light and accommodation. There is no enlargement of the lacrimal glands. The salivary and lacrimal secretions are normal. The pulse is regular and of normal tension. The epitrochlear and axillary glands are normal. The teeth are in good condition. The tonsils are not diseased. Both parotid glands are soft, of the same consistency and swollen symmetrically to the size of a lemon. They are not tender, not adherent to the skin and nonfluctuating. They do not interfere with the movements of the jaw. The lungs are normal on physical examination and this is confirmed by X-ray exami-

nation. Cardiac examination reveals a faint systolic murmur at the apex, following exercise. The knee jerks are a trifle exaggerated. The liver and spleen are not enlarged. The systolic blood pressure is 144 mm. and diastolic 72 mm. The urine is negative. Wassermann test negative. Hookworm ova were discovered in feces. With appropriate treatment subsequent examinations were negative.

The blood count was as follows:

Hemoglobin.....	Per cent (Sahli).....	90
Red blood cells.....		6,390,000
White blood cells.....		6,000
Differential count:		
Polymorphonuclear leukocytes.....	per cent.....	51
Large lymphocytes.....	do.....	12
Small lymphocytes.....	do.....	23
Eosinophiles.....	do.....	13

The etiology of the case is obscure. Syphilis can be eliminated as a result of the Wassermann test and the history elicited. Aside from the eosinophilia which can be attributed to the presence of the hookworm, there is no evidence of leukemia, pseudoleukemia, or other blood disease. The case is therefore not one of a leukemic or pseudo-leukemic origin. The case is absolutely noninflammatory, is of too long duration, and is not associated with a testicular disturbance, which eliminates the question of mumps. As X-ray examination and physical examination of the lungs is negative and there is no evidence of tuberculosis elsewhere, it is fair to deduce that this is not an etiological factor.

The chronicity of the swellings and their symmetrical distribution eliminates both benign and malignant tumors in the differential diagnosis.

The disease per se is not fatal. Treatment, except possibly by the X-ray, is unavailing.

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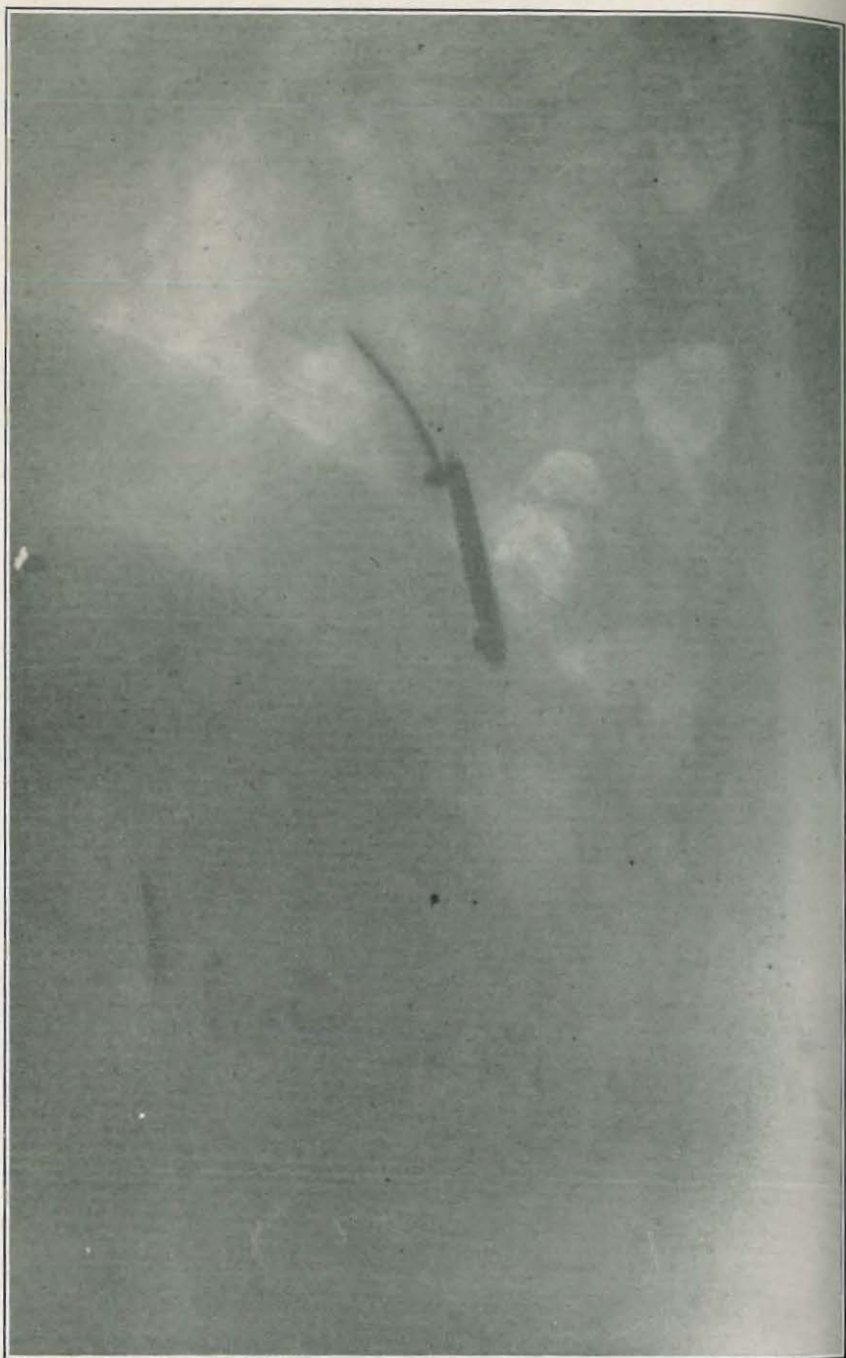
DENDRITIC CALCULI IN THE KIDNEY.

By G. G. Ross, Lieutenant, M. C., United States Navy.

F. F. McG., fireman second class, age 25, admitted February 10, 1918, from U. S. S. *Monaghan*. Upon examination, he complained of pain in upper right abdomen and right loin and of what he termed "stomach trouble." He had never been sick in bed in his life, but for the preceding five or six years had experienced at intervals a



Dendritic calculi of right kidney.



Early picture of foreign body in bronchus.

sensation of fullness and heaviness in the epigastric region. There was distinct tenderness in the right hypochondrium, not only over gall bladder but extending outward to anterior axillary line. After several carefully studied gastric analyses had been made and treatment instituted, the patient's gastro-intestinal symptoms persisted. An X-ray examination February 28 revealed dendritic calculi in right kidney. Cystoscopic examination on February 28 showed normal function of both kidneys although four out of five urinalyses, immediately preceding this cystoscopic examination, showed blood. A culture of the catheterized specimen of urine from right kidney was sterile. On March 2 patient was transferred to surgical service.

On March 6 the patient was operated upon. An Israel incision was made in the right lumbar region. As the kidney was adherent both at upper pole and posteriorly, it was delivered with some difficulty. Through kidney cortex several large calculi could be palpated. A small incision was made into the convex surface of the kidney to enable the operator to verify the presence of the stones and to enable him to decide whether or not removal of the several calculi could be accomplished without complete destruction of the kidney substance; or whether or not nephrectomy would be the logical surgical procedure to be followed. As the calculi were very large and irregular in outline, filling up all the calices, they could be removed neither via pelvis nor via cortex without complete destruction of kidney substance and dangerous hemorrhage. Nephrectomy therefore was performed. There was no pus. Muscles sutured in series with catgut. Rubber tube drainage. Dichloramin-T was used to control an infection at lower angle of wound. Otherwise there was uncomplicated recovery. The removed kidney, when sectioned, showed large dendritic calculi in its calices.

FOREIGN BODY IN BRONCHUS.

By E. W. GOULD, Lieutenant, M. C., United States Navy.

Eleven years ago in Providence, R. I., before she began her training as nurse, the patient inhaled a "beauty-pin" with five pearls. This accident occurred while she was lying down on her back at night, and was using the open pin to remove a temporary filling from her tooth. She dropped the pin into her mouth and at the same time took a deep breath. This accident caused so little irritation at the time that she was not sure that it had gone down her larynx and searched the bed closely to locate the pin if possible. She did not mention that fact to others until the next day when she had a slight sharp pain in the right anterior chest about the level of the fourth or fifth rib.

Bronchoscopy was done four days later at Providence, R. I., by a physician who was able to locate the pin, but was not able to remove it, because the point had become embedded in the mucous membrane. She was then taken to Philadelphia, Pa., where X-ray examinations showed the pin to be in one of the small bronchi in the lower right lobe not far from its present position.

During the succeeding years there have been very few symptoms. She has had occasional slight cough with mucous expectoration and occasional attacks of slight pain in the right anterior chest caused more frequently by lifting or vigorous change of position than by deep inspiration. She never spat up blood until early in May, 1918, when she had an hemoptysis of about 1 ounce of fresh blood, which was not preceded by severe cough. She has had a very slight cough since that time, but no blood has been seen in the small amount of expectoration. The general health is very good and the slight pains which she sometimes experiences in her right anterior chest do not in any way interfere with her duties. No signs of the presence of this pin can be made out by physical examination. The accompanying X-ray picture would seem to indicate that there had been very little irritation of the lungs surrounding the pin. Comparison with the X-ray picture taken 11 years ago shows that the pin is in practically the same position but that it has rotated on its long axis about 90°.

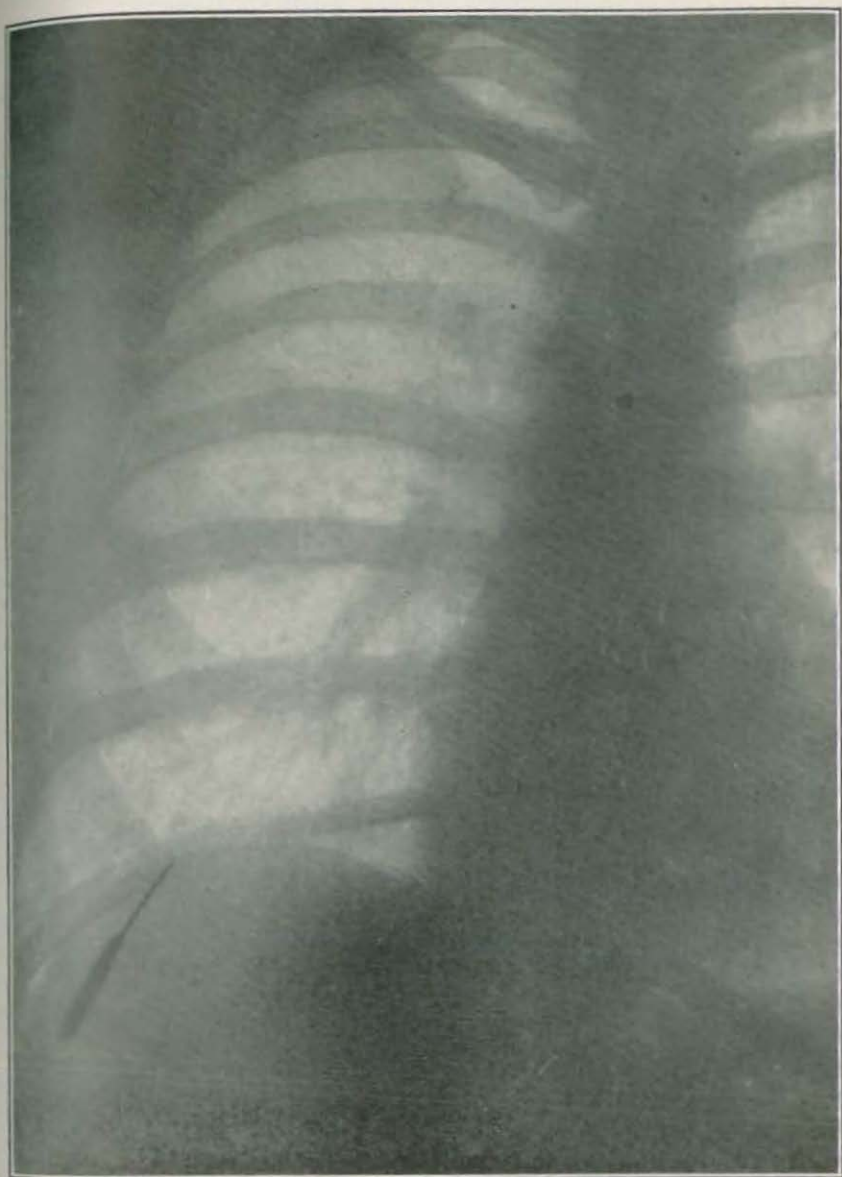
A CASE OF MULTIPLE SEBACEOUS CYSTS.

By G. A. GRAY, Lieutenant, M. C., United States Navy.

The following condition was noticed on a recruit reporting for draft, and was thought to be of sufficient interest on account of its rarity to be photographed and reported for record.

Private H. G. M., United States Marine Corps, age 25 years, first noticed the appearance of a cyst on his scrotum about 10 years ago. The lesion started as a small yellowish-red swelling near the top of his scrotum and increased slowly in size. Before the first cyst had become very large others developed, and at the end of the first year of the condition there were seven tumors on the right side of his scrotum and eight on the left. Since that time other growths have made their appearance in no definite sequence, until at the present writing 114 cysts are noted, varying in size from that of a marble to that of a small bird shot. The lesions are usually symptomless but at times one or more break down with a typical discharge.

Eighteen years ago he had a small cyst the size of a pea over the left malar region; 10 years ago one the size of a hazel nut on his



Later picture of foreign body in bronchus.



Sebaceous cysts of scrotum.

left elbow; eight years ago a slightly smaller one in the right mandibular region. These were removed as they occurred.

At the Naval Hospital, Marine Barracks, Paris Island, S. C., one of the scrotal tumors was removed and diagnosed as being a sebaceous cyst. This diagnosis was confirmed after removing four of the tumors. The accompanying pictures present the subject graphically.

A CASE OF UNDULANT FEVER.

By J. C. PARHAM, Lieutenant Commander, M. C., United States Navy.

Undulant fever is almost a total stranger to the Navy returns of sick but upon learning that the destination of my ship would be in a zone where it is endemic I reviewed the literature of this disease in order that I might not overlook any cases that might confront me. One case has occurred on this ship and the history is interesting.

Ensign H. G. K., N. N. V., had been losing weight slowly for several months. Upon his annual physical examination which took place the latter part of January, a suspicious lesion was located in his right pulmonary apex. There was slightly increased vocal and tactile fremitus and harsh breathing with some prolongation of the expiratory murmur. No adventitious sounds could be heard. He was closely observed thereafter and a temperature chart started. He gave a history of malaise, and frequent headaches in the supra-orbital region. Several weeks earlier he had developed an otitis media which had yielded readily to treatment. His temperature chart showed a daily elevation to 99 or 99.5° F. There was no family history of note or personal history that pointed to tuberculosis. There were no night sweats or coughs and hence no sputum. He complained of constipation of recent origin. Several days later opportunity for consultation presented itself and another medical officer examined him. He was told the history of the case but was not informed as to my physical findings. He reported the same symptoms and the same signs that I had found in the area given above.

The patient's condition did not improve; temperature showed an increasing daily rise and he was surveyed as with "diagnosis undetermined" and transferred to the Royal Naval Hospital, Plymouth, England, on February 8, 1918, for diagnosis and treatment.

His temperature by this time was beginning to show a typical typhoid ascent and a Widal showed agglutination in 1-125. The medical officer in charge of the case did not confirm the chest findings and inclined to a diagnosis of typhoid or paratyphoid. Patient had had typhoid prophylactic in June, 1917. The Widal reaction was

negative for paratyphoid, A and B. Cultures of blood, feces, and urine were negative for *B. typhosus* and paratyphoid, A and B.

Diagnostic tuberculin could not be given on account of his temperature and by an unfortunate coincidence an X-ray of the lungs was impossible at the time.

Close questioning by the medical officer in charge, who had seen service in the Mediterranean, developed the fact that while ashore on patrol duty in Gibraltar some weeks previously, this officer had had tea diluted with goat's milk. An agglutination test was positive in 1-400 dilution for *M. melitensis*.

In this case the findings in the lungs which were corroborated by another medical officer; the fact that the patient had had typhoid fever in 1915 and the prophylactic less than a year previously; the fact that no milk is allowed on board when in Gibraltar and that all milk imported from Spain is required to be sterilized before being offered for sale, all served to lead to the conclusion that the case was one of incipient tuberculosis instead of Malta fever.

The latest available Annual Sanitary Report for Gibraltar, 1916, shows that during this year six cases were reported, the year previous two cases, and during 1914 three cases occurred. Investigation showed that five of the cases reported in 1916 originated in milk imported from Spain and that there was reason to believe that the milk had been sold unboiled. Such is believed to have been the origin of this case.

PROGRESS IN MEDICAL SCIENCES.

REVIEWERS.

Surgeon H. S. CUMMING, United States Public Health Service.
Lieutenant Commander F. M. BOGAN, M. C., United States Navy.
Lieutenant Commander G. B. TRIBLE, M. C., United States Navy.
Lieutenant Commander D. G. SUTTON, M. C., United States Navy.
Lieutenant Commander G. F. CLARK, M. C., United States Navy.
Lieutenant Commander W. A. BLOEDORN, M. C., United States Navy.

GENERAL MEDICINE.

STEPHENS, J. W. W., YORKE, W., BLACKLOCK, B., MACFIE, J. W. S., COOPER, C. F.,
and CARTER, H. F. Studies in the treatment of malaria. *Ann. Trop. Med.*
and *Parasit.*, May 11, 1918.

The authors have conducted a series of extensive investigations into the results obtained by the oral administration of quinine sulphate in simple tertian malaria and their conclusion should be of great interest.

In the observations recorded all the cases were adult males infected in Macedonia at least 6 months previously, and all had had more or less quinine during this period.

In every instance a diagnosis of simple tertian malaria was made by microscopical examination. In the vast majority parasites were present in the blood on the day treatment commenced.

Quinine sulphate in solution was given daily in two or more 10 or 15 grain doses. The cases are grouped according to the total daily dose given.

The continuous daily administration of quinine sulphate was tried, giving one series of cases 20 grains daily, another series 30 grains daily and a third series 45 grains daily. This treatment was continued for eight weeks. The authors endeavored to observe all cases for 60 days after cessation of treatment.

The results were based on the percentage of relapses both during the treatment and following cessation of treatment.

Practically all of the cases were able to take a daily dose of grains 20-30 for eight weeks or more. When, however, the daily dose reached grains 45 it was found that only seven out of nineteen cases

were able to complete the full eight weeks' treatment. In the remaining twelve the treatment had to be stopped prematurely owing to tremors and vomiting.

The authors conclude that the superiority of the grains 45 treatment is clear, as the maximum percentage of relapses possible in an observation period of 60 days is less than the observed minimum values in any of the other series.

Interrupted treatment, i. e., treatment on one or more days at intervals, instead of daily, over a given period was tried.

The treatments were given on two consecutive days each week and were extended over a period of eight weeks or more.

The cases were divided into a 10-grain series, a 15-grain series, a 30-grain series and a 45-grain series, and the results obtained were considered from a palliative point of view and a curative point of view the same as in the series of cases in which quinine was given continuously.

In comparing the results of the various forms of prolonged interrupted treatment the authors found it necessary to give two sets of figures as some of the cases could not be observed for the full period of 60 days after treatment; (1) minimum figure, i. e., the percentage actually observed to have relapsed; (2) maximum figure, i. e., one based on the assumption that all cases not observed for a period of 60 days relapsed before the expiration of that period.

The authors conclude that of the various forms of interrupted treatment used, the superiority of grains 45 treatment is clear, as the maximum percentage of relapses possible in an observation period of 60 days is less than the observed minimum values in the grains 10 series. The curative value of grains 45 on two consecutive days weekly for a period of 8 weeks—no relapse in an observation period of 60 days being the criterion of cure—lies between 71.4 and 61.9 per cent.

All the patients were able to take without difficulty the largest dose of quinine employed, namely, grains 45 (three doses of 15 grains) on two consecutive days weekly.

Comparing the results of the interrupted and continuous treatment the authors conclude that interrupted treatment with quinine grains 30 or 45 twice weekly is preferable to continuous treatment with quinine grains 30 or 45 seven times weekly. Grains 45 twice weekly is better than grains 30 twice weekly or than grains 30 daily, both as a palliative and as a curative treatment.

The interrupted treatment requires over any given period only two-sevenths of the quantity of quinine required for the corresponding continuous treatment.

[W. A. B.]

GOETSCH, E. Newer methods in the diagnosis of thyroid disorders; pathological and clinical. *New York State Jour. Med.*, July, 1918.

The author from the study of numerous cases of thyroid disorders has devised newer methods in the diagnosis of these affections which should be of great interest.

He divides his present paper into two parts: (A) Functional activity of thyroid adenomata, as indicated by the cellular content of mitochondria. (B) Adrenalin hypersensitiveness in clinical states of hyperthyroidism.

Under the first heading the author outlines the difficulties which exist at present in establishing an association between clinical symptoms and histological structure in cases of adenomata, the ordinary grosser pictures of colloid hypertrophy and exophthalmic hyperplasia failing absolutely to indicate glandular inactivity on the one hand or secretory overactivity on the other.

There is an obvious necessity therefore of obtaining if possible a histological method which is capable of demonstrating within the cell structures which are closely associated with its functional activity. This is not a difficult matter to recognize in glandular organs such as the pancreas, whose secretory activity is evidenced by the appearance of zymogen granules. In the thyroid, as in most of the ductless glands, the existence of such definite granules is still problematical.

There are, however, other intracellular structures which have been known to exist in all living cells, whether plant or animal, which are closely associated in number and size with changes in the activities of the cell. These structures are known as mitochondria. They occur in the cytoplasm of all living cells whether plant or animal. In the higher power magnification the mitochondria appear as granules or as straight or curved filaments or rods of varying lengths up to four or five microns. They are most abundant in the active stages of the life of the cells and diminish progressively in number as the cells become senile.

The operative material of about 200 cases of thyroid disease was examined for the occurrence of mitochondria in the glands and some interesting and very constant results were obtained. Thus in the well-recognized cases of colloid goiter unassociated with symptoms of hyperthyroidism very few or practically none of these structures were found in the thyroid cells. In every case of exophthalmic goiter examined the mitochondria were found to be present in enormous numbers. Thus their occurrence in small or large numbers, as an index of functional activity of the thyroid cell, corresponds very closely to our conception of functional activity of colloid and exophthalmic goiter.

As further evidence of increased secretory activity of thyroid adenomata the author describes the "hypersensitiveness to adrenalin" test, which is carried out as follows:

The patient having been in bed thoroughly at rest a day or more previously and having become acquainted with the attending physician who is to do the test, is assured that the examination is in no way painful and is in no way associated with any danger.

Two readings are taken, at 5-minute intervals, of the blood pressure systolic and diastolic, pulse rate, and respiration. A note is made of the subjective and objective condition of the patient. This includes the state of the subjective nervous manifestations, the throbbing, heat and cold sensations, asthenia, and the objective signs, such as pallor or flushing of the hands and face, the size of the pupils, throbbing of the neck vessels and precordium, tremor, temperature of the hands and feet, perspiration, and any other characteristic signs or symptoms. These signs are all noted previous to the injection of the adrenalin so that comparison may be made after the injection.

A hypodermic syringe armed with a fine needle which, when inserted, causes little discomfort, is then used to inject 0.5 cc. (7.5 minims) of the commercial 1-1,000 solution of adrenalin chloride into the deltoid region, subcutaneously. Intramuscular and intravenous injections were not given. Readings are then made every 2½ minutes for 10 minutes, then every 5 minutes up to 1 hour, and then every 10 minutes for half an hour longer. At the end of 1½ hours, sometimes earlier, the reaction has usually entirely passed off. The repeated early readings are made in order not to miss certain reactions on the part of the pulse and blood pressure that may come on in less than 5 minutes after the injection is made. This is particularly true of cases of active hyperthyroidism.

In a so-called positive reaction there is usually an early rise in blood pressure and pulse of over 10 points at least; there may be a rise of as much as 50 points or even more. In the course of 30 to 45 minutes there is a moderate fall, then a slight secondary rise, then a second fall to the normal in about 1½ hours. Along with these one sees an exaggeration of the clinical picture of Grave's disease or hyperthyroidism brought out, especially the nervous manifestations. The particular symptoms of which the patient has complained are usually increased, and in addition there are brought out many symptoms which have been latent. Thus it is not uncommon to have extra systoles brought out, after the injection of the adrenalin. The patient is usually aware of them and may tell one that she has felt this same thing a year or two previously, at which time the symptoms of the disease were more active.

The following may all or in part be found: Increased tremor, apprehension, throbbing, asthenia, and in fact an increase of any of the symptoms of which the patient may have complained. Vasomotor changes may be present, namely; and early palor of the face, lips, and fingers, due to vasoconstriction, to be followed in 15 to 30 minutes by a stage of vasodilation with flushing and sweating. There may be a slight rise of temperature and a slight diuresis.

In order to interpret a test as positive it is regarded as necessary to have a majority of these signs and symptoms definitely brought out or increased.

A normal person shows no signs and symptoms, no reaction whatever on the part of the blood pressure or pulse, when 7 minims or 0.5 cc. of 1-1,000 adrenalin solution is injected.

The test has been of great value and help in the diagnosis of that large group of borderline cases resembling in some respects true hyperthyroidism, but without definite recognizable signs on the part of the patient generally or in the findings of the thyroid gland, which may not be palpably enlarged.

In summarizing, then, the following conclusions are drawn:

Thyroid adenomata are responsible of themselves for hyperthyroidism. They are often multiple and should be removed whenever it is possible to make the diagnosis. The very common belief among many physicians that they are innocuous and need no surgical treatment except when they produce mechanical pressure is incorrect. In a small percentage of cases, 2 per cent in this series, malignant degeneration occurred. Symptoms of hyperthyroidism disappear when an adenoma formerly active degenerates, only to be followed by a second wave of hyperthyroidism when a new healthy adenoma arises, as is so frequently the case. Almost every form of degeneration recognized by the pathologist can occur in these adenomata. The thyroid gland itself associated with an active adenoma presents a simple colloid appearance, contains few or almost no mitochondria, and is relatively inactive. The abundance of mitochondria in the thyroid cell forms a good index for judging of the activity of the tissue under consideration, whether this tissue be from active colloid goiter, exophthalmic goiter, or from an adenoma; the greater the number of mitochondria in the thyroid cell the greater the functional activity of the latter.

In states of hyperthyroidism there is a hypersensitiveness to adrenalin whether administered hypodermically or intradermically, which hypersensitiveness is proportional in a remarkable way to the degree of hyperthyroidism present.

The reaction to adrenalin should be of considerable value in the diagnosis of obscure borderline cases of nervous disturbances, which may or may not have their origin in true hyperthyroidism.

[W. A. B.]

MACALLUM, A. B. The ancient factors in the relations between the blood plasma and the kidneys. Amer. Jour. Med. Sc., July, 1918.

The author has drawn some very interesting conclusions from a long series of examinations of the inorganic composition of the sera of certain vertebrates, the function which the kidney exercises in regulating this inorganic composition and the ancient factor which appears to govern the concentration of the inorganic salts in the blood plasma.

Among all the organs with their varied history as to structure and function, the kidney function in one particular respect has not changed from the time it first began to evolve in the very far past. This function is the regulation of the inorganic composition of the internal medium of the body, known as the blood plasma.

The renal organ in the embryological history of the vertebrate is as ancient as the neural canal and appears to antedate the closure of this canal.

The salts of the blood plasma range between 0.78 and 0.88 per cent of the weight of the plasma, and they consist of the chlorides, phosphates, carbonates, and sulphates of sodium, potassium, calcium, and magnesium. The salts of sodium are by far the most abundant, after which come those of potassium, calcium, and magnesium in the order mentioned. The salts of sodium, chiefly the chloride, amount to more than 90 per cent of the total inorganic solids of the plasma.

The following table shows the elements arranged in values proportional to the most abundant one, sodium, which is made to equal 100, and shows a surprising resemblance in the values obtained from plasmas of all the mammals:

	Na.	K.	Ca.	Mg.
Dogfish (<i>Ancanthias vulgaris</i>).....	100	4.61	2.71	2.46
Cod (<i>Gadus callarias</i>).....	100	9.506	3.93	1.41
Pollock (<i>Pollachius virens</i>).....	100	4.33	3.10	1.46
Dog.....	100	6.86	2.52	0.81
Mammal (average).....	100	6.69	2.58	0.80
Man (C. Schmidt).....	100	9.22	3.37	1.76
Man (A. B. M.).....	100	6.11	2.71	0.85

The parallelism in the ratios of these elements in the highest as well as in the lowest vertebrates is a cardinal fact and suggests that

it is an endowment received from the common ancestor of both, the protovertebrate which must have existed in the early Cambrian or pre-Cambrian times.

