VOL. XII NO. 3

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
MEDICAL INSPECTOR J. S. TAYLOR, U. S. NAVY
IN CHARGE

JULY, 1918

(QUARTERLY)

WASHINGTON
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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 I, No. 1, April, 1907.
Volume I, No. 2, July, 1907.
Volume II, No. 1, January, 1908.
Volume VII, No. 3, July, 1913.
Volume VIII, No. 3, July, 1914.
Volume IX, No. 2, April, 1915.
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 part 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.

THOMAS YOUNG, M. D., 1773–1829.

Reproduced from an engraving of the portrait by Sir Thomas Lawrence, R. A., by kind permission of John Murray, London.

U. S. NAVAL MEDICAL BULLETIN.

VOL. XII. JULY, 1918. No. 3.

SPECIAL ARTICLES.

PLAN AND DESCRIPTION OF A FLEET HOSPITAL SHIP.

By E. M. BLACKWELL, Medical Inspector, United States Navy.

In designing a hospital ship, probably the most essential feature is the proper grouping and arrangement of the various compartments, coordinating the ship's work so that it can be carried on with the greatest convenience to all and with as little loss of time, space, and motion and with as few assistants as possible. The designer must have a broad perspective and not be prejudiced in favor of one branch or specialty in medicine or surgery to the detriment of another and thus inclined to provide most generously and adequately for one while making insufficient provision for another. We know how prone the various specialists are to consider their own particular specialty the most important of all, and for this reason the grouping and arrangement of the various rooms and compartments in a hospital or hospital ship should be left to some one who has a good general knowledge of the requirements of each of the special branches and can view and provide for each adequately and impartially without detriment to the others. He can then call on the specialists to assist in working out the details of the various divisions.

The construction and arrangement of a hospital ship is very different from that of a hospital. There is just so much space available in the ship, and that space is confined to the limits of the hull and deck houses above it, and one can not add wings or extend the ship and give it any shape or arrangement desired, as can be done with hospitals, while even simple changes are much harder to effect. The compartments must be smaller and wards and berthing spaces more crowded and congested, and hence natural ventilation and light are not so good as in hospitals.

The various necessities and details of the arrangement of a hospital ship can only be taken in collectively and properly coordinated, so as to make for convenience and prevent loss of time, space, and motion in carrying on the work, after long practical experience in the actual workings of a hospital ship in active service, and through practical familiarity with the work, duties, and requirements that must be met and accomplished. Theoretical knowledge can not

take the place of practical knowledge and experience in designing and constructing a hospital ship. It is a well-known fact that many business enterprises, such as factories, hotels, hospitals, etc., have been financial failures or have had to have extensive alterations made on account of the inconvenient arrangement of the buildings and the consequent increase of work and expenses and the delays and loss of time in carrying on the work. This applies with equal or more force to a hospital ship and the greatest of care should be exercised by the designer in having the various compartments, wards, operating rooms, laboratories, offices, galleries, mess rooms, pantries, toilets, and storerooms conveniently arranged and heated so that the work can be carried on with a minimum of delay, exertion, attendants, and expense and with the greatest convenience to all.

The accompanying plans have been worked out after over eight years' close study of the subject and five years of practical work and experience on a hospital ship under varying conditions of active service with the fleet. In the last year, owing to the great expansion of the Navy and the consequent sickness and epidemics among the recruits, nearly as much work was done on board the only hospital ship of the Navy at the time as was accomplished by it in seven years previous. The services and duties required of the hospital ship have been considered from about all of the different standpoints and nothing that is practicable has been left out of the plans that would add to the better care, treatment, comfort, and contentment of the patients, officers, and crew of the ship. Experience has shown about how many patients should be provided for on a hospital ship in ordinary times of peace and also during the great expansion of the Navy in the present war, and these requirements have been amply met, with a good margin for greater emergencies, in the plans presented herewith.

A large hospital ship is not so desirable as two medium-sized ones from the fact that the larger one would scarcely ever be filled to near its capacity, except occasionally for short periods during wars or epidemics, and then should be supplemented by sufficient ambulance ships to relieve the congestion and carry the patients to base hospitals, where they should be treated rather than on hospital ships. A very large ship would be expensive to run with a few patients aboard and could only be in one place at a time, and if it became necessary to lay it up for repairs there would be no relief for it, whereas two hospital ships could serve at different points and with different fleets at the same time and act as reliefs for each other, so that the fleet would never be without a hospital ship in attendance. Hospital ships with normal capacities of about 200 beds for the sick when the berths are not superimposed, of 400 when superimposed, and of about 500 when filled to capacity would meet the require-

ments of the service better than larger ships. The hospital ship generally has a large out-patient clientèle, but at least three-fourths of its work is on patients regularly admitted to the sick list of the ship, so the comfort, care, and treatment of those on board should be the first consideration.

As the hospital ship is for the sole purpose of caring for the sick and wounded, the arrangement of the medical department of the ship, as approved by the Bureau of Medicine and Surgery, should be strictly adhered to by the constructors and should not be changed in any respect unless it interferes with the structural strength of the ship. As in hospitals, there should be no unnecessary ornamentation and filagree work; but everything should be plain and simple, and there should be as few cracks, corners, angles and dead spaces as possible to harbor dust, dirt, vermin, etc., and interfere with keeping the ship clean and sanitary.

In arranging the medical department of this ship it has been the endeavor to leave sufficient space for all that is necessary in the deck and engineer departments of the ship; but as the sole purpose of the ship is the care and treatment of the sick and wounded the maximum of space should be assigned to the medical department. Whenever there is any question as to the use of space for the various departments, preference should be given to the medical department unless it would interfere very materially with the running of the ship or its structural strength and features. An attempt has been made to group rooms and compartments that have a good deal in common close and conveniently to each other, so that time will not be lost in communication, and also to have easy and convenient communication between the various parts of the same deck and between the different decks, as nothing makes for delays and inefficiency more than bad communications, which are often the cause of failure in the management of affairs.

The accompanying plans are necessarily imperfect and incomplete, as, not being a naval architect or draftsman, the writer has not the technical ability to make working plans of the ship. They are sufficiently plain, however, to show the naval constructor just what arrangement of the various compartments should obtain in the medical department and berthing spaces, and there has been as little interference with the navigating and engineer departments as possible, while at the same time making the plans and the relations of the various departments intelligible. The plans have been drawn to scale and sufficient space has been given to each room and compartment for the installation of all necessary apparatus and equipment and for the work to be carried on therein and the various uses required of them. After the various rooms and compartments are satisfactorily planned, the installation of the equipment is comparatively easy.

GENERAL CHARACTERISTICS OF THE SHIP.

The general characteristics of the ship, in accordance with the plans, should be about as follows:

Length over all	feet..	435
Length, water line	do....	420
Beam	do....	55
Depth of hold	do....	40
Draft, loaded	do....	21
Displacement, about	tons ..	8,500
Engines (turbine), electric drive.		
Speed, cruising	knots..	15
Speed, full power	do....	18
Cruising radius, about	miles..	8,000
Fuel, oil, about	gallons..	250,000

The ship will have four decks in the hull, including the hold, two above and two below the water line, and four decks above the hull, including the bridge and top of the deck house, making eight decks in all, six of which will be above the water line, thus making the living spaces light and airy. The ship will be high out of the water, which will necessitate the stowing of heavy cargo weights and ballast below to keep it steady. Some of the oil and water tanks might be arranged to act as antirolling tanks, which, I understand, have given satisfaction in passenger ships. I am informed that gyroscopes in vessels as stabilizers are of doubtful utility and that few passenger ships have them, their utility not having been satisfactorily proved in those ships in which they have been installed. In view of this and the additional expense and difficulty of installation, the space taken up, the extra power required for it, as well as the expense of maintenance, the installation of one in this ship has not been contemplated. If, however, it were desired to install one, the space occupied by some of the after oil tanks could be used for that purpose, but this would decrease the cruising radius of the ship.

Bridge deck.—The bridge is located over the pilot house, the chart room, and the navigator's storeroom, and is half a deck above the rest of the deck, which extends over the commanding officer's and master's cabins and quarters and the deck and engineer officers' mess room and quarters. This deck is 28 feet wide and extends from frame 45 to frame 105. It has no inclosures or obstructions on it except the tops of two elevator shafts, the engine room and fireroom skylights, and two gravity tanks.

Boat deck.—This deck extends from frame 44 to frame 142, and between frames 49 and 133 it is the full width of the ship. The deck house, which is 28 feet wide, extends from frame 45 to frame 105 and contains the following compartments from forward aft: Pilot house with chart room and navigator's storeroom adjoining, half a deck above the rest of the deck; the master's cabin with stateroom, toilet

pantry, and yeoman's office adjoining; the commanding officer's cabin with stateroom, toilet, and pantry, with wireless office forward of pantry. Then come the first officer's and the chief engineer's quarters, each with a small office adjoining. On one side of the fireroom uptake is the ship's officers' pantry and on the other a toilet and small mess storeroom. On each side of and aft of the engine room uptake are the ship's officers' staterooms, 10 in all, with a toilet and small country between. This deck has communications with the decks below by two elevators and two inside stairways and four outside ladders. An elevator and a stairway are located in the passageway between the commanding officer's and the master's quarters between frames 55 and 63, and also another between the first officer's and chief engineer's quarters between frames 74 and 76. They run from top to bottom of the ship and give excellent access to the various decks.

On each side of the deck house there is an open deck 18 feet wide on which most of the boats are stowed. The boats contemplated for this deck are two 35-foot motor boats, two 33-foot motor sailing launches, two 33-foot sailing launches, four 30-foot cutters, four 30-foot whale boats, one 21-foot motor dory, and one 21-foot dinghey, together with as many life rafts as may be necessary, which can be stowed on the after part of the deck. In addition there will be two 40-foot motor-ambulance boats stowed on the forward deck below. Attention is directed to the fact that the heavier boats are located where they can be handled with the winches and booms. These boats and rafts will be capable of accommodating all the officers, men, and patients in case of "abandon ship."

Superstructure deck.—This deck extends the full length and breadth of the ship. From the bow to the deck house at frame 45 is an open deck, the forecastle deck, on the after part of which two ambulance boats will be stowed. This deck will furnish an excellent place for exercise and recreation for the crew and patients in good weather. The deck house begins at frame 45 and extends aft to frame 104, where there is a break between it and the isolation wards, which begin at frame 113 and extend aft to frame 132, where there is a 6-foot passage, aft of which are 2 detention rooms and a space for laboratory animals. The deck house is 36 feet wide, and on each side is a covered promenade deck 9 feet wide, which will be excellent for exercise and recreation. This deck communicates with the deck below by eight ladders and a companionway on the forecastle.

The compartments of the deck houses will be named in order from forward aft. The main operating room, etherizing room, wash room dressing and recovery room, sterilizing room, lobby, and elevator occupy the space from frame 45 to frame 58. The operating room is 35 feet long by 18 wide and 12 high. It will be equipped with two

operating tables and all other necessary apparatus. It has 11 large ports, which will give all the natural light and ventilation desired. It opens out into a lobby, into which open the etherizing room, the wash room, the recovery and dressing room, the sterilizing room, and the elevator, which makes all of these rooms very convenient to the operating room.

Abaft of these rooms is a 6-foot athwartship passage, and then come the sick officers' quarters from frame 60 to frame 78. These quarters comprise eight rooms, each 9 feet by 12, and a mess and recreation room 30 feet long by 12 wide, with a wing on each side 9 feet by 12 running to the outer deck, thus giving through and through light and ventilation. The rooms will be equipped with hospital beds and other necessary furniture. These quarters open aft into a passage, into which open a pantry, room for hospital corpsmen in attendance, an elevator, and a toilet. The medical officers' pantry opens into this passage and extends aft along the right side of the fireroom uptake to the wardroom. The wardroom, or medical officers' mess room, is located between the fire and engine room uptakes. It is 12 feet by 35 and runs athwartship from one side of the deck house to the other, giving it excellent through and through light and ventilation. There are 10 rooms for medical officers located between the wardroom and the after end of the deck house, with a small country between them into which open the rooms and the toilets. The executive surgeon has a private toilet attached to his quarters.