The following table shows the striking parallel existing between the inorganic constituents of ocean water and the inorganic composition of the common jelly fish, *Aurelia flavidula*:

	Na.	K.	Ca.	Mg.
Ocean water (Dittmar).....	100	3.63	3.91	12.10
<i>Aurelia flavidula</i> (Macallum).....	100	5.18	4.13	11.43

The above table shows that the fluid in the tissues of *Aurelia* is but slightly modified ocean water and of the same concentration as the latter.

When the ratios for sea water were compared with the ratios of the blood plasma of a mammal, as, for example, the dog, there appears to be no doubt of their oceanic origin.

The horseshoe crab, *Limulus polyphemus*, which has had its habitat in the ocean since its origin in the Palaeozoic age, has a plasma in which the parallelism between it and ocean water is incontrovertible.

In both the lobster and the crab the concentration of the inorganic salts of the plasma appears to vary with the concentration of the ocean water of their habitat, and in brackish water it falls to that of the latter.

There is then a profound difference between the blood plasma of vertebrates and that of invertebrates. That of the latter varies more or less readily with an immediate change in the medium of the habitat, while that of the former is affected, and then but appreciably, only after millions of years.

The parallelism already referred to in the ratios of the elements in the different forms of vertebrates and invertebrates appears to indicate that the blood plasma of vertebrates was also originally sea water, not the sea water of the present age, but of a far past when the concentration of its salts was less than one-third of what it is now.

The kidney has maintained this concentration and these ratios, practically unchanged, through long ages of vertebrate history. It is this organ that has made a fundamental difference between the vertebrate and the invertebrate, not only in the struggle for existence but also in the capacity to evolve higher forms of animal life. The animal form that must accommodate its internal medium to that of its habitat has an enormous handicap when it changes its environment.

The author concludes from his examination of the plasma in Bright's disease that the very first change from the normal to the definitely established primary condition in some of the forms of Bright's disease is a loss of the power of the kidney to maintain the Palaco-oceanic ratios. The structure in the kidney involved in maintaining these ratios consists of the proximal convoluted tubules, which are also concerned in reducing the H-ion concentration of the blood plasma.

The author regards the blood plasma, so far as its inorganic salts are concerned, as but a reproduction of the remotely ancient ocean, the original home of all life on the globe.

[W. A. B.]

CECIL, R. L. Sensitized vaccines in the prophylaxis and treatment of infections. Amer. Jour. Med. Sc., June, 1918.

The author describes the development of the use of sensitized vaccines with the results obtained by their use and reports a series of cases in which he used such vaccines both as a prophylactic and as a curative measure.

A sensitized vaccine is defined as a suspension of bacteria which has been previously treated with an homologous serum. The bacteria are washed before injection so that whatever antibody is present in the vaccine is firmly attached to the bacteria, and whatever value sensitization of a vaccine possesses probably inheres from the direct influence of the antibody on the bacteria to which it is attached.

Sensitized vaccine appears to have been more frequently employed as a prophylactic and therapeutic agent in typhoid fever than in any other infection, although Shiga used a sensitized vaccine for immunizing against plague and dysentery and Calmette and Guerin for protection against bovine tuberculosis in cattle.

Sensitized gonococcus vaccine has been extensively employed as a therapeutic measure with apparently gratifying results.

Sensitized streptococcus, staphylococcus and pneumococcus vaccines have been employed as well as sensitized tuberculin with results which appear to justify further work along these lines.

Besredka employed sensitized plague and typhoid bacilli in 1902 and found that the sensitized bacilli, both subcutaneously and intraperitoneally, were considerably less toxic than the nonsensitized bacilli; furthermore, that injections of sensitized bacilli were followed by an almost immediate increase in immunity, in contrast to the nonsensitized bacteria which excited first a so-called "negative phase."

The author has employed sensitized vaccines of typhoid bacillus, gonococcus, streptococcus and staphylococcus aureus and tubercle bacillus.

The typhoid vaccine was employed in 20 cases, in which it was used for prophylaxis. The dosage employed was the same as that usually employed with ordinary typhoid vaccine, namely, 500 million for the first inoculation and 1 billion each for the second and third. In 8 cases the vaccine was given at 7-day intervals; in the remaining 12 cases it was administered every other day. The latter method caused no unpleasant symptoms.

The local reaction produced by the sensitized vaccine was always mild and appeared to be less severe than that which usually follows an injection of ordinary typhoid vaccine. The lesser toxicity of the sensitized vaccine and its possibly superior immunizing power are sufficient reasons for giving it a trial.

Sensitized gonococcus vaccine was employed in 16 cases of gonococcus infection, chiefly gonorrhoeal vaginitis uncomplicated and complicated with endometritis, salpingitis, and arthritis. The inoculations were given at intervals of 5 to 10 days, the dosage varying from 100 million to 2 billion. The reactions were usually mild, there being usually, however, a sharp local reaction following the first inoculation. Six of these cases recovered completely, and all but 2 showed improvement.

The author employed sensitized tuberculin in 4 cases of tuberculous adenitis, 3 of whom showed improvement and in 2 cases the glands disappeared. The author arrives at the following conclusions:

It has been shown by numerous investigators that a vaccine sensitized with an homologous serum produces less local and constitutional disturbance when injected subcutaneously, than does a non-sensitized vaccine. Even living virulent organisms when properly sensitized can be injected subcutaneously without serious consequences.

Sensitized vaccines have been extensively used for prophylactic and therapeutic purposes.

The sensitized typhoid vaccine produces a somewhat milder reaction than ordinary typhoid vaccine, and probably gives just as high an immunity. At the present time, however, the evidence for its superiority is not sufficient to justify the substitution of sensitized for ordinary vaccine in practice.

In the various infections treated with sensitized vaccines the results were, as a rule, no better than would have been expected with ordinary vaccine. It happened that in a few instances recovery followed the administration of sensitized vaccine after treatment with ordinary vaccine had failed. This may have been due to the fact that larger doses could be employed without untoward symptoms.

The chief objection to the general use of sensitized vaccines is the increased labor and time necessary for their preparation.

At the present time it would seem desirable to limit their use to the treatment of infections in which there is hypersensitiveness to ordinary vaccines or in which the latter have proved inefficacious.

[W. A. B.]

HELD, I. W., and ROEMER, J. X-ray diagnosis of pulmonary tuberculosis. Interstate Med. Jour., Volume 25, Number 4.

Everyone who has occasion to take or interpret X-ray plates of the chest should read and assimilate this article. It is seldom that so much of real value is found in such small space. Starting out with an exposition of the relative values and special uses of fluoroscopy and radiography, it is pointed out that neither is of any value in the diagnosis of tuberculosis unless proper focusing is used. As a result of poor focusing, shadows which stimulate disease are seen. In fluoroscopying a patient in the dorso-ventral position, with the tube at a level of the third or fourth dorsal vertebra, normal apices will appear shadowed.

In the normal lung both apices are not of equal dimensions and equally bright. The right apex, because of stronger musculature of the shoulder in right-handed people, throws a darker shadow than the left. The reverse is true in left-handed people. The least curvature of the spine darkens the apical shadow. Normal pluræ and glands throw no shadow.

The primary focus (initial lesion) is in the lymphoid tissues of the hilus, a region inaccessible to any other method of diagnosis but the X-ray. The apices are now considered to be the primary focus in about 5 per cent of lung involvement.

The difference in appearance between healed and active lesions of the hilus are emphasized. The former is characterized by a dense elongated, quadrangular shadow, mostly on one side, which extends from the second to about the fourth rib along the outer border of the pericardium. The butterfly appearance is still maintained. From the hilus small strands project upward to the second rib and below to the base. Calcified glands varying in size from 2 to 10 mm. are seen mostly at the hilus. Acute processes originating at the hilus are generally unilateral, the shadow is denser than in healed lesions, the butterfly shape is obliterated, the area is circumscribed, and there may be evidence that several foci have coalesced. Vascularization is marked. Ringlike shadows of various sizes indicate dilated bronchi.

The fluoroscope is indispensable in the study of the apices. The first fluoroscopic impression as to the difference in the shadow of the two apices is of paramount importance. The somewhat darker shadow of one apex, often brightening up after prolonged fluoroscopy,

is of great diagnostic value. The cough phenomenon of Kreutzfuchs, which means the clearing up of the shadow by coughing and inspiration, should be observed. Early apical tuberculosis should be suspected if the shadow does not clear or if it clears less on one side than the other. Further evidence of early apical tuberculosis can be shown by study of the X-ray plate. An infiltrated apex is narrower than a healthy one, the presence of small glands is also positive evidence. The calcification of the cartilage of the first rib and the small heart, once famous as diagnostic features, are now discredited.

Certain anatomical conditions and lesions of a nontubercular nature may cause the apices to be shadowed. Nasal obstruction retarding entrance of air into the lungs, or pressure on the larynx, trachea, bronchi, or pulmonary tissue by thymus, enlarged glands, tumors, etc., cause collapse, induration and showing of the apices.

The classification of pulmonary tuberculosis by Gerhard, Turban, and others, depending on the amount of pathological involvement, is now being disregarded, and Peterson's method of classification and prognosis, depending upon the symptoms and general condition of the patient, accepted. This has been made possible by means of the X-ray. Peterson has emphasized certain clinical facts heretofore overlooked—i. e., that a person presenting but few physical signs in the lungs may succumb because tubercles erode a large blood vessel and produce fatal hemorrhage, or may cause meningitis or miliary tuberculosis, while patients with cavities may live for years in comparative comfort.

For the diagnosis of tuberculosis of the hilus, tuberculosis complicating chronic emphysema, for the indications and results of a therapeutic artificial pneumothorax, the X-ray supersedes all other methods of diagnosis.

[F. M. B.]

HERRICK, W. W. Intravenous serum treatment of epidemic cerebro-spinal meningitis. Arch. Int. Med., April, 1918.

The author's article is a report of observations on 208 cases of cerebro-spinal meningitis at the Base Hospital, Camp Jackson, S. C. The following conclusions were reached:

1. "The disease is in most, probably in all, instances a primary meningococcus sepsis with usual, but not necessarily universal, secondary meningitis.
2. "The diagnosis can be made in at least 50 per cent of the cases in the premeningitic stage of sepsis.
3. "Treatment by large amounts of antimeningococcus serum intravenously, combined with active spinal drainage and intraspinal serum administration, has reduced the duration of the disease, the number and severity of complications and the mortality."

Maj. Herrick is of the opinion that the name of the disease, "cerebro-spinal meningitis," and of the causative agent has led to a single manifestation of the disease, the meningitis aspect, usurping such a prominent place in the commonly accepted ideas of the nature of the disease that important facts have been kept in the background and that the premeningitic stage of the meningococcus sepsis has for practical purposes been disregarded.

It is his view that in a recognition of this primary stage of sepsis lies the key to early diagnosis and more effective treatment. Appreciation of this fact resulted in the recognition by Maj. Herrick and his coworkers of primary meningococcus sepsis in almost half of the cases before the characteristic selective action on the meninges had been exerted; the recognition of abortive cases or of other types of meningococcus sepsis not showing meningitis, the establishment of intravenous serum therapy, notable reduction of mortality and, further, the development of clinical and laboratory methods of value.

Emphasis is laid on the fact that cerebro-spinal fever is a medical emergency, on the prompt recognition of which, and vigorous action, the life or future well-being of the victim depends more than in almost any other acute disease. To insure early diagnosis instructions were issued to regimental surgeons to refer at once to the Base Hospital all men complaining of headache, fever, vomiting, or other suggestive symptoms. This procedure afforded an exceptional opportunity for study of the early stages of cerebro-spinal meningitis and other acute diseases.

Meningitis was preceded by a stage of generalized infection which lasted from a few hours to three days, averaging about 48 hours, and a few cases, usually the abortive or fulminating, rarely those with prolonged course, never developed meningitis.

Recognition of the premeningeal stage of sepsis depended upon clinical and bacteriological evidence. Clinical evidence of the incipient disease is fairly definite for the practiced observer, although for certainty laboratory confirmation is usually necessary.

Tenderness of the eyeballs, dilatation of the pupils and in a few cases slight retinal edema with faint obscuration of the disk margins and fullness of the retinal veins were among the less common symptoms.

In a large proportion of the cases there was an upper respiratory tract infection, coryza, pharyngitis, tonsillitis, laryngitis, rarely bronchitis, in four cases of pneumonia.

The skin manifestations are considered the most important; of these, mottling giving a lead-colored appearance appears early. Tache cérébrale is constant but not of diagnostic value. A few cases have shown a puzzling macular rash. The predominant skin sign is the petechial rash which appears with astonishing rapidity in crops

about the shoulder or pelvic girdle, less frequently over the trunk, extremities, face, oral mucosa, and conjunctivae. The petechiae vary in size up to 1 cm., do not disappear on pressure, and last about three days, leaving a pigmented stain. In the presence of an epidemic this rash is considered diagnostic. A purpura is a feature of the fulminating cases; it develops with the greatest rapidity, and within a few hours considerable portions of the body may be covered. Maj. Herrick considers that next to the rash an unequal enhancement of the deep reflexes is the most valuable early evidence of the disease. While an increase in reflex irritability is not uncommon in a variety of infections the increase is uniform on both sides, while in cerebro-spinal fever it is unequal.

Headache of the "pressure" or "bursting" frontal or vertical, less often occipital, type occurred early in about 85 per cent of the cases, and chills were common. Rigid neck, Kernig's sign, and Brudzinski's were almost always *absent* during this stage. The clinical suspicion aroused by any combination of two or more of the signs or symptoms enumerated demand lumbar puncture.

During the stage of sepsis the spinal fluid is usually clear. In 60 per cent of his cases there was slight increase in pressure, a normal number of cells, the fluid reduced Fehling's solution and in some instances showed a trace of globulin. After long centrifuging and evaporation of several cubic centimeters of the fluid on a slide a few extra cellular polymorphous meningococci may be found. Repetition of the puncture often results in finding organisms. Capt. F. W. Baeslack, chief of the hospital laboratory, has found meningococci by blood culture in this early stage in 36 per cent of cases so examined. (Jour. Am. Med. Assn., 1918, 70, 684.)

The manifold complications of the epidemic constitute a strong argument in favor of the view that the disease is primarily a sepsis. The rapidity of invasion of the eye, for instance, points toward hematogenous infection. Prompt enucleation of the eye as a focus is urged in cases of panophthalmitis.

The myocardium seems to suffer little; one case of endocarditis, six of dry fibrinous, and two cases of pericarditis with effusion were noted. Otitis media was common but no case required mastoid operation. The accessory sinuses of the nose were frequently found filled with pus.

Three cases showed orchitis or epididymitis which was nonsuppurative and soon subsided.

Arthritis was a marked feature of the epidemic, but the prognosis is good and permanent disability rare.

The recognition that cerebro-spinal fever often occurs during the course of other acute disease is a matter of highest importance. The organism thrives in a soil prepared by any conditions which lower

resistance; hence change in environment, fatigue of travel, or of unaccustomed drill, and homesickness act in a manner similar to such acute diseases as measles, tonsillitis, or other respiratory infections.

The most marked constant finding in the 31 necropsies performed was a remarkable dryness of the body, muscles, and internal organs. No evidence of suppuration about the cribriform plate of the ethmoid or macroscopic appearances were found to suggest extension of the infection from that point.

The intravenous treatment has been based on the conception that the disease is, in its early stages, a generalized meningococcus sepsis which can be recognized before meningitis or other local complications occur. Instead of attacking a metastatic focus in the meninges endeavor has been made to reach the organism during the stage of systemic invasion by intravenous serum therapy.

The method finally adopted when a patient presented early symptoms was as follows:

If the fluid obtained from lumbar puncture was clear, no injection was made; if cloudy, enough was removed to reduce pressure to normal and a less amount of serum allowed to run into the canal. The fluid removed was transferred in a thermos bottle to the laboratory and meanwhile a small dose of serum was given to determine sensitiveness. One hour later 50 to 120 c. c. of serum were given by the veins from a large glass syringe. In a case of ordinary severity the intravenous dose was repeated every 12 hours until the temperature became normal or until six or eight injections had been given. In severe cases the serum was repeated every 8 hours until the desired results were obtained. In fact, the size and frequency of intravenous serum doses was like those prescribed by workers in Rockefeller Institute in lobar pneumonia. No ill effects from large doses were observed and sterilization of the blood was attempted by massive doses, especially in the early stages when a positive blood culture and a clinical picture indicated general hematogenous infection. When meningitis was established this treatment was supplemented by spinal drainage about half an hour after intravenous injection. Sufficient serum was introduced into the canal to relieve headache.

With large intravenous injections meningococci as a rule disappear from the fluid within 24 to 48 hours. Some prolonged cases in which the serum apparently acts as an irritant, causing delirium and headache, do better without serum. Second in importance to serum is morphine, which should be given freely, especially in early stages.

The total mortality in the entire series of 208 cases was 26 per cent. In the 129 cases treated by intraspinal methods alone or with intravenous doses of only 10 to 45 c. c. it was 31.7 per cent; in 79

treated with large amounts of serum intravenously and average or smaller amounts intrathecally, 16.4 per cent.

Mild cases do well under either treatment; it is in the most severe types that intravenous methods give the most striking results.

Maj. Herrick claims that the value of the treatment is found in the shortened course, diminished number of complications, prompt disappearance of meningococci from the spinal fluid, and decreased mortality.

In cases showing signs of a blocking of the foramina Lieut. Cobb devised a method of starting the flow of spinal fluid. Chloroform is given to relax the neck muscles and the head is manipulated to break up adhesions that may be forming about the foramen magnum and fourth ventricle.

Liberal drainage and the use of this method is advised by Maj. Herrick when drainage is slight and symptoms persist.

[H. S. C.]

HOPPE, H. H. The Medical Treatment of Graves' disease with special reference to the use of corpus luteum extract. Jour. Nerv. and Ment. Dis., April, 1918.

The author discusses the origin, structure, and physiology of the corpus luteum. He shows the results of various investigators who conclude that the corpus luteum is epithelial in character and is derived from the epithelial cells of the membrana granulosa of the Graafian follicles.

There are two kinds of specific cells in the corpus luteum, namely, the luteum cells and the paraluteum cells. The corpus luteum is therefore regarded as a ductless gland, pouring its secretion directly into the blood vessels and having a most important function in regulating the sexual life of woman.

Being one of the ductless glands, the ovary, perhaps through the corpus luteum, stands in relation to all the other ductless glands and is the avenue through which all the other ductless glands influence the function of the female generative organs.

Falta divides the ductless glands into two groups, the acceleratory group and the retardative group, in so far as they produce acceleratory or retarding hormones. These groups through their hormones exert an antagonistic effect on the metabolic process of the body. Thus, the hormone of the thyroid gland is regarded as acceleratory. It quickens metabolism and increases excitability, as is evidenced in Graves' disease, whereas the absence of this hormone which we see in myxedema, causes an arrest of growth or an inhibition of metabolism. Opposed to this action is the group of glands with retardation, anabolistic, or assimilatory hormones. The author regards the secretion of the corpus luteum as having this function.

As the result of his clinical experience in the treatment of Graves's disease, he suggests that the internal secretion of the corpus luteum has an inhibitory effect on the thyroid secretion, and that hyperthyroidism is an expression of a dysfunction of the corpus luteum in the female and of the interstitial glands of the testicle in the male.

The most serious objection to this theory is that typical Graves's disease rarely follows removal of the ovaries and testicles. However, there is a marked increase in the size of the pituitary after castration in both male and female and this may mean a physiological compensation of function.

The author had treated about 20 cases of Graves's disease in the past three years in which the ordinary Forchheimer treatment was attended with only indifferent success. The combination, however, of the quinine hydrobromate, extract of belladonna with the extract of corpus luteum, was found to be rapidly beneficial in nearly all the cases and the improvement was usually so rapid and so marked, in a few days to a week, as to be accounted for only on the ground that the corpus luteum was the active therapeutic agent. These cases were all clinically cases of Graves's disease, no doubtful cases being included.

The most notable and prompt improvement is in the cardiovascular symptoms. The pulse rate drops very quickly and the disagreeable symptoms caused by the disturbance of circulation quickly subside. Then the general nervous irritability diminishes and the patients return to more or less normal condition. They show a tendency to relapse, however, if they stop the extract of corpus luteum.

The author regards the Graves' symptom complex as a result of a defective or deficient secretion of the corpus luteum which when replaced by giving the extract of corpus luteum continuously results in improvement and a fairly normal state.

[W. A. B.]

HAYNES, R. S. The differential diagnosis of enlargements of the cervical lymph nodes. Arch. Pediat., April, 1918.

The author divides enlargement of the cervical lymph nodes into three classes as follows: (a) inflammations—simple or tuberculous, (b) hyperplasias, and (c) neoplasms.

The commonest forms of enlargement of these lymph nodes are the infections or enlargements secondary to bacterial invasion of structures of the head and throat whose lymphatic drainage terminates in one or other of the groups of lymph nodes situated in the superficial or deep structures of the neck.

Hyperplasias of the lymph nodes occur typically with the infectious diseases, particularly the exanthemata, scarlet fever, measles,

German measles, and diphtheria, or in syphilis and, more rarely, generalized tuberculosis; in leukemia, Hodgkin's disease, and the glandular fever of Pfeiffer.

Neoplasms are the least common of the enlargements and as types are mentioned lymphadenoma, lymphosarcoma as primary diseases and carcinoma as a secondary process.

Enlargement of the cervical lymph nodes, other than that due to infections, is usually accompanied by signs of disease elsewhere which serve to establish a diagnosis even if the enlargements themselves can not be differentiated. The glandular swellings accompanying the exanthemata are acute and the symptoms and physical signs of the primary disease are present. Those of scarlet fever are typically of the deep cervical glands, both anterior and posterior, and may progress to intense infiltration and to suppuration.

The enlarged lymph nodes of diphtheria are also acute and overshadowed by the symptoms of the primary disease so that the diagnosis is reasonably certain. In measles the enlargement is apt to occur days or weeks after the original disease.

In mumps the swelling of salivary glands may be confused with corresponding groups of superficial lymph nodes. Particularly is there likely to be confusion between submaxillary mumps and enlargement of the submaxillary nodes; the latter are situated above the salivary gland, often on the horizontal ramus of the mandible. A bilateral swelling in this region serves to establish mumps as the diagnosis.

The acute glandular fever of Pfeiffer runs a characteristic course of fever, constitutional symptoms, and enlargement, usually bilateral, of the deep cervical lymph nodes. The nodes may become the size of walnuts, but are discrete, hard, very sensitive, do not suppurate, and subside after a week or two.

The enlargement of cervical nodes which occurs in syphilis is part of a general adenopathy. The posterior cervical group is likely to be involved. The nodes are discrete, without signs of inflammation, and not adherent to adjacent structures. The Wassermann reaction and the luetin skin test will clear up the diagnosis.

Hodgkin's disease shows constant progression of enlargement without coalescing or suppuration, the involvement of other groups of nodes, particularly within the thorax and abdomen, the splenic enlargement, and progressive anemia.

Lymphosarcoma may resemble Hodgkin's disease at first but there is a tendency for the capsule of the node to rupture and the nodes to become adherent to each other and the surrounding tissues.

Acute lymphatic leukemia presents enlargement of nodes up to walnut size, discrete and with little or no redness or tenderness. The diagnosis is made by blood examination. Anemia with 1 to 3 mil-

lion red blood cells, hemoglobin of 20 to 30 per cent, and leucocytes of 50,000 to 150,000, of which 90 to 98 per cent are lymphocytes, complete the picture.

Enlargement of the occipital, mastoid, preauricular, and parotid nodes may be due to a tuberculous infection such as lupus but more probably is due to a pyogenic infection such as results from eczema, pediculosis, furunculosis, fissures, and cracks about the nostrils or corners of the mouth.

Enlargement of the submental and submaxillary groups may be due to pyogenic infection of the teeth and gums.

Differentiation between simple and tuberculous infections may be very difficult. In pyogenic infection there is likelihood of evidence of inflammation in mouth, throat, or nasopharynx. Usually the swelling is larger, comprises more lymph nodes, has more perinodular swelling, is tender, reddened, hot, and elastic, all the tissues being bound up in the swelling.

Examination of the blood will show a polynucleosis in pyogenic and a lymphocytosis in tuberculous enlargements. The tuberculin test, the complement fixation test, or the von Pirquet reaction are valuable aids in diagnosis.

In some cases excision of the gland itself may be necessary for a positive diagnosis.

[W. A. B.]

SURGERY.

ALVAREZ, W. C. Is the purgation of patients before operation justifiable? *Surg., Gynec., and Obst.*, June, 1918.

The author's views are startling and would, perhaps, be more convincing if he were less radical, but it is rare for crusaders to occupy middle ground. There is probably no single detail of surgical procedure upon which there has been such worldwide agreement as the rule to evacuate the bowels of a patient about to undergo operation under a general anesthetic. It is no easy matter to renounce the habits of years, and the more fixed and universal a practice has become the more likely it is to outlast its usefulness. When the propriety of such a measure is questioned in a dispassionate and scientific way we should listen to the arguments without prejudice.

Dr. Alvarez claims (1) that the administration of the anesthetic is not rendered more safe or easy or agreeable by preliminary purgation; (2) that preliminary purgation does not lessen the danger of autointoxication, gas pains, or peritonitis, but, if anything, tends to induce these conditions through disturbance of the normal mesenteric circulation.

The author states that the idea of preparation preliminary to operation is partly ascribable to the patient's desire for some such thing and must be a "relic of medical practice 2,000 and more years ago." He connects it with the humoral theory of disease.

Experiments on rabbits demonstrated that purgation induced apathy and appearance of sickness. The bowels were found injected, full of gas, sometimes atonic and flabby, often irritable here and there, and inclined to contract down into hard white cords. In many rabbits the mesenteric vessels and intestinal walls were engorged.

The author's summary of reasons for avoiding purgatives before operations are in part as follows: Purgatives "bring about pathological conditions by interfering with intestinal absorption and upsetting the balance of salts. The body is weakened and not strengthened." "There is an increased growth of bacteria." "There is a tendency to flatulence and distention." "Purgation makes the bowel react poorly to drugs." "The purge must be responsible for some of the post-operative nausea and vomiting."

While not agreeing with the contention of the author, the reviewer hopes that the article in question will be widely read and believes that it will do good because there is undoubtedly a great deal of thoughtless prescribing and there are not a few in the ranks of our profession who believe that if a thing is good the more of it the better. We habitually speak of severe or mild purgatives and dictionaries classify them as drastic, simple, saline, laxative, etc.; therefore the term "purgation" does not imply the production of excessive alvine discharges. To induce violet enteric activity and copious loss of fluid does seem irrational and, of course, in certain cases even the mildest purgative will be harmful, as in cases of appendicitis, intussusception, volvulus, etc. Alvarez says:

If a patient's bowels move normally every day and particularly if they move on the morning of the operation, as they probably will do if breakfast is allowed, no enema should be given. Enemas need be given only to those who are definitely constipated.

This view of the situation seems optimistic in the extreme. A considerable proportion of surgical patients are women, and women as a class are notoriously constipated. While they may have established a very considerable degree of tolerance for the presence in the body of 1 or 2 pounds of excrementitious matter, most men are apt to be rather miserable when the bowels are inactive. Patients have a right to expect that these details will be considered by the medical attendant before and not after the operation with its inevitable discomfort and possible suffering. It is our observation that the change of habits incident to becoming a hospital patient tends to constipation and that a satisfactory stool on the morning of operation, breakfast or no breakfast, is rarely to be expected.

We sincerely hope that the third-day purgative will continue in vogue in obstretic practice, because we have vivid recollections of the increased comfort and well-being that came to the women of the lying-in ward when they were relieved of their faecal accumulations. Experienced matrons often begged for the "C. O. and G." on the second day, and there were few who did not admit afterwards that the relief secured amply made up for the horrid taste. The third-day purgative constantly brought down slightly elevated temperatures or seemed to do so. If not related as cause and result, still the two events were constantly related in point of time.

The trouble with purgation before operation is that it is part of a routine procedure, and routine procedures, though beneficial in many ways, have huge disadvantages as well. Had Dr. Alvarez contended that the routine administration of *drastic cathartics* prior to operation was wrong there would be no dissent. Routine procedures make hospitals run smoothly and are good, but in the long run that surgeon will have the most lasting success who, besides manual dexterity and diagnostic acumen, possesses an insight into temperament and can spare the time to inquire about the individual habits and needs of his patients. The patients of such a surgeon will have adequate preparation for operation, but it will probably not be the same in two cases. For one a cheerful smile or a reassuring word about the children at home will suffice, and for another a very liberal stimulation of the emunctories may not lead to drastic catharsis. As to the unsatisfactory and disagreeable action of salts, we are in hearty agreement with the author and recommend as a substitute a fluid preparation of cascara, castor oil given in a sirup of rhubarb, or the palatable and thorough compound licorice powder.