At frame 104 there is a break in the deck house to frame 113, where the isolation wards begin. There are six of these wards in all, each with a separate toilet containing a water-closet, washbasin and shower bath. The two forward wards are 17 by 18 feet and have 14 beds each. The two middle wards are 11 by 18 feet and have 8 beds each. The after wards are 12 by 16 feet and have 8 beds each, making 60 beds in all. Abaft of these wards are 2 rooms for hospital corpsmen in attendance, a pantry, and a disinfecting and wash room. There is then a 6-foot athwartship passage abaft of which are 2 detention rooms for the observation of undetermined cases until the diagnosis can be fully determined. Three beds can be placed in each of these rooms if necessary.

It would appear at first that six wards and two detention rooms for contagious cases are too many; but experience has shown that this number is not excessive. There have been many instances where there were as many as six or seven different kinds of contagious cases aboard at the same time besides three or four undetermined cases, which should have been segregated. It would be impracticable to provide permanently as much space as is necessary to accommodate all the contagious cases in a severe epidemic; but provisions should be made for expanding in case of need. This expansion has been

PLANS FOR A FLEET HOSPITAL SHIP.

GENERAL DIMENSIONS.

Length, Overall.	435 Feet.
Length, Water line.	420 "
Beam.	55 "
Depth of Hold.	40 "
Draft, Loaded.	21 "
Displacement. About	8500 Tons.
Scale.	1 Inch = 24 Feet.

Arrows → denote ladders going down.

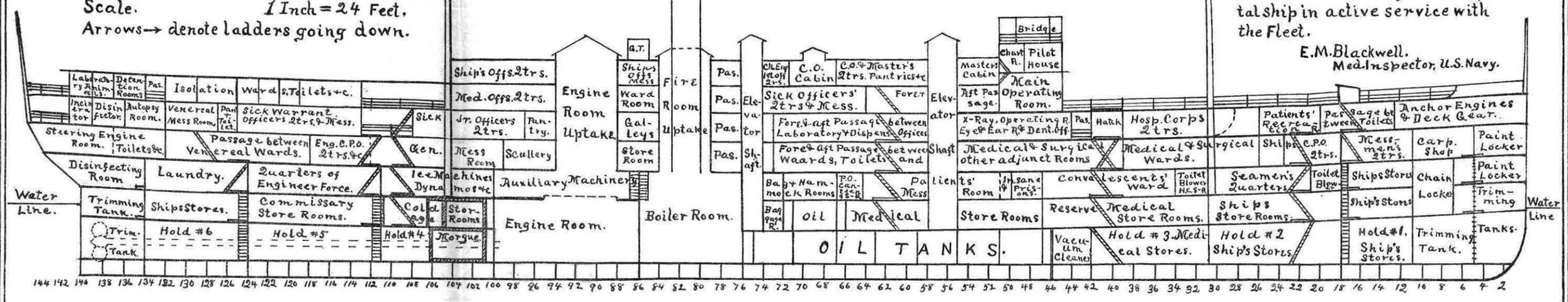
ENGINEER DEPARTMENT.

Engines.	Turbine or Electric Drive.
Speed. Cruising	15 Knots.
Speed. Full power	18 "
Cruising Radius. About	8,000 Miles.
Fuel. Oil. About	250,000 Gals.

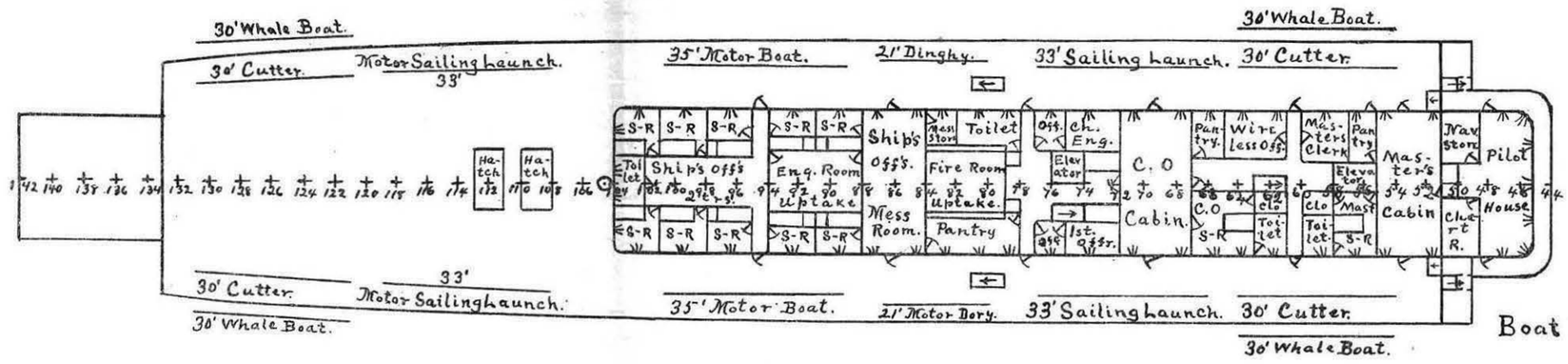
EXPLANATORY.

These plans have been worked out after careful study of the subject for over 8 years and after 5 years of varied experience and active duty on a hospital ship in active service with the Fleet.

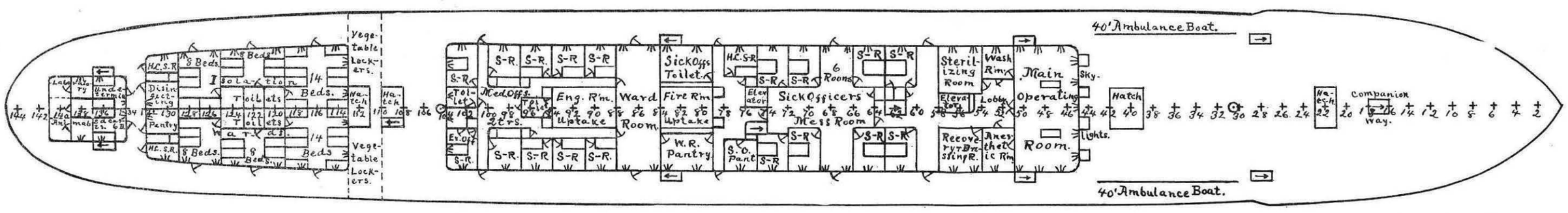
E.M. Blackwell.
Med. Inspector, U.S. Navy.



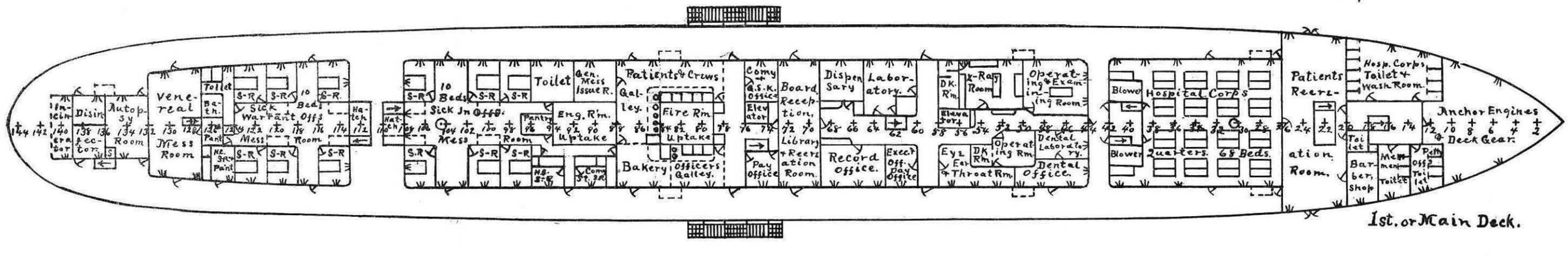
Inboard Profile.



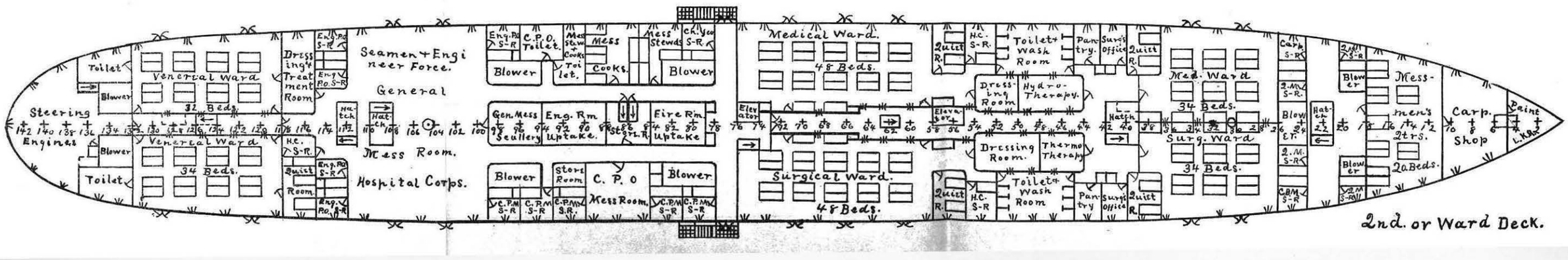
Boat Deck.



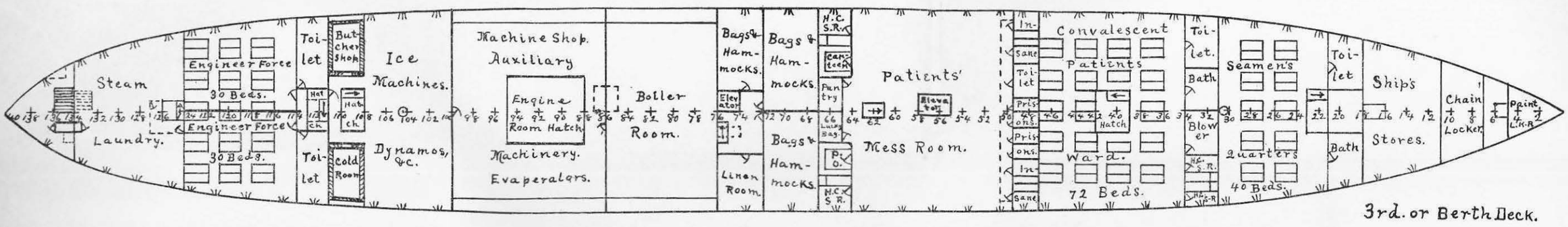
Superstructure Deck.



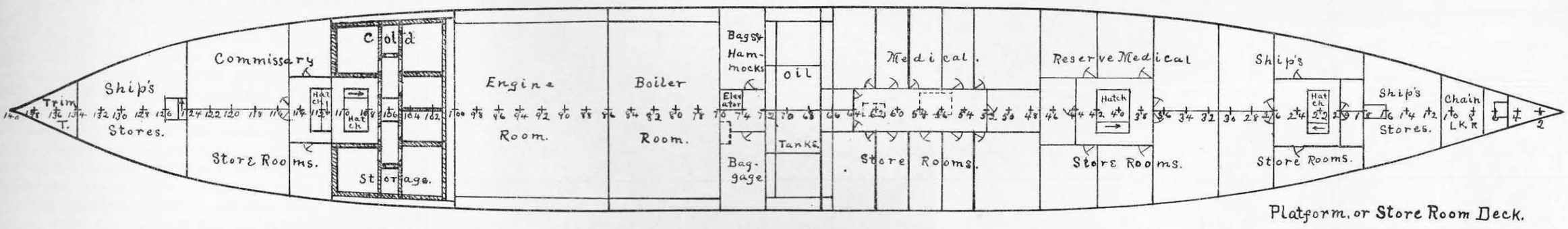
1st. or Main Deck.



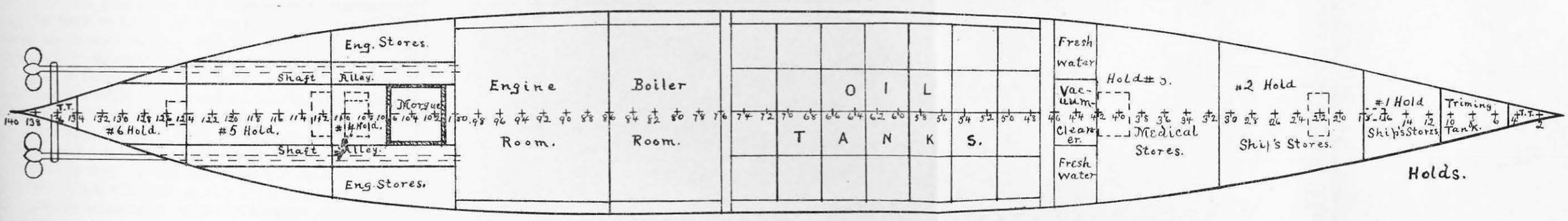
2nd. or Ward Deck.