CORNER, E. M. The surgery of painful amputation stumps. Proc. Roy. Soc. Med., May, 1918.

As shown by Marinesco, the chief factor causing pain in stumps to be fitted with artificial limbs is inflammatory change within the nerves, and it has been found as late as 38 months after the amputation in a healed stump. Amputations were rather neglected before the war and in large hospitals used to be handed over by the surgeon to his house officer. Painful nerves in stumps were not unknown before the war, but painful scars and bulbous nerve endings were uncommon. In 1913 there were no such cases among 529 applicants for artificial limbs to the Royal Surgical Aid Society. In 1915 began the work at Roehampton House, and here, out of the first 93 cases sent to be fitted with artificial limbs, 38 were found to be unready. However, now, improvement in the technique of amputations is progressive.

The end of a nerve in healing has to go through three stages, which may be brief but can not be obviated. They are: First, the stage of repair inflammation; secondly, the stage of compression; thirdly and finally, the stage of regeneration. To reduce the first stage it is necessary to close the end of every structure left open by the cutting and sawing of the amputation. There must be no infection, so that the wound can be closed without drainage and without the discharge of serum from open ends. Amputation surgery is complicated by an additional difficulty of a threefold character—namely, the compression, inflammation, and regeneration of nerve endings. Active inflammation is kept alive by the irritaton of unabsorbable ligatures. It is curious that with the changes in the nerve endings the products of irritation from ligatures should be carried to the nerve lymphatics. The condition reminds one of tetanus, in which the poisons are conveyed by the neural lymphatics to the nervous system. The resemblance is increased by the spasmodic cramplike pain.

Compression acts in hundreds of ways. It is mainly brought about by the contraction of the fibrous tissue on to the expanding, growing tissue of the cut nerve end. "The contracting cap of fibrous tissue over the nerve end is derived from the endoneurium, perineurium, and epineurium coats of the nerve. Through the meshes in them the unprotected regenerated fibers have to pass. This is the main place at which the strangulation of the nerves takes place. If any of the nerve sheaths can be uninjured in the division of the nerve, so much less the strangulation of the new nerve fibers to be formed by regeneration. This is shown by the different shapes of the nerve endings if the epineurium is preserved or not. If no epineurium is retained the nerve ending is truly bulbous. If the epineurium is retained the nerve ending becomes pencil shaped. Between these two extremes there are any number of variations in the shape of nerve endings, such as those obtained by my 'swinging-door method' of dividing nerves." The distal division is made with a sharp instrument by two oblique snips meeting centrally at an acute angle. As the nerve, which has been pulled down and obliquely divided by two cuts, one from each side, retracts, the cut surfaces become coapted.

In order to produce a painless stump the inflammatory stage and the contracting of scar tissue must be over before the nerve fibers push their way out of the nerve bulb and through the mesh of the "internal" scar.

The following paragraphs are quoted literally from the author's paper:

Normally, more or less of this takes place, but in these war cases regeneration begins very early after nerve injury and its processes

proceed rapidly, this perhaps being due to the increased vascularity brought about by the inflammation and the irritation of the sepsis. Thus the nerve fibers begin to regenerate in a few days, according to Italian authorities, and they branch and branch again; one original fiber becoming represented by many fibers, each of which is a potential source of trouble—it may encounter an inflammatory nodule or become compressed. Thus, possibilities of future trouble are manifold; the early regeneration enables the young fibers to become long enough to be strangulated before the scar tissue has ceased to contract, and the greater number of branches of new fibers make the occurrence of trouble still more probable.

After the growing fibers of nerve regeneration have escaped from the nerve bulb and the zones of certain and possible compression, they follow the direction of the scaffolding of connective tissue and make their appearances in strange places, completely foreign to the course of a nerve. For instance, in one example regeneration had taken place from the sciatic nerve and reached the popliteal artery, where part of the advancing regeneration fibers followed the artery through the adductor magnus and appeared on the front of the thigh, forming a tender lump. In other cases the progress of the regeneration fibers is like the course of a river, and where an obstruction is met the flow pools up until the obstruction is overcome. Thus regeneration neuromata are formed and mark the site as a regeneration "pool." No less than three neuromata were present, attached to the long saphenous nerve in the case of Thomas and the small sciatic nerve in the case of Anstey. So far as I know at present these regeneration neuromata seldom possess foci of inflammation, but they may be sources of pain, not of spontaneous pain but they cause pain when pressed upon.

In inflammation and compression, two forms of the causation of pain are in evidence. The inflammation does not remain in the nerve bulb and only extended peripherally, but it also progresses up the nerve as an ascending neuritis.

Clinically there may be distinguished at least five types of pain in amputation stumps, the first of which is universal and the last uncommon.

First. Early pain, coming on immediately after the amputation, dependent on an endoneuritis set up by the injuries inflicted on the nerves at that operation. When alone present this accession of pain dies away in a few days or weeks.

Secondly. Compression pain, coming on about two months after the interval and sometimes steadily increasing.

Thirdly. Inflammatory pain. The early pain never passes off, or it may become paroxysmal and severe, or it may even be still more clearly defined, as in a man recently under my care.

Clinically these cases may be grouped in a series; pain immediately after the operation is due to the trauma of that operation and the inflammation of the repairing tissues; a little later, after from 2 to 10 months, the pain is due to the compression of the nerve fibers by the contraction of scar tissue; later still, pain is due to active inflammatory changes in the nerve ends.

The *fourth* clinical type is produced by the regeneration of nerve fibers. It is characterized clinically by more continuous pain and illusions as to the presence of the missing part; for instance, the amputated foot. The pain is acute, and first appears within a few days of the amputation. At first it is not great, but increases in severity.

The fourth type has clinical features of both the second and the third type.

The *fifth* type is only recognized clinically by the process of elimination; nerve trunk after nerve trunk is removed by operation and their consideration eliminated by trustworthy surgery. Still the pain and tenderness persist, and are not of neurotic origin. The pain may originate from the irritation and inflammation round a silk ligature or other foreign body. Or the skiagram may show that it is due to disease in the bone; terminal rarefaction of the bone is due to the injuries of operation and the healing of the wound, but when the bony changes are farther afield they are partly due to nervous irritation—dystrophy. Such cases exhibit the usual signs of bone pain, night pain, and pain in wet weather, and are very persistent. They are frequently called neurotic patients, but the fault is not theirs but ours—we have not found out the cause of the patient's pain. We should bear the reproach. The stumps of patients of this type frequently twitch and twitter.

It would appear then that there are many causes for nonnerve-trunk pain in amputation stumps, and these may be classified according to their source of origin—bone pain, muscle pain, ligature pain, and joint pains. This class of case is one of the most interesting to study. In the exploitation and unraveling of these cases one speedily becomes aware of the fact that this infective inflammatory wound callus has the greatest tendency to spread along vessels and easily envelops the nerves which may accompany them, and, further, that this condition is made worse by the presence of unabsorbable ligatures, irritation produced by which maintains the inflammation.

One of the most successful amputations of the whole war is a supramalleolar amputation of the foot, a Syme's amputation. With it the patient can walk as well as he ever did and follow his ordinary avocation. Unfortunately the Syme stumps are sometimes tender. The stump is ideal to look at. The explanation of the painful stump is almost always the same—the *posterior tibial nerve is strangulated*

by the large internal scar. The anterior tibial nerve has either been retracted or cut short. The posterior tibial nerve is not so easily found and is rarely cut short. Some of these posterior tibial nerves become strangulated; the majority escape. By the contraction of the fibrous tissue they may be tied to the posterior surface of the tibia or pulled under the newly fastened down tendo Achillis.

The swollen and œdematous strangulated end of the nerve is easily demonstrated. In fact, for the demonstration of nerve strangulation I know of no better stump. The nerve lies in the heel flap which was brought over the end of the amputated limb, covering it entirely, a long flap carrying a nerve. The retraction after the division of the nerve trunk is well shown, but I have never found trouble with this nerve as it lay in the flap, but higher, about the level of the external skin scar. Theoretically these nerves should be divided at the level of the skin incision, but practically, as teachers of operative surgery know well, the nerve is redivided higher up in the freeing of the heel flap. So it escapes lower down as it lies in the heel flap.

The anterior tibial nerve always escapes as its end retracts and is not exposed to the irritation of the healing wounds; and the incision is so situated that the nerve end is wholly above the amputation. The anterior tibial nerve always escapes and the posterior tibial nerve always gets strangulated.

But why is there such a high percentage of painful nerve bulbs in the amputation stumps of the upper arm? The nerves and muscles here are included in one big cicatrix whose lower end is at the amputation, forming a neuro-vascular bundle. This formation is only found here, not elsewhere. It is peculiar to this part principally, I believe, for two reasons: First, on the inner side of the upper arm there is a huge lymphatic and blood course, enabling the rapid and extensive formation, and subsequently contraction, of scar; secondly, in this situation the nerve endings are only covered by a thin sensitive skin. Bony formations here are unusual, whilst they are plentiful and a distinctive feature on the posterior and inner part of the thigh.

Almost all the amputations through the arm have been done by means of the circular method. In view of the formation of so large a scar, involving so many nerves, it is better to convert the circular amputation into a racquet incision, and, through the incision representing the handle of the racquet lying over the vessels and on the inner side of the arm, the nerve can be removed. A great length of nerve can be removed, as the nerves which become painful and bulbous have no branches of importance in the arm. The median nerve, the ulnar nerve, and the internal cutaneous nerve can be removed up

to the axilla; and the musculo-spiral nerve can be removed as far as its junction with the circumflex nerve.

Forearm stumps, bearing very little pressure, are very unusually painful. In the neighborhood of the wrist the median and ulnar nerves would seem to be seldom nipped or inflamed, but they regenerate into infective fibrous tissue and into adherent tendons, the regeneration here, as elsewhere, being a new formation, and invading structures like malignant disease. The pull of the tendons or the inflammation and cicatrization of the scar tissue sometimes makes their excision necessary. The mass of tissue might be compared to a fruit and the nerve to the stalk. Sometimes these are very troublesome cases.

(1) Tender nerve bulbs should be excised together with a long piece of nerve so as to get above any perineuritis or ascending neuritis there.

(2) The best method of removing a nerve is by means of the epineural sleeve.

(3) Drainage should always be employed. A good-sized tube is used. Its nonuse leads to hemorrhage.

(4) All ligatures and buried sutures should be of absorbable material to minimize sources of irritation.

(5) Injections of alcohol, quinine, and urea, etc., should not be used, as about three or four fifths of an injection flows out of the nerve into the surrounding connective tissue, causing later a large formation of scar tissue round the nerve and its subsequent strangulation.

(6) Fixation abscesses are easily produced by tucking gauze or part of a swab into a recess of the wound and leaving it there. They seem to attract a certain amount of the infection to the abscess, which, when the gauze is removed, allows that sepsis to drain away. Perhaps these fixation abscesses are more frequently made unintentionally than intentionally, and are at times most beneficial. The gauze may be left there as long as three or four weeks. They certainly seem to relieve the pain in some cases—infective cases for instance—and are a good counterirritant.

Another method for relieving pain is the use of an old-fashioned seton of gauze put through the skin of the stump a little above the amputation.

The recommendations that I would make to those surgeons doing the amputations are:

(1) Let technique be as surgically clean as possible. Much harm results from "lighting a fire" in a wound.

(2) Use only absorbable sutures.

(3) Cut all nerves as short as possible, using the "swing-door method" to close their mouths.

(4) Cut all vessels short, as they form the greatest channel for the spread of infection. By cutting them short "the door is closed."

(5) Drain temporarily all amputation wounds, using a large tube, and at least one.

(6) Start the Carrel-Dakin treatment at the time of operation in dirty cases.

(7) In clean cases close the deep wound with a few catgut stitches.

WILLEMS, C. Abdominal self-protection in war surgery. *Belgian Medical Archives*, 1917.

Among the few symptoms that may be considered pathognomonic in surgery is rigidity of the abdominal wall. This symptom or sign should be sought in every case of injury to the belly or where chest, loins, or pelvis are involved. The examination is made with the patient on his back, the head low, the thighs flexed, the knees apart, the mouth open. The patient is told to relax the abdominal muscles as much as possible. The hand is placed flat on the belly, slow gradual pressure is made. Gentle, steady pressure may cause pain, but if rigidity is not present the abdominal contents may be compressed by this maneuver. If rigidity is present the muscles become hard and boardlike and offer stubborn resistance to pressure. In its most conspicuous form abdominal rigidity is general but there may be localized rigidity only.

General rigidity indicates a perforation of the peritoneum, but does not prove a ruptured viscus. Large hemorrhage excites general rigidity. Less severe hemorrhage would excite less rigidity.

General rigidity varies in character. It is seen best in cases of perforation of the gut. Here it appears early, extends over the whole belly, and passes away before septic peritonitis is fully developed.

Perforation of the bowel usually shows general rigidity prior to the development of peritonitis. Rigidity is less when it is caused by hemorrhage.

Wounds of the liver, if not excessive, may show results almost identical with those due to a perforated gut.

Injuries to the kidney may cause localized rigidity which might be a misleading symptom.

DANIELOPOULU, D. Typhus fever. *Archives of heart disease*, 1918.

The red blood count is normal unless there is cyanosis with cold extremities. Then the blood is blackish in color and shows a polycythaemia of 7,500,000. In the great majority of cases the leucocyte

count is raised. Sometimes there is an initial reduction, but this rarely lasts. In mild or moderate cases the leucocyte count may reach 20,000. In grave and fatal cases the leucocytes may reach toward the end as high as 128,000.

In the differential leucocyte count in typhus Danielopoulu arrives at conclusions rather different from those of previous observers. He finds that a mononuclear increase, due to the large and medium sized cells, is the predominant feature, and he has followed fatal cases with a mononuclear percentage of 50, 63, 68, 71, and even 76. The polymorphonuclear leucocytes and the large mononuclears often show degenerative vacuolation of their protoplasm. Granular neutrophil myelocytes are very rare and nucleated red blood cells even more so. The blood almost constantly shows the presence of mononuclears with highly basophil protoplasm without granules and with an eccentrically placed nucleus; these cells vary in size; some are quite small and the largest measure 20 μ ; they are oval or more rarely round.

DENNIS, F. L. Tonsillectomy in the tuberculous. arynoscop, St. Louis, November, 1917.

Difficulty was encountered in estimating the direct results of tonsillectomy in these cases—first, some cases were well on toward recovery, at time of operation, and continued to improve, which probably would have occurred without operation; second, there was lack of definite information regarding the condition before operation, and inability to follow case afterwards; third, it was impossible to judge exactly what effects the operation has had on the tubercular process.

In general, certain conditions must be observed; a time should be chosen when the lungs are relatively quiescent, ether is contraindicated; local anesthesia if possible.

After operation, the author advises the application of tincture of iodine to the wound.

In general, his experience has been favorable.

[G. B. T.]

Reprints and extracts from the Medical Supplement to the Daily Review of the Foreign Press. Issued by the General Staff, War Office, London.

Volume 1, No. 6 (June 1, 1918), contains an illustrated article on *prosthetic appliances*, in which the history of artificial arms and hands is given in detail, beginning with the artificial arm used by Götz von Berlichingen in 1509 which is preserved in Nuremberg. In this the fingers were not capable of active movements but were adjustable. It permitted great grasping power. All the finger joints

were movable and the fingers were held in extension by flat springs. When forcibly flexed the fingers remained in that position until released by pressure on a projected button at the wrist. A Berlin dentist named Peter Baliff produced a mechanical hand in 1818. In this the normal position of the fingers was flexion, which was maintained by special springs and extension through catgut cords worked by the action of the sound shoulder with straps around the chest. The weak point in this device was the weakness of grasp. The principle was developed by Karoline Eichler, but in the hand made by her the fingers are in extension, maintained by spiral springs. Flexion is brought about by means of catgut cords worked by the sound shoulder.

The Keller hand for forearm amputations has been extremely popular in Germany. It has three stiff metal claws and is used in conjunction with a strap.

The arm of Lange is an interchangeable work and Sunday arm. This is attached to a leather cap, closely modeled on the shoulder girdle, or, in upper arm cases, a leather ring around the shoulders with steel strips attached to it.

The important points in an upper arm prosthesis are: Accurate adjustment and fixation to the trunk; (2) great simplicity of construction; (3) solid material is required.

The Carnes hand has been used by Dr. Max Cohn even, for operating.

Lange describes two kinds of hands, one for finger-tip grip, the other for the broad or palmar grip.

Adequate arm prosthesis is much more difficult of attainment than the production of a suitable artificial lower limb. This absence of cutaneous sensation in the hand may be atoned for in a measure by the development of the muscular sense of the stump muscles. The artificial hand to be useful should form a fist for grasping purposes; the hand should utilize the sense of touch, or at least the muscle sense.

The artificial arm should be wholly independent of the function of the muscles of the sound limb. No artificial arm has any great value unless it permits a man to pursue his daily life and work. Among the signs of a good artificial arm are the following: (1) Power of flexion and extension at the elbow; (2) rotation around the long axis of the upper arm; (3) pronation and supination, flexion, and extension at the wrist.

For an arm to be useful there must be free movements of the shoulder.

Maintenance of the free movements of the shoulder is *asine qua non* of a useful arm.

Of the short muscles all except the *opponens pollicis* can be sacrificed.

In musculo spiral palsy the fist can not be closed while the wrist is flexed.

“For hard work it has been well said, ‘The stump is the best prosthesis.’ The mechanism of the hand is wonderful, but skill in its use depends more on the cerebral cortex. The stump has sensation, which plays an enormously important rôle in the mechanism of the hand. Not only is there cutaneous sensibility, but muscular sense and pressure sense. Sensibility can be developed in use and touch corpuscles increased in number, so that after a year or two the stump may be as sensitive as the finger-tips, but this will happen only if the stump is continually uncovered and exposed to fresh air, so that it is not coddled, but hardened and strongly vascularized.”

The following directions are given for making Martin's Waterproof Glue:

Dissolve in a water bath (or the ordinary gluepot) 1 kilogram (35 ounces) of the best glue in 1 liter ($1\frac{1}{2}$ pints) of water. When the solution is homogeneous precipitate it by adding the following solution of tannic acid: Acid tannic, 2,500 grams, say, 5 pounds; acid carbolic, 500 grams, say, 1 pound; water, 50,000 grams, say, 10 gallons.

Add this solution to the glue until it becomes a milky white throughout.

Let it cool down to 35 C. (95 F.).

Collect the precipitate then produced and wash it thoroughly in tepid running water at about 30 C. (86 F.) until the washing water is only very slightly discolored by the addition of a dram or two of an aqueous solution of sulphate of iron of a strength of 10 per cent.

The stringy precipitate should be leathery and of a pale mauve color. It becomes rather brittle when cold.

Take this precipitate and make it soft again in the water bath.

Dissolve it at a temperature of 80° to 90 C. (176° to 194 F.) in dilute alcohol (alcohol as used for burning or ethyl alcohol of 90°, 1 part to 3 parts of distilled water). Dilute till it has a sirup-like consistence when cold; it coagulates while becoming paler in tint.

Before using the solution bring it to the boil, which occurs at about 80 C. (176 F.).

This glue is used hot, and it should remain of a constant consistency.

As soon as it becomes in the air the color of dark-brown caramel, and remains so, it must be restored to the proper tint by the addition of a certain quantity of dilute alcohol.

Dr. Martin uses a table or trough kept at a constant temperature by a current of hot water. The vessels containing the glue in use are stood in this running water. The glue is applied with a brush and the adherence of the strips of wood is secured by pressure with a hot copper roller.

Cramer states that bony spurs, either from periostium or medulla, are rare in the upper part of the tibia but they are almost the rule in the femur. The arch of the sound foot must receive close attention in case of amputation of the lower extremity, because of the additional strain put upon it after long confinement to bed. The effects may be disguised but the disposition of the patient to throw the weight on the outer side of the foot, raise the border and so inadvertently conceal a flat foot. The following are the stumps that need operative interference: (1) stumps with sinuses, which usually go down to dead or an infected ligature; (2) stumps with abundant skin; (3) stumps with little or no skin covering; (4) stumps which can not bear pressure because skin over them is too tender.

Preliminary to reamputation there must be weight extension applied to the skin during a period of nearly 3 weeks but never for longer.

In doing reamputation it is essential to leave no bleeding points untied.

The most difficult stumps to handle are the short ones with projecting point ends. One has to try to cover them, sometimes by sacrificing more bone, sometimes by using pedicled flaps. Stumps of the upper arm are easier to close over than those of the thigh.

In Volume 1, No. 7 (July 1, 1918) there is a review of WEDERHAKE, The surgical use of human fat. Berl. klin. Wehnschr., 1918, 55, 47.

Wederhake reports on the surgical uses of human fat, which he always obtained from the living body, either from the omentum or from lipomata. After due preparation and sterilization it is in a liquid state. Before use it is heated to body temperature. The author employed it with advantage in the following groups of cases:

(1) By way of hypodermic injections to raise depressed and detach adherent scars.

(2) In connection with suture of tendons.

(3) By injection into the sheaths in case of tendovaginitis crepitans.

(4) By injection into the sheaths of the flexors in Dupuytren's contraction. The author claims that no other mode of treatment brings about reliable results in so short a time.

(5) In traumatic oedema, the most important field for the use of human fat, since here it shows in a preeminent degree its striking capacity for *dissolving scar tissue*.

(6) In dealing with the after effects of phlegmonous tendovaginitis.

(7) For padding the skin over bony prominences. Thus it proved useful in a case in which the plantar fat of the heel had completely disappeared from trophic lesion.

(8) For filling vein grafts used for bridging defects in the continuity of a nerve.

(9) By hypodermic injection in pruritus ani et vulvæ.

(10) For detaching nerve adhesions.

(11) As a dressing for wounds. But it does not supply an ointment base.

Its chief value, however, lies in the fact that it dissolves cicatricial material, chiefly in connection with the sheaths of tendons. It is superior in this respect to thiosinamin, fibrolysin, and cholin; but its effects are purely local.

MARTINI, E. München. Med. Wehnschr., 1918, 65, 404,

recommends the use of the following epilatory powder in the prophylaxis of typhus; Two parts of strontium sulphate and one part each of zinc oxide and talc. The powder is made into a paste with water and applied to the hairy parts of the trunk and limbs; the crust is removed in about 10 minutes. The patient is then washed all over, and the skin, especially of the scrotum and anal region, greased with oil or vaseline. The paste is not applied to the face or head, the hair of which is carefully shaved. The patient's clothes are in the meanwhile deloused in another room. This epilatory method is applied to all typhus patients, to those suspected to have the disease, and to those known to have been exposed to infection. During the last 18 months this routine has been in vogue at the Wloclawek fever hospital and none of the staff, the male and female nurses, or the washerwomen have contracted typhus.

Transfusion with the blood obtained from convalescent patients is described by KABELEK, J. Wien. klin. Wehnschr., 1918, 31, 47-50,

as very simple and not necessitating centrifugalization or delay to allow the blood to clot. Whole blood is employed and it is considered that this is more likely to be sterile than the serum. It is doubtful if the red cells and the platelets exert any specially beneficial influence, but the leucocytes certainly do. The technique is free from

complicated steps; the syringe is washed through with a 4 per cent solution of sodium citrate in normal saline, and an amount equal to one-tenth of the blood to be withdrawn is retained, for example, 2 cc. when 20 cc. of blood, the smallest quantity of blood that has any effect, are to be taken. The blood is then withdrawn from the vein at the elbow of the convalescent patient, mixed with the citrate solution already in the syringe, and injected into the febrile patient. The earlier in the course of the disease the transfusion was given the better the results. If given before the rash appeared, a prompt and permanent fall of temperature resulted; when administered later, the recovery was not so rapid, but the course of the disease is shortened and the symptoms alleviated. No bad results were observed.

Daily Review of Foreign Press, July, 1918, points out that psoriasis is now less severe in type in Germany, owing to the reduction of meat and the increase of milk and vegetables in the general diet.

Scabies is a serious scourge among French troops, as under war conditions vexatious complications are numerous and common. These are persistent ulcers, boils, superficial phlebitis.

MILIAN, G., in *Paris Médicale*,

recommends the use of an insoluble sulphur preparation whereby the treatment is simplified and abbreviated. The ointment is made by mixing vaseline and lanoline, 250 grams of each, to which is added first a solution of sulphide of potassium in 250 grams of water, and then oxide of zinc (5 grams) in 200 grams of liquid vaseline. After a bath or wash with soap and water this ointment is applied all over the body, and the patient puts on his clothes; the next day the process is repeated, and on the following day a bath with soaping is given to remove entirely the slightly irritating ointment. Scabies with impetigo and boils can thus be treated, and the need for disinfection of the clothes is done away with. Two further points, however, should be mentioned. In the first place, the objective signs of scabies often become more prominent for three or four days after the ointment has been applied, thus burrows previously invisible become evident; and, in the second place, persons with susceptible skins or those who have not been thoroughly washed with soap after the second application of the ointment may have a more or less widespread acute nonsuppurative folliculitis which appears, in about 2 per cent of the cases, four or five days after the use of the ointment, and lasts for five or six days. These red papules, due to the irritation of the remains of the ointment, must not be mistaken for a relapse of the scabies.

HYGIENE.

SMITH, C. E., and SCHÖBERG, H. M. Sanitation of swimming pools. Am. Jour. Pub. Health, June, 1918.

The diseases likely to be acquired by bathing in polluted water fall into three groups: Intestinal diseases, those of eye and ear, and venereal. Typhoid fever and dysentery have been contracted through the ingestion of polluted river water by bathers. Trachoma and ear infections have been reported following the use of swimming pools. Cases of gonorrhœa and infections of the vagina by the bacillus prodigiosus following use of public baths have been reported. The greatest menace to health is represented by the *B. coli communis* and the *B. typhosus*.

Management of the water.—There is no direct relationship between number of weekly fillings and sanitary condition of the water in a swimming pool. Dilution is expensive and efficient. Refiltration improves general appearance of the water, lowers bacterial content of swimming-pool water, and reduces cost of maintenance.

Chemical disinfection.—Copper sulphate destroys bacteria and algæ. From 0.04 parts of copper sulphate per million of water used each day to 0.5 parts per million is recommended. The effects of blue vitriol taken internally in small doses frequently repeated has not been determined, but in concentrated form it is poisonous, hence the need of great care in its employment for purposes of disinfection. Calcium hypochlorite is an effective germicide through the liberation of chlorine. Tully recommends 0.5 parts hypochlorite of calcium (30 p. c. available chlorine) per million. Others believe that as much as 3 parts per million are necessary. This subject is still under investigation. The amount of bleach required depends in part on the hardness of the water. At this writing the chemical is costly, and it may be cheaper to use liquid chlorine. Chlorine being irritating to mucous membranes is unpopular with the patrons of swimming pools.

Administration has much to do with keeping the bacterial count low. Bathers should be instructed in swimming-pool sanitation and should be inspected before entering the water. They should have a cleansing with soap and hot water preliminary to entering the pool.

General conclusions.—Swimming pools should be so well lighted that a submerged person can always be readily seen. Economy therefore suggests locating the pool at the top of a building. The waste water from the pool can then be used for flushing of closets, urinals, etc., in the building. The sides of tank should be smooth. Four sides of the pool should be available for use with life rails all around. Overflow gutters are necessary, and there should be a trip basin 12 inches below the main platform. When the tank is emptied

the sides should be scraped, scrubbed, and flushed, then steamed, aired, and dried. Wreaths of sediment on the floor should be removed and pumps on the general plan of a vacuum cleaner are recommended. Refiltration and constant agitation of the water should prevent formation of wreaths. The water selected for the pool should be the cleanest available and not that whose source is simply the most accessible.

Constant refiltration makes it possible to use a given filling a greater length of time. This is an important item in cost of maintenance and will more than compensate for the initial cost of the equipment. The tendency toward installing a plant of too small capacity should be avoided. It should be possible to refilter all the water in the tank in one day (eight-hour days are in vogue). Usual frequent attention should be given to reversal of filters, washing, and steaming.

Dilution should be practiced sufficiently to make up the loss by splashing, etc. No definite amount can be stated. This should depend on the number of bathers, frequency of refilling, etc. As a rough working rule it is suggested that the dilution be sufficient to amount to one filling between refillings.

Refillings should be determined by the number of bathers, size of pool, and bacterial content, as there is no direct relationship between the number of weekly refillings and the sanitary condition of water. The general appearance of the water counts for nothing.

Chemical disinfection is imperative.—Both calcium hypochlorite and copper sulphate have advantages—the latter probably being the favorite. Either should be used in strengths increasing from 0.5 parts to the million of water, depending on the size of the pool, number of bathers, the hardness of the water, and the bacterial reduction obtained. Bleach must be tested frequently for available chlorine. It quickly disappears from the pool.