3rd. or Berth Deck.



Platform, or Store Room Deck.



Holds.

BERTHING CAPACITES OF SHIP.

OFFICERS AND CREW.

MEDICAL DEPARTMENT.

Commanding Officer.	1
Medical Officers.	8
Supply Officers.	2
Chief Phar. Mates.	10
Chief Yeomen.	4
Pharmacist Mates.	90
Messman Branch.	40
Total.	155.

SHIP'S OFFICERS & MEN.

Master.	1
Deck Officers.	6
Engineer Officers.	6
Seamen Petty Officers.	12
Engineer Petty Officers.	10
Seaman Branch.	40
Engineer Force.	60
	135.

BEDS IN WARDS FOR SICK OFFICERS & MEN.

Officers.	28
Enlisted Men.	
Surgical Wards.	82
Medical & Special Wards.	86
Convalescents' Ward.	72
Venereal Wards.	66
Isolation Wards.	66
Extra Berthing Spaces.	100
	500.

Grand Total. 790.

E.M.B.
May. 1918.

58725—18. (To face page 252.)

provided for in these plans, as the venereal wards in the afterpart of the ward deck can be entirely and easily blocked off from the rest of the ship and mild contagious cases such as mumps and measles, which form the great majority of contagious cases, kept there. This would give 132 beds for contagious cases. Besides this 50 or 60 patients could be accommodated under awnings on the decks around the isolation wards, making accommodations for about 200 cases in all, which would probably meet nearly every condition. Two railings or screens 8 or 10 feet apart will run across the deck forward of the wards to keep contagious cases within their confines.

Abaft of the detention rooms is a space for laboratory animals consisting of two rooms for housing in cold weather, two runways outside, and a feed locker. On each side of this deck house is a ladder going down to a large disinfecting room on the next deck. Infected articles can be put down these ladders into the disinfecting room, from which there is a chute down to the laundry.

First or main deck.—The hull of the ship extends up to the deck above this one as far back as frame 28, where the sides of the ship are cut away from above and continue with this deck to the stern of the ship. The anchor engines and deck gear occupy the forward part of this deck back to frame 11, abaft of which to frame 20 come the toilets for the seamen petty officers and the messmen; and the barber shop and toilet on the right side and the Hospital Corps wash room and toilet on the left. From frame 20 to frame 26 the patients' recreation room is located. It is 18 feet wide and about 50 feet long, extending clear across the ship. It has large ports and doors at each end and a large hatch which will make it very light, airy, and comfortable, and an excellent lounging place for convalescent patients.

From the after bulkhead of the recreation room a covered gangway deck 9 feet wide extends along each side of the ship to the stern. The deck is wide enough to allow benches and chairs alongside the deck house for the accommodation of patients and leave plenty of room for a gangway.

The deck house on this deck is 36 feet wide, and in the forward part of it between frames 26 and 42 are the Hospital Corps quarters, containing 68 beds. This is a very light and airy compartment and would make an excellent ward, but it is very public and noisy, being located right under the winches and forecastle deck, where there is generally work going on and many hands are present. In the afterpart of the compartment is a large hatch with ladders to the deck below. On each side of this hatch is a blower room for ventilating the wards and other spaces below. Abaft of the Hospital Corps quarters is a 6-foot athwartship passage at each end of which will be installed an extension crane with a trolley for hoisting patients aboard in stretchers.

From frame 44 to 58 are located the dental rooms and eye, ear, nose, and throat rooms on the right side, and a small operating and examining room and the X-ray rooms on the left side. Between these rooms runs a fore and aft passage with a lobby and benches for patients and others who are awaiting their turns for examination, treatment, etc.

The dental rooms consist of an office with two dental chairs for operative work and a laboratory for other work. Both will be equipped with all the necessary apparatus. The office is 8 by 21 feet and the laboratory is 8 by 15 feet. Both have large air ports and each one has a skylight 3 feet square overhead, which will give excellent light for operative work.

The eye rooms consist of a general examining room which is 12 by 21 feet, a dark room for ophthalmoscopic examinations, which is 6 by 6 feet, and an operating room 11 by 12 feet for eye, ear, nose and throat operations. There is sufficient space here for installing all the necessary apparatus.

The small operating, cystoscopic and examining room is directly under the main operating room and is 15 by 18 feet. It will have one operating table and all other necessary apparatus and, in addition to its use for patients admitted to the ship, it will be very convenient and useful in examining and treating out-patients sent to the ship. It has two syklights, each 3 feet square, which will give excellent light and ventilation.

The X-ray room is just abaft the small operating room. It is 12 by 18 feet, and connected with it is a dark room 6 by 12 feet. The X-ray machine will be placed against the forward bulkhead next to the small operating room, so that wires can be run from the machine to tubes at the operating table, so that fluoroscopic examinations and even photographic plates can be made while the patient is undergoing operation. As the main operating room is just above, the wires could be extended to the operating tables up there and the fluoroscope used and plates taken. It is quite an advantage to have the X-ray machine near the operating room so that the fluoroscope can be used and plates taken, especially in fractures, dislocations, and gunshot wounds; but this is not a necessity. The X-ray room is placed as near the operating rooms in this ship as is practicable. In the dark room there will be a coil with brine circulating in it to cool the water used in developing photographic plates, and one of the cold rooms near the ice machines can be used for that purpose in very warm weather if necessary.

There is a 6-foot athwartship passage between frames 58 to 60, abaft of which come the executive's and officer of the day's office and the record office on the right and the bacteriological and chemical laboratory and the dispensary on the left, and between them a fore and aft passage and lobby with benches for patients and others

waiting their turns. The laboratory will be 16 by 18 feet and in one corner will have an incubator room 6 by 6 feet. In addition there will be a small cold room down near the ice machines to keep media, vaccines, and sera cool.

Next comes a board, examining, reception, and recreation room and library. It is 12 feet wide, 35 feet long, and extends from one side to the other of the deck house. This is a very necessary room, and the want of it is felt very keenly on other hospital ships of the Navy. Abaft of this is the pay office on the right and the general storekeeper's office and the commissary office on the left. Between these offices and the galleys is a 6-foot athwartship passage, into which open the two galleys and the food and baggage elevator. This elevator serves for all the messes of the ship and it is accompanied by stairways and ladders from the top to the bottom of the ship and is very convenient to the galleys.

The galleys and the bakery occupy the space around the fireroom uptake from frames 78 to 80. The officers' galley and the bakery are on the right side, and each is 12 by 15 feet. The crew's and patients' galley is on the left side of and abaft of the fireroom uptake, and occupies a space 12 feet wide by 42 feet long. There is ample space for the galleys. There will be larger ports and doors on each side of the galleys, and the bulkheads between the galleys and passage will be heavy wire mesh to afford good circulation of air. The ranges, boilers, and bake ovens will be grouped around the bulkheads of the fireroom uptake and a large hood will extend around three sides of the uptake over the ranges, boilers, and bake ovens. A vent in the top of the hood 1 foot wide and 15 feet long, extending up to the top of the uptake, will carry off the excess heat of the galleys and make them much more comfortable. Galleys should always be located around the fireroom uptake, as then the heat is concentrated in one place and can be carried off more easily by vents, and the galley smokestacks can be connected up to the ship's smokestack more readily, and there will not be so much wild heat distributed about the ship. From the bakery a passage leads aft to the commissary steward's stateroom and the junior officers' sick quarters. A mess-store issue room opens into the after part of the patients' and crew's galley.

The junior officers' sick quarters extend from frame 92 to 108 and comprise six staterooms each 9 by 12 feet, a room for two hospital corpsmen in attendance, pantry, toilet, and mess room, and a ward 12 by 33 feet with two wings 9 by 12 feet going out to the sides of the deck house and giving good through and through light and ventilation. In the forward and the after parts of the mess room four beds can be installed and curtained off so they will not interfere with the compartment as a mess room.

Between the junior officers' sick quarters and the warrant officers' sick quarters there is a 15-foot athwartship passage with two cargo hatches leading it below. In this passage will be installed two extension cranes with trolleys on them for hoisting patients aboard in stretchers.

The warrant officers' sick quarters extend from frame 113 to frame 127 and comprise six staterooms each 9 by 12 feet, a pantry, a room for hospital corpsmen in attendance, and a toilet and a mess room and ward in which four beds could be installed in the forward and after parts by curtaining them off, leaving sufficient room for messing. The mess room is 12 feet wide by 33 feet long and has two wings 6 by 12 feet extending out to each side of the deck house, giving through and through light and ventilation.

If it should be found desirable to put female nurses aboard this ship, either the junior officers' sick quarters or the warrant officers' sick quarters would have to be used for them. The first would probably be more comfortable, but the latter more private. Whether or not female nurses would be advantageous aboard a hospital ship intended for a long stay with the fleet is still problematical.

Abaft of the warrant officers' sick quarters is a mess and recreation room and pantry for venereal cases whose wards are on the deck just below, from which a ladder leads up to their mess room, which is 15 feet wide and 30 feet long. Abaft of this is the autopsy room, 12 by 18 feet, and then comes a disinfecting room, 9 by 18 feet, with a large steam disinfector opening into each of the rooms. The infected articles are put in on the left side, sterilized, and taken out on the right side. A ladder leads from the isolation wards down to the left door of the disinfecting room and then a chute leads from the right disinfecting room to the laundry. As this disinfector is outside and on the after part of the deck, infected articles from other ships can be easily brought aboard and disinfected without danger of infecting the ship. Abaft of the disinfecting room is the incinerator for burning garbage, trash, etc., It will be seen that the contagious and venereal cases, laboratory animals, autopsy room, disinfector, and incinerator are all on the after part of the ship and as far removed as possible from other patients and parts of the ship, so there will be a minimum of danger of infection spreading or of other disagreeable conditions arising therefrom. It will also be seen that the offices, laboratories, operating and examining rooms are centrally and conveniently located on this deck and are very accessible to each other and by ladders and elevator to the decks above and below.

Second or ward deck.—This is the first deck wholly within the hull of the ship and contains the principal wards. In the bow of the ship on this deck is the paint locker, abaft of which is the carpenter shop. Then come the messmen's quarters with 20 beds, abaft of which are the quarters of the petty officers of the seaman branch, including six

staterooms, each with two berths and a country between in which additional berths can be installed if necessary. In the forward part of this compartment are two blower rooms for ventilating purposes.

Between frames 26 and 76 are located the medical and surgical wards of the ship. Two wards are in the forward part and two in the after part and between them are all the adjunct rooms which serve the four wards. The forward wards are located between frames 26 and 39, and a longitudinal bulkhead down the center of the ship divides these spaces into the two wards. Just forward of them is a blower room for ventilation. The longitudinal bulkhead will have large openings or windows in it, which will afford through and through ventilation for the wards. There are large ports in the side of the ship for light and ventilation. Each ward has 32 beds and a quiet room attached with two beds.

The adjunct rooms of the wards are located between frames 39 and 55 and consist of the following rooms on each side from forward aft: An office for the surgeon and hospital corpsman in charge of the wards for keeping records, etc., a pantry and diet kitchen for serving special diets to patients, a large wash and toilet room, and a room for two hospital corpsmen in charge of the wards. In the forward part of this space is a large hatch with a lobby around it with ladders for communication with the decks above and below, which gives good natural ventilation to the space. Between the adjunct rooms mentioned are a hydrotherapeutic room, a thermotherapeutic room, and two dressing rooms. From frame 44 to frame 76 between the adjunct rooms and the after wards there runs a wide passage which gives communication fore and aft without the necessity of having to pass through the wards and other rooms and thus prevents their being used as gangways. There will be large doors and ports or windows in the walls of this passage, thus giving through-and-through ventilation to the wards. An elevator and ladders in this passage extending from the top deck down to the storerooms furnish easy communication from the wards to the decks above and below. The after wards, one on each side, contain 46 beds each and a quiet room with two beds. The two wards on the right side are for surgical cases and those on the left for medical and special cases.

Abaft of the wards is a 6-foot athwartship passage terminating at each end at a large port or door in the side of the ship, which leads out to the first landing of the gangway ladder, so patients and baggage can be brought into the ship on this deck rather than be taken to the deck above and then brought back. An elevator and a stairway are on the forward side of this passage, making it very convenient to transfer baggage to baggage rooms just below. From this passage to the general mess room a passage runs aft on each side of the fireroom and engine-room uptakes, between which are an engineer's storeroom and ladders leading down to the fireroom and engine room. On the right side of the ship are the chief petty officers' mess room,

five staterooms with two beds each for chief pharmacist's mates, two blower rooms, and a small storeroom. On the left side are the quarters for the mess stewards and cooks, two staterooms with two beds each for chief petty officers, two blower rooms, and two toilets, one for chief petty officers and one for the mess stewards and cooks. The general mess scullery is just abaft of the engine-room uptake and just forward of the general mess room.

The general mess room extends from frame 99 to frame 112 and the full width of the ship. It is therefore 39 feet wide by about 50 feet long. The right side is assigned to the Hospital Corps and the left to the deck and engine-room forces. Opening into the after part of the general mess room are four staterooms, two on each side for engineer petty officers. Two cargo hatches also open into the after part of this space.

The venereal wards and adjuncts extend from frame 115 to frame 132. A wide fore-and-aft passage runs between the wards. There are doors and large ports or windows in the walls of the passage for through-and-through ventilation to the wards. Each ward has 32 beds and the right ward has a quiet room with two beds and a room for two hospital corpsmen in charge. The left ward has a large dressing and treatment room attached and each ward has a toilet and wash room opening into the after part of it. In the passage is a hatch with a ladder leading down to the laundry, and there is a ladder leading up to the venereal mess and recreation room on the deck above. Abaft these wards are two blower rooms and the steering engine room.

Third or berth deck.—In the bow of this deck is a storeroom for paint connected by a hatch with the paint locker above. Abaft of it comes the chain locker and then a large space for a ship's storeroom. The seamen's quarters occupy the space from frames 18 to 31. In the forward part to the right is the wash room and to the left the toilet and a blower room is between the two. A large hatch gives access to these quarters which contain 40 beds and permit more to be installed, if necessary. There is a convalescent ward of 72 beds in the space from frame 31 to frame 47. On the right, forward, are two rooms for four hospital corpsmen on night duty. On the left side is a wash room and a toilet. A blower is located between the wash room and the hospital corpsmen's room. A large hatch gives ingress and egress to and from this compartment.

Abaft of this ward from frame 47 to frame 57 is located the convalescent patients' mess room. In the forward part are four strong rooms, two on each side, for the insane. Between them are four prison cells and a small toilet for the accommodation of the insane and the prisoners. Four feet in front of these rooms is a heavy wire mesh partition to prevent the escape of and to keep others from interfering with the inmates. In the afterpart of the compartment are

two rooms for the assistant masters at arms and two hospital corpsmen in charge of the compartment, a room for the canteen and another for the post office, and a pantry and a "lucky bag." An elevator and a ladder give access from above and below to this compartment. Abaft of this come the bag and hammock rooms for the storage of patients' baggage and a linen repair room. An elevator and a ladder give access to these rooms.

The boiler room is located between frames 76 and 86 and the upper platform of the engine room between frames 86 and 100. The machine shop and evaporators will probably be installed here. Abaft of the engine-room platform is a compartment containing the ice machines and dynamos, a butcher shop and a cold room for fruits, vegetables, eggs, butter, etc.

The quarters of the engineer force come next between frames 111 and 124. The compartment is divided into two by a fore and aft bulkhead down the center with large ports in it to give free circulation. Forward of each room is a toilet and wash room. Each room has 30 beds. Abaft of these quarters comes the laundry from frame 124 to frame 134. A dryer opens into the laundry through the after bulkhead and a steam disinfector also opens into it from a fumigating room just abaft the bulkhead. This fumigating room will be arranged so the ports can be opened up after fumigating without having to go into the room and the gases be forced out by blowers. The most modern machinery will be installed in the laundry.

Platform or storeroom deck.—In the bow is a trimming tank abaft of which comes the chain locker and then a space for ships' stores.

Abaft of this from frame 18 to frame 31 are other ships' storerooms, and abaft of these from frame 31 to frame 47 come the reserve medical storerooms. The foregoing storerooms are reached through cargo hatches from above. The reserve medical stores will be generally kept in the original boxes and packages for issue to other ships in emergencies as needed.

The ships' medical storerooms are located on this deck between frames 47 and 66. The elevator and a ladder come down into a handling room between these storerooms. The medical stores in these rooms will be unpacked and placed on shelves ready for the immediate use of the ship. In installing shelves or bins for stowing medicines, provisions, or other stores, it is best, when practicable, to have them run athwartship, as the sides and supports of the shelves act as stays for the articles and prevent them from falling out when the ship is rolling in rough weather, and battens do not have to be put up in front to prevent this as is the case if the shelves are fore and aft. The storerooms will be inclosed with heavy wire mesh screen to permit better circulation and so the condition of the room and contents can be seen at inspection without the necessity of having to open the door and go inside.

Abaft the medical storerooms come some tanks for either fuel oil or fresh water. Two baggage rooms come next, abaft of which come the boiler room and the engine room between frames 76 and 100. The cold-storage rooms occupy the space between frames 100 and 111 and are just under the space occupied by the ice machines. There are eight rooms, four of them quite large, two of them medium sized, and two of them small for the use of officers' messes. There are two air locks, each of which serves four rooms. Between the air locks is a small room for keeping media, vaccines, and sera for the laboratory. A large hatch coming down into the handling room affords access to the cold-storage room. Abaft of the cold-storage room come the commissary rooms. A large hatch leads down into the handling room between the storerooms and affords access to them. Abaft of the commissary storeroom is a space for ship's stores and then the after trimming tank.

Hold.—The hold has trimming tanks forward and then No. 1 and 2 holds for ship's stores and No. 3 hold for heavy and bulky medical stores. Abaft of this are two fresh-water tanks and between them a compartment for the installation of the apparatus for the vacuum cleaning system with which the ship should be equipped. Abaft of these are situated the fuel-oil tanks between frames 47 and 75. There are 28 separate tanks in this space, which is surrounded on all sides by cofferdams. Next are the boiler and engine rooms between frames 76 and 100. Then follow the morgue, shaft alleys, and storerooms or ballast tanks, and Nos. 4, 5, and 6 holds in succession, and finally the after trimming tank.

There are 13 water-tight compartments in this ship. There are water-tight bulkheads at frames Nos. 5, 11, 18, 31, 47, 65, 76, 86, 100, 111, 124, and 134. These water-tight bulkheals extend clear up to the second or ward deck, which is about 10 feet above the water line. This should give a very good margin of safety; but as there is no direct communication on the third or berth deck, which is 2 feet above the water line, communication on that deck will be very inconvenient. It is suggested that a perfectly water-tight door might be cut in each of the following bulkheads on that deck, namely: Between the boiler room and upper platform of the engine room and between this and the ice machine and dynamo room and between this and the engineer forces' quarters. These doors could be closed and locked at sea and be perfectly safe; but could be opened in port and would be of great value and convenience to the engineer force as most of the time is spent in port.

From the first or main deck down all hatches must be water-tight and kept closed at sea whenever practicable or necessary. Hatches on the forecastle deck must be water-tight and kept closed at sea. As the hatches are the only means of ingress and egress below the

ward deck and have to be kept open or opened at sea, they should be made so they can be easily opened and closed. The elevator shafts should have water-tight doors on every deck from the main deck down. In the after hatches of the ship, freight platforms might be installed, which could be loaded in the holds and hooked on to falls attached to the after winches and hoisted.

Vegetable lockers should be installed on the superstructure just forward of the isolation ward. In cold weather the vegetables can be put below in No. 5 hold under the commissary storerooms. Artificial ventilation above the ward deck will not be necessary as the natural ventilation, supplemented by electric fans, will be sufficient. There should be good artificial ventilation on the ward deck and all below. The supply system of ventilation is best; but all toilets below deck should have both the supply and exhaust systems.

For internal communication the ship should have a complete system of bells, telephones, etc. There should be a scuttle butt in the general mess room, one in the lobby around the large hatch between the medical and surgical wards, and one in the patients' recreation room. It is probable that the water in these could be kept cool by the circulation of brine more economically and easily than by using cold air from the ice machine.

BERTHING CAPACITY.

The berthing accommodations for the personnel of the ship will be as follows:

Officers and crew.

	Medical department.	Deck and engineer departments.
Officers	11	13
Chief petty officers	14	22
Hospital Corps	90	.....
Seaman branch	.....	40
Engineer force	.....	60
Stewards, cooks, and messmen	30	10
Total	145	145

Patients.

Commissioned officers	18	
Warrant officers, enlisted men	10	
		28
Surgical ward	82	
Medical and special wards	86	
Convalescents' ward	72	
Venereal wards	66	
Isolation wards	66	
		372
Total		400

In addition to this number of permanent beds, in case of emergency, there can be installed in the mess rooms, recreation rooms, etc., at least 100 cots or Gosso beds for temporary use by convalescents or the slightly sick or injured. The Gosso beds, which have been installed on some of the hospital ships of the Navy, do very well for temporary use in emergencies, but they should not be employed as permanent beds in the regular wards of the ship.

On account of the lack of space on board ship, it is not possible to provide as much deck space and air space in the rooms and wards as for patients in hospitals and elsewhere on shore, and even the minimum of 15 cubic meters of air space per man can not be provided. This lack of air space on board, however, can be compensated for by artificial ventilation which can change the air in the compartments as often per hour as may be desired or necessary. It will not be necessary to have artificial ventilating systems above the ward deck, as with large ports and electric fans on the upper decks sufficient ventilation can be obtained. The officers' and chief petty officers' staterooms contain from 600 to 800 cubic feet of air and will have sufficient air space with the good ventilation they have. All the sick officers' rooms will have 800 cubic feet or more per man which will be sufficient with the good ventilation afforded them.

In the wards and berthing spaces there will be much less cubic air space per man, but they will have good artificial ventilation and the circulation is generally better in large compartments than in small ones. The wards and berthing spaces will have approximately the following dimensions and deck areas and cubic air space, and deck space and air space per man when the berths are superimposed and the wards filled to capacity, which will probably not happen often and then only for short periods:

Each of the two forward wards on the ward deck is 25 by 39 feet and has 975 square feet of deck and 7,800 cubic feet, giving 28 square feet of deck space and 230 cubic feet of air space per patient.

Each of the after wards is 24 by 63 feet and has 1,512 square feet of deck and 12,000 cubic feet, giving 30 square feet of deck space and 250 cubic feet of air space per patient.

The convalescent ward on the berth deck is 39 by 53 feet, has 2,067 square feet of deck and 16,540 cubic feet, giving about 28 square feet of deck space and 230 cubic feet of air space per patient.

Each of the venereal wards is 22 by 42 feet and has 924 square feet of deck, 7,390 cubic feet, giving 28 square feet of deck space and 230 cubic feet of air space per patient.

The six isolation wards combined are 31 by 48 feet and have 1,488 square feet of deck and 12,000 cubic feet, giving 25 square feet of deck space and 200 cubic feet of air space per patient. These wards have not as much air space per man as the other wards, but they are

high above water and have much better natural light and ventilation. Besides, the great majority of these patients are up and about and will spend most of their time on deck in the open air in good weather.

When the ship is not filled to more than half its capacity, which will be most of the time, there will be no necessity for having superimposed berths in the wards and the deck space and air space per patient will be doubled, giving each from 50 to 60 square feet of deck space and from 400 to 500 cubic feet of air space. The wards of the ship will accommodate 220 patients without having superimposed berths and this number would be entirely sufficient for ordinary times.

Berthing spaces of the crew have approximately the following capacities.

The Hospital Corps quarters are 36 by 44 feet and have 1,584 square feet of deck and 12,700 cubic feet, giving 24 square feet of deck space and 190 cubic feet of air space per man. This compartment is high above the water and has excellent natural ventilation.

The seaman's quarters on the berth deck are 30 by 48 feet and have 1,440 square feet of deck and 11,500 cubic feet, giving 36 square feet of deck space and 288 cubic feet of air space per man.