Supervision of bathers.—Full shower bath with soap should be demanded of all bathers. To make this possible the shower apparatus must be inspected very frequently. Instruction should be given bathers in the purpose of the bath. Especial attention should be given the perineal region. When water strikes a person's body the natural tendency is to urinate. This should occur in the shower, not in the pool. The floor should be taken care of to prevent tracking the dirt, bacteria, etc., which have been washed off by the shower, onto the deck about the pool. On the pool platform inspection of every entrant should be performed. Bathers should wear no clothes. If this be impracticable the authorities of the pool should furnish the suits—one-piece, undyed, scanty—and see that they are properly sterilized and dried between usings.

PATHOLOGY, BACTERIOLOGY AND ANIMAL PARASITOLOGY.

EBERSON, F. A bacteriological study of the diphtheroid organisms, with special reference to Hodgkin's disease. Jour. Infect. Dis., July, 1918.

The writer has given an excellent historical review of the diphtheroids. He states the difficulties in classification and suggests that they be placed in nine groups, under the term "Corynebacteria."

He realizes that his classification is far from being complete.

Agglutination and complement fixation tests were carried out to determine the identity of strains isolated from Hodgkin's disease. Sera from four patients having Hodgkin's disease failed to cause agglutination of eleven strains of bacteria, eight of which had been isolated from glands in cases of Hodgkin's disease and three from (1) a case of leukemia, (2) ascitic fluid in cirrhosis, and (3) blood.

Complement fixation tests led to the conclusion that the cause of Hodgkin's disease is not the organism described by numerous workers, and that cultural characteristics did not serve to differentiate the supposed cause of Hodgkin's disease from numerous saprophytic diphtheroids.

The following table has been prepared from his tentative classification:

Surgeon General's Library,
U. S. Navy

Diphtheroids (Eberson), Gram positive, nonspore forming, nonmotile, no liquefaction of gelatin (except C. Putidum).

Group.	Name of organism.	Dextrose.	Maltose.	Saccharose.	Dextrin.	Lactose.	Mannite.	Raffinose.	Aerobic=A.	Anaerobic=AN.	Virulence.	Isolated from—	Remarks.
1	C. Diphtheria.....	+	+	-	+				A		+	.....	Polar bodies, toxin products.
1	C. Pseudodiphtheriae sp. nov.	+	+	-	+				A		-	Tonsils.....	No toxin produced.
2	C. Pseudodiphtheriticum...	-	-	-	-				A		-	.....	Short and thick; broth cloudy.
2	C. Ceruminis.....	-	-	-	-				A		-	Normal ear.....	Broth clear with sediment.
2	C. Delicatum sp. nov.....	±	±	-	-				A	AN	-	Ascitic fluid blood cult.....	Small and delicate.
3	C. Xerosis.....	+	+	+	-				A		-	Eye.....	Delicate growth.
3	C. Epidermidis sp. nov.....	+	+						A	AN	-	Skin pus pockets.....	Small, ovoid.
3	C. Suppuratum sp. nov.....	+	+	±					A		-	Pus pockets, abscesses.....	Heavy; glistening growth.
3	A. Auris.....	+	+	-							±	Ear.....	Long; scanty growth.
3	C. Cerebralis sp. nov.....	+	+			+					-	Brain.....	Ovoid, coccoid.
4	C. Nodosum.....	+	+	+	+						-	Urine.....	White growth on agar.
4	C. Acidum sp. nov.....	+	+	+	+	+	+	-	A		-	Urine.....	Do.
4	C. Ascites sp. nov.....	+	+	+	+	-	+				-	Ascitic fluid.....	Many club-shaped forms.
4	C. Flocculens sp. nov.....	+	+	+	+	+	-					Appendix.....	No cloud; Neisser's granules; flocculent sediment.
5	C. Hoagii.....	+	-	+								.....	Abundant but imperfect granules, salmon-colored in serum.
5	C. Aurantiacum sp. nov.....	+	+						A	AN		.....	Coccoid; orange pigment.
5	C. Glandulae sp. nov.....	+	+	+	±							Hodgkin's disease.....	Ovoid and coccoid; col. dry and heaped up.
5	C. Striatum.....	+	+	-								Nasal mucus.....	Large, irregular granules; thick bars.
5	C. Segmentosum nom. nov.....	+									-	do.....	Polar bodies.
6	C. Putidum sp. nov.....	-	-	-	-	-	-	-	A	AN		Ascitic fluid.....	Offensive odor; liquefies gelatin.

7	<i>C. Typhi-exanthematici</i>....	+	+	.....	.....	.....	.....	AN	+	Typhus fever.....	Acid in inulin and galactose pleomorphic.
7	<i>C. Acnes</i>.....	+	+	+	.....	.....	+	±	A	Pustules (deep).....	Acid in inulin.
8	<i>C. Pseudotuberculosis</i>.....	+	+	.....	.....	.....	.....	.....	.....	Animals.....	Toxin produced golden pigment.
8	<i>C. Pyogenes</i>.....	-	.....	.....	.....	.....	.....	A	AN	.....	Hemoglobinophilic.
8	<i>C. Vaccinae</i>.....	.....	.....	.....	.....	.....	.....	A	AN	Vaccine pustules in calves.	Yellow pigment.
9	<i>C. Lymphophilus</i>.....	+	.....	.....	.....	.....	.....	.....	AN	Hodgkin's disease.....	Slender; pleomorphic.

[G. F. C.]

NOGUCHI, H. The spirochetel flora of the normal male genitalia. Jour. Exper. Med., June 1, 1918.

On account of the reports by Martin, Nankivell and Sundell, and by Patterson of the presence of spirochaetes in urine in cases of trench fever or "P. U. O." (Pyrexia of unknown origin), Noguchi has studied the spirochetel flora of the normal male genitalia.

His discussion and summary is as follows:

The varieties of spirochetes enumerated and photomicrographed from the male smegma flora represent practically every form hitherto described by Nankivell and Sundell and by Patterson in the specimens of urine from trench-fever cases. The urethral flora, as studied by Stoddard, seem to contain more varieties, but, except those of his more detailed morphological descriptions, every form observed by him is among those found in the smegma. Stoddard saw certain forms with hooked ends suggestive of the *Leptospira icterohaemorrhagica* of infective jaundice, but the resemblance ends with this one feature, and differentiation should always be possible under the dark-field microscope, by means of which the leptospira reveals its highly characteristic minute elementary spirals, presenting the appearance of a chain of dots. Of all the spirochetes, none has so closely set spirals as the jaundice leptospira, the distance between two spirals being only 0.5 microns. Various methods, including Fontana's, Benains's, the mordant gentian violet stain, or Burri's india-ink method, are inadequate to differentiate the leptospira from other spirochetes.

Why a positive spirochete finding with the films from the urethra and the specimens of urine was not obtained is difficult to explain, except on the grounds of the paucity of specimens examined. At all events, the recent negative results reported by Fiessinger with French soldiers and invalids after cleansing of the urethra and glans seem to be in harmony with my results.

In conclusion it may be stated that *Spironema refrigens*, *Treponema calligramum*, and *Treponema minutum* represent practically all the spirochetel forms observed in the male smegma flora. A leptospira has never been conclusively shown to be present in the specimens of normal urine or smegma. For the satisfactory microscopic demonstration of a leptospira a dark-field illuminator is indispensable.

[G. F. C.]

MILITARY, LEGAL AND INDUSTRIAL.

MILLS, C. K. Notes on the influence of wars and the psychology of the times. Am. Jour. Insanity. Vol. 74, No. 4. April, 1918.

Since the beginning of the present war and especially since this country has become involved in the conflict, every one, of course, has been interested in arriving at the truth relative to its definite causative factors. To arrive at a conclusion on that point it is necessary for us to go back and study the factors involved in other wars, the effect of those wars on the times, and to fully understand the national, as well as the international, psychology of the present. These things the author presents to us in a very instructive and interesting way and for that reason the article is well worth careful perusal. We are reminded that in times of peace people are very liable to lose

sight of the higher ideals, become self-centered, and indulge in excesses of all kinds. In times of war the heroic qualities of the people are developed; they become as a rule, self-sacrificing, and having a desire to be of some assistance to their relatives who are on either side they do all manner of things, involving manual labor. It is not uncommon in times of war to see individuals actively engaged in all forms of war work, who had formerly lived what might be termed parasitic existences. Wars may be traced to the influence of former wars. The emotions and sentiments of the people at one period of conflict become more or less crystalized in their psychology, and later, under the influence of a variety of solvents they are set free again to become active. This can be well illustrated by the strife which began in England in 1643 against the tyranny of the King. These efforts passed down to the American and French revolutions. At the beginning of this war Germany believed that defeat was impossible, but now there are evidences that the psychology of that country is changing and the people are beginning to realize that her foes may be unconquerable. England was more self-complacent, rather than self-idolatrous, her energies having been expended along the lines of commerce and social development. The American was apparently entirely interested in accumulating great wealth, and in so doing he lost sight of many of the desirable ideals and believed, for some reason, that the possibility of this country being involved in the war was very remote, because of the fact that 3,000 miles separated it from Europe. A poor understanding of international psychology resulted in the unpreparedness in England, as well as in America, and so the present conflict is being prolonged many years. If the allied nations had been fully prepared there is no question that the war would probably have been over by this time. In conclusion, the author refers to the possibility of international peace by agreement, and is of the opinion that there will be no such thing unless all parties to the agreement are individually strong enough to support what they consider to be their rights by force. [D. G. S.]

BRILL, A. A. The adjustment of the Jew to the American environment. *Mental Hygiene*. Vol. 2. No. 2. April, 1918.

Since the entrance of the United States into the world conflict, and the accompanying increase in the Army and Navy, it has been noted that there has been a proportionate increase in the incidence of mental disorders of functional type. A very high percentage of these cases have been in individuals of Jewish extraction, the patients as a rule recovering when the service conditions of stress and discipline have been removed. To be of assistance to these patients it is, of course, desirable to have an insight into the character and emotional make-up of the race, its normal conflicts and its reactions, so

that any illness developing in a man may be discovered in its incipency and possibly kept from actually assuming the aspects of a definite psychosis. The general features, as outlined above, are wonderfully expressed by the author of the article, and it is recommended for careful study by all medical officers of the Navy. Aside from the professional value of the article it is interesting from the psychological standpoint and contains valuable information which every American in an executive position should be familiar with. The physicians specializing in mental conditions have realized for years that the Jews, as a race, usually evidence functional mental derangements, almost to the exclusion of organic brain lesions and the senile conditions found in the non-Jew. Because of conflicts through which the Jewish race has gone in the past centuries, as a result of the treatment of other peoples and nations, the Jew, as an individual, is now realized to be oversensitive and inclined to repress the greater number of his difficulties. As a result, when repression is not successful, a psychosis develops usually of functional type. There have been two definite psychological factors involved in the emotional make-up of the Jew that we see to-day. The first is a reaction which has come as a result of religious conditions which have made it necessary for him to develop along very narrow lines. It is therefore difficult for him to adjust to outside life, he is a poor competitor for existence, aside from financial and business matters, is usually coddled and spoiled, self-willed and egotistical. Because of the actions of the non-Jews with whom he comes into contact, he, as a rule, represses his emotions and becomes an isolated individual. His feelings, his desires, and his ideals are not understood by those with whom he is thrown, and because of his inability to meet the difficult problems in an outward manner he apparently prefers to remain by himself. The second factor is said to be the family situation, where all of the patient's love, affection, and interest is centered in the home. He is not allowed to select his own mate; he is suspicious and fearful of outsiders, is a poor mixer, and as a result when he gets into a difficult situation, given added responsibility, and required to use initiative, he, as a rule, develops a paranoid reaction. It is not uncommon to see this reaction in officers of the Naval Reserve Corps who are pushed into difficult situations, having left a home of ease where their every want had been supplied by the parents. They usually develop ideas of reference, feel that the people about them are not showing proper respect, and a little later on, if this tendency is allowed to develop, they will feel that some definite action is being taken against them by their associates.

[D. G. S.]

ARMSTRONG-JONES, R. Notes on drink and its regulation in relation to work and health of Great Britain. *Ann. Jour. Insanity*. Vol. 74, No. 4. April, 1918.

The question of prohibition and allied suggestions have been constantly before the public in this country in a political and social way for a number of years, but no effort had been made for a Government regulation of liquor traffic until the onset of the present war. Since that time there has been a regulation by the Army and Navy, in the vicinity of cantonments, naval bases, etc., in the form of absolute prohibition. Great Britain decided to arrive at the same destination by regulation of liquor through a board of central control, which was instituted by an act of Parliament in June, 1915. This board was authorized to not only regulate liquor control, but to maintain the efficiency of the workers in various areas. All of Great Britain was included, with the exception of Ireland, which has less than one-twentieth of the population of the whole. In most cases this board owned and controlled the licensed premises, established canteens, eating houses, regulated the hours the various establishments were to be kept open, legalized the sale of spirits and beer of a lower strength than formerly made, and made very definite efforts to lower incidents of drunkenness, especially at week ends. It also abolished the sale of intoxicating liquors in bottles from grocers and other places, so that the intoxicant could not be conveniently carried away for consumption later.

The canteens and eating houses were tastefully decorated, the proprietors of these establishments were paid on a commission basis, the larger rate of commission being allowed on edibles and none on intoxicating liquors. As a result the efficiency of the workmen, soldiers, sailors, etc., was raised to a great degree, there was less drunkenness, and at the same time the laboring class apparently made no objection to the procedures as outlined. The success of the board's efforts was apparently very marked and the medical profession of Great Britain is very much elated over the outcome.

[D. G. S.]*

HAMILTON, A. Effect of the air hammer on the hands of stonecutters. *Monthly Review*, U. S. Bur. Lab. Statistics, April, 1918.

Dr. Alice Hamilton has investigated a curious condition in the hands of stonecutters which seems to follow the use of the air hammer in cutting and carving stone, and which is found among the limestone workers of Indiana, the granite cutters of Massachusetts and Vermont, the marble workers of Long Island City, and the workers in the sandstone mills of northern Ohio.

The pneumatic hammer employed consists of a handle containing the hammer, which is driven by compressed air and is said to deliver

from 3,000 to 3,500 strokes per minute. There are various ways of holding the handle in the right hand while the chisel is held by the left hand against the hammer with the cutting edge pressed against the stone. With the exception of the workers in the marble shops in Long Island City all the workmen seen by Dr. Hamilton were without any adequate means of conveniently warming their hands in the winter.

A description of one or two of the more marked cases of anemia in the fingers will show just what this condition is. The first one is a limestone cutter whom I saw early in the morning when the temperature was about 14 F. He had been out of doors for over half an hour, and in order to be able to show me his hands in a typical condition he had refrained from rubbing them violently and swinging his arms about, as he would ordinarily do to restore the circulation. The discomfort, however, had grown so intense in his fingers that he could not bear it any longer and almost at once after I arrived he began rubbing and kneading and shaking his hands. The four fingers of his left hand were a dead greenish white and were shrunken, quite like the hand of a corpse. The whiteness involved all the little finger to the knuckle, but in the other fingers it stopped midway between knuckle and second joint. As he rubbed his hand the contrast between fingers and hand increased and at one stage it was very striking, the crimson and slightly swollen hand meeting the white, shrunken fingers abruptly, without any intermediate zone. On the palmar side the condition was not so distinct, for the skin was too thick and calloused to allow the color to show well.

The right hand was much less affected, the little finger escaped altogether, the three others were white, but not dead white, as far as the second joints, and there was a ring of white around the second phalanx of the thumb. After vigorous massage and beating of his arms back and forth over his chest the blood gradually filled the fingers and the appearance then was fairly normal, showing only a moderately purplish-red color, and no swelling.

These stonecutters are exceptionally good material for such a study, for they are intelligent men, usually of good education, and able to note and describe their symptoms clearly. There is among some of them a tendency to dwell, perhaps too much, on the nervous disorders which they believe are caused by the tiring vibrations of the hammer, and which give them a good deal of worry. Of nearly all of the men, however, this is not true. Many of them have no complaint at all, except of the actual condition in the hands, but others suffer from more or less distressing symptoms which they think are caused by the vibrating hammer. The most common symptom is covered by that vague term "nervousness." They say that they feel jumpy and irritable, upset by a slamming door, unable to settle down after a full day's work with the tool. Their sleep is disturbed and restless, and they have buzzing or ringing in the ears. The numbness in the hands is inconvenient, for they can not hold a newspaper or a book for any length of time without being forced to put it down and rub and knead their hands. Sometimes they have to sleep with the left arm hanging down from the bed, or the numbness will waken them, and then they must get up and swing the arms about or bathe the hands in hot water. Some of them are not troubled at all in summer, others get numb fingers on chilly days, or if they put their hands in cold water. A few men complain of trouble with the left foot, which is colder than the right.

There are several reasons why the left hand is more affected than the right. In the first place a greater effort must be made by the left hand in grasping

the tool, holding one end against the hammer, and guiding and pressing the other end along the surface of the stone. The fingers often clasp the tool so tightly that the blood is driven from them, and this, together with the vibration of the tool from the blows of the hammer and the influence of the cold, seems to set up a condition in the blood vessels which leads to spasmodic contractions and the resulting blanched and shrunken condition. The right hand can hold the larger hammer more loosely and can shift it in different ways during work, and the vibrations are not felt so severely as in the left hand.

Some men continue to be liable to attacks of white fingers even after they have given up stonecutting for several years.

There were altogether 123 workmen in the three branches of soft stone, marble, and granite work whom I examined, and I found only 17 who had not had the so-called "dead fingers." If we omit those who sought me out in order to show me their hands and who might be looked upon as picked cases, there remain 102 whom I saw in the mills and who were not selected at all, but taken as they came. Only 16 of these were quite free from the trouble.

Dr. Hamilton describes the condition as a spastic anemia dependent on three factors, (1) long continued muscular contraction of the fingers, (2) mechanical vibrations of the tool, (3) the cold.

HOOKER, E. H. Criticism of venereal prophylaxis. *Social Hygiene*, April, 1918.

The writer takes an article by Medical Inspector Charles E. Riggs, United States Navy, which appeared in *Social Hygiene* for July, 1917, and was only an elaboration of the article which appeared in the *NAVAL MEDICAL BULLETIN* for January, 1917, as a text for an attack on venereal prophylaxis. The author's contentions seem to be that prophylaxis is not sufficiently effective and can not be owing to the inherent difficulties attending prompt administration; that the Government attitude toward continence, venereal diseases, etc., is not what it should be; that repression of prostitution depends ultimately for its success upon the cooperation of men in the service; that "continence should be considered by the practical man, not on the ground of morals" but because regulation has failed. The essayist gives as her final argument against prophylaxis: "It is an effort on the part of the Government to make it safe for men to satisfy their sexual passions without regard to the primary purpose of sex."

In the beginning of her paper the essayist seems to concede that the "practical impossibility" of a measure makes it of "at least debatable value," and we rather think that this thought should have considerable weight before it is expected of an overworked parental Government that it shall forcibly put a stop to fornication. We may be wrong, but we infer that the writer for *Social Hygiene* expects the Government to penalize the men "by lack of pay or refusal of leave for having had illicit intercourse." She admits indirectly that a good many men would escape punishment by not confessing to their sin, but makes no suggestion as to how the offend-

ers could be detected. One is reminded of the fable of the mice wishing to bell the cat, a plan excellent in theory but characterized by "practical impossibility" of execution. One recalls, too, the chastity belts of the middle ages and a more extended historical retrospect suggests that punishment has never yet proved efficacious as a means of preventing sin.

It seems to the reviewer unfair to charge the Government with "connivance" at male incontinence, to accuse the Government of officially tolerating male prostitution, and to say that the men infer "from this attitude on the part of Government that promiscuous intercourse is permissible" and direct their conduct accordingly.

"Government" is a term of sufficient vagueness to permit of all sorts of attacks and much vilification with impunity to the critic, but this same vagueness makes it rather difficult to speak accurately of the "Government's attitude." If by the "Government's attitude" the essayist is speaking of the Army policy, that is one thing; the attitude of the Navy Department may be somewhat different; Congress may have an attitude all its own. It seems to at least one reader of E. H. Hooker's article as though the author held that in some way or other Bachmann and Riggs and the Government and Napoleon and physicians generally are banded together in a hypocritical sort of way to condone incontinence in men. While not prepared to take up the cudgels for Government, we can not admit that when Congress passed a law which mulcted men of the Army and Navy of their pay while carried on the sick list for venereal disease characterized as due to their "own misconduct," it was condoning incontinence. The law now in force recognizes the medical fact that venereal disease may be innocently acquired, and the victims of venereal disease so acquired are not punished. There is no escape, therefore, from the conclusion that the intention was not to punish the victim of venereal disease but the person guilty of illicit sexual intercourse, whose sin is disclosed by his physical affliction. In practice the law amounts to a punishment for contracting venereal disease, but it was doubtless intended to punish illicit intercourse, or at any rate it is the nearest approach to doing so. At least it was proposed not to spend public funds on pay to men disqualified from performing their duty by acts of misconduct on their part.

We have seen the innocent child blind from birth owing to gonorrhoea of the mother. We have seen the beloved mother and devoted wife suffering an amputation of the leg for supposed tuberculosis when the real disease was congenital syphilis acquired through the sin of a parent. We have seen the young bride of a week writhe in pain from an acute vaginitis and proctitis acquired from her husband, and we have no sympathy with the dispassionate moralist who can stand coldly aside and permit child, mother, or

bride to be made the unwitting victim of a disease that can in many cases—alas, not in all—be prevented by physical means; who refuses such physical prevention of suffering because a far better, a more ideal, a worthier prevention would be that due to moral agencies.

If men are hardly prevented from improper conduct by a full knowledge of the punishment which nature herself imposes and a knowledge of the punishment superadded by the authorities, we are at a loss to know what punitive measures are still within the power of the authorities. One doubts if the essayist is really familiar with the history of prophylaxis in the United States Navy and of the attitude of the "authorities" which "govern" it. As E. H. Hooker is not alone in her ignorance on this subject, it is briefly rehearsed here.

Prophylaxis in the Navy began to be employed on a considerable scale some 16 years ago and was first conspicuous on the China station, where, owing to conditions ashore, the prevalence of venereal disease in the personnel of our ships reached a startling magnitude. It began as a purely medical and sanitary measure, and the results to health promptly recommended it to the military authorities. Prophylaxis then became more or less general throughout the Navy, but its administration has always varied widely according to the views of individual commanding officers of ships and fleets. In home waters the moral aspect of prophylaxis soon obtruded itself into the problem and moral and ethical considerations soon made it "practically impossible" to administer prophylaxis in a thoroughgoing manner.

Meanwhile changes in the internal economy of ships and stations also contributed to the decline of prophylaxis. As periods of liberty and furlough were increased and lengthened the possibility of prompt and efficient prophylaxis was much reduced. Coincidentally with these changes and the frank failure of prophylaxis in many cases, due largely to indifference on the part of the men, in spite of court-martials and fines for failure to take prophylaxis, a large proportion of the medical officers of the Navy realized the necessity for enlarging the scope of prophylaxis so as to include more instruction on venereal disease, and on the importance and value of continence.

It is hard to realize that any portion of the American public is still unaware of the very pronounced and outspoken attitude of the present head of the Navy Department on this subject. The Honorable Secretary of the Navy has more than once given public expression to his convictions and no officer or man in the service to-day can be in the full possession of his mental faculties if he claims that the government of the Navy sympathizes with, condones, or connives at sexual impurity.

Prophylaxis in the Navy to-day is a good deal more than the administration after coitus of an injection or salve. There has been for some time a concentrated and strenuous effort on the part of the medical officers of the Navy to impart to officers and men of the service such information regarding health and disease and such conceptions of life, worthy effort and true success as shall build up in the man a power of inhibition far superior as a deterrent from sin, to the fear of punishment. In the instruction given to-day the physical agents like calomel ointment, and solutions of the silver salts are mentioned as the last resort in the attempt to maintain efficiency, and the subject is so handled that it is as unfair to speak of medical preventives of venereal disease as incentives to immorality as it would be to pronounce the Savior's atonement and saving grace a warrant for sin.

The author has gracefully conceded to Dr. Riggs a "fine sincerity" and the possible ability to "give fair consideration to a point of view opposite his own." The point of view is everything. For one person the point of view may be the quiet study room, with suggestions of refinement and culture in books, paintings, and furniture. The world is viewed through mullioned windows. The glance is to the far horizon and the clear dawn of a better era. There are others, "intelligent medical men," for instance, who have neither the time nor the type of mentality for casuistry, academic discussions, and fine theoretical distinctions. In the heat and burden of the day they find themselves jostled and pushed about by the struggling, sweating mass of humanity that goes faltering and staggering along the rough road of life, now fainting, now falling, by the wayside. To those thus plunged amid their fellow men, knowing them, pitying them, sympathizing with them, one form of duty appeals with special force. It is the duty to bind up wounds and to heal bruises; to reduce by every means in their power the sum total of human suffering and sorrow. To the glory of the medical profession be it said that its members have never stood aside like the Pharisee or the Puritan speculating on the moral quality of the needy or demanding vouchers of respectability from those in pain.

For the honest and upright physician of to-day who is well informed about the ravages of venereal disease and the toll they take from innocent women and children, there is but one course open. He must warn and exhort every man that he has any chance of influencing; he must do everything in his power to deter that man from vice, but when his books, his tracts, his speeches, his private talks, his illustrated lectures, his posters, his moving pictures, his pleadings, and his prayers have all failed to deter him from vice and cohabitation with a harlot, it remains the doctor's duty to try to prevent the development of syphilis and of gonorrhoea in that man.

because every case of venereal disease is a potential infector of innocent women and children; because from one case of gonorrhœa may come indirectly hundreds of other cases and cases of peritonitis and sterility and an interminable list of ills; because a single case of syphilis may directly or indirectly lead to hundreds of other cases, to locomotor ataxia, to dementia præcox, and an interminable list of ills.

We take so cold and material a view of life and its facts through association with men and women of all types, clean and unclean, that we believe evil practices and physical disabilities form a vicious circle. Immorality induces venereal disease, and venereal disease indirectly causes immorality, because gonorrhœa and syphilis mean loss of time, loss of pay, hunger, discouragement, the craving for liquor, or drugs to dispel that discouragement. Children born of alcoholic or starving parents, of those addicted to drugs, of the unemployed, the syphilitic, etc., are not only candidates for the reform school, the prison, and the asylum but help to populate the dive and brothel.

It is the custom in America to consider that every fallen woman, whether a professional prostitute or an amateur dabbler in sin, was originally the victim of some one man's lust but, as many more women are tempted or attacked than fall, it is fair to suppose that those who do succumb to man's passion have some weakness or abnormality which predisposes them to sexual indulgence. In a large proportion of cases low wages, loneliness, and all the other explanations which have been adduced are insufficient to account for lack of resistance. Recent investigations in this country and abroad show that distinct mental or physical abnormality, even if no more than "neurotic taint," is common among professional prostitutes, and it seems highly probable that while one man may be the exciting cause of wrongdoing, some man of a previous generation established the predisposing cause when he bequeathed to his offspring the heritage from a diseased body, a weakened mind, and a debased and perverted moral nature. If the prevention of venereal disease means lessening some of the factors prejudicial to physical integrity, comfort, and happiness, and if the lack of physical integrity and well-being contributes in any way to immorality, prophylaxis has a right to be carried on.

It seems unreasonable to ask that a parental government be required to replace the nursery governess, the father and mother, the school and the church in the life of the soldier and sailor and yet be refused the prerogatives of a big-hearted physician. Now, in spite of her attacks against the Government's attitude, surely the writer in Social Hygiene must know something of the vast and

comprehensive effort for good represented by the Commission on Training Camp Activities, the assistance of which commission was not forced upon the Government but cheerfully and eagerly accepted. The moment government accepts, fosters, and enlarges the services of an agent, those services may reasonably be considered part of government effort. It is only fair, therefore, to concede that the Government is exerting itself directly to promote morality in its military forces if all the influences exerted by the Commission on Training Camp Activities and other authorized workers for the Government are really on the side of morality. It is of interest to compare the attitude of the American Government with the attitudes of different Governments abroad. Some, though perhaps entertaining concern over the impairment of military efficiency due to venereal disease, are doing little or nothing, others are in great agitation but wide diversity of opinion among the people halts action. In other cases fairly successful regulation is practiced, and, if we may believe well authenticated reports, includes the establishment of carefully supervised brothels at the front. The most striking contrast is furnished by those Governments which, by means of force furnish their armies with means to gratify lust, urge one-night marriages and see virtue in "capsule impregnations."

The term "own misconduct" includes alcoholic excesses, drug addiction, etc. Just how far would Hooker's standard compel us to go if we graded the Government's liability to medical aid by the ethical aspect of the genesis of disease? Shall we decline to vaccinate a man against smallpox because he was exposed to the disease, while absent without leave, through his own misconduct? Shall we refuse to give antitetanic serum to a man who cut his foot on broken glass or rusty nail because the accident occurred as he was climbing a back-yard fence the night the police were raiding the "joint"? Is the doctor to give tonics, sedatives, soporifics, food to the drunkard verging on the horrors of delirium tremens? These are all illustrations of preventive measures against the consequences of evil practices, and since the wrath of God is directed against the sin and not against the sinner, we think that man, and even sinless woman, may incline to mercy. [EDITOR.]