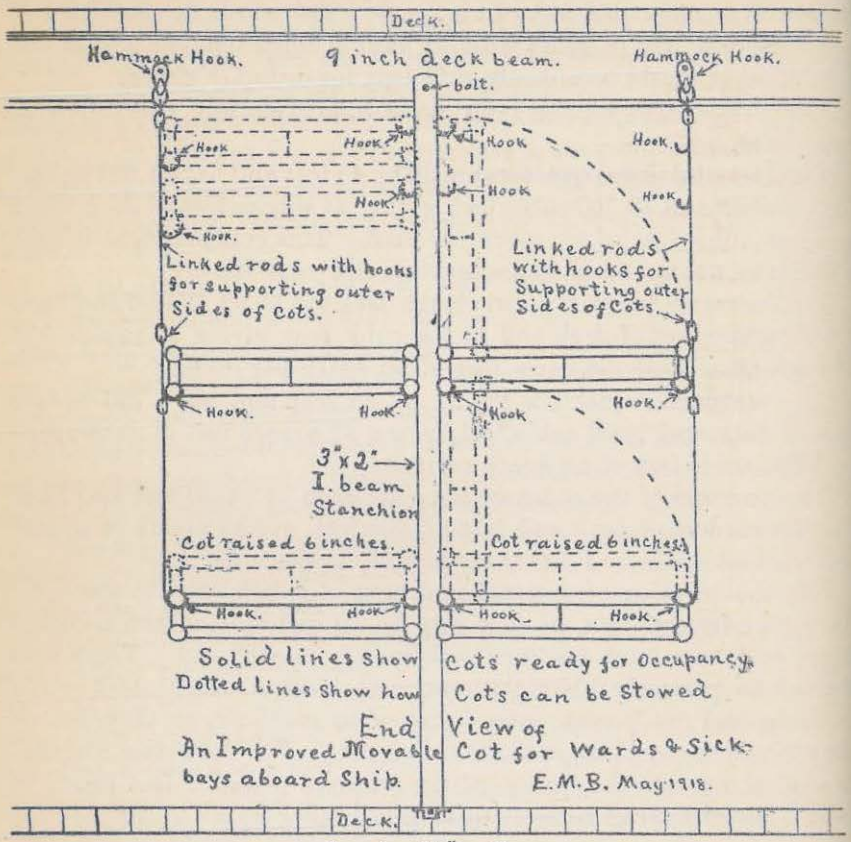
The messmen's quarters are 21 by 36 feet and have 756 square feet of deck and 6,000 cubic feet, giving 37 square feet of deck space and 300 cubic feet of air space per man.

The quarters of the engineer force are each 24 by 30 feet and have 720 square feet of deck and 5,760 cubic feet, giving about 24 square feet of deck space and 200 cubic feet of air space per man.

For the berthing of patients and crew it is proposed to use ordinary pipe-framed cots, 6½ feet long by 30 inches wide and 6 inches deep, with wire-mesh bottoms with springs at each end. These cots should be perfectly plain with no attachments except the spring bottoms and not permanently fastened to anything, so they can be moved about anywhere in the ward or ship. For the better installation of these cots the frames of the ship are placed 3 feet apart, so that a stanchion can be secured to every other frame to support the cots and avoid the necessity of having special attachments to the deck overhead to support them. A pair of stanchions will support four cots, one above and one below on each side. The stanchions will be 3 by 2 inch I beams, secured to the deck beams above by removable bolts and to the deck below by tenons that fit into mortised deck plates. Thus there will be only two obstructions on deck to collect dirt and interfere with cleaning instead of six obstructions with other kind of support. Broad flat hooks will be riveted to each side of the I beam at 20 and 52 inches above the deck to receive and support the pipes of the frames of the cots on one side, while the other side will be supported by chains or rods suspended from

the deck beams above. The accompanying drawings illustrate the working of these cots very well.

The advantage of these cots is that they and the stanchions are portable and patients can be moved about the wards or ship without being taken out of their cots, and the cots can be folded against the stanchions or stored overhead or taken out of the walls and stored below. They can also be made into swinging cots if desired by suspending them from hooks on the overhead deck beams. When the



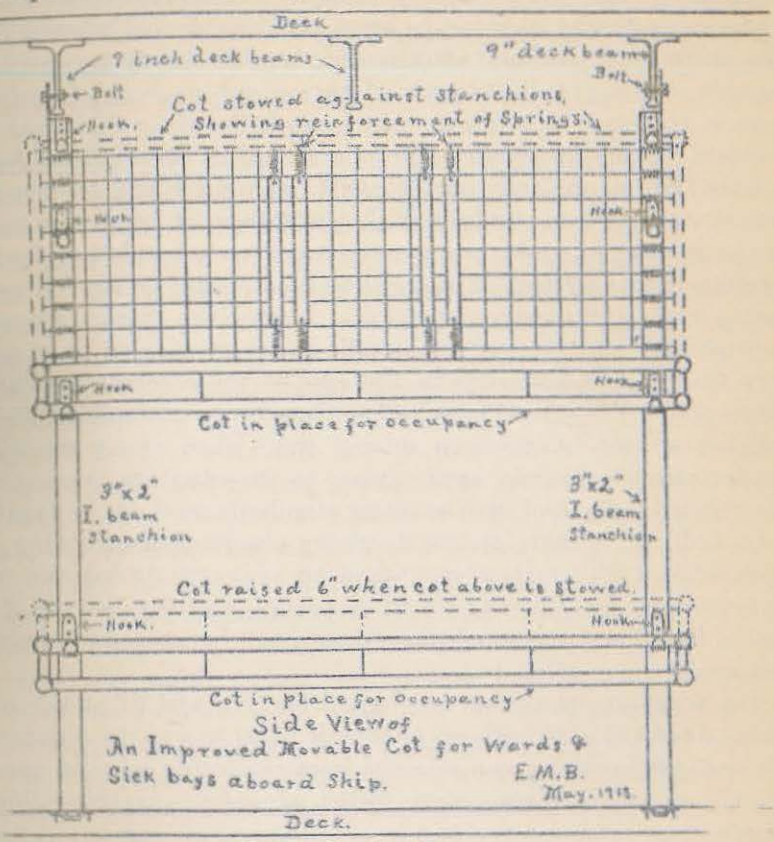
Scale 3/4" = 1'.

overhead cot is not being used it can be folded or stored under the deck beam or in the hold below. The lower cot then will be much more convenient for attending to the patient and can be raised or lowered to any height desired.

It has been noticed that the bottom of the standard cots of the Navy sag a great deal, which makes them very uncomfortable for patients. To obviate this, it would be well to reinforce the bottom from side to side with supports with stout springs at each end fastened to the bottom pipes. Two supports should be placed so they

would come between the sacrum and shoulder blades and two between the sacrum and knees, as they would give more support to those parts and would not put so much weight on the sacrum, which is so prone to have bedsores from pressure and this would probably give the patient much comfort. The accompanying diagram illustrates this feature of the cot.

There are many details in the construction of a hospital ship which will require the constant supervision of a medical officer of experi-



ence and familiarity with the requirements to see that they are properly carried out; for no matter how proficient the naval constructor may be there are many things bearing on the needs of the medical department that he does not understand and he can not view them from the same standpoint and appreciate what is a necessity as the medical officer does. Therefore a medical officer or as many as are necessary should be detailed to confer and advise with the constructors and see that the intentions and ideas of the Bureau of Medicine and Surgery are carried out from the time the plans are begun until the ship is finished and completely equipped.

NORMAL HEARING.

By G. B. TRIBLE, Surgeon, United States Navy.

The proposed large increase in the personnel of the Navy brings the question of physical qualifications to the fore. One of the most fruitful subjects for controversy has been the necessary hearing requirements, particularly for entrance to the Naval Academy. Every year has seen its percentage of rejections, its percentage of belated acceptances who have taken treatment and reached the required minimum, and who later for the most part were found below normal. The absence of a definite standard for hearing widely accepted and capable of being easily interpreted has caused much more confusion than is the case with vision. It is undoubtedly a fact that *any standard that causes rejection will be criticized by those affected* but it is only fair, in the interests of the Government and of the individual, to avoid an unduly high percentage of rejections, unless the acceptance of such cases would immediately jeopardize the best interests of the service, or later cause an excessive number of retirements in the early years of service. Because the enlisted personnel is constantly changing while the officers are permanent, it is necessary that the requirements in the case of the officers, particularly those of the line, should be higher than those maintained for the enlisted service. Conditions during war, when many temporary appointments are made, approximate to the situation existing with the enlisted force, and such exacting standards need not be required.

In addition to more or less desultory observation extending over several years, this matter was taken up at length during two tours of temporary duty at the Naval Academy, and the reports of the results found and the conclusions drawn will be quoted at length in this article.

"In order to determine the normal hearing and to establish the Naval Academy standard, or, putting it another way, to standardize the tests, 208 midshipmen selected from the four classes in approximately equal numbers, were tested according to the following schedule:

Name.	Otoscope.	Bone.	Watch.	Acoumeter.	Whispered voice.	Conversational voice.	Tuning fork.
.....	.....	.....	.....	.....	.....	.....	.....

"Four hundred, and sixteen ears were thus tested, using the Trenton-Ingersoll watch, Politzer's acoumeter, whispered voice (residual air only), spoken voice, etc., making use of the medical examining board room where the candidates for entrance and midshipmen during semiannual examinations are all examined. The results are

highly instructive; the watch showed the greatest variation, while the acoumeter was practically uniform between 60 and 70 feet. Whispered voice ranged between 25 and 35 feet, with a few candidates hearing at 40 and 45, the majority, however, only at 30 to 33 feet, the length of the large board room. Spoken voice (conversational tones) was heard about 70 feet, the space not permitting a test at the full distance. The figures for the watch are given in detail. There were but 19 ears below 5 feet (60 inches), and only three below 3 feet (36 inches). It can be seen that present requirements, namely, 40 inches for entrance, and 20 inches for continuance, are inadequate, and must allow a number to enter who are not normal, and it is suggested that 60 inches for entrance would be the lowest normal measurement, while 30 inches for continuance would not cause the rejection of any normal case. Temporary defects caused by coryzas, ingestion of drugs (quinine for instance), can be excluded by reexamination after the lapse of suitable time. With space permitting, as it does at the academy, the acoumeter is much more satisfactory and less apt to give varying results. In addition, this test is frequently used by civilian specialists, while the watch test is not. However, the value of the watch, if properly standardized by a series of 50 cases for example, must be recognized, though for diagnostic purposes it is of no assistance, except in a general way as an easy and simple method of making sound. The present whispered voice test, with 15 feet accepted as normal distance, is ridiculously low; in fact, is very misleading since defective cases being aware of their condition and realizing the importance of making a good showing, pay strict attention to whispered voice, and it has been rare to find one who could not hear whispered voice 15 feet. Not alone is this true, but cases known to possess but little hearing when compared to the normal have exceeded those who had good hearing, the one case paying strict attention, and the other not. The normal hearing for whispered voice is around 20 meters, under good conditions, in a large room with absolute quiet. Under conditions existing at the Academy, 25 feet as a minimum would not exclude any normal candidate, and would remove the present discrepancies. Use of the various tuning forks, except as diagnostic measures as in the Weber, Rinne, Schwabach, or Bing tests, or to try out the extreme low tones, is impracticable. But little dependence can be placed in the statements regarding the length of time the fork is heard. Finally the examiner becomes exhausted and the candidate confused, and in a test where duration of hearing is measured in seconds, the result obtained can not be highly edifying. The otoscopic examination is of supreme importance and should be done with a magnifying otoscope of the De Zeng or similar type, with the Siegel pneumatic attachment, in order to observe the mobility of the drum and to aid

in the discovery of old perforations or atrophic areas. Some of the scars are as thin as tissue paper, and their independent movement on alternate rarefaction and condensation is very striking and can not be overlooked."

Results of hearing tests—Trenton-Ingersoll watch.

	Right ear.	Left ear.	Total.
Under 2 feet	0	0	0
2 feet	2	1	3
3 feet	4	6	10
4 feet	2	4	6
5 feet	20	13	33
6 feet	21	23	44
7 feet	15	15	30
8 feet	17	17	34
9 feet	11	10	21
10 feet	35	33	68
11 feet	2	0	2
12 feet	22	22	44
13 feet	7	6	13
14 feet	6	4	10
15 feet	31	37	68
16 feet	0	1	1
17 feet	2	1	3
18 feet	5	4	9
19 feet	0	0	0
20 feet	6	11	17
Total	208	208	416

Nineteen, or 4.6 per cent, below 60 inches. In many cases better ear was much more, or the condition might have been temporary, or beginning disease.