Vital Statistics of the Philippines.

The following facts and figures are derived from the report of Surgeon J. D. Long, U. S. Public Health Service, Director of Public Health, to the Secretary of Public Instruction, for the fourth quarter of 1917.

Births.—In Manila alone, 2,241, or 33.32 per thousand of inhabitants.

Marriages.—There were 543 marriages, a marriage rate of 16.15 per thousand.

Deaths.—There were 1,926 deaths in Manila, giving a rate of 28.64 per thousand inhabitants. Of these, 56 were due to typhoid fever; 125 to dysentery; 38 to tetanus; 130 to beriberi; 360 to tuberculosis. There were no deaths from cholera in the last quarter of 1917 in the city of Manila. Deaths from cholera in the Provinces were 1,805.

Bubonic plague.—There were no cases and no deaths from this disease in Manila during the last quarter of 1917. A total of 30,142 rats were caught by means of traps or poison in the city. All were negative for bubonic plague.

Segregation of lepers.—During the quarter, or rather during the month of November, a leper-collecting trip was made to various Provinces of the Archipelago, 194 lepers being gathered, 192 of whom were removed to Culion leper colony and 2 brought to San Lazaro Hospital.

Military Statistics.

[Extract from Annual Report of the Japanese Navy Department for the year 1915-16.]

Comparing the number of sick cases and the number of sick days in the Imperial Japanese Navy in 1915 with those of the preceding year, the sick rate and the rate of number invalided both increased, but the death rate decreased; and comparing with the averages of the last 18 years, the sick rate and death rate both decreased, but the rate of number invalided increased. The number of death per 1,000 of sick cases decreased, but the rate of the invalided increased.

Personnel.—The average day number of petty officers and men in 1915 is 51,439, showing an increase of 4,476 over the similar number of the preceding year, 46,963. Owing to the war, part of the reserves were called to active service, the term of those in active service was lengthened, and a larger number of volunteers and conscripts were raised; hence the increase.

Numbers in various branches are as follows:

Cadets	529
Petty officers:	
Seaman branch	5,976
Engineer branch	3,425
Other branches	1,505
Men:	
Seaman branch	22,435
Engineer branch	13,516
Other branches	3,065
Civil officials and employees	867
In prison	121
Total	51,439

	Total number.	Per 1,000 of entire force.		
		1915	1914	Average last 17 years.
Sick cases.....	40,555	788.40	755.70	795.15
Died.....	40,579	788.88	762.75	.....
	198	3.85	3.58	5.28
	208	4.04	9.24	.....
Invalided from service.....	836	16.25	13.71	15.02
	842	16.35	13.71	.....

In the above table, in columns "1914" and "1915" the lower figures include the number wounded or killed in the war.

Number of cases of the principal contagious diseases and of "kakke" are as follows:

Measles.....	9
Scarlet fever.....	2
Typhoid fever.....	106
Paratyphoid, type A.....	69
Paratyphoid, type B.....	80
Dysentery.....	135
Malaria.....	195
Meningitis cerebro-spinalis epidemicus.....	2
Influenza.....	183
Kakke.....	198
Tuberculosis of lungs.....	323

REPORTS.

REPORT OF 140 CASES OF PNEUMONIA, UNITED STATES NAVAL HOSPITAL, CHELSEA, MASS.

By L. W. MCGUIRE, Lieutenant Commander, M. C., United States Navy.

Of the 140 cases of pneumonia occurring at this hospital between October and March, both inclusive, 98 were typed and 42 were not typed; 14 were type 1, 15 were type 2, 2 were type 3, 67 were type 4.

The type 4 includes the cases due to the streptococcus, which was an important factor in this series. It was not found practicable to separate the pneumococcus type 4 from the streptococcus in all cases, both being present in some, but in many the streptococcus only was found. As the streptococcus and not the pneumococcus was found in the pleural exudate which so commonly occurred, it can be safely stated that a large percentage of type 4 was a streptococcal infection. These men, when admitted, were seriously ill, very toxic, and rapidly developed serious complications, the most common being empyema, which developed in 50 per cent of this group. In other words, of 67 cases of type 4 and streptococcal pneumonia, 33 developed empyema. For a time it seemed almost the rule for the pneumonias to have fluid in the pleural cavity, necessitating aspiration, and this fluid rapidly becoming purulent. The streptococcus was the common organism present in the pleural exudate. In two cases the streptococcus *hemolyticus* was present.

This outbreak of pneumonia was of an unusual form as to the etiology, its severity, and its complications. Clinically it was difficult and often impossible to differentiate between the lobar and bronchial types, as there was often present a large involvement with fluid, but many were known to be broncho-pneumonias, which would indicate a secondary infection. As there were many streptococcal sore throats being admitted and also many infections of the maxillary sinus, middle ear and mastoid, and an occasional case of streptococcal septicæmia and thrombosis of the cavernous sinus, it would seem that there was a widespread streptococcal infection present in certain localities in this district, the pneumonia being an incident in its activities.

It is interesting to note the stations in which these pneumonias developed. If we exclude the ships, 106 cases developed in this vicinity, 89 of which came from two stations, Commonwealth Pier and the Radio School. From the Commonwealth Pier came 46,

and from the Radio School 43. From the entire navy yard only four cases developed in this period; the remainder were isolated cases from different stations. Of these 89 cases from the Radio School and Commonwealth Pier, 58 were typed. Of the 58 typed, 38 were type 4, which is 65 per cent.

	Average complements.	Incidence of pneumonia per thousand.
Commonwealth Pier.....	3, 679	12.5
Radio School.....	3, 208	13.4
Navy yard.....	1, 525	2.6

Measles has been mentioned in some of the Army cantonments as the probable origin of many of their streptococcic pneumonias, especially of the broncho-pneumonias. While there has been a certain amount of measles present in this district, there was no epidemic nor anything approaching one. Very few of these pneumonias followed measles (2 cases), and it does not seem to have played an important part. Many of these men gave a history of a previous infection of the upper respiratory tract before becoming ill with pneumonia. Influenza also was prevalent. Considering the places in which the great majority developed, it would seem to be a question of housing a large number of men together in close contact, as happened on Commonwealth Pier and at the radio school, resulting in the spread of acute infections of the upper respiratory tract, many of which end in pneumonia. The enlisted personnel of the navy yard, which includes many women as yeomen, lives for the most part at home and was not subjected to overcrowding or that intimate contact, which probably accounts for the small number of pneumonias in comparison with the radio school and Commonwealth Pier.

Mortality.—Of the 140 cases, 41 died, a mortality of 29.2 per cent.

Types.	Cases.	Deaths.	Per cent.	Normal mortality.
Type 1.....	14	1	7.2	25
Type 2.....	15	6	40.0	32
Type 3.....	2	2	.....	45
Type 4.....	67	22	32.8	16
Not typed.....	42	10	23.3	.....

As I have stated, complications were common, especially empyema. Purulent pericarditis, endocarditis, and myocarditis developed in a limited number.

Empyema was present in 49 of the 140, or 35 per cent. Of the 49 empyemas, 33 developed in the type 4 group. Of the 49 which devel-

oped empyema, 20 died, 14 of the deaths being in the type 4. It is evident that the type 4, which is ordinarily the mildest type of pneumonia, having a mortality of 17 per cent in this series, was the most virulent, due to the presence of streptococcus.

These men developed fluid early; they were commonly admitted with fluid and often with pus in the pleural cavity. This pus was usually a thin, slightly colored fluid, which, on examination, showed abundant streptococci and broken-down cells, and not the thick yellow pus commonly seen following a lobar pneumonia. It was the practice to open the pleural cavity, resect a rib and drain early in this class of cases, but many, if not most of them, died in from one to three days. It was evident that it was not the proper procedure. This was discontinued and repeated aspiration carried out with far better results. After aspiration there was usually temporary improvement. The pus would re-collect and was aspirated as often as necessary, which was sufficient to tide many of them over their pneumonia; they would apparently develop a resistance, gain strength and weight, and become good surgical risks instead of a desperate operation. None of our cases were cured of an empyema by aspiration alone. Several ran a flat temperature for from two days to a week between aspirations during their convalescence and were apparently well of their empyema, but all eventually had to have the pleural cavity drained and with most excellent results.

Serum treatment.—All of the type 1 cases received serum, although some were sensitive to horse serum, which interfered with giving large amounts. The average case received about 400 c. c., it being given intravenously in 100 c. c. doses. In several cases after administering the type 1 serum the patient had a drop of temperature, with a corresponding improvement of the other symptoms. As one patient remarked, "I came to the hospital yesterday sick with pneumonia; they gave me an injection in the arm and to-day I am well." This serum has a specific action comparable to the results obtained with diphtheria antitoxin in diphtheria. The only regret is that so few of our cases were of type 1. As our mortality in this type 1 was 7.2 per cent, the serum treatment speaks for itself. In the type 2 part of our cases received serum, some with apparent benefit, but on the whole the results were not gratifying. It is believed that better results may be obtained by using larger amounts of the serum. In types 3 and 4 serum is not used.

CONCLUSIONS.

1. There was present a severe grade of pneumonia, in large part due to the streptococcus, with a high mortality.

2. The outbreak had no connection with measles, but did follow acute infections of the upper respiratory tract.
3. The bulk of the cases occurred where large numbers of men were thrown together, often resulting in overcrowding.
4. Serum treatment is of the utmost importance in type 1, and has a promising field in type 2.
5. Wherever pneumonias are treated, laboratory facilities to determine the type should be available.
6. Repeated aspirations in empyema, especially of the streptococcic type, followed by draining the pleural cavity, offer the best chance for recovery.

**REPORT OF 106 CASES OF PNEUMONIA AT THE NAVAL HOSPITAL,
LEAGUE ISLAND, PA.**

By F. J. DEVER, Lieutenant, M. C., and R. S. BOLES, Lieutenant, M. C., United States Navy.

In a comprehensive survey of the pneumonia situation in the military camps of the United States, during the past winter, several features were prominent. Probably the most significant and distinct was the large percentage of cases of empyema which developed, most of them following broncho-pneumonia secondary to measles. The infectious agent was a hemolytic streptococcus. These particular cases were most severe and occurred very early in the course of the pneumonia, and the mortality rate reported from some camps was as high as 50 per cent. The mortality rate from pneumonia itself, as reported from various camps, varied from 5 to 40 per cent, the great variation undoubtedly being due to the type of infecting organism.

The pneumonia at this hospital was of the usual clinical variety, and in no case secondary to measles. The diagnosis of pneumonia was made only in those cases presenting definite physical signs and symptoms and in which examination of sputum revealed one of the varieties of pneumococci. The total number of cases observed was 106, of which 90, or 84.9 per cent, were of the lobar variety and 16, or 15.1 per cent, of the bronchial variety. In this series deaths from all causes (as shown in Table I) totaled 27, yielding a mortality rate of 25.4 per cent. Deaths which could be actually attributed to lobar pneumonia numbered 15, giving a mortality rate of 14.1 per cent.

TABLE I.

Causes.	Deaths.	Mortality (per cent).
Empyema.....	5	4.71
Empyema and diphtheria.....	3	2.83
Pneumococcic meningitis.....	2	1.88
Broncho-pneumonia.....	2	1.88
Lobar pneumonia.....	15	14.15

With the cooperation of Passed Assistant Surgeon E. A. Case, United States Naval Reserve Force, an attempt was made to study the type determination in all cases, but owing to the scarcity of white mice, this was possible in but 68 cases. The result of this study is shown in Table II.

TABLE II—Type determination in 68 cases.

Type.	Cases.	Per cent.
Type I.....	11	16.1 with 2 deaths.
Type II.....	4	5.8 with 1 death.
Type III.....	9	13.2 with 3 deaths.
Type IV.....	39	57.3 with 10 deaths.
Streptococcus.....	5	7.3 with 1 death.

The sputum was collected in sterile Petri dishes and sent to the laboratory immediately. The greatest number of cases fell in the Type IV group.

We observe that the type itself is no criterion of the severity of the infection, inasmuch as many of our Type IV infections were extremely severe and rapidly fatal. It must be borne in mind that the group of organisms classified under Type IV is heterogeneous. No satisfactory distinction of the organisms of this group can be made.

TABLE III.—Deaths due to types.

Type.	Per cent mortality.
Type I.....	18.18
Type II.....	25
Type III.....	33.33
Type IV.....	25.64
Streptococcus.....	20

The study of Table III shows Type III to be the most virulent of the pneumococci. Another interesting fact revealed is the virulence of some of the organisms classified under Type IV. In prac-

tically all the statistics published prior to the use of the serum specific for Type I, a mortality rate is shown much higher than that found in Type IV group. In our present series of cases Type I presents the lowest mortality rate. This is attributed to the use of specific serum which was administered intravenously. The initial dose varied from 50 to 100 c. c., depending on the severity of the infection. We were also surprised to find that in pneumonia due to streptococci the mortality rate was less than that of Type IV.

In 80 cases the disease was initiated with a chill and in 26 cases the onset was gradual.

TABLE IV.

	Cases.	Per cent.
Onset with chill:		
Due to Type I infection.....	10	12.5
Due to Type II infection.....	4	5
Due to Type III infection.....	1	1.2
Due to Type IV infection.....	35	43.75
Due to streptococci infection.....	3	3.75
Onset without chill:		
Due to Type I infection.....	2	7.68
Due to Type III infection.....	3	11.11
Due to Type IV infection.....	4	15.38
Due to streptococci infection.....	2	7.68

Contrary to the usual expectation, a large percentage of Type III cases developed gradually. All Type II infections began suddenly with a chill.

TABLE V.—*Distribution of the disease.*

	Cases.	Per cent.
Left lower involved.....	47	52.22
Right lower involved.....	25	27.77
Left upper involved.....	4	4.44
Right upper involved.....	6	6.66
Right middle involved.....	3	3.33
Right and left lower.....	1	1.11
Massive (both sides).....	4	4.44

The study of the distribution of the disease reveals nothing new. As shown in most tables previously reported, the lower lobe of the left lung is involved in the greatest number of cases.

It was of interest to note that the majority of men admitted with pneumonia came from the western part of the United States (30.4 per cent). The South furnished 29 per cent, the East 23.2 per cent, and the North 17.4 per cent. It was also distinctly noticeable that the men from the western and southern parts of the United States were more acutely ill and succumbed in a greater proportion than those from the northern part.

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TABLE VI.—Distribution of cases as to rating of men.

	Cases.	Per cent.
Seaman.....	33	31.13
Fireman.....	22	20.76
Private, Marine Corps.....	15	14.15
Electrician.....	9	8.49
Machinist's mate.....	6	5.66
Water tender.....	3	2.83
Hospital apprentice.....	2	1.89
Coxswain.....	2	1.89
Oiler.....	3	2.83
Carpenter's mate.....	2	1.89
Chief boatswain's mate.....	2	1.89
Quartermaster.....	1	.94
Sergeant.....	1	.94
Coppersmith.....	1	.94
Patternmaker.....	1	.94
Mess attendant.....	1	.94
Ensign.....	1	.94
Pharmacist's mate.....	1	.94

In Table VI it is observed that the greatest number of cases
occurred in the seaman branch.

In accord with the experience of the Medical Department in all
other camps and hospitals we had an unusually large number of
cases of empyema, all of them following lobar pneumonia. The
mortality rate was low chiefly because the pneumococcus and not the
streptococcus was the infecting organism in the large majority of
cases. It is also likely that the mortality rate was kept down by the
prompt recognition of the onset of empyema. It was our rule to
make exploratory aspiration in all cases of pneumonia in which the
crisis did not occur by the eleventh day of the disease. Immediately
upon the discovery of turbid fluid in the pleural cavity a rib resec-
tion or thoracotomy was performed. By this method the severe
toxemia, which is so common in cases where pus is retained in the
pleural cavity for a considerable length of time, was avoided. We
believe, contrary to the recommendation of certain authors, that
thorough surgical drainage should be instituted immediately upon
the discovery of turbid fluid instead of resorting to repeated aspira-
tions until thick pus develops.

TABLE VII.—Complications.

	Cases.	Per cent.
Empyema; 27 cases, all following lobar pneumonia:		
Type I infection.....	3	11.11
Type III infection.....	2	7.4
Type IV infection.....	6	22.22
Streptococcic infection.....	2	7.4
Type II infection.....	0	0
No type determination shown.....	14	.....

Table VII shows the incidence of empyema in various types of pneumococcic pneumonia. The largest number occurred in Type IV infections, as was to be expected.

TABLE VIII.

	Cases.	Per cent of total number.
Serofibrinous pleurisy.....	4	3.76
Pneumococcic meningitis.....	2	1.88
Cholecystitis with jaundice.....	2	1.88
Ac. parenchymatous nephritis.....	2	1.88
Pericarditis and serofib. pleur.....	1	.94
Mental confusion.....	1	.94
Rheumatic fever.....	1	.94
Otitis media.....	2	1.88
Diphtheria.....	1	1.88
Pericarditis with effusion.....	1	.94
Enteritis.....	1	.94
Jaundice, otitis media and erysipelas combined.....	1	.94
Erysipelas and serofibrinous pleurisy combined.....	1	.94
Furunculosis.....	1	.94
Acute endocarditis	1	.94
Erysipelas.....		
Multiple neuritis.....		
Otitis media.....		
} combined.....		

The complications met with were numerous and various.

Otitis media was not as common in our series as it was in the series reported from the various camps in which the streptococcic type of infection prevailed. Pneumococcus invaded the meninges in two cases, both of which died.

As a rule when jaundice occurs during the course of pneumonia, it terminates fatally. This was not true in the two cases of jaundice in our series.

In one patient, as shown in Table VIII, a series of complications occurred, all of them in themselves rather serious, namely, otitis media, multiple neuritis, erysipelas, and finally acute endocarditis. This patient recovered.

The treatment instituted was largely symptomatic. We endeavored to medicate as little as possible. Stimulation was not used unless indicated by the character of the second pulmonic sound and the quality of the muscular element of the first sound of the heart. When necessary, strychnine was used hypodermatically. Stress should be laid upon the value of open air in the treatment of lobar pneumonia. This was adhered to rigidly in all our cases with, we believe, excellent results. Our cases of broncho-pneumonia were treated *indoors*, because in our opinion these cases are harmed by open-air treatment, particularly cold air. The use of vaccines we know to be unsatisfactory, and in some instances even dangerous. We are of the opinion

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in the mid-axillary line proved to be the most satisfactory due to the fact that the fluid or pus is not evacuated by gravity to any great degree, but by lung expansion. Since this is the point on the thoracic wall that the expanding lung touches last any fluid remaining is more likely to be forced out.

The anesthesia chosen depended upon the condition of the patient. Of the three anesthetics used nitrous oxide and oxygen proved to be the most satisfactory from the standpoint of the patient's best interests. This anesthesia relieved the patient of any pulmonary complication that might have arisen from ether or chloroform and so added insult to injury.

Local anesthesia was not used on account of the seriousness of the condition of each patient. They all had gone through the siege of a most severe pneumonia and by no means were able to tolerate any added physical or mental perturbation.

Operative technique.—Patients were prepared by thorough bath and purge and at the time of operation the chest wall of the affected side was painted with iodine and then cleansed with alcohol.

The anesthetic was then administered and as soon as the point of anesthesia was reached, aspiration was performed, followed by either thoracotomy or rapid partial rib resection, the latter preferred. The drainage tubes were then placed in situ and dressings applied. Patients were conscious before they were removed from the operating table.

In our early cases, the usual fetid odor that accompanies empyema prevailed throughout the wards and not only impeded recovery of patients by making them feel repugnance for food, but also caused the attendants to feel disgusted when they had to enter wards to care for these patients. After having gone along a month with the old routine post operative treatment of empyema, the modified method of using Dakin solution was instituted. The pleural cavity was thoroughly cleansed by inserting a catheter and aspirating the pus by aid of a glass syringe. This was done until the cavity was empty. The amount of fluid pus and fibrin removed was noted and then an equal amount of Dakin solution was slowly forced into the cavity and then withdrawn; this was repeated until the solution returned clear. The cavity was then filled (not to distension) with Dakin solution which was allowed to remain therein two hours. The same treatment was resumed every two hours thereafter. Daily record was made of the decrease of pus, which in every case was rapid.

During this treatment, free use of the Wolfe bottles was employed. Each morning between 8 and 8.30 a. m., a few minutes prior to treatment, the patients each blew their Wolfe bottles and expelled as much pus as possible.

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Coincident with the modified method of using Dakin solution, the odor about the wards absolutely disappeared. The patients' appetites improved and each case gained rapidly in weight.

In our series of 27 cases, 6 ended fatally, two cases having died of intercurrent diphtheria, two of multilocular abscesses of the lung, one of septic endocarditis and one of hemorrhage of the lung. The multilocular abscesses were discovered post-mortem, leading us, therefore, to make a thorough and most valuable study of our cases from time to time by the use of the X-ray, the X-ray findings being the only possible method of confirming the presence of multilocular abscesses. The X-ray not only reveals the presence of the abscesses, but also is an indicator of the lung expansion, the amount of pus, and the extent of the diaphragmatic movements.

Our recoveries were such as to warrant patients returning to the duties of their ratings.

During the treatment of these cases, the interesting phenomenon, pleuritic epilepsy, occurred in four cases. In case No. 1 the phenomenon occurred upon the introduction of the catheter into the cavity; second, upon emptying the pus from the cavity. The symptoms came on as the amount ceased to flow: in our third and fourth cases, after the cavity had been filled with Dakin solution. The symptoms were as follows: First, severe pain at the angle of the scapula; second, feeling of faintness; third, loss of consciousness with profound shock; fourth, convulsions. In each case the patient recovered in about 10 minutes without any special treatment.

The dangers of this treatment are: First, pleuritic epilepsy, which may occur as above noted; second, too great pressure from the fluid; third, too rapid injection of the fluid; fourth, distention of the cavity; fifth, hemorrhage from the injudicious use of the catheter.

The complications of the empyemas were two cases of pyopneumothorax and two of atelectasis. In our two cases of pyopneumothorax, the Dakin solution, in fact any solution, was not tolerated by the patient. The cases are remaining and other treatment has been instituted. The two cases of atelectasis are improving under this treatment.

SUMMARY.

The following points are emphasized: First, all cases followed lobar pneumonia and were of pneumococcic origin. This fact probably accounts for our low mortality. Second, early diagnosis followed by prompt surgical intervention and treatment; third, the free, persistent, conscientious use of Dakin solution; fourth, free use of the X-ray from the diagnostic standpoint.

THE CYSTOSCOPE AS AN AID IN THE CARREL-DAKIN TREATMENT OF
EMPYEMA.

By B. C. WILLIS, Lieutenant (J. G.), M. C., United States Navy.

The accurate placing of Carrel tubes, so that every portion and pocket of the wound may be reached, is only second to the thorough opening and removal of all devitalized and necrotic tissue. In the treatment of empyema we have no devitalized and necrotic tissue to deal with, so the problem is one of thoroughly dakinizing the entire cavity accurately so that fresh Dakin's Solution may come in contact with the entire infected surface. In the United States Naval Hospital, Newport, R. I., there have come to my attention 36 cases, and several of them still discharged pus after most persistent efforts had been made to clear them up, the Carrel tubes having been pushed into the chest cavities with no definite idea of the extent of pockets or cavities. It was thought that if the tubes could be accurately placed by sight after careful determination of the extent of the cavity we might more reasonably expect a cure. Being familiar with the direct vision Braasch Cystoscope I could see no reason why this instrument might not be used for the purpose of thoroughly inspecting pleural cavities before placing the tubes, and further, to aid in accurately placing Carrel tubes in all pockets and over surface of large cavities. While this is by no means an ideal instrument it is a part of the armamentarium of nearly every hospital. The small speculums of one-half inch caliber, electrically lighted might be more desirable. To facilitate pleuroscopic examinations of the chest, at operations, which consist of the usual rib resection at the lowest point of the cavity, we make the incision a little longer, remove an inch and a half of rib and stitch the skin margins down to pleura of respective edge. This allows a wider angle of view in the pleural cavity, which is greatly limited if the wound edges are approximated in the usual manner. A sterile cystoscope is introduced through the opening into cavity, thorough inspection of the cavity is made, using air as a medium, and the points for the location of the tubes are selected. A new Carrel tube, stiffened with No. 23 silver wire is then passed through the cystoscope to the depth desired and the latter is removed while feeding the tube through cystoscope, so as not to pull it back out of position. The number of holes to the tube is to be judged by the depth of the cavity to be treated. We have had the apex of a pleural cavity under view repeatedly. Eight cases have been treated in this manner during the past 10 days with very satisfactory improvement in the amount and consistency of the discharge. Owing to the caliber of the cystoscope being so near that of the new Carrel tubing we are considering a new instrument with greater lumen and of a shorter curved beak. This preliminary report is made in the hope that others will try the method and report their results.

REPORT

By R. G. LeCON

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REPORT OF OPERATING UNITS AT THE FRONT.¹

By R. G. LeCONTE, Lieutenant Commander, M. C., United States Navy.

On June 8, six medical officers and four members of the Hospital Corps reported to me in Paris. On the following day we were assigned to duty with the American Red Cross Military Hospital No. 1 at Neuilly, where we were detailed to work in the operating rooms. The commanding officer requested that 4 nurses and an anesthetist be added to our teams from Brest, and this additional personnel reported at Neuilly at 8 a. m., June 10. Our Navy contingent then numbered 16 persons.

The German offensive started May 25 on the Chemin de Dames from Rheims to Soissons. By May 30 the Germans had taken Chateau-Thierry and were in force on the river Marne. They had come through a distance of about 40 miles on a 50-mile front. The French, assisted by American troops, stopped their further advance. The casualties were heavy. A large number of French hospital beds in the invaded district had been lost and new hospitals had to be created back of the present line. Large numbers of wounded arrived at the American hospitals in Paris from 1 to 3 days after their primary field dressing, and, in many instances, without any operative procedure except the injection of antitetanic serum. This delay of transportation caused a repetition of the surgical conditions of 1915, namely, massive infections and gas gangrene. The narrow limits of trench warfare, and, incident thereto, the prompt care of the wounded and the proximity to the battle front, had all disappeared.

Before this offensive, the hospital at Neuilly was about half full and contained 300 French wounded. Its capacity was increased quickly to over 1,000 beds, but there was no increase in the staff. The maximum of admissions to the hospital in one day was 591 patients (all Americans), the maximum of evacuations was 292, and the maximum number of patients, 1,064. More than 2,500 patients were admitted in less than a month and the mortality was about 1.3 per cent. This sudden and enormous increase in the hospital activities exhausted the medical and nursing staffs, many of whom were working for more than 20 hours a day. Our teams took charge of the operating rooms, allowing their personnel a much needed rest. During our first two days we operated on about 160 wounded, of whom more than 20 per cent had multiple wounds. We manned five operating tables simultaneously. About 70 per cent of those operated

¹The commanding officer of the Navy Base Hospital, Brest, Medical Inspector H. C. Curl, United States Navy, in forwarding this report, says: "I was informed by the senior operating surgeon of the American ambulance at Neuilly that the work of our men was of the very *highest character*; that he had practically turned over the entire operating service to them. He asked me to express to the Bureau of Medicine and Surgery his gratitude for the help rendered."

upon were marines. The operative work then gradually decreased, and, when not occupied with it, we helped in the wards where the dressings were extremely heavy. For part of the time, owing to the exhaustion of the senior surgeon, we had charge of his wards, about 380 patients. Our stay at Neuilly was 21 days. We left Paris June 30, arriving at Brest the same evening.

The work of our nurses and hospital corpsmen was of the best and was universally appreciated by all who came in contact with them. Two incidents deserve special mention. A marine requiring a shoulder-joint amputation, and a machine gunner requiring a thigh amputation, each suffering from secondary hemorrhage and gas gangrene, required also an immediate transfusion of blood. There was no one in the hospital prepared to act as donor. All of our corpsmen volunteered, and Charles L. Steele, Pharmacist's mate, third class, United States Naval Reserve Force, and McWhite Harnsberger, Pharmacist's mate, third class, United States Navy, were chosen because their blood reaction was similar to those of the patients. This donation of blood contributed more than any other factor in the saving of these two patients' lives.

From this three weeks' duty the following conclusions may be drawn:

That the massive infections and gas gangrenes of 1915 were due primarily to delay in operations, and not to a lack of surgical knowledge. While the science of war surgery has vastly improved in three years, given the same conditions of delay as existed in 1915, the same massive infections would be encountered on the operating table to-day. Therefore, the statements made last winter by a number of accomplished military surgeons, namely, that an aseptic technique with the excision of the damaged tissue (*débridement*) had done away with the use of antiseptics, can apply only to cases operated upon within a few hours of the receipt of the injury. In trench warfare this condition exists, but in a war of movement it does not exist, and therefore an antiseptic which will retard or prevent massive infection should be used at the primary dressing. A study should be made to provide the best antiseptic for this purpose.