A number of cases had been held over for final action, and a brief outline of their history and condition is given. These cases found defective were practically all due to various catarrhal conditions, actual injury from gunfire, swimming, or other causes being exceedingly rare, as shown by the following table:

Name.	Class.	Defect.	Origin.	
			Prior to appointment.	After appointment.
B. T. W.	Fourth	Defective hearing (diagnosis doubtful).	Temporary, on entrance.	
C. J. J.	Third	Defective hearing; catarrhal otitis media.	.....	Probably following swimming, after 1 year.
C. C.	First	.....do.....	Defect noted on entrance; considered temporary.	
C. C. R.	Second	Defective hearing	Defective hearing noted on entrance.	

Name.	Class.	Defect.	Origin.	
			Prior to appointment.	After appointment.
F. P. K.	Third	Defective hearing; catarrhal otitis media.	Temporarily, on entrance.	
G. J. F. W.	First	do	Defective hearing.	
H. S. A.	do	Defective hearing; middle ear disease (diagnosis in doubt).		Developed rapidly after more than 2 years at the academy.
H. A. W.	Fourth	Catarrhal otitis media.	Noted on entrance.	
H. A. L.	Second	do	Noted on entrance (reappointment).	
H. E. G.	do	do		1 year after appointment.
H. W. H.	Third	Defective hearing; internal ear involvement.		Probably complication or sequel of pleurisy, with effusion; not noted before that time and now very markedly deaf.
H. J. H.	Fourth	Catarrhal otitis media.	Entrance; temporary; later examination, passed.	
McK. W. A.	First	do		During first year.
McC. E. F.	Third	do		Do.
M. A. C.	First	do		Do.
M. E. W.	Second	do	Entrance; defect considered temporary.	
P. J.	First	do		Developed during second year.
P. A. J.	Second	do	Entrance; considered temporary.	
R. F. D.	do	do	do	
R. G. E.	do	do	Defective hearing noted on entrance.	
S. G. B.	do	Defective hearing; internal ear involvement.	do	
V. J. A.	First	Catarrhal otitis media.		During second year.
W. J. N.	Second	do		After second year.
W. E. A.	Fourth	Involvement of both middle and internal ears.		During first year.
W. R., jr.	do	Catarrhal otitis media.	Entrance.	

Continuing the work commenced in 1915, during the last part of 1916 further studies were made and a report submitted, part of which is quoted.

"The question of defective hearing is one of the greatest importance and one which has caused nearly as much trouble among the student body as that of defective vision. Certainly it has been a greater source of annoyance and has given rise to more controversy upon the

examination for entrance than the visual requirements. This is due in part to a lack of definite agreement among otologists as to just what constitutes a normal ear, and what variations can be accepted without jeopardizing the efficiency of the Navy personnel later, when those presenting such variations are in positions of responsibility. Unfortunately, there is no easily ascertained standard, such as exists in the field of ophthalmology where the vision of 20/20, for instance, is accepted practically throughout the world, as a condition approximately normal, though latent errors of refraction may exist."

The question of avoiding a high percentage of early retirements, due to preventable causes, must be taken into consideration. In a recent confidential report from the British Admiralty, it was stated that the deleterious effects of gunfire and shell explosion are much intensified in those in whom diseased conditions of the ear were present, so that the effects of explosives could only be taken as aggravating factors and not as primarily causative factors in the production of deafnesss or ruptured drum. Unfortunately, no method of ear protection yet devised is satisfactory. The experience of the British in their naval battles shows that, taken all in all, mere cotton pledgets placed in the external canal are as efficient as any other means of protection. All these points must be taken into consideration in selecting and maintaining a standard of hearing for entrance. A vast deal of criticism is bound to be attached to any standard which causes a certain number of rejections, since the rejected applicants naturally wishing to bolster up their cause, or considering that they have a justifiable grievance will be prone to indulge in a certain amount of exaggeration, whether consciously or unconsciously. Civilian specialists consulted later may in some instances fail to find the condition present which was reported by the naval examiner. Possibly this may occur, because it was merely temporary, but again, if the defect be found, it may be considered of slight import. It is a fact that no one can predict the ultimate outcome of any one case, but long experience has proved that those showing slight defects of hearing make for an unfavorable prognosis under the climatic conditions prevailing at Annapolis, and those showing slight abnormalities on entrance, which have been presumably of a temporary nature and have been waived upon reexamination, furnish a great percentage of all the cases later rejected at the semiannual examinations.

In order to obtain the present-day opinion among otologists, and endeavoring to secure the cooperation of the leading members of the profession in that speciality, in conjunction with the members of the medical staff of the Academy, a questionnaire was prepared and sent to the American Otological Society, a copy of which is appended. Copies of the replies received, except a few mere perfunctory

acknowledgments, are appended. It can be seen from a consideration of these letters that no standardhas yet received general acceptance, nor is any one particular system or routine of examination or practice carried out by these prominent specialists. Very few can be found who place much reliance upon the watch test, nor do the members of the medical staff of the Academy, except as a ready method of measuring the acuity of the hearing. Thus the Trenton-Ingersoll watch has been so standardized by hundreds of tests that except in rare instances no one with a normal ear should fail to hear this watch above 60 inches. In those who are older this does not hold, nor in the case of the enlisted personnel, especially those drawn from industrial pursuits. However, in order to obtain the cooperation of the profession at large, and to avoid the appearance of undue tenacity in upholding a standard no longer accepted by the majority, it is recommended that the assistance of the subcommittee of otolaryngology of the medical section of the Council of National Defense be invoked. It may be possible in this way to obtain suggestions for a standard acceptable for both the Military and Naval Academies, and one which will be recognized by otologists at large, and free the medical examining board and the Bureau of Medicine and Surgery from much controversy. The necessity for a higher standard of hearing in the case of candidates for the Academy in contradistinction to those wishing to enlist, or even enter one of the staff corps, is apparent. In the case of midshipmen very little productive labor is performed until after five years' education, during which time they have received pay, been educated at Government expense, and then become eligible for retirement at three-quarters of the highest sea pay. In the case of the staff corps the expense of education was borne by the individual, the natural selective processes have had full play during the period of his college or professional training, and he is able in a shorter time to render service. With the enlisted personnel very few enter with the idea of making the Navy the field of their life work, and each and all are ready for duty nearly immediately, the pay is proportionately small, and the disability pension correspondingly low. It should not be impossible with the millions to draw from in this country to secure men physically qualified in all particulars, willing and able to enter the Academy. Very few actual cases develop at the Academy due to anything done or undergone as a part of the academic course. Every year a case or two of ruptured drum occurs from athletics in some form or another, but the main trouble is a sequel of catarrhal processes from the numerous cases of influenza or similar diseases of the upper respiratory tract. Naturally most of this is due to climatic influences and the mere presence of a large number of youths in a comparatively small space. This is unavoidable, and

doubtless occurs at all other institutions of learning where a dormitory system prevails and large classes are the rule.

It can be readily seen that a satisfactory standard is going to be extremely difficult to obtain, and it is rather interesting to note that with all the criticism that has been directed against the watch test, this test has been retained in the Army Aviation Service, presumably meeting the approval of the many distinguished specialists in the Medical Reserve Corps of the Army. The great difficulty with the watch test is to tell whether or not the candidate or applicant hears when he says he does. The benefit of the doubt always must be given to the candidate. The acoumeter is much preferable where sufficient space exists. More extended experience and careful consideration of the suggestions made by Dr. Randall regarding the use of tuning forks in quantitative estimation of the hearing power have not changed the opinion expressed in the first part of this article. It is not believed that they are suitable for this purpose, except to measure the high and low tone limits. It is a fact that the British service uses the difference between the air and bone conduction as standard, as noted below.

Hearing tests as carried out in a large naval hospital. Average condition in health.

Fork.....128.....	AC>BC. +35″H	AC>BC (H=Healthy). +35″H
Speech.....	1.....	1.....
Whisper.....	1.....	1.....

NOTE.—A fork of 128 vibrations is the best for all general purposes. AC=Aural conduction; BC=Bone conduction. AC should be heard for a longer time than BC, by about 35 seconds. H=Healthy.

Speech and whisper are reckoned as 1 in a healthy person, and any diminution is expressed in fractions of 1.

Words suggested for use in speech and whisper.

Right ear.	Left ear.
1. Flour.	1. Sal.
2. Floor.	2. Sale.
3. Four.	3. Sarl.
4. Flier.	4. Sell.
5. Flewer.	5. Seal.
6. Fleer.	6. Sil.
7. Flayer.	7. Syle.
8. Flow-er.	8. Sol.
	9. Soil.
	10. Soul.

Expressions are used suitable to the class of work in which the patient is engaged. Thus: "Close up, gun's crew," etc.

Again, in testing with figures it is a good plan to use the figures 5 and 9, as they are constantly mistaken for each other, as is the case with the letters "F" and "L" and "S."

Suggestions as to amount of hearing essential for the proper performance of the duties enumerated below.

1. Signal staff:

BC must be healthy (H) on both sides.

AC must be greater than BC by at least 10 seconds.

Thus	AC>BC +10″H	AC>BC +10″H
Speech	¾	¾
Whisper	¾	¾

2. Telephone operators:

There must be no discharge; no tinnitus.

AC>BC +20″H		AC>BC +20″H
Speech	1	1
Whisper	1	1

3. Stokers:

If paracusis Willisii be present, it will tend to increasing hearing.

There must be no tinnitus; no vertigo.

A.....with hearing in one ear nil....then			
AC>BC +20″ H		AC>BC +20″H	(Healthy ear.)
Speech	¾	¾	
Whisper	¾	¾	
B.....with hearing in one ear.	¾	...then	(Healthy ear.)
AC>BC +10″ H		AC>BC +10″H	
Speech	¾	¾	
Whisper	¾	¾	

4. E. R. A'S and engine-room staffs.

There must be no tinnitus.

AC>BC +20″H		AC>BC +20″H
Speech	¾	¾
Whisper	¾	¾

5. Gunners:

A. Sight setters	AC>BC +20″ H	AC>BC +20″H
Speech	1	1
Whisper	1	1
B. Remainder of gun's crew	AC>BC +10″ H	AC>BC +10″ H
Speech	¾	¾
Whisper	¾	¾
6. The man at the wheel	AC>BC +20″ H	AC>BC +20″ H
Speech	1	1
Whisper	1	1

So much depends on the individual affected, his character, zeal, and aptitude, that the above remarks should be considered as suggestions only, and not in any way as definite rules."

Up to June 19, 1917, 423 candidates for the present fourth-year class were examined by the permanent medical examining board, and of these the rejections were as follows:

"Defective hearing, 41; defective vision, 20; color-blind, 8; poor physique, 4; varicosities (to be accepted after operation), 4; enlarged tonsils, 3; hydrocele, 2; deficient teeth, 2; extreme malocclusion, 2; flat feet, 1; hammer toes, 1; hernia, 1; hemorrhoids, 1; curvature of spine, 1; intermittent heart, 1; undescended testicle, 1; perforation of ear drum, 1; perforation of nasal septum, 1; deformity of elbow, 1; ulcer on fauces, chronic pharyngitis, and cervical adenitis, 1."

"Special attention was paid to the examination of the ears of the candidates, as defective hearing is always the cause of the greatest number of rejections, and deafness being a progressive and pensionable disability, it behooves us to be most careful that the hearing on entrance reaches the minimum standard required, which is, as we know from experience, very low. A record of this examination shows 301 candidates heard the watch tick from 60 to 120 inches, 81 from 40 to 60 inches, and 41 failed to hear at 40, the minimum standard." (Letter from Medical Director A. M. D. McCormick, United States Navy, June 19, 1917.)

UNITED STATES NAVAL ACADEMY,
MEDICAL DEPARTMENT,
Annapolis, Md., October 31, 1916.

DEAR DOCTOR: In connection with my present duty as specialist at the Naval Academy and from my previous duties here and at Washington, it has become evident to me that some differences of opinion exist as to what constitutes the normal ear. The lines of treatment followed and the results expected in the various diseased conditions also seem to vary considerably. Will you be kind enough to answer the following questions, that I may have the benefit of your experience?

While this is purely unofficial and the replies will be requested from all members of the American Otological Society and other otologists, answers to these questions will not only be a great favor to me but will be appreciated by the entire medical staff, and copies will be filed for reference, and may result in saving valuable men to the service.

1. What stress do you place upon the so-called retracted drum?

2. What importance do you place upon the watch as a ready means of gauging hearing? What watch do you use, and what is the distance that, from your experience, you have determined to be normal?

3. What stress do you place on the acoumeter, Politzer type? Do you use any other type?

4. What method of testing quantitatively by tuning forks do you employ, what are the forks used, and what length of time do you consider normal for the respective forks?

5. Do you consider breaks or gaps for higher tones, using Galton's whistle, of import in the young (16–25 years of age)?

6. What do you consider normal for the whispered voice, using numbers and residual air? Do you use conversational voice? What distance do you consider normal?

7. What other methods do you employ and what is their relative importance in your experience?

8. After the removal of obstructions, deflected septa, adenoid hypertrophy, large tonsils, etc., in what percentage of cases does the hearing return to normal in the chronic catarrhal otitis media cases? How soon after operations and how permanent is the improvement?

9. What effect has instillation through the Eustachian catheter into the middle ear had in your work and do you use it in catarrhal cases? In suppurative cases? And what remedies?

10. What treatment do you consider best, if any, in cases showing impaired hearing but no objective signs, so far as the drum membranes and tubes are concerned and no impairment of high tones (probably incipient otosclerosis)?

11. In chronic catarrhal otitis media, in a hypothetical case, subject to duty at sea, and under considerable nervous strain, exposed to rapid changes of temperature, and in the midst of constant noise, with added deleterious effects of gunfire, what is the probable prognosis; that is, length of time workable hearing will be retained (usually without treatment)?

The medical examining board is frequently confronted by cases giving a history of defective hearing and who have, in a number of instances, been under treatment and care of prominent otologists and who present letters stating that at the time last examined (usually within a week or two) their hearing had reached a certain acuity, sufficient to meet the required standard. Upon examination by members of the board under extremely good conditions, so far as eliminating extraneous sounds is concerned, it has been found that the hearing is much below that given by the examiner. The question is, Just how much permanency is usual in these cases after treatment?

It has been our experience that under existing service conditions they often deteriorate. It is not that these cases are not able to perform duty for a certain period, but the question of early retirement, inability to perform sea duty, etc., complicate matters. An expression of opinion along these lines will be appreciated.

Thanking you, I beg to remain,

Yours, fraternally,

G. B. Trible,
Passed Assistant Surgeon, United States Navy.

Salient points only from selected replies will be given. Dr. William C. Braislin, of Brooklyn, states in reply to question No. 2: "Any watch test, to be useful, must be tested on several normal ears and the distances heard by them ascertained." In reply to No. 3, he states: "Politzer is the standard." To No. 4, "Forks are chiefly useful in differentiating between lesions of the sound-conducting and sound-perceiving apparatus." And to No. 5, "Yes; they indicate incurable defects in the auditory centers."

Dr. Clarence J. Blake, of Boston, says that he uses a tuning fork, 512 v. s. (physical C), of 60 seconds' normal audible duration aerially; also the Politzer ticking acoumeter, and in addition the spoken and whispered voice at distances, respectively, of about 60 and 35 feet.

Dr. Ralph Butler, of Philadelphia, rarely uses the watch and has not used the acoumeter for years and does not consider it necessary if a series of forks and the Galton whistle are used. He uses a series of forks and calculates the hearing from the distance rather than the duration.

Dr. Bishop Canfield, of Michigan, places "no importance whatever upon the watch or the acoumeter tests," but tests quantitatively with forks as follows: "I note the number of seconds during which the observer with normal ear hears the tuning fork after the patient no longer hears it. Or, as in the Rinné test, when negative, note how long the ear with an increased bone conduction hears it after the normal ear no longer hears it. For quantitative test I use the 128th–256th and 4,096 vibration forks. I have tested these forks on a considerable number of normal persons and have in this way learned the duration of my particular set of forks. As different forks of the same pitch vary considerably in intensity and duration during which they can be heard, I find it necessary to test out each separate set of forks in this way. Consequently I know of no normal for the respective forks." The following little schedule is used:

Date, ...

R.			L.	
b	a	Voice.	b	a
—	—	Whis.	—	—
—	—	W.	—	—
—	—	R.	—	—
b	a		b	a
—	—	Sch.	—	—
—	—	C.	—	—
—	—	c^4	—	—
—	—	Watch.	—	—
—	—	Tin.	—	—
—	—	Tube.	—	—

He considers "21 feet normal for the whispered voice, using residual air, and for the conversational voice, residual air, 35 to 40 feet."

Dr. E. B. Dench, of New York, states that the watch is the worst test he has had for hearing. Personally he uses the ordinary dollar watch the normal hearing for which is about 50 inches. He does not use the Politzer, or any other type of acoumeter, nor the tuning forks for quantitative tests, but only for qualitative tests, and regards the Galton whistle as a valuable instrument. He considers the normal ear will hear the whispered voice, residual air, using numbers of two figures, at about 40 to 50 feet. The conversational voice will be heard without difficulty at about 75 feet, and determines the lower tone limit by the Bezold series of tuning forks, and the upper tone limit by the Galton whistle.

Dr. Percy Fridenberg, of New York, states that the watch is useful only as a standard of comparison in noting change of hearing from one visit to another, and the acoumeter, the same as the watch. He uses the entire range of tuning forks C to C–5. The whispered voice, ranging from 20 to 40 feet, and the conversational voice, 70 to 100.

Dr. Louis K. Guggenheim, of St. Louis, never uses the watch for testing hearing but uses the whispered voice, conversational voice (with and without the noise apparatus) and different tuning forks. He considers 8 to 10 meters normal for whisper with residual air. Conversational voice is used when the whispered voice is not heard.

Dr. Thomas J. Harris, of New York, states in reply to No. 2: "None." And to No. 3, "Of assistance in connection with the voice test," and to No. 4, "Yes." "The Dench-Bezold, C–64 fork in connection with the Hartmann Ton-Reihe." And in reply to No. 6: "Considers 40 feet normal for the whispered voice, and uses conversational voice only where the whispered voice can not be heard." It is worthy of note that Dr. Harris is the only one recommending reeducation by means of mechanical instruments, such as the Zünd, or the Meyer-Rowan.

Dr. C. R. Holmes, of Cincinnati, replies to No. 2: "The watch is important for gauging hearing. I use a stop watch especially made for that purpose which I brought from Germany; the normal distance for this watch is 5 feet." He states: "The acoumeter is also valuable, if you have a room long enough to test it." He considers 20 feet normal with low whisper, residual air, and forwards the following diagram which he worked up in conjunction with Prof. H. Neumann of Vienna.

A. B. R.		A. B. L.
. .	Convers.	. .
. .	Whis.	. .
. .	Noise appar.	. .
. .	Hearing tube	. .
. .	Weber	. .
. .	Rinné	. .
. .	Schwabach	. .
. .	C–1	. .
. .	A–1	. .
. .	C–2	. .
. .	C–4	. .
. .	Galton	. .
. .	Stenger	. .
. .	Vertigo	. .
. .	Tinnitus	. .
. .	Equil. dist.	. .
. .	Spont. nystag.	. .
. .	Caloric nystag.	. .
. .	Nystag. after turn.	. .
. .	Galvan. nystag.	. .
. .	Fistula symptom.	. .

Dr. J. M. Ingersoll, of Cleveland, states that "the watch test may be made a fairly accurate, rough test. If it is necessary to have a new mainspring put in, or any repair work done upon the watch the distance must be determined again." His watch, at present, is heard by the normal ear about 100 centimeters. He considers the Politzer acoumeter the most accurate test for hearing that we have, and states: "I have had a set screw drilled in the metal bar of my acoumeter which regulates the distance which the little hammer falls. The set screw is graded—1, 2, 3, 4, four equal spaces—and in this way I am able to regulate the sound and use the acoumeter in an ordinary size room." He uses the whispered voice very little, and the conversational voice only as a rough test. Gaps in the higher tones of young people are regarded with suspicion.

Dr. Phillip B. Kerrison, of New York, states in reply to questions No. 2 and No. 3, "The watch and acoumeter (Politzer) are similar testing instruments, the acoumeter being louder and available for deafer patients. It is a convenient test of impaired hearing, but, in our present knowledge, hardly a qualitative test. So many people with good practical hearing for conversation, hear the watch and acoumeter very badly, but I am of the opinion that one should not on this alone, give too unfavorable a prognosis, or make it the basis for excluding the individual from a particular line of work, provided his hearing by other tests, shows him capable of performing the

necessary duties." In reply to No. 4 he believes that, "the most practical use of the forks is in determining (a) the lower limit of tone perception, and (b) change in the ratio of bone conduction and air conduction." As to the duration of hearing of the various forks which might be taken as a normal standard, "various forks of the same pitch—even in such standard sets as the Hartmann fork—differ so much in different forks that this is difficult to say; it must be determined separately for each set of forks."

Dr. George A. Leland, of Boston, states in reply to No. 2: "I have not used the watch as a test for many years, since they are so variable; but when I did, I used the Waltham, open-face, procured in 1878, with a normal distance of about 5 feet," and in reply to No. 3: "I use the Politzer acoumeter obtained of H. Reiner in Wien, normal distance supposed to be about 50 feet, but as my office gives me only 25 feet of clear distance, I consider that pretty good for city dwellers, but rather short for the rural." A footnote regarding the acoumeter states: "These also may vary, though made by the same manufacturer." Normal distance for whispered numbers, using residual air—numbers without dentals and sibilants—he considers 25 feet. And in reply to No. 7: "I do not have time to employ other methods than those above mentioned, but I consider that there is no real test for the hearing, and that I get sufficient estimate from the acoumeter, whispered voice, and the forks, when necessary."

Dr. E. R. Lewis, of Dubuque, Iowa, adds: "My firm conviction is that until we have a uniformly adopted mathematical standard series of tests in which the personal equation is reduced to the irreducible minimum and standard methods of expressing results of these tests, similar for example to the oculist 6/6 vision, such discrepancies between findings will continue to be observed. I believe a standardizing committee representing the United States Navy, Army, and the American Otologic Society, should be created to bring uniformity into this, at present chaotic, field."

Dr. James M. McKernon, of New York, places "very little dependence on the watch test." He does not use one, but uses Politzer's acoumeter and considers it of value as an adjunct in the functional test. He uses the Hartmann series of forks, and modified Dench, and takes his own ear as a standard in testing. The whispered voice he considers normal at 40 to 50 feet, and spoken voice, conversational tone, 40 to 60 feet."

Dr. Alexander B. Randall, of Philadelphia, replied in full, and his views are given in detail.

1. "Retracted drumheads are usually depressed by reason of preponderant external air pressures, and are presumptive evidence of defect of ventilation, past or present. They impeach the Eusta-

chian tubes, but should be looked for as 'telltales' on the nose and throat, which may be the sole, usually are the primary, seats of trouble.

2. "The watch seems of almost no value. My loud-ticking Waltham is used in hardly one case in a thousand; it has no place in my scheme of tests; it should be heard 1 meter or more. I used to hear R. 12 feet, L. 12 inches; but now can hear it 14 inches and 8 inches, with hearing for all other tests above normal except in a noise. As this last may, like my hissing tinnitus for 40 years, mark some nerve lesion, the watch may be, as Roosa claimed, 'of value as a (prodromal) test of inner-ear impairment.'

3. "I know of no 'acoumeter' presumably so good as Politzer's. As made in Vienna by his accredited maker, I found it to vary so utterly in pitch and loudness that I never supplied myself with one, although we were in 1883 woefully short of apparatus. It ceased to be used in Politzer's clinic as soon as he retired.

4. "I have wasted much time measuring the duration of my forks and regard the timing method as specious and clumsy. Two large prismatic A-forks at my University of Pennsylvania clinic (213 d. v. s.) have duration 100 seconds air, 45 seconds bone. My smaller A-fork (clamped) has 90 seconds and 40 seconds, respectively. I find it more reliable as well as handy to measure the distance at which they are heard by air after a standard blow, which is given by allowing the fork to fall of its own weight through its own height to strike on the muscle cushion above the knee. I accept 12 inches for the smaller, and 15 inches for the larger as representing approximately normal hearing in surroundings not totally soundproof. For the A-50 I accept 2 inches; for the C-2000′, 5 inches, as minimal normal. (All flatted from French theoretical 56.7, 113.3, and 2048 d. v. s.)