Patients that were immediately evacuated after operation, in whom the wounds were excised and then closed or partially closed and drained, did badly and required a complete reopening of the wound. By closure or partial closure the infection spread far beyond the limits of the wound. It therefore again emphasizes the fact that *débridement* with closure of the wound can not be done on patients that must be evacuated. Excision of the damaged structures should be done, but the wound must be left wide open, loosely packed with gauze, and some antiseptic used to retard infection.

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gas gangrenes of 1915 were due not to a lack of surgical knowledge, surgery has vastly improved in instances of delay as existed in 1915, but were encountered on the operating table. The operations made last winter by a number of surgeons, namely, that an aseptic débridement of damaged tissue (débridement) and antiseptics, can apply only to cases of the receipt of the injury. In war conditions, but in a war of movement it is difficult to apply antiseptic which will retard or prevent infection at the primary dressing. A dressing which is the best antiseptic for this purpose. The dressing should be evacuated after operation, in order to prevent it from then closed or partially closed, which would result in a complete reopening of the wound and insure the infection spread far better. Therefore again emphasizes the importance of the wound can not be done. Excision of the damaged structure should be left wide open, loosely covered with an antiseptic used to retard infection.

In severely wounded cases is more harmful to the patient, warmth, and comfort assumed in feeding and resuscitation trip, much more than as the patient arrives at the operating table.

When the bed capacity of the hospital activities increased tenfold, it is useless to admit 400 patients if the personnel is 200 operators. The number of patients admitted has to a no small degree to the layout of the operating table.

PLAGUE IN CHINA

By H. M. STENHOPE

The epidemic of plague broke out in the annals of medicine and unselfish devotion of all in an effort to check the disease, a brilliant example of the Chinese with serious problems.

Inside of three months the disease spread far as China was concerned.

The epidemic swept through six days, in a great country of most primitive nature."

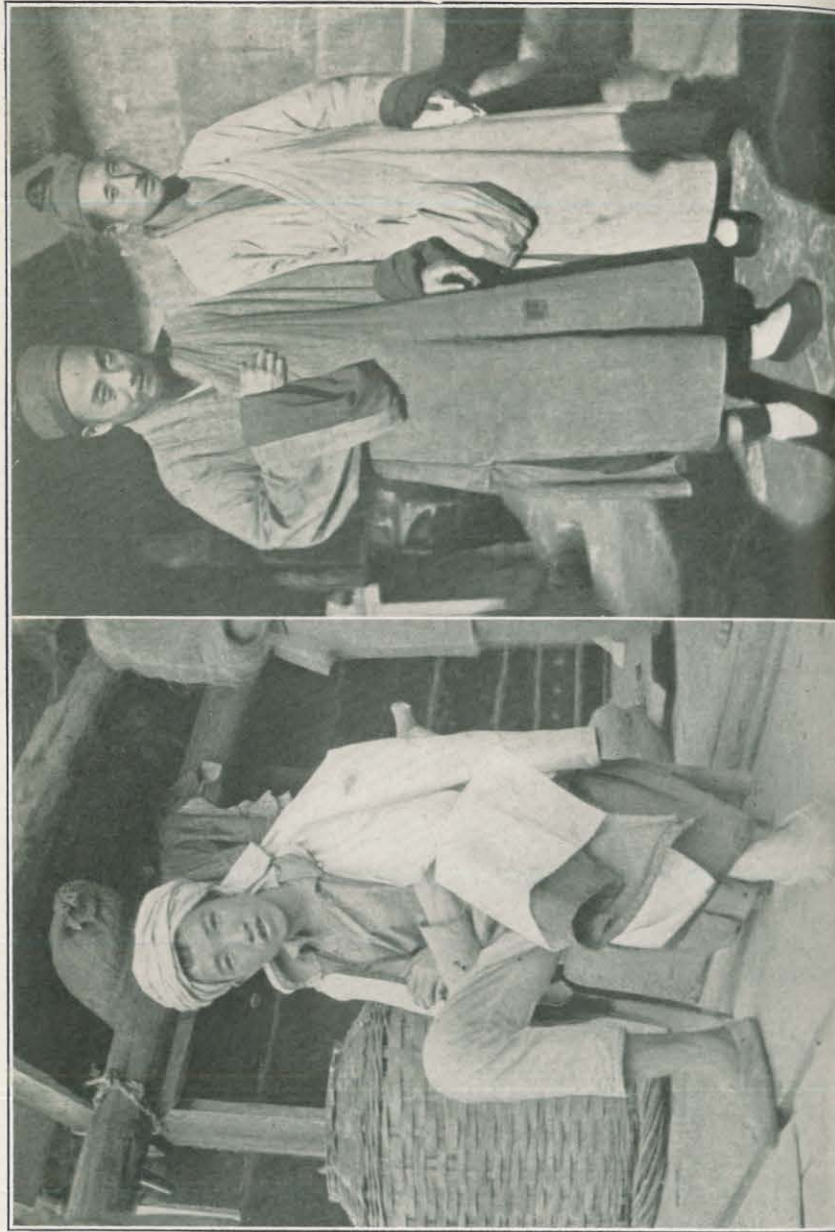
Press dispatches published the attitude of the Chinese government. The disease appeared inside the

People are reported dying rapidly. Deaths in one wool carters coming from the center entering infection en route. The traffic.

Two days later the following

Drs. Lewis, Jouvet, Eklund, and others, by the police, invaded their

¹ These notes on the plague reports published during the effect it might have on the health ground is at present the Yangtze slow and uncertain. But we must and thus be brought into clear (Apr. 13, 1918.)



Buddhist priests of western China.

Number one boatman of junk on Fuchow River.

In severely wounded cases a long continuous ambulance journey is more harmful to the patient than one broken by rest with feeding, warmth, and comfort. The delay of six or eight hours, consumed in feeding and resting the wounded on a 40 or 50 mile ambulance trip, much more than compensates for the delay in operation, as the patient arrives at the end of his journey in a far better condition for operation.

When the bed capacity of a hospital is suddenly doubled, and its activities increased tenfold, the personnel must also be increased. It is useless to admit 400 cases requiring operation when the limit of the personnel is 200 operations a day. This discrepancy between the number of patients and the personnel at Neuilly contributed in no small degree to the lateness of the arrival of the wounded on the operating table.

PLAGUE IN CHINA AND THE FAR EAST IN 1918.¹

By H. M. STENHOUSE, Lieutenant, M. C., United States Navy.

The epidemic of pneumonic plague of 1918 in China will stand out in the annals of medical history as giving proof of the courage and unselfish devotion of doctors and missionaries who risked their all in an effort to check the ravages of this dread disease, and as a brilliant example of the complete inefficiency of Chinese in dealing with serious problems.

Inside of three months an area of 160,000 square miles was infected, whereas the spread of the disease might readily have been limited, as far as China was concerned, to the territory north of the Great Wall.

The epidemic swept rapidly along, at the rate of "300 miles in six days, in a great country where means of communication are of the most primitive nature," and later by rail in less time.

Press dispatches published early in the epidemic illustrate the attitude of the Chinese officials. For example, five days after the disease appeared inside the Great Wall—

People are reported dying by the roadside and in the inns. Disease spreading rapidly. Deaths in one village numbered 32 in three days. Hundreds of wool carters coming from infected centers daily toward the railway and scattering infection en route. Nothing being done by local authorities to stop traffic.

Two days later the following appeared:

Drs. Lewis, Jouvelet, Eckfelt, and Wu Lien Teh report that a mob, assisted by the police, invaded their quarters after investigating a case of plague.

¹These notes on the plague situation in China have been made after a study of reports published during the epidemic. Our original object was to ascertain what effect it might have on the health of officers and men of the U. S. S. *Palos*. Our cruising ground is at present the Yangtze above the Gorges, where travel and communication are slow and uncertain. But we may, after the river rises, be ordered to the lower Yangtze and thus be brought into closer proximity to the danger zone. (Wanh-sien, China, Apr. 13, 1918.)



Buddhist priests of Western China.



Number one boatman of Junk on Fuchow River.

The doctors were held prisoners, being refused transportation back to Peking.

Up to this time simply closing the gates of the Great Wall to all traffic would have confined the epidemic north of the wall and the control of that limited area would have been a comparatively easy task. But all warnings as to the gravity of the situation were either ignored or but half-heartedly observed. The actual conditions were masked by the "hopeful optimism" of the officials, and in the face of assumed precautions, a soldier carrying a sick child evaded the quarantine, traveled from an infected place by rail and quickly spread the disease 500 miles from his point of embarkation.

Dr. Arthur Stanley, health officer of Shanghai, observed that:

It is the Tientsin-Pukow Railway which has subjected the lower end of the Yangtze Valley to very considerable damage. This line has for some time past been notorious as a soldier-infected road. A leakage in the northern quarantine occurred. A person from the infected area in northernmost Shansi incubating pneumonic plague passed through Fencheng and through Kalgan on a certificate of medical inspection only, without the absolutely essential detention under observation during a quarantine period of five days at the shortest. * * *

This infected person is reported as having taken the train at Peking when already in the initial stage of the actual disease. She started coughing on the train, became worse, and died soon after reaching her home at Fengyang, Anhui, which is about 100 miles north of Pukow (Nanking). This case infected persons among her immediate family and neighbors, who all died of pneumonic plague between February 6 and 9.

There is probably no place in the world where silver and gold fail to affect the lives and habits of the people. But China is so literally living from hand to mouth that money is the ever-present aspiration of everyone. And money will purchase anything. If it is a question of having to stop trains or to decimate the population the latter is doomed to die unless more money is to be made by stopping the railways. The governor of Suiyuan "refused to believe that plague even existed." Evidently the governor's reason for disbelief was the revenue derived from the wool carters, which amounts to \$500 daily, passing through his hands. It was not until the "group banks" came through with a loan of \$240,000 and a promise of \$1,200,000 that action was really taken toward protecting the lines of communication. And as shown, the practical effectiveness of this protection was nullified by fear of a "truculent" soldier.

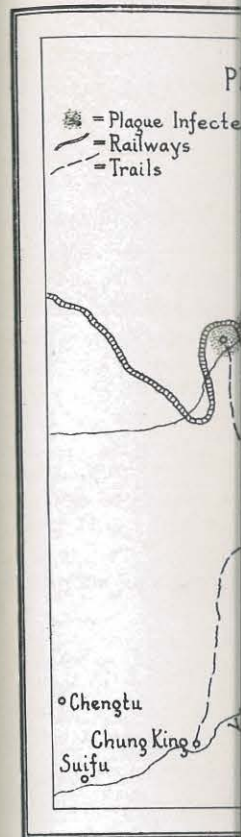
PROGRESS OF THE EPIDEMIC.

The following is a brief chronicle of the epidemic:

November 15, 1917: Origin at Patsobolong, Mongolia.

January 5, 1918: Cases appear outside and to north of Great Wall.

January 17, 1918: Three cases south of Yenmen Pass (Great



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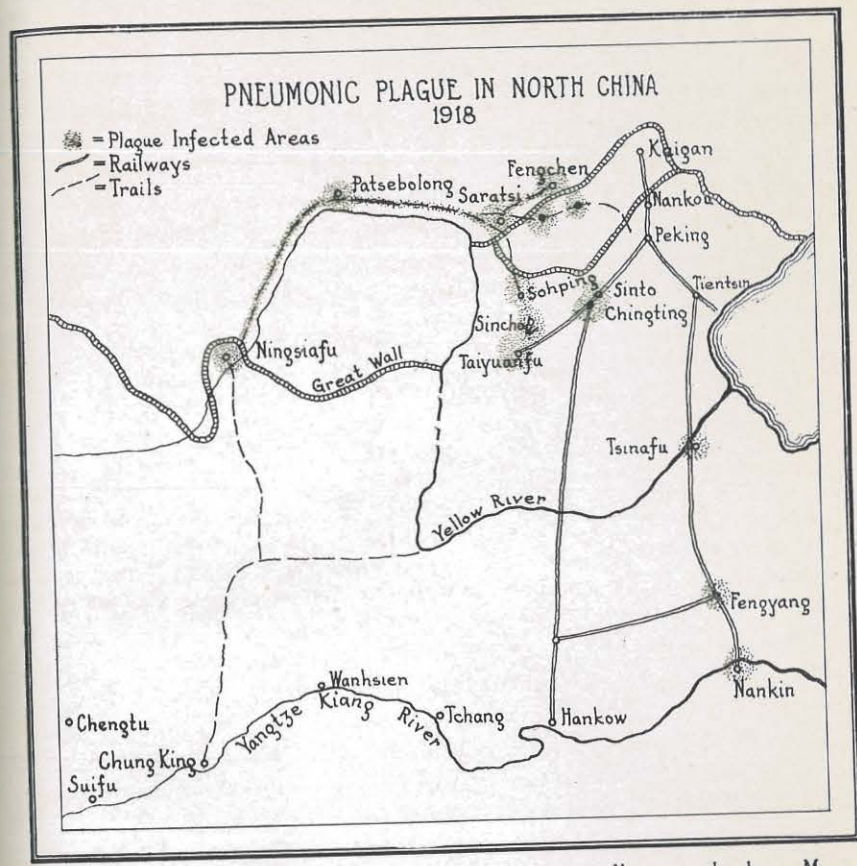
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Epidemic started at Patsebolong Nov. 15, 1917 It spread along Mon-
golian Trade Route. Jan 5, 1918 at Sopingfu 6 cases occurred. From
there it spread rapidly reaching Fengyang Feb. 28, 1918. The area
north and south of the Great Wall was heavily infected largely be-
cause prevention was antagonized by officials. March 1, 1918 four
deaths were reported from Ningsiafu (Kansu). Within three and
one half months infection spread over 1,500 miles, largely in regions
without rapid transit.

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Wall). Two deaths at Sinchow. Reported present at Taichow. All other passes closed.

January 18, 1918: Deaths reported along road south of Taichow. (four days north Taiyuanfu by cart). Prevention stations established at Kalgan and Kangchuan. Peking still untouched. All railways running as usual except Peking-Kalgan road.

January 20, 1918: Increasing at Saratsi.

January 21, 1918: Peking officials begin to realize seriousness of situation. Begin to train plague prevention police. At Fengchen 11 deaths to date. Situation serious at Paotowchen. Traffic to be intercepted eastward. All travelers to be placed in quarantine six days. Suiyuan governor decides to allow preventive measures. Tohsien, spreading rapidly. Saratsi, 1,000 deaths in five days.

January 22, 1918: Two soldiers die of plague at Fengchen. Total deaths there to date 27. Kweihachen, 100 deaths. Hsinchow. 13 deaths between 16th and 22nd of January.

January 23, 1918: Tatungfu without plague. Four cases develop eight *li* distant. Saratsi, conditions bad. Traffic down Yellow River not stopped. Fear spread south through Shansi.

January 24, 1918: Tatungfu; city divided into four sectors each under a physician (Drs. Smyly, Chen, Jouvelet, and Kosuge). Domiliciary inspections instituted. Two deaths, one proven bacteriologically. Gates closed at Paotowchen. Peking announces receipt of advance of \$240,000 by group banks to combat plague. Total of \$1,200,000 to be loaned for that purpose. Government consents to establish properly equipped quarantine station at Nankou. Sun Ts'ung; 17 deaths to date. Taichow; 35 deaths; disease spreading rapidly. North of the Great Wall 1,000 deaths in 5 days. Saratsi, deaths increasing. Gates closed. Dr. Young working at Taiyuanfu.

January 27, 1918: At Fengchen, 4 deaths among soldiers. Total of 34 deaths to date. Taiyuanfu; 233 deaths to date. Saratsi, nearly all villages infected. All infected die. Kansu reports plague spreading westward. Has reached Santaoho, north of Ningsiafu. Belgian priest dies; 3 others infected.

February 1, 1918: Peking hopeful of keeping plague from coming south. Ministry of Interior divides infected area into four districts.

MINISTRY DIVIDES INFECTED AREA INTO FOUR DISTRICTS.

First. Suiyuan area under Dr. Chuan Shao-tsing "with full power." (Area of 10,000 square miles.) Most heavily infected territory.

Second. Charhar under Dr. Ho Show Yin.

Third. From Tatung north to Provincial Boundary and south to Yenmen Pass. Under Tuchun of Shansi with Dr. S. P. Chen as

medical director of quarantine stations at Kalgan and Nankou to keep Kingsui Railway open. (Area of 35,000 square miles.)

Fourth. From Yenmen Pass southward along the Great Wall under Tuchun of Shansi. Boundaries of Chihli, Charhar, and Shansi to be strictly watched by troops under Tuchun of Chihli. Gen. Chiang is responsible for preventive and suppressive measures generally. (Area of 75,000 square miles.)

February 3, 1918: Sinlo reported infected. Shansi south of Wall; 35 deaths in two days. Fengchen; total deaths, 70.

February 5, 1918: Inside Wall near Yellow River is a newly-infected area. It is announced that the road on both sides of the Yellow River should be watched as well as the river itself when open to boats. Translations being made of plague literature. No new cases for a week in Taichow district.

February 15, 1918: Tingchow; no further cases. Chentinfu; satisfactory. Huts to the number of 200 shipped to Fengchen for advance quarantine station. Peking announces: "Spread of plague now under control."

February 18, 1918: Suiyuan district, 1,500 dead; more in outlying regions. Shansi; 116 dead in past two days.

February 23, 1918: Four suspicious deaths in Peking. Average of 60 deaths a day in Shansi admitted officially.

February 28, 1918: Fengyang, Anhui; 8 deaths from bubonic plague; Pengpu; 1 death.

March 1, 1918: Tsinanfu, 4 cases.

March 15, 1918: Nanking, 25 cases.

Table of reported cases.

Place.	Cases.	Date reported.
Fengyang.....	8	Feb. 28, 1918
Fengchen.....	76	Feb. 3, 1918
Hsinchow.....	13	Jan. 16 to 22, 1918.
Kwei Wha Chen.....	100	Jan. 22, 1918
Tsinfa.....	4	Mar. 1, 1918
Pengpu.....	1	Feb. 23, 1918
Sintaoho.....	4	Jan. 23, 1918
Saratsi.....	1,000	Jan. 16 to 21, 1918.
Shansi.....	157	Feb. 3, 1918
Sinchow.....	2	Jan. 17, 1918
Suiyuan.....	1,500	Feb. 18, 1918
Sun Ts'ung.....	17	Jan. 24, 1918
Taichow.....	38	None since Feb. 1, 1918
Taiyuan Fu.....	233	Jan. 27, 1918
Tatun Fu.....	6	Jan. 24, 1918
Taihsien.....	17	Jan. 24, 1918



tions at Kalgan and Nankou to
 a of 35,000 square miles.)
 uthward along the Great Wall
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 troops under Tuchun of Chihli.
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infected. Shansi south of Wall;
 ; total deaths, 70.

near Yellow River is a newly-in-
 the road on both sides of the Yel-
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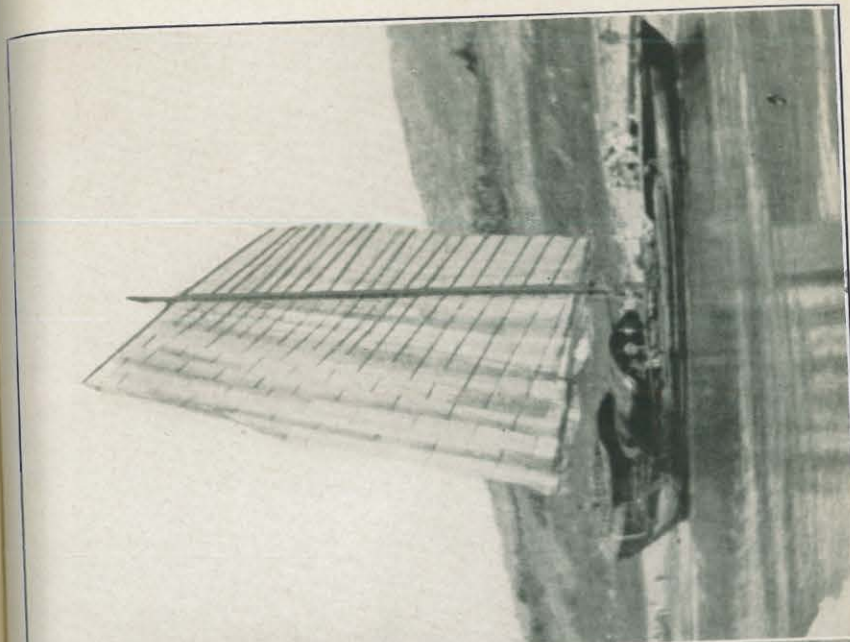
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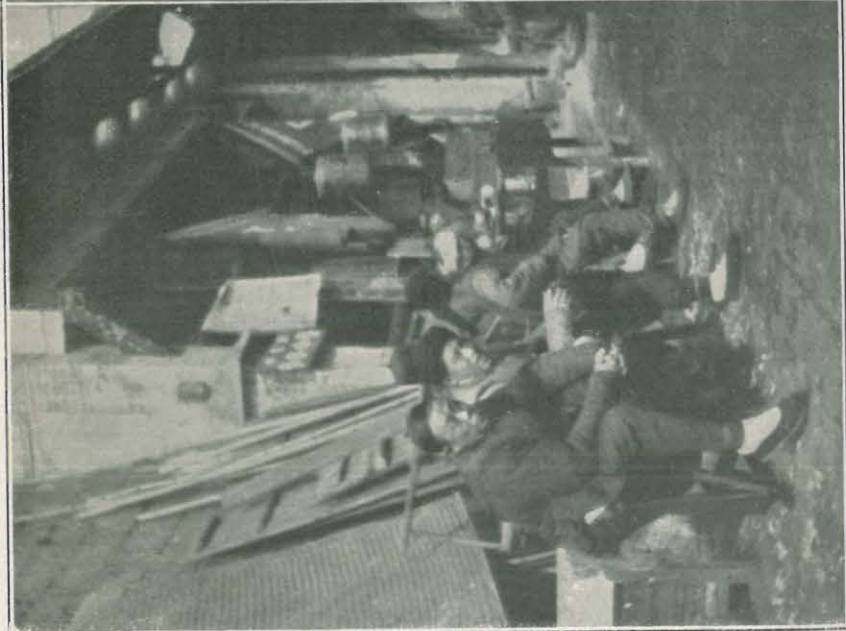
Junk on upper Yangtze.



Coolie carrying rice, Wanh Sien, Yangtze Valley.



Road cut in the solid rock along gorges of the upper Yangtze.



A street scene in Chieng-Kin, Szechuan Province.

702-2

The figures above are no such thing as a registration reports. The only information is that from volunteer workers would at first imagine from. They should only be considered as epidemic. Only 2,952 deaths and 1,000 deaths were occurring.

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Tingsiang in Shansi se... officials than most of the... largely through early de... with the advice of physic... reflects credit on all conce... is of interest:

In combating the pneumoni... low very closely the methods... first place there is no hospita... the second place there are no... yuan on the south. Finally... rural rather than urban. In... in hospitals, with the railway... large cities. In view of these... service has been developed i... that giving wide publicity to... be of great service to the Ch... combat this or similar epidem...

Tingsiang is a small distri... city is practically the geograp... campaign an attempt was m... area in detention stations at... tlet city. Within a day or... To correct this "travelers w... but were promptly interned... such as temples."

When plague appeared in a... Within the village itself ther... and contacts.

Following this "more dra... closed to all persons except... office. All the villages in th... village being strictly forbid...

Looking toward the f... danger to China, especia...

The figures above are not to be regarded as statistics. There is no such thing as a registration area in China outside the larger treaty ports. The only information to be had from the infected territory is that from volunteer workers. The situation is far worse than one would at first imagine from a cursory glance at the figures alone. They should only be considered in tracing the progress of the epidemic. Only 2,952 deaths are there represented. As a matter of fact 1,000 deaths were occurring in a few days in some neighborhoods.

The alteration in the type of the disease from pneumonic to bubonic at Fengyang, Anhui, is noteworthy. This may have been transmitted by human fleas or it may have resulted after development of the disease in a rat.

Tingsiang in Shansi seems to have fared better at the hands of officials than most of the plague regions. Here it was no doubt largely through early devastation that the people so readily fell in with the advice of physicians. The plan worked out in this district reflects credit on all concerned. The following plan of organization is of interest:

In combating the pneumonic plague in Shansi it has not been possible to follow very closely the methods employed in Manchuria seven years ago. In the first place there is no hospital in all the north of Shansi above Taiyuanfu. In the second place there are no railways between Tatung on the north and Taiyuan on the south. Finally the territory affected has been predominantly rural rather than urban. In Manchuria seven years ago it was possible to work in hospitals, with the railways as bases, and practically all the work was done in large cities. In view of these different conditions a new type of public health service has been developed in the present campaign, and the writer believes that giving wide publicity to the methods employed, especially in villages, will be of great service to the Chinese people and to all who may be called upon to combat this or similar epidemics in the future.

Tingsiang is a small district, having a total of but 96 villages. The district city is practically the geographic center of the district. At the beginning of the campaign an attempt was made to hold all travelers returning from infected area in detention stations at the passes, or in the detention station at the district city. Within a day or two, however, these detention stations were filled. To correct this "travelers were permitted to return to their native villages, but were promptly interned either in their own courts or in public buildings such as temples."

When plague appeared in a village that village was promptly isolated. * * * Within the village itself there was, of course, the isolation of the plague patients and contacts.

Following this "more drastic measures were adopted. The city gates were closed to all persons except those holding special permits from the antiplague office. All the villages in the district were isolated, intercourse from village to village being strictly forbidden."

Looking toward the future we must consider another source of danger to China, especially to the Upper Yangtze, from the bubonic

Road cut in the solid rock along gorges of the upper Yangtze.

A street scene in Chieng-Kin, Szechuan Province.

plague in India, Siam, and French Indo-China. This region is in fact nearer than the Mongolian epidemic was. And there is rail communication within 100 miles of Szechuan which comes through Tonkin, one of the infected areas of Indo-China. Furthermore, the main road southward out of Chungking passes through Yunnanfu (the French railway terminus), directly to the borders of Burma, thence to the British railway terminus, which runs from Mandalay almost to the border of Yunnan. Almost all of India is infected with bubonic epidemics, the Madras Presidency being probably the most heavily infected part.

Stitt in 1914 said:

The plague epidemic with which all parts of the world are now so concerned is supposed to have originated in China, in the Province of Yunnan.

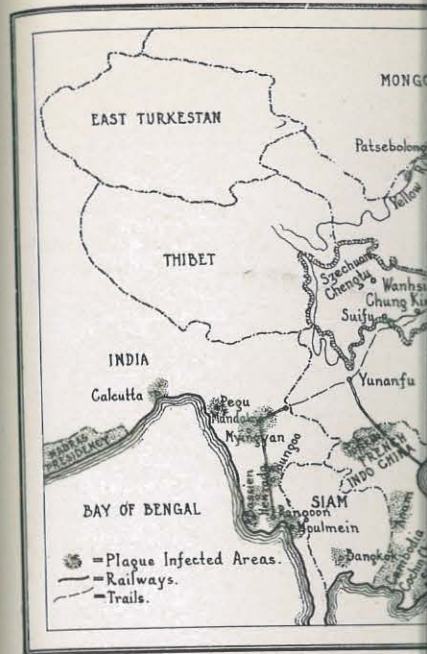
The proximity of Yunnan to India is significant, and the nearness of Yunnan to Szechuan is equally important. It suggests the possibility of this interior China being a huge reservoir of infection.

During the past year it is estimated that 100,000 Yunnan and Kweichow soldiers have entered Szechuan. They have taken over the entire Province and have carried on military operations requiring the transportation of supplies and munitions from the southern country to the area of conquest. All of this has been done by coolies. It will be seen that the actual number of men coming from questionable districts is probably at least twice 100,000, probably 400,000 or 500,000. This military migration continues and is utterly void of any sanitary or hygienic organization or arrangement.

Reference to the following tables and to the map will show more clearly the danger from this direction. When we realize that 15,000 junks ply between Ichang and Chungking the year round, and that steamers run between these two cities in the summer and below Ichang to Hankow the entire year, we can appreciate what is in store for China if plague begins to take root in Szechuan.

To account for the absence of cases here we can not plead too strongly for the theory of isolation, although the map shows certain natural barriers. Rivers are more or less an obstruction to rodents. But rivers which are crossed by boats reduce the obstruction, and human cases naturally could be carried across rivers during the incubation period. Mountains are natural barriers to rodents if they are high enough and afford scant vegetation or other food. High altitudes operate against invalid migration. Distance increases the protection.

It seems unlikely that these natural barriers are wholly responsible for Szechuan's freedom from infection. There must be other



Bubonic Type is prevalent south of China in Mongolia and North China. In India the soldiers have come to Szechuan from



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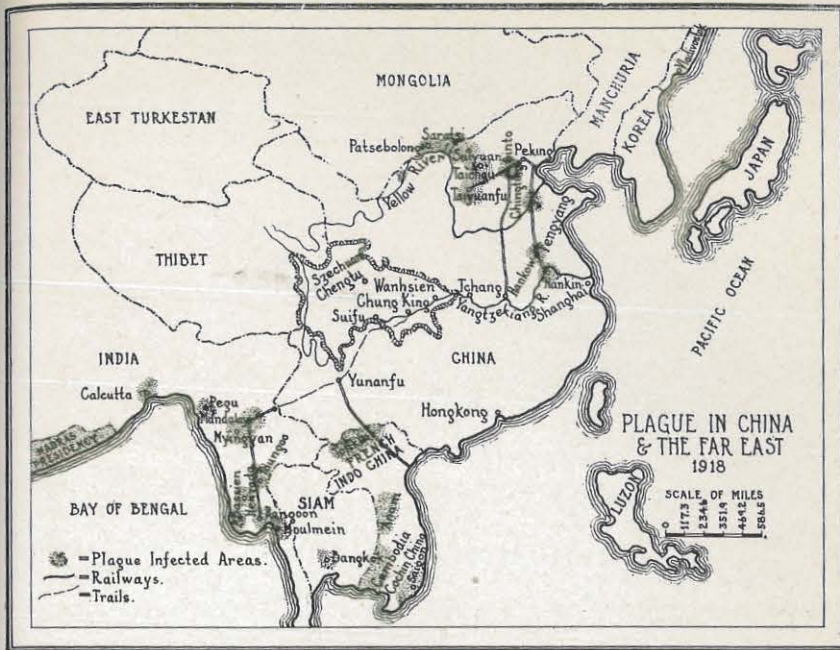
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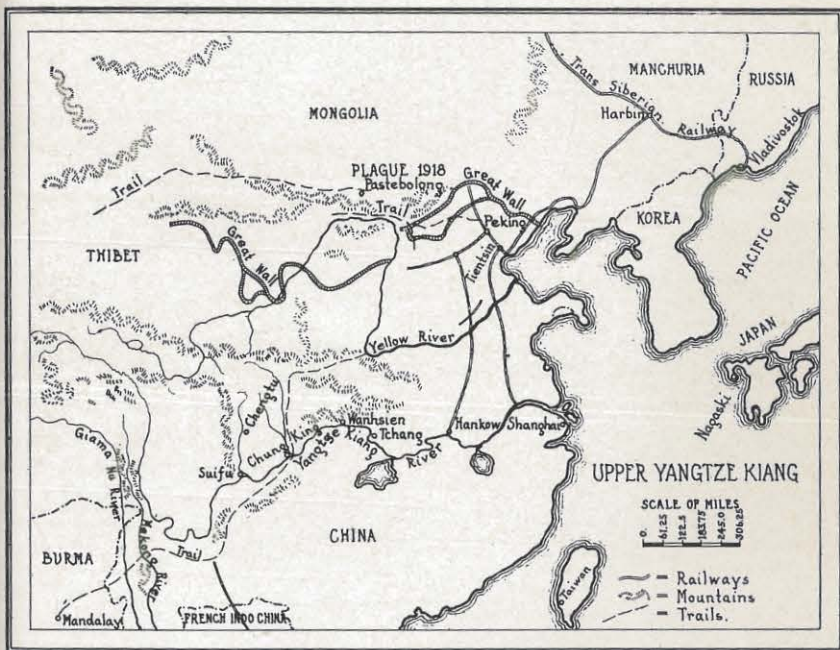
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Bubonic Type is prevalent south of China and at Fengyang. The Pneumonic Epidemic is in Mongolia and North China. In India there were 17,000 cases in 14 days 100,000 soldiers have come to Szechuan from Yunnanfu and Kweichow in the past year.





City wall, Quay Fu, Yangtze Valley.
Junk on upper Yangtze.

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factors operative, such as sectional immunity or periodic immunity, or existence of the disease in mild endemic form.

Sectional immunity may be due to two causes in addition to natural barriers: (1) To active immunization after the ravages of a previous epidemic; (2) climatic conditions.

Periodical immunity is something about which we have still much to learn, though it probably depends to some extent on the immunization from previous epidemics. It was suggested by Dr. Clements of the Philippine health service during an epidemic of cholera in the Philippines in 1916. He believed that cholera returned in wave-like intervals of a certain number of years, and he was working on that idea with Dr. Long of the United States Public Health Service, then director of the Philippine health service. No doubt their findings have been published, though we do not have access to them.

It may be that plague exhibits this tendency to recur after an interval of years, perhaps depending upon the persistence of active immunity developed in a previous outbreak and transmitted weakly to succeeding generations.

“Dr. Kitasato, in a lecture, traced the plague as far back as 200 A. D., when it found its way to Egypt and Europe. The visitations were reported until between the end of the thirteenth century and the beginning of the fourteenth. Europe, as medical science advanced, was able to drive out the pest except for an inconsequential outbreak some 11 years ago.”

At any rate, there is nothing to prevent plague spreading in Szechuan if introduced unless it can be explained as above. It would mean periodical rat immunity as well as human immunity, for rats are accepted on equal social terms with the average resident of this region. Rat fleas are not conspicuous by their absence if the few which we have examined are to be taken as examples.

Statistical table.

INDIA.

Date.	Cases.	Deaths.
Apr. 15-June 30, 1917.....	43,992	30,197
July 1-Oct. 20, 1917.....	45,657	34,074
Oct. 21-Oct. 27, 1917.....	13,571	9,390



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Statistical table.—Continued.

DISTRIBUTION.

Place.	Date.	Cases.	Last report.	Cases.
Bassein.....	Apr. 1-June 30.....	54	July 1-Oct. 13, 1917.	29
Bombay.....	Apr. 22-June 30.....	397	July 1-Oct. 20, 1917.	432
Calcutta.....	Apr. 29-June 2.....	38	July 1-July 21, 1917.	4
Henzada.....	Apr. 1-June 30.....	35	Aug. 12-Sept. 15, 1917.	7
Karachi.....	Apr. 22-June 30.....	468	July 1-Oct. 20, 1917.	49
Madras Presidency.....	Apr. 22-June 30.....	250	July 1-Oct. 20, 1917.	5,490
Mandalay.....	Apr. 8-May 12.....	9	July 29-Oct. 10, 1917.	66
Moulmein.....	Apr. 1-June 30.....	74	July 1-Oct. 10, 1917.	39
Myingyan.....	Apr. 1-Apr. 7.....	1	None.....	
Pegu.....	May 27-June 2.....	2	July 29-Sept. 22, 1917.	2
Rangoon.....	Apr. 15-June 30.....	183	July 1-Oct. 20, 1917.	605
Toungoo.....	Apr. 8-Apr. 14.....	2	July 29-Sept. 1, 1917.	12

INDO-CHINA.

Date.	Cases.	Deaths.
Feb. 1-June 30, 1917.....	730	491
July 1-Aug. 31, 1917.....	119	89

DISTRIBUTION.

Place.	Date.	Cases.	Last report.	Cases.
Anam.....	Feb. 1-June 30.....	232	Aug. 1-31.....	7
Cambodia.....	Feb. 1-June 30.....	132	Aug. 1-31.....	26
Cochin China.....	Feb. 1-June 30.....	219	Aug. 1-31.....	16
Kwang Chow Wan.....	May 1-June 30.....	34		
Tonkin.....	Feb. 1-June 30.....	113	Aug. 1-31.....	1

SIAM.

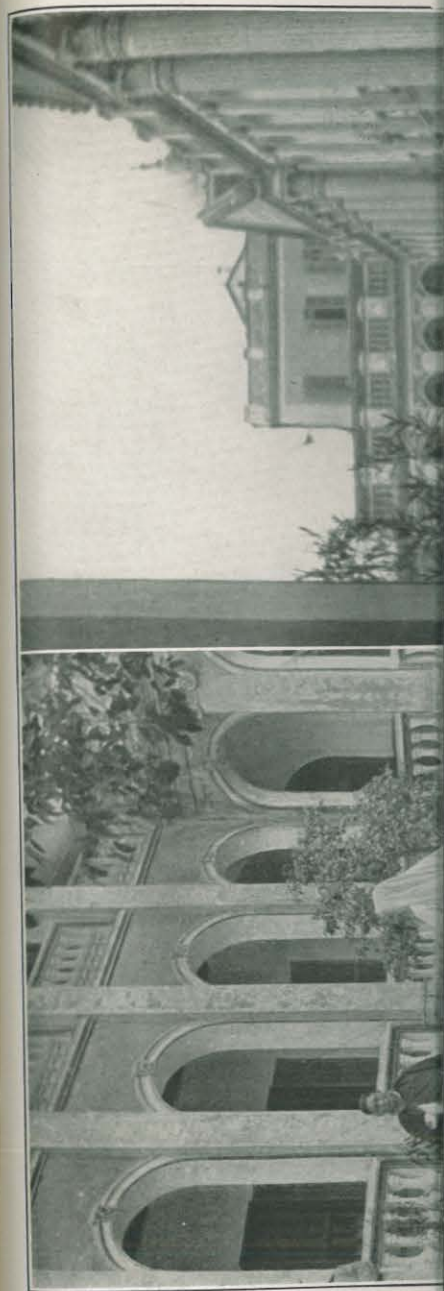
Place.	Date.	Cases.	Deaths.
Bangkok.....	Apr. 22-June 30.....	13	12
	July 3-Oct. 27.....	31	29

RELIEF WORK AT GUATEMALA CITY.

After the earthquakes of December, 1917, and January, 1918.

By S. M. TAYLOR, Lieutenant, M. C., United States Navy.

Having received orders from the Navy Department to visit the city of Guatemala and report on conditions and render what aid we



Continued.

N.

Cases.	Last report.	Cases.
54	July 1-Oct. 13, 1917.	29
397	July 1-Oct. 20, 1917.	432
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2	July 29-Sept. 1, 1917	12

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Cases.	Deaths.
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119	89

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Cases.	Last report.	Cases.
232	Aug. 1-31.....	7
132	Aug. 1-31.....	26
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34	
113	Aug. 1-31.....	1

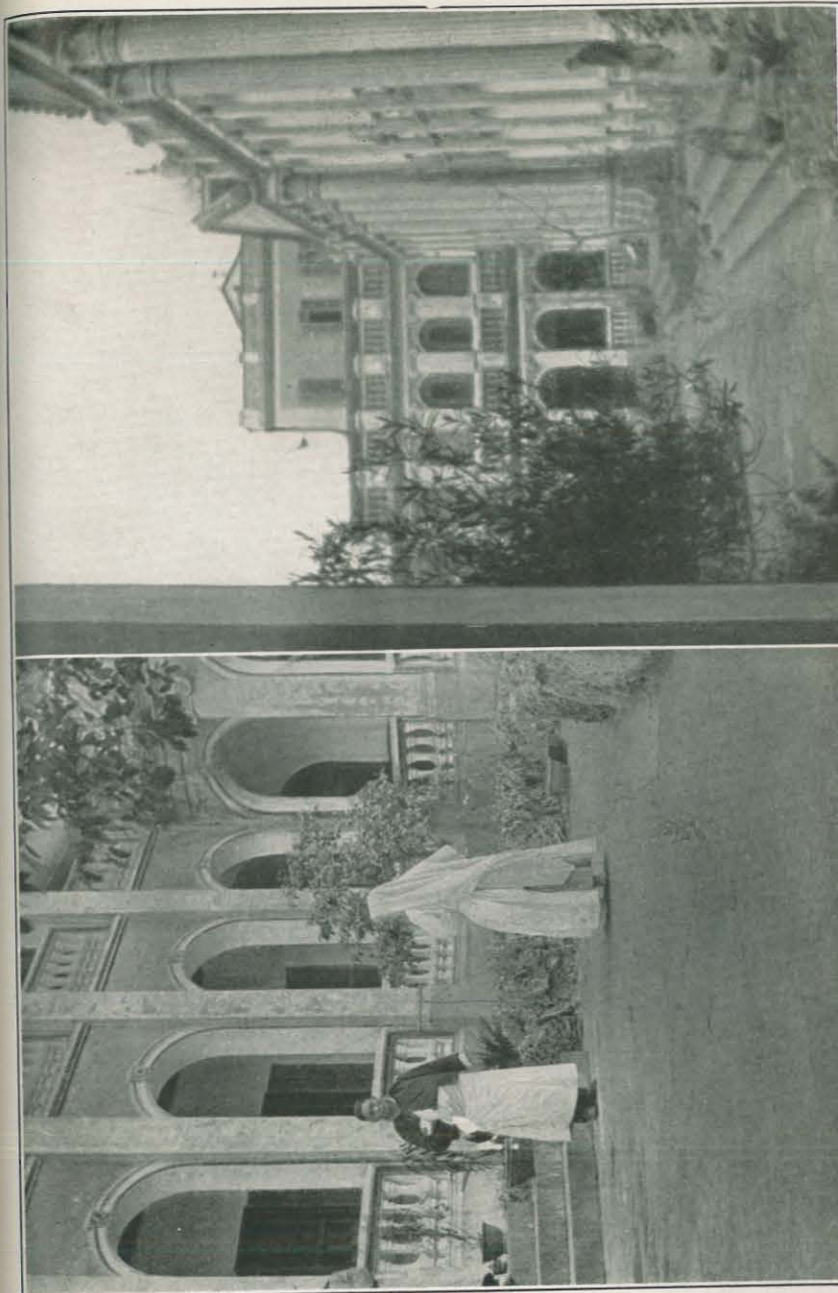
Date.	Cases.	Deaths.
22-June 30.....	13	12
3-Oct. 27.....	31	29

SEMALA CITY.

1917, and January, 1918.

, United States Navy.

avy Department to visit the
ions and render what aid we



Views of the hospital of the French Catholic Mission, Chieng-Kin.

could, Capt. Brumby and one hospital apprentice, the morning by special o'clock in the afternoon. ber of buildings along t earthquake. Dr. A. M. at the train, and he and I went to the first-aid sta equipment, and patient wounds dressed. We v American Legation to r

Capt. Brumby, Ensign of refugees, and myself American Legation, sleep hospital corpsmen sleep the veranda when the 10.30 p. m. We all imm it was with difficulty th to be rolling in waves, one. The disturbance lasted 10 seconds, and fr ation of earthquakes. ing the night. The nex legation without some ately to the first-aid s great many more buil People were waiting b and the hospital corps ing the wounded. We the injured that had a

The following is a l eral capacities before

Hospital General -----
 Hospital Militar -----
 Hospital De Venereas -----
 Hospital Americano -----
 Hospital De Epidemias -----
 Hospital De Leprosos -----
 Asilo de Dementes -----
 Asilo de Maternidad -----
 Asilo de Convalecientes -----
 Asilo de Mendijs -----
 Hospital de Los Caraely -----
 Hospital antirabico -----
 Hospital de vacuna -----

All the patients of after the quake on I

could, Capt. Brumby and two other officers, two pharmacist's mates, one hospital apprentice, second class, and myself, left San Jose in the morning by special train, and arrived at Guatemala City at 4 o'clock in the afternoon. Before arriving at the city we saw a number of buildings along the railroad that had been destroyed by the earthquake. Dr. A. M. Struse, of the Rockefeller Institute, met us at the train, and he and I and the pharmacist's mates with equipment, went to the first-aid station established by him. Here I found no equipment, and patients were waiting by the score to have their wounds dressed. We worked till nightfall, when I went to the American Legation to report the conditions to Capt. Brumby.

Capt. Brumby, Ensign Purdy, the staff of the legation, a number of refugees, and myself spent the night in the court square of the American Legation, sleeping on mattresses—the other officer and the hospital corpsmen sleeping in a stable near by. We were sitting on the veranda when the most terrible earthquake came; this was at 10.30 p. m. We all immediately rushed out in the court square, and it was with difficulty that we could keep our feet. The earth seemed to be rolling in waves, not a to-and-fro motion, but an up and down one. The disturbance seemed to be directly under us. The shock lasted 10 seconds, and from then on till daybreak there was a continuation of earthquakes. Ensign Purdy and I counted 240 quakes during the night. The next morning, as soon as we could get out of the legation without some of the walls falling in on us, I went immediately to the first-aid station. On the way down I noticed that a great many more buildings had been destroyed during the night. People were waiting by the hundreds to have their wounds dressed, and the hospital corpsmen and Dr. Struse were already busy dressing the wounded. We worked till 12 o'clock and had dressed all of the injured that had applied for assistance.

The following is a list of the hospitals in the city and their several capacities before the earthquake on December 25:

	Beds.
Hospital General	800
Hospital Militar.....	300
Hospital De Venereas	100
Hospital Americano	25
Hospital De Epidemias.....	100
Hospital De Leprosos	100
Asilo de Dementes.....	300
Asilo de Maternidad	200
Asilo de Convalecientes.....	200
Asilo de Mendiyos.....	100
Hospital de Los Caraely.....	200
Hospital antirabico.....	100
Hospital de vacuna.....	25

All the patients of the above hospitals were removed to the open after the quake on December 25, as every one of the hospitals was

practically destroyed. Many of the instruments and practically all of the medicines and dressings were lost, owing to the fact that the heavy walls buried them. Fortunately not many of the patients were killed, but no one could give a correct idea as to how many had been killed. After the quake on January 3, 1918, every hospital, and such parts of them as were left standing were totally destroyed, and any patients that were not removed far enough away in the open were killed. The American legation was the only building left standing in the city after the shock on January 3, 1918, and it was considered very unsafe, as the walls had large cracks in them. The sewage disposal was only fair before the earthquake, the discharge emptying into a creek below the city. After the quake all, or practically all, of the pipes burst, and their contents were emptied into the streets. Before the quake there were two water supplies, one coming from a large spring, and the other from a river. The one coming from the river was considered bad. This condition had been reported to the Government, but no effort was made to remedy it. After the quake there was no water to be had in the city, and it was a common occurrence to see the people drinking the water from the sewers.

There were 70 native doctors in the city before the quake, but I am sorry to say that 40 of them left immediately after the first quake. There were 50 drug stores that were completely destroyed and practically nothing could be saved. Great credit must be given those native doctors who did stay and gave all their efforts to help relieve the dreadful situation.

BULLETIN NO. 1 OF THE BOARD OF HEALTH OF THE ROCKEFELLER FOUNDATION.

With the idea of preventing typhoid fever, dysentery, and other intestinal infections the following measures should be taken:

1. Each family will endeavor to build provisional toilets. In order that these should fulfill their full object, they should be a yard in depth.

2. The water for drinking should be used boiled, filtered, or mixed with another chemical substance, among the most practical are the hypochlorite of lime and the tincture of iodine. In order to use the hypochlorite of lime, take one gram of it and mix with one liter of water, shake it and use it 15 minutes after. The tincture of iodine should be used in the following manner—to a liter of water add two drops, shake and wait 15 minutes before using.

3. In order to prevent smallpox it is necessary that one be vaccinated. This office has requested of the home office in New York a sufficient quantity of the vaccine to vaccinate against smallpox, typhoid fever, etc. As soon as it arrives it will be distributed gratuitously.

This board established an emergency hospital on the second avenue south, opposite the Escuela Practica Senioritas.

GUATEMALA, December 31, 1917.

Among the most prevalent diseases were typhoid; typhus (in outskirts of the city); malaria; smallpox; tuberculosis common, especi-

ally grandular; goiter common; amebic and bacillary (high infection) prevalent; hook-worm, 22 to 25; meningitis, mostly among the poor, still worse the officials try to cure.

The medical authorities were doing nothing. They would recommend things ignored. They could not get a first-aid station, and when they tried that the native soldiers shot at them. It seemed that they would not run the first-aid stations properly.

Among the most severe injuries were of all kinds; fractures, simple and compound, severe lacerations of all kinds. Many died to have nothing physically wrong with them, suffering from shock, which was followed by vomiting.

During the month of December there were several earthquakes, but the people were not prepared. The first powerful earthquake was on the evening of the 1st, the second at 10.45, and the third on the 3rd, shocks practically destroyed the city during the night. On Saturday the 7th there was the next large shock. This was the last of the native physician. The next day was the Year's night. The last and largest was on the 10.30 on the evening of January 3, 1918, at the American Legation. This was the most severe. This last shock caused a great destruction as stated before of the city.

Fortunately the food companies had established stations where they had supplies, the conditions were not so bad, nothing left. It is estimated that 1000 were killed and 800 wounded.

In the cemetery at least 1000 graves by the force of the earthquake were burned in oil.

Great credit is due Chief Pharmacist's Mate (Third Class) W. W. who repeatedly exposed himself to bring out the injured.

ally grandular; goiter common, especially among men; dysentery amebic and bacillary (high infant mortality); venereal diseases, very prevalent; hook-worm, 22 to 25 per cent; and epidemic cerebro-spinal meningitis, mostly among the native soldiers. To make matters still worse the officials try to conceal the contagious diseases.

The medical authorities were practically powerless to do anything. They would recommend sanitary measures only to have them ignored. They could not get the people to carry the wounded to the first-aid station, and when told to work they refused. It is true that the native soldiers shot a great many people for looting, but it seemed that they would not help to guard the hospitals and the first-aid stations properly.

Among the most severe injuries were the following: Contusions of all kinds; fractures, simple and compound; peritonitis; and severe lacerations of all kinds. A great many of the people seemed to have nothing physically wrong with them, but seemed to be suffering from shock, which was characterized by extreme nervousness and vomiting.

During the month of December there had been a great many earthquakes, but the people did not pay much attention to them. The first powerful earthquake occurred at 10.30 on Christmas evening, the second at 10.45, and the third about 11 p. m. These three shocks practically destroyed the city. Smaller shocks occurred during the night. On Saturday, at 2 o'clock in the afternoon, occurred the next large shock. This shock killed Dr. Volla, a prominent native physician. The next large shock came at 12 o'clock New Year's night. The last and most terrible of all the shocks came at 10.30 on the evening of January 3 while we were there in the American Legation. This shock was considered by all the most severe. This last shock completely destroyed the city with the exception as stated before of the American Legation.

Fortunately the food conditions were good, and the Government had established stations where food was given out. As to medical supplies, the conditions were very bad, as there was practically nothing left. It is estimated that about 350 persons were killed and 800 wounded.

In the cemetery at least 10,000 bodies were thrown out of the graves by the force of the shocks. These bodies were immediately burned in oil.

Great credit is due Chief Pharmacist's Mate William Schofield, Pharmacist's Mate (Third Class) C. A. Ray, and Hospital Apprentice (Second Class) W. W. Methven, United States Navy, who repeatedly exposed themselves to danger in falling buildings in order to bring out the injured.

REPORT OF AN EPIDEMIC OF 3-DAY FEVER AT THE UNITED STATES
NAVAL AIR STATION, ——— FRANCE.

By D. FERGUSON, Lieutenant, M. C., United States Navy.

An epidemic resembling influenza, which has been sweeping through Europe, reached the United States Naval Air Station at ———, France, on June 24, 1918. The French authorities reported an epidemic in Algiers, in the eastern Mediterranean States, and the eastern Adriatic littoral during the spring and summer of 1917, and according to information received by medical officers of the United States Army considered these epidemics as dengue and pappataci fever. It is now thought that these epidemics were the beginning of the one now prevailing.

Etiology.—Up to May 27, 1918, the exciting organism was not definitely identified. Since then, in eight cultures made on cases in the ——— Regiment, United States Army, American Expeditionary Force, at Base Laboratory, Base Section No. 1, five cultures were positive for an influenza-like organism, described as a small gram negative bacillus in symbiosis with the pneumonias. It grows only on blood medium and presents the characteristic dew-drop colonies. It is very difficult to grow alone and to transplant. Morphologically it is indistinguishable from Pfeiffer's organism, but, due to the difficulties attending research, it has been impossible as yet to determine accurately its biological characteristics. Cultures are non-toxic for rabbits.

In a series of 20 blood cultures all were negative, though everything pointed to a general infection.

A series of 20 pharyngeal cultures were made at Base Hospital No. 8, American Expeditionary Force, and the results will be available for our study on the return of the bacteriologist from detached duty at the front. The final opinions of the laboratory men of the American Expeditionary Force as to the identity of the organism will be forwarded as soon as they become available. No immunizing work has been attempted as yet. White and colored races are equally susceptible.

Symptoms.—Sudden onset of fever, varying from 90° to 105°, more commonly 102°, with intense headache, backache, and general pains throughout the body. The degree of prostration varies greatly in different cases. Pain in the chest, made worse by deep inspiration, and some cough without corresponding physical signs were characteristic of the majority of cases.

Physical signs.—The majority of cases were negative on physical examination except for infection of the pharynx and infection of the conjunctiva, the latter giving the appearance of "pink eye."

Clinical course.
hours, falls rapidly in a few hours. Appetite usually goes to zero.

Complications.
ity, and the only reported case of frontal meningitis.

Treatment.—

Prevention.—
ditionary Force. The character of the disease in the units and organizations is bedding and quarters. The following are prevented there was a regular quarantined in base.

Epidemiology.
Force show that the cases were affected. The disease was usually at the front.

The incubation period of the disease is important. The disease is imported and sudden noneffective.

By H.

The patient, a native of California, was admitted to the hospital on January 27, 1918, on the night of January 27, 1918. There was a macule on the right side of the chest. The scratching was pronounced and swollen. Their appearance was that of a macule of 103°, with a diameter of 103°. The skin was red. When first seen, the temperature of the right cheek showed a temperature with a center of the incision that

FEVER AT THE UNITED STATES
— FRANCE.

United States Navy.

which has been sweeping United States Naval Air Station at French authorities reported Mediterranean States, and the spring and summer of 1917, and medical officers of the United States as dengue and pappataci epidemics were the beginning

exciting organism was not in all cultures made on cases in any, American Expeditionary Force No. 1, five cultures were obtained, described as a small gram negative pneumonias. It grows only in characteristic dew-drop colonies. It is a transplanted. Morphologically it is an organism, but, due to the difference it is impossible as yet to determine its characteristics. Cultures are non-

cultures were negative, though every-

cultures were made at Base Hospital and the results will be available. The bacteriologist from detached units of the laboratory men of the hospital the identity of the organism is not available. No immunizing sera are available and colored races are equally

fever varying from 90° to 105°, headache, backache, and general weakness of prostration varies greatly and is made worse by deep inspirations. Outstanding physical signs were

cultures were negative on physical examination of pharynx and infection of the conjunctiva of "pink eye."

Clinical course.—The fever attains the highest point within 36 hours, falls rapidly, and is generally normal at the end of 48 or 72 hours. Appetite returns with the fall of the fever and the patient usually goes to duty after 3 days in the sick bay.

Complications.—In the 163 cases treated here there was no mortality, and the only serious complications were a case of otitis media and a case of frontal sinusitis.

Treatment is purely symptomatic.

Prevention.—The surgeon of Base Section No. 1, American Expeditionary Force, is of the opinion that, in view of the benign character of the disease and its rapid spread, the isolation of affected units and organizations would not be justified. The daily airing of bedding and quarters and the discouragement of promiscuous spitting are preventive measures recommended. It has been noted that there was a relatively higher proportion of cases among the men quartered in barracks than among the officers quartered in billets.

Epidemiology.—The statistics of the American Expeditionary Force show that from 12 to 80 per cent of the men in different units were affected. An epidemic lasts from 10 to 20 days. The epidemic was usually at its highest within a week after the first case was reported.

The incubation period appears to be from 2 to 3 days, and the disease is important from a military standpoint solely on account of the sudden noneffectiveness of nearly half the personnel exposed.

REPORT OF A DEATH FROM ANTHRAX.

By H. B. LEHMBERG, Lieutenant, M. C., United States Navy.

The patient, a fireman, second class, age 27 years and 7 months, a native of California, 5 feet 8 inches high, weighing 151 pounds, was admitted to the United States Naval Hospital, Honolulu, Hawaii, on January 27, 1918. The patient had been in good health until the night of January 24, when he scratched with his finger nails a small macule on the right cheek, which he ascribed to the bite of a mosquito. The scratching was soon followed by inflammation of the area and pronounced swelling of the cheek. Constitutional symptoms made their appearance promptly and the patient developed a temperature of 103°, with a pulse of 118 and a respiratory rate of 22 to the minute. The swelling was incised and Wright's dressing applied. When first seen by the medical officer in the hospital the patient had a temperature of 103.6°; pulse rate, 124; respiratory rate, 22. The right cheek showed a small pustule about 1.5 centimeters in diameter, with a center slightly depressed and brownish in color. Owing to the incision that had been made the pustule was not typical in ap-

pearance, but anthrax was suspected and smears were made. These smears were negative for anthrax bacilli but positive for streptococci. Dakin's solution was used for a local treatment, while tincture of chlorid of iron and ipecac were administered internally. On January 28 smears were again negative for anthrax bacilli and so was the blood. Cultures were made. There was no improvement in the patient's condition. On January 30 the cultures made on January 28 showed the presence of a few anthrax bacilli, but the infection had become so generalized that the excision of the pustule was thought not advisable. On January 31 the temperature dropped to 101°, the pulse to 72 per minute. The patient became delirious, vomited, and developed other symptoms of cerebral irritation. A spinal puncture was made and an examination of the fluid showed it to be loaded with anthrax bacilli. The patient died at 6.45 p. m., January 31, 1918.

PRESENCE OF BALANTIDIUM COLI IN THE VIRGIN ISLANDS OF THE UNITED STATES.

By H. RYDEEN, Pharmacist (T.), United States Navy.

The patient, a girl 11 years of age, who has never been away from St. Thomas, complained of getting "dizzy" and of frequent loose bowel movements.

On examination of feces ova of *Ascaris lumbricoides*, *Trichiuris trichiura*, *Necator americanus*, and motile *Balantidium coli* were found.

Examination of feces following medication with santonin and betanaphthol showed only encysted forms of *Balantidium coli*. Subsequent examinations five and seven days later showed them as they were first seen. This is believed to be the first case of *Balantidium coli* reported from these islands.

It has been noticed that it is rather difficult to distinguish this organism in solid or even semisolid feces, but this can be overcome by emulsifying a small quantity of feces in water at a temperature of 37° to 38 C. Encysted forms can best be seen by using the method recommended by Rear Admiral E. R. Stitt, M. C., United States Navy, of mixing feces with iodine solution (Lugol's).

REPORT ON TETANUS INFECTION.

By JUDSON DALAND, Lieutenant Commander, M. C., United States Navy.

Some time ago I met an American physician whom I have known for some years and who has spent about 10 years in Germany, where he remained until March, 1917. He served in a hospital in Berlin

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and smears were made. These bacilli but positive for streptococci. A local treatment, while tincture administered internally. On five for anthrax bacilli and so. There was no improvement in 10 the cultures made on January 10 for anthrax bacilli, but the infection had on of the pustule was thought temperature dropped to 101°, the became delirious, vomited, and irritation. A spinal puncture fluid showed it to be loaded died at 6.45 p. m., January 31,

THE VIRGIN ISLANDS OF THE UNITED STATES.

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difficult to distinguish this organisms, but this can be overcome by in water at a temperature of must be seen by using the method R. Stitt, M. C., United States Station (Lugol's).

PLAGUE INFECTION.

ander, M. C., United States Navy.

physician whom I have known about 10 years in Germany, where served in a hospital in Berlin

and told me that soldiers who had received wounds at the front, when operated upon subsequently for any reason whatsoever, as an appendectomy, for example, frequently developed tetanus and died. It appears that tetanus bacilli were introduced into the patients at the time of the original wounds and remained latent or local until they became active in consequence of a lowered resistance due to the second operation. It is now the rule in the hospitals in Germany that all such patients, before a second operation, receive an immunizing dose of the antitetanus serum which absolutely prevents the occurrence of tetanus.

I believe that this information is of great practical value and should be transmitted to the medical officers of the Army and Navy.

UNITED STATES

Additions to the pathological

Accession No.	Tissue.	
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PRACTICAL BACTERIOLOGY, BLO
A. B., Ph. G., M. D. Fifth
Pa., 1918.

All the good features retained, and the new vo of its predecessors, cont possible by the use of in print. Rear Admiral S of rear admiral as an off cal Department of the course of the last 29 year

Rear Admiral Stitt's the laboratory of the Na his association with st Georgetown University, made him peculiarly we and lucid style.

A MANUAL OF CLINICAL DIAC
DENTS, HOSPITAL PHYSIC
B. A., M. D. Ninth Edit
1918.

In general this book a fact that a ninth editio

UNITED STATES NAVAL MEDICAL SCHOOL LABORATORIES.

*Additions to the pathological collection, United States Naval Medical School,
January-June, 1918.*

Accession No.	Tissue.	Diagnosis.	Collected by or received from—
1398	Blood smears.....	Benign tertian malaria.....	Commander C. St. J. Butler, M. C.
1399	do.....	B. lepræ.....	Do.
1400	Feces.....	Various ova parasites.....	Do.
1401	Blood smears.....	Quartan malaria; estivo-autumnal malaria.	Lieutenant Comdr. F. X. Koltes, M. C.
1402	do.....	do.....	Lieutenant T. T. Gately, M. C.
1403	do.....	Benign tertian malaria.....	Lieutenant E. Dockry, M. C.

BOOK NOTICES.

PRACTICAL BACTERIOLOGY, BLOOD WORK, AND ANIMAL PARASITOLOGY, by *E. R. Stitt, A. B., Ph. G., M. D.* Fifth Edition. P. Blakiston's Son & Co., Philadelphia, Pa., 1918.

All the good features of other editions of this book have been retained, and the new volume, without noticeably exceeding the bulk of its predecessors, contains much new material. This was made possible by the use of interpolations in smaller but perfectly legible print. Rear Admiral Stitt has recently been promoted to the rank of rear admiral as an official recognition of his services to the Medical Department of the Navy and to the scientific world during the course of the last 29 years.

Rear Admiral Stitt's many years' experience as a teacher in the laboratory of the Naval Medical School, Washington, D. C., and his association with students at the Jefferson Medical College, Georgetown University, and George Washington University have made him peculiarly well qualified to impart instruction in a simple and lucid style.

A MANUAL OF CLINICAL DIAGNOSIS, BY MEANS OF LABORATORY METHODS, FOR STUDENTS, HOSPITAL PHYSICIANS, AND PRACTITIONERS, by *Charles E. Simon, B. A., M. D.* Ninth Edition. Lea & Febiger, Philadelphia and New York, 1918.

In general this book attains a high standard of usefulness, and the fact that a ninth edition has been called for is no small tribute to

the value of the book. It would be ungenerous to allude to minor defects but for the fact that by mentioning oversights or inaccuracies these may be corrected in a possible tenth edition. Four types of pneumococci are mentioned, but the methods of determining and differentiating them are not given. No mention is made of the different types of meningococci nor of the Dryer technique for determining typhoid and paratyphoid infections. In discussing the Wassermann test on cerebro-spinal fluid the author does not state whether he inactivates the fluid or not. In the description of the preparation of amboceptor the injection of animals is described, but it is not stated whether the injection is given intravenously, intraperitoneally, or subcutaneously. The term typhoid serum is used when presumably antityphoid serum is meant. The author has not always followed the usually accepted authorities in the matter of nomenclature; thus he speaks of *Plasmodium immaculatum* instead of *Plasmodium falciparum*, and of *Uncinaria americana* instead of *Necator americanus*. In the study of gastric contents no mention is made of the "fractional method." The duodenal contents are not considered.

THE TREATMENT OF WAR WOUNDS. By *W. W. Keen, M. D., LL.D.* Second edition. W. B. Saunders Co., Philadelphia, Pa., 1918.

The book has been considerably enlarged and improved since the appearance of the first edition last year. It now forms a compact, practical handbook reviewing the principal features of modern war surgery.

THE SERIOUSNESS OF VENEREAL DISEASE. By *Sprague Charleton, M. D., F. A. C. S.* Paul B. Hoeber, New York, 1918.

This small but beautifully prepared volume is a reprint of a limited edition arranged by the author as a gift for Base Hospital No. 48. It contains 26 pictures of syphilitic manifestations, each accompanied by a few words of text. At the end are instructions to men having gonorrhoea and syphilis. As a sample of the bookmaker's art this little volume is admirable. Considered, however, as a contribution to the campaign against venereal disease, its value is questionable. The object of all instruction and education should be toward the cultivation of purity, continence, and self-control. Without these restraints, fear of the consequences acts only during the absence of serious temptation or leads to irregular methods of sexual gratification in which risk to health is supposed to be less. On the other hand, the wisdom of giving this book to a patient having a venereal disease may be questioned because so many of them have an exaggerated horror of their predicament.

THE MEDICAL REPORT OF
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THE MEDICAL REPORT OF THE RICE EXPEDITION TO BRAZIL. By *W. T. Councilman, M. D.*, and *R. A. Lambert, M. D.* From the School of Tropical Medicine, Harvard University. Cambridge. Harvard University Press, 1918.

An interesting account of an expedition primarily undertaken for a study of physical geography, especially that of the region between the Rio Negro and the Orinoco River. Owing to the extremely low water in the Rio Negro the original intention could not be fully carried out. The report contains a chapter on the Amazon Valley. Speaking of the Indians of the Rio Negro, the report says:

Certain of the customs are also to the advantage of the male, as when a woman gives birth to a child the father goes through a period of rest in his hammock and receives delicacies and congratulations.

The valley of the Amazon is the most unchanged and unchanging great region on earth. * * * The population is on the highway of the watercourses. * * * Apart from the Indians the population is a heterogeneous mixture. * * * There is a steady immigration of Portuguese, who form an industrious, hard-working population, and do most of the work. The population in the cities is extraordinarily varied, for the wealth coming from the rubber industry has attracted immigrants from the entire world. * * * Certain trades fall into the hands of different nationalities; the sale of dry goods by peddling is in the hands of the Armenians, and the very extended trade of prostitution is chiefly conducted by the Poles.

In addition to rubber the region produces gutta-percha, sarsaparilla, tobacco, sugar, cacao, mandioca, piassaba fiber, nuts, and a variety of forest products, among them many valuable drugs. The chief exports are rubber, nuts, and sarsaparilla. The great wealth of the region, which has hardly been touched, lies in the timber, and as a source of natural wealth this can hardly be destroyed. There are many difficulties which lie in the way of its exploitation, the chief of these being the great variety of the growth. All of the wood has value as timber, but the character differs so greatly that the unsorted lumber could not be used for a common purpose, not even for the production of wood pulp. Doubtless, however, the time is approaching when the demand for lumber, with the rapidly decreasing supply, will compel the world to draw upon this seemingly inexhaustible source.

"Much of the life is inimical or certainly unfriendly to man." The unprovoked attack on a man by the jaguar is unusual. The boa constrictor, though rare, has been known to attack man. Among poisonous reptiles are the rattlesnake, the coral snake, and the jacaraca. Mention is made of an ant an inch or more in length, found chiefly in the forests, whose sting produces great pain and prostration and sometimes death. This is the Tucandera or conga. Of the "foraging ants" the most interesting is the Saüba or leaf-cutting ant, which carries sections of leaves to its nest. After the material has been prepared by chewing, it provides a soil for the growth of a fungus, which constitutes the ant's favorite food. It excavates long tunnels in the earth, with communications extending hundreds of feet, and

throws up mounds of earth several feet high. Nests are formed in the trees. Some species are winged.

The region is characterized by a small biting fly, 2 to 3 mm. in length and $\frac{1}{2}$ mm. in breadth. Protection from the bite can be obtained only by close-meshed head nets and gloves. This fly is known as the pium and to it are ascribed the ulcers so common in this region. A more tormenting insect than the pium is the larval form of a species of Trombididea. It has a soft body, with 6 legs provided with claws and a powerful hypostoma, which it drives into the skin. It is so small as to be barely visible to the naked eye and is bright orange in color. The sting produces no irritation at the moment but later an indurated wheal several centimeters in diameter forms.

The small towns of the upper Amazon are usually situated on high ground and appear comparatively healthy, the malaria being milder than that seen on the lower Rio Negro.

In discussing malaria on the Rio Negro, 3 general types of infection are recognized: (1) An infection characterized by the presence of numerous parasites in the blood with little or no disturbance in health, especially in children under 10 years; (2) a chronic infection showing moderate anemia, weakness with considerable splenic enlargement. There is an absence or scarcity of organisms in the circulating blood. This corresponds to the so-called "malarial cachexia" of many writers. It is a predominating type in the Amazon region; (3) the ordinary type of infection as we see it in susceptible people from the temperate zone who visit the Tropics.

Chronic malaria is extremely prevalent in the Amazon Valley. Acute and malignant malaria was not observed by the Rice Expedition, but it is said to exist. Of the cases examined, only 7.2 per cent showed organisms in the circulating blood. No quartan forms were found.

Leprosy is widespread. No cases of yaws or filariasis were seen. Ulcers are extremely common and have recently acquired greater interest through the discovery in them of Leishmania. The accepted mode of treatment consists of intravenous use of tartar emetic.

CLINICAL DIAGNOSIS. A MANUAL OF LABORATORY METHODS, by James Campbell Todd, Ph. B., M. D. Fourth Edition. W. B. Saunders Co., Philadelphia, Pa., 1918.

A work of over 600 pages filled with illustrations of unusual merit.

DISEASES OF THE MALE URETHRA, INCLUDING IMPOTENCE AND STERILITY, by I. S. Koll, B. S., M. D., F. A. C. S. Illustrated. W. B. Saunders Co., Philadelphia, Pa., 1918.

The type, paper, and illustrations are of the high order which characterizes Saunders's publications. Besides many new drawings,

illustrative of the text, the revelations of confusion has arisen as on pages 80 and 81 and

The chapters on gonorrhea, and on tumors of the urethra, are of material not commonly found

The author claims that from 5 to 10 days, prior to the discharge has begun in 20 days, he is doing well known.

He puts his patient to drink 15 to 25 glasses of bicarbonate of soda. Albargin are made throughly sterilized as a 1 per cent base, with glycerin added for 15 minutes, and then this material should be used.

If the patient can not take injections of procaine strength and twice a week treatment includes folic acid water. If the germicidal treatment has failed, necessarily, a proof of the germs are found after several times a day. Examinations have been made "preferably a glass of water followed the alcohol of the penis, an anterior

Next morning examination has been effected. No form a favorable opinion sketchiness and lack of confidence and unconvinced. Advice, regarding procedure he has to offer in connection and without a guide. Hence to surgical treatment

high. Nests are formed in all biting fly, 2 to 3 mm. in diameter from the bite can be obtained on gloves. This fly is known as the common in this region. The pupa is the larval form of a body, with 6 legs provided which it drives into the skin. It is seen to the naked eye and is bright red with no irritation at the moment of insertion. It is 1 to 2 millimeters in diameter forms. The pupae are usually situated on the body of a healthy, the malaria being absent.

There are, 3 general types of infection characterized by the presence of (1) a little or no disturbance in the system; (2) a chronic infection with considerable splenic enlargement; (3) a malarial type in the Amazon region as we see it in susceptible individuals who visit the Tropics.

The author's experience in the Amazon Valley is based on observations by the Rice Expedition. Of 1000 individuals examined, only 7.2 per cent were found to have malarial parasites. No quartan forms were observed. Filariasis was seen in 10 per cent. Recently acquired greater infection by Leishmania. The accepted treatment is the use of tartar emetic.

BY METHODS, by James Campbell
W. B. Saunders Co., Philadelphia,

with illustrations of unusual

IMPOTENCE AND STERILITY, by I. S.
W. B. Saunders Co., Philadelphia,

of the high order which
Besides many new drawings,

illustrative of the text, there are numerous colored plates to illustrate the revelations of the endoscope. It is unfortunate that some confusion has arisen as to the nomenclature of the instruments shown on pages 80 and 81 and referred to on pages 80 and 86.

The chapters on nongonorrheal urethritis, on the history of gonorrhea, and on tumors of the urethra are interesting and include material not commonly found in other works.

The author claims to cure 60 per cent of his gonorrhea patients in from 5 to 10 days, provided he can see them within 24 hours after the discharge has begun. If he can cure 30 per cent of his patients in 20 days, he is doing well and his methods deserve to be made known.

He puts his patient to bed for 48 to 72 hours and directs him to drink 15 to 25 glasses of water in 24 hours, and teaspoonful doses of bicarbonate of soda are given for ardor urinæ. Instillations of albargin are made three or four times a day. The albargin, administered as a 1 per cent ointment, with gelatin and tragacanth as a base, with glycerin added for hygroscopic effect, should be retained 15 minutes, and then a swab made with a toothpick and coated with this material should be placed within the urethra for 15 minutes. If the patient can not endure the smarting of the albargin he should take injections of protargol solution twice a day, using 2 per cent strength and twice using a strength of $\frac{1}{2}$ to 1 per cent. The treatment includes frequent immersion of the penis in very hot water. If the germs of gonorrhea are found after 24 hours this treatment has failed, but if the germs are not found this is not necessarily a proof of success, since they may appear later. If no germs are found after 24 to 36 hours, stop the injections, but look several times a day for gonococci. When the bacteriological examinations have been negative for 24 hours give the alcohol test, "preferably a glass of beer or ale." No disastrous results having followed the alcohol test, wait a couple of days and then massage the penis, an anterior sound having been passed.

Next morning examine the secretion, and if it is negative a cure has been effected. No one reading Dr. Koll's book could fail to form a favorable opinion of the author's ability, but there is a sketchiness and lack of detail throughout which leaves one dissatisfied and unconvinced. The author concentrates into 52 lines all the advice, regarding preparation, operation, and after treatment, which he has to offer in connection with external urethrotomy, both with and without a guide. It would have been better to omit all reference to surgical treatment than to give only such a bare outline as

would scarce suffice to direct the beginner and yet would be superfluous for the expert.

APPLIED ANATOMY. THE CONSTRUCTION OF THE HUMAN BODY CONSIDERED IN RELATION TO ITS FUNCTIONS, DISEASES, AND INJURIES, by *Gwilym G. Davis, M. D., LL. D.* Fifth Edition. J. B. Lippincott Co., Philadelphia, Pa., 1918.

A beautiful volume whose author has been more successful than is common in attempts to combine the teaching of anatomy and surgery. The drawings which illustrate surface anatomy are particularly instructive. A man may know his anatomy, both by the book and by the subject, and yet sometimes be confused, unable to tell his way about amid the muscles and bones, baffled by their cutaneous covering.

NAVAL HYGIENE, by *James Chambers Pryor, A. M., M. D.* P. Blakiston's Son & Co., Philadelphia, Pa., 1918.

The author is to be congratulated upon having accomplished the object which he set for himself, namely, to produce a "student's manual of elementary character." Few of the so-called manuals with which the book market is overstocked to-day can rival Commander Pryor's book, which is eminently clear, concise, and to the point and yet singularly complete and satisfying for a book of its size. It is only the author's modesty which characterizes as "elementary" the material presented. It would be hard to suggest any line for comprehensive alteration or improvement. Among the special features of the book may be mentioned (1) the appendix, which gives the principal instructions to be observed in recruiting, in preparing health records, descriptive lists, finger prints, etc.; (2) a glossary of nautical terms employed; (3) the ready methods of calculating percentages and averages and rates of sickness for official statistical returns; (4) a complete index covering 34 pages. Of special interest, also, are the chapters on aviation, submarines, and diving.

The book is eminently practical. It gives just enough and not too much for the medical officer who has to face the daily problems of life on board ship. While it will be a boon to the young medical officer making his first cruise, there is a vast amount of valuable information, culled from many sources, as well as from the varied experiences of the writer, which will have great interest for every member of the profession. The numerous illustrations not only subservise the intended purpose to elucidate the text but throw interesting and vivid sidelights on life afloat under the flag. (Medical officers may obtain this book by requisition on the Naval Medical Supply Depot, Brooklyn, N. Y.)

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OF THE HUMAN BODY CONSIDERED IN AND INJURIES, by *Gwilym G. Davis*, Lippincott Co., Philadelphia, Pa., 1918.

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Author, A. M., M. D. P. Blakiston's Son

and upon having accomplished the purpose, namely, to produce a "student's

Few of the so-called manuals stocked to-day can rival Compton's. It is clear, concise, and to the point and satisfying for a book of its class. Its style which characterizes as "elementary." It would be hard to suggest any improvement.

Among the features mentioned (1) the appendix, (2) the points to be observed in recruiting, (3) the positive lists, finger prints, etc.; (4) the employed; (5) the ready methods of diagnosis and rates of sickness for officers. A complete index covering 34 pages. Chapters on aviation, submarines,

1. It gives just enough and not too much. Who has to face the daily problems of the war will be a boon to the young medical officer. There is a vast amount of valuable material, as well as from the varied sources, will have great interest for every officer. Numerous illustrations not only illustrate the text but throw interesting light upon the subject under the flag. (Medical officers interested in the Naval Medical Supply

A TEXTBOOK OF ELEMENTARY MILITARY HYGIENE AND SANITATION, by *Frank R. Keefer, A. M., M. D.* Second Edition, Revised. W. B. Saunders Co., Philadelphia, Pa., 1918.

A nontechnical presentation of the topic has long been needed and this work fully meets the requirements. Being intended not for medical officers or members of the Hospital Corps but primarily for officers and men of other branches of the military establishments, the strictly medical topics have been lightly touched upon, while matters that should be generally known are discussed in greater detail. Excellent judgment has been shown in making this distinction in the language employed, in the illustrations, and in the size of the book. It does not seem unreasonable to require the mastery of its contents by all officers entrusted with the command of troops. In spite of the repeated lessons from previous campaigns, military and naval men are slow to grasp the extreme importance of hygiene and sanitation for the successful issue of their enterprises. Though it may be far off, the day is undoubtedly coming when the loss of from 5 to 20 times as many men from disease as from wounds will be as discreditable to those in command as a fault in strategy; when to permit any considerable proportion of one's available force to be made unavailable, through preventable sickness, will be held as criminal as to permit them to lose their lives through failure to afford adequate protection in trench, bomb-proof, and turret.

TROPICAL SURGERY AND DISEASES OF THE FAR EAST, by *J. R. McDill, M. D., F. A. C. S., Major, Medical Reserve Corps, U. S. A.* C. V. Mosby Co., St. Louis, Mo., 1918.

The author has collected and, under a misleading and inappropriate title, presents to the reader in a most attractive way many facts of interest regarding tropical diseases. His personal observations and suggestions are valuable. The illustrations are profuse and derived either from the author's collections or periodical literature. Without having much to say about surgery and without in any sense exhausting the topic of tropical diseases, the book still deserves a place in the library of a doctor going to the Far East.

THE SUBMARINE IN WAR AND PEACE. ITS DEVELOPMENTS AND ITS POSSIBILITIES, by *Simon Lake, M. I. N. A.* With 71 illustrations and a chart. J. B. Lippincott Co., Philadelphia and London, 1918.

This is the history of the development of the submarine from the time of David Bushnell's quasi achievement to the present time, written in a singularly interesting style, free from technicalities. Ample space is devoted to the achievements of Mr. Holland. The author's experiences when endeavoring to get an audience with a former Sec-

retary of the Navy are amusingly set forth. The concluding chapters deal with the future of the submarine.

Mr. Lake pleads the cause of the inventors and inveighs against the skepticism and indifference of the world, though he magnanimously alludes to the professional handicaps which prevent the naval officer from taking up new inventions with proper avidity, but this narrative is itself the best justification of the hesitation felt by the general public about backing an inventor. The failures, the narrow escapes, the forgotten essentials that mark the progress of some great achievement, from its conception as an idea to its birth and later development into a device of commercial value, may well give the financier pause. The utter unreliability of the inventor has been appreciated by every form of government. The bold imaginative and creative powers of the inventor are the very antithesis of the nicely calculated and meticulous operations of ordinary business. For a military man, who, to justify his control of men and his leadership, must be regarded as eminently practical and reliable, the espousing of so doubtful a proposition as a new invention, is to put in jeopardy the most valuable asset of his professional reputation.

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ANNOUNCEMENTS.

Mr. Herbert Putnam, the Librarian of Congress, and General Director of the Library War Service, American Library Association, has asked the **Bulletin** to give publicity to the following facts about the work of the Library War Service.

In a period of 7 months

- 1,271,800 books have been shipped to 39 large camps, where there are trained librarians and 36 library buildings;
- 185,000 books to 211 small camps;
- 130,000 books to 111 naval stations;
- 30,000 books to 111 vessels;
- 20,000 books among 81 hospitals—Army and Navy;
- 200,000 books for use on transports and overseas.

Thus 2,000,000 gift books have been sent out through 600 agencies.

In addition to all this, 350,000 new books, mainly technical, have been purchased and put to use.

The subjects covered range from fiction, poetry, history to technical and scientific works.

If there is any ship, camp, hospital or station without a supply of suitable reading matter for the men, send the following data to the Library War Service Headquarters, Library of Congress, Washington, D. C.:

- Name and address of camp (or vessel);
- Kind of camp (or vessel);
- Approximate number of men in camp (or on board);
- What agencies are supplying reading matter and to what extent;
- What local library, if any, is cooperating;
- How many and what kind of books are needed;
- How many magazines are needed;
- Where will reading matter be housed;
- Who should be notified when books and magazines are shipped;
- Will he arrange for the circulation of this reading matter throughout the entire camp (or vessel).

There is no red tape about getting the books; men in charge will be asked to keep simple records, instructions for which are furnished with each library.

There has recently been organized in New York a society called the American Defense Society, with headquarters at 44 East Twenty-third Street, New York, which counts among its officers an ex-Presi-

dent of the United States, an ex-Attorney General, an ex-Secretary of the Treasury, an ex-ambassador to Germany, an ex-ambassador to France, and other notables.

The specific purpose of this organization is to replace in the American market all articles manufactured in Germany by articles manufactured in America or elsewhere. The following is the pledge of membership, which we consider a comprehensive arraignment of Germany for its high crimes and misdemeanors:

That I may not directly contribute financial aid to the German military policy with its disregard of international law, its attacks on unfortified towns, its massacres of the innocent and the helpless, its enslavement of peoples, its use of poison gas and flames, its ignoring the Red Cross badge, its bombing hospitals, and its torpedoing defenseless merchant ships,

I pledge myself never to buy any article made in Germany.

A new magazine has recently made its appearance abroad. The first number of the

REVUE INTERALLIÉE POUR L'ÉTUDE DES QUESTIONS INTÉRESSANT LES MUTILÉS DE LA GUERRE

bears the date of April, 1918. It is the official organ of the Permanent Interallied Committee for collection, classification, and dissemination of information relative to the rehabilitation of the wounded. Dr. Bourrillon is president of this committee. The editor of the review is Dr. J. Camus, 102 Rue du Bac, Paris.

With Ales Hrdlicka as editor, and apparently under the auspices of the Smithsonian Institution, the first number of the

AMERICAN JOURNAL OF PHYSICAL ANTHROPOLOGY

has recently made its appearance. The preface is an attempt to justify the "establishment of a new scientific journal. * * * at this critical period." The other articles are:

Hrdlicka, Ales: "Physical anthropology: Its scope and aims."

Miller, G. S., jr.: "The piltown jaw."

Hooton, E. A.: "On certain Eskimoid characters in Icelandic skulls."

Holmes, W. H.: "Organization of the Committee on Anthropology of the National Research Council, and its activities for year 1917."

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NOTICE TO SERVICE CONTRIBUTORS.

When contributions are typewritten, double spacing and wide margin are desirable. Fasteners which can not be removed without tearing the paper are an abomination. A large proportion of the articles submitted have an official form such as letterheads, numbered paragraphs, and needless spacing between paragraphs, all of which requires correction before going to press. The BULLETIN endeavors to follow a uniform style in headings, and captions, and the editor can be spared much time and trouble and unnecessary errors can be obviated if authors will follow in the above particulars the practice of recent issues. This is not only important in special articles but still more so in reviews. For example, an article by P. A. Surg. G. Alen, U. S. N., on Removal of the Gasserian Ganglion, should be headed as follows:

Removal of the Gasserian Ganglion.

By G. Alen, Passed Assistant Surgeon, United States Navy.

If a review is submitted of an article by J. E. Thompson, M. B., B. S. (Lond.), F. R. C. S. (Eng.), F. A. C. S., Galveston, Tex., Professor of Surgery, University of Texas, entitled "A Study of Modern Operations in Hypospadias from an Anatomical and Functional Standpoint," appearing in Surgery, Gynecology, and Obstetrics, Volume XXV, No. 4, October, 1917, the following heading would conform to the usage of the BULLETIN in recent years:

Thompson, J. E. Modern Operations for Hypospadias. Surg., Gynec., and Obst. October, 1917.

The author's initials are important, not so his titles. If the reviewer is not familiar with the exact abbreviation employed by the Index-Catalogue of the Surgeon General's Library and the style adopted by the American Medical Association Press, it is best to write the name of the periodical in full.

The greatest accuracy and fullness should be employed in all citations, as it has sometimes been necessary to decline articles otherwise desirable because it was impossible for the editor to understand or verify references, quotations, etc. The frequency of gross errors in orthography in many contributions is conclusive evidence that authors often fail to read over their manuscripts after they have been typewritten.

Contributions which require illustration must be received two months prior to the date of the issue for which they are intended.

Only the names of actual reviewers for a current number appear.

The BULLETIN prints only original articles, translations, in whole or in part, and reviews and all original contributions are accepted on the assumption that they have not appeared previously and are not to be reprinted elsewhere without an understanding to that effect.

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