5. "Most whistles sold as Galton's are travesties, sounding above the O-point or otherwise faulty. Loss of the upper range of a good whistle (not one of five Edelmann's test was quite so good as my simpler Galton) is apt to mean either a thickened drumhead, a slightly rigid stapes, or an impairment in the lower turn of the cochlea. Such a gap may not be confirmed by the corresponding Koenig rod of the Monochord. The whistle is best held near the upper back margin of the pinna (Darwinian tubercle) blowing away from the ear and sounded by successive squeezes without inspiration.

6. "The faintest articulate whisper ought to be audible at 0.5 meter; a forced stage whisper with the 'reserve air' (after tidal expiration, I understand 'residual air' to be that which can never be expelled from the lungs that have breathed) should be audible 15 meters. Conversational tone is too unstandardizable. I find it awkward and not very useful formally to measure the hearing by this means, but roughly test the patient's ability in the history

taking. Apparent gain is to be expected on each repetition, as the patient grows more familiar with the voice and the test. The habitual fatigue of the listener and the recognized effort of the speaker in home conversation form very practical tests; as does church attendance, where one usually listens from the same seat to the same voice. Were I without the handier tuning forks I should use voice.

7. "Roosa's Rinné test is by pointing the fork (A = 200 best) near to the meatus, then reversing and resting the handle on the mastoid, asking: 'Louder front or back, back or front?' Air conduction should be twice as loud (perhaps four times; i. e., twice as long) as bone conduction. Children, even mental defectives, can generally decide. A deaf ear having thus shown its hearing, Weber's test, made from several points in the mid line of the head can be correctly lateralized. The patient tells what he hears, not what he thinks. Made from the nose bridge, the patient should in a normal ear hear the 200–500 fork exactly as long as the fingers holding it can feel the vibrations (Gardiner-Brown's test.) It is easy to estimate how many seconds too short or too long it is perceived; the known proper duration of that fork by bone—this is the Schwabach. Of great practical value is the Politzer test. The A tuning fork held before the nose should be heard louder in the act of swallowing—a test of physiologic function of Eustachian musculature rather than of hearing; yet illuminating as to causation of tinnitus, prognosis of tympanic catarrh, etc.

8. "Subacute defects may clear away at once after removal of their causes, but really chronic conditions rarely will, except under treatment, usually by catheter, and not often completely. We may generally hold out a prospect of recovering the loss of the last six months, possibly of the past year or two; more than that is as unusual as it is gratifying. I have numbers of O. m. c. c. patients who are successful stenographers, although hearing very badly when they came. 'Signing the pledge does not cure hobnailed liver.' Youth and good physique of patients make for good prognosis.

9. "I depend much in the treatment of O. m. c. c. on 2 per cent aqueous solution of dionin per catheter 1 to 3 drops thrown into the catheter by pipette are blown as a coarse spray up the tube. Since using it these dozen years, I have almost no use for a bougie, so well does it clear stuffy tubes. It reddens the drumhead, but rarely overacts at all, and generally gives prompt and distinct improvement in cases resisting other treatment. Liquid petrolatum, usually with 1 to 2 per cent menthol-camphor, is also often sprayed per catheter. I rarely use the catheter in suppurative cases, but it can be very useful in a few.

10. "I am rather skeptical as to otosclerosis, having seen hardly 25 in as many years in over 30,000 new cases. Schwarze's flush of the promontory and Loewenburg's use of chloroform vapor, which feels cold instead of hot in the tympanum, are much more suspicious points than Bezold's 'triad,' which is common to all O. m. c. c. cases. Many called 'otosclerotic' by others have improved much on dionin; many on Donovan's solution by mouth; some on cirrholysin (thiosinamin-bismuth biniodide). Heredity is very questionable.

11. "Noises are harmful if the internal ear is involved; in O. m. c. c. little so, unless the tubes are closed. Advanced stages of O. m. c. c. have generally shrunken, too wide tubes. Gargling, especially hot, can do much to get and keep the tubes open, and under its use 'colds' may become stepping-stones up instead of forcing the hearing downhill. A semiannual course of treatments is advisable, as much to try for further betterment as to prevent backsliding. Among the picked men of Army and Navy the prognosis should be better than among city dwellers, unless for inaccessibility of expert care. Duration of workable hearing seems too individual to permit of any estimate."

Dr. W. K. Rogers, of Columbus, Ohio, submits the following answers: No. 2. "A great deal. Any watch that has been carefully gauged; using the same watch for comparison." No. 3. "The same as a watch when the watch is not heard by air conduction. A spring acoumeter supplants the Politzer type, when the latter is not heard."

Dr. George E. Shambaugh, of Chicago: No. 1. "A retracted drum membrane is very often seen in cases where there is no defect in the hearing, when it indicates a condition produced by a previous tubal catarrah from which the patient has made a complete recovery. When observed in a case where there is a defect in the hearing and where the tuning-fork tests disclose an obstruction in the sound-conducting mechanism, it is fair to decide that the defect is probably due to an adhesive middle-ear catarrh." No. 2. "I do not use the watch to test the ability of a patient to hear." No. 3. "The Politzer acoumeter is a simple method for testing quantitatively a patient's hearing." No. 4. "For quantitative tests of hearing in addition to the whispered or spoken voice, I use, first, a large C fork, 64 d. v., which by comparison with a normal hearing ear I designate as 'normal,' 'moderately shortened,' or 'much shortened'; second, a C–4 fork, 2048 d. v., which I compare in the same way with the normal; third, Galton whistle (Edelman)." No. 5. "The recognition of breaks or gaps in the hearing for the Galton whistle in the young indicates, as a rule, that the patient is suffering from otosclerosis involving the labyrinth. The prognosis is unfavorable." No. 6. "Normal for the whispered voice depends largely on the condition under which the test is made. In a noisy downtown office building,

such as I work in, I find with the windows closed that the normal hearing is only about 5 meters. I do not use the spoken voice." No. 7. "In addition to the whispered voice I test, first, for a defect at the lower tone scale, usually by means of the large C fork. An elevation of the lower tone limit in most cases should be considered an evidence of obstruction in the conducting mechanism. Second, for a defect in the upper tone scale, by means of the Galton whistle, and for a defect in the middle of the tone scale using a C–4 fork. A defect for the Galton whistle or the C–4 fork indicates a disease of the sound-perceiving mechanism. In addition, I use the Weber, Schwabach, and the Rinné tests to assist in making the differential diagnosis between a defect due to obstruction in the sound-conducting or the sound-perceiving mechanism." No. 8. "Operations on the nose and throat never result in a restoration of the hearing to the normal in cases of chronic catarrhal otitis media. The cases where the hearing returns to the normal after, for example, removal of the adenoids, are cases of subacute tubotympanic catarrh. In those cases where the tubal catarrh is influenced favorably by operation on the nose or throat, the improvement should be expected during the first few months after operation and is likely to be permanent." No. 9. "I do not use instillation through the Eustachian catheter except in occasional cases of chronic suppurative otitis media for clearing the tympanic cavity." No. 10. "The only treatment likely to be of much value in such cases is that which aims to improve the patient's general health. This includes the removal of infected tonsils." No. 11. "This question hardly permits of a satisfactory answer, since the progress depends a great deal upon such factors as the history of the progress in the individual case and whether there has already appeared any evidence of the secondary degeneration in the labyrinth which so frequently complicates these cases of long-standing obstructive deafness.

"In conclusion, I venture to say that the prognosis as regards the progress of the deafness depends largely upon the type of process which is producing the defect, rather than upon the degree of the existing defect. For example, a patient may have a well-marked defect as the result of an exhausted suppurative otitis media, where it is highly probable that there will be no increase in the defect, at least until quite late in life. In another case there may be a very slight defect, but if this is due to incipient otosclerosis, and especially if there are other cases of the same disease in near relatives, the outlook is bad, since it would be exceptional if there was not enough progress in the condition to constitute a decided handicap before the patient passes middle life."

Dr. J. B. Shapleigh, of St. Louis, Mo., in answer to No. 2, states: "As a measure of hearing, the watch should not be used alone, but in

conjunction with voice tests. It serves better as a measure of noting variations in hearing than as a measure of hearing. Any watch may be used. There is no universal normal distance; the normal distance for the watch used must be predetermined for that watch and place by experiment with normal ears." No. 3. "As a measure of quantitative hearing, the acoumeter is like a standard watch, but somewhat better. I use it in connection with other tests; I use the Politzer type." No. 4. "I do not use forks much for quantitative testing. Medium-tone fork, should be heard about 30 seconds for normal blow, meaning by this, letting the fork strike on the knee when falling of its own weight through an arc of 90°." No. 6. "Ordinary whisper, 30 to 40 feet." No. 7. "For quantitative tests I use speech and acoumeter, or watch. For relative testing, forks (in series) and Galton whistle, with or without noise apparatus as indicated."

Dr. Sargent F. Snow, of Syracuse, N. Y., in reply to No. 2, states: "I do not regard the watch as a reliable gauge, unless we know what the normal hearing for that particular make of watch has been determined. Personally I use an ordinary stop watch which has rather a loud tick, the sound of which is subdued by a chamois covering, so that normal ears hear the tick sound at 100 inches. Some of the finer Swiss makes can only be heard 60 inches, but I have found most ordinary watches could be heard within 100 inches under quiet surroundings." No. 3. "The Politzer I consider reliable and useful in cases showing degree of deafness not measurable by watch ticks." No. 6. "I would answer by saying whispered voice test is useful in all cases of marked impairment, but hard to use in rooms of less than 20 feet dimensions; ordinary voice is useful in many cases to test ability for coordination of sounds."

Dr. Ernest De Wolfe Wales, of Indianapolis, in reply to No. 2, says: "The watch is one of the least important tests. I consider it of no importance compared with the whispered voice and low conversational voice—of interest only." No. 3. "Of interest in very deaf patients, or as a measure for future reference." No. 4. "512 U. S. fork (weighted) Rinné, 35 to 12 inches normal for my fork." No. 6. "Depends on the number whispered: 2, 4, 5, about 25 feet; 8, 9, 6, about 30 feet. I use conversational voice in all cases, and register it if not heard above 25 feet, which is the length of my office; low conversational voice should be heard about 75 feet."

Dr. Hiram Woods, of Baltimore, Md., in reply to No. 2, states: "Chiefly to note improvement for otherwise inflation I use my own Waltham watch, and I found by experience that a practically normal ear hears it at 3 feet." No. 3. "I presume very little; I used it constantly until about three years ago, when I broke it, and have not gotten another. It gives only one isolated sound." No. 6. "Twenty

to twenty-five feet. I begin with a whisper, after method described in questions, and approach patient until it is heard. If the soft whisper is not heard at all, I make the voice gradually louder until the conversational or loud voice is employed; Anything short of 20 feet whisper, I think, is abnormal."

It can be seen that there is no unanimity of opinion regarding what constitutes a normal ear. It would seem possible to devise a standard which, although not ideal, would meet universal acceptance.

DIAGNOSIS AND SURGICAL JUDGEMENT IN ACUTE ABDOMINAL PAIN.

By P. J. Murphy, Assistant Surgeon, United States Navy.

The diagnosis of acute abdominal pain is made by carefully obtained history, by examination, often by exclusion, and sometimes only by laparotomy. The moral responsibility which the surgeon owes to his patient is intensified by the very frequent inability of the medical attendant either accurately to locate the focus of the abdominal crisis, or to exclude some of the border line or nonsurgical causes of abdominal pain, and even the not infrequent cases where the cause is something entirely extra-abdominal. Several times during my service in the great Cook County Hospital, Chicago, have I seen early lower lobed pneumonia cases incised only to find a negative abdomen and to have the early thoracic physical signs develop the next day. When such oftentimes unavoidable errors in diagnosis are made by surgeons of experience and ability, one hesitates to think of the innumerable cases of tabetic crises, of the various forms of spondylitis, of intercostal neuralgia, of pleurisies, of various poisonings, as well as the many nonsurgical abdominal and pelvic conditions on which laparotomies are performed by men of less experience or ability.

Before attempting to trace the cause of any inflammatory disease within the abdomen, one must make sure that an inflammatory process really exists. To do this the early stage must be most carefully watched, or a careful history of it obtained. If these initial symptoms point to an inflammatory insult to the peritoneum, we must not be content with the vague diagnosis of "peritonitis," but, by careful investigation and observation at the beginning, trace its source, for once the peritonitis has become generalized, we are no more able to discover its origin than we can detect the origin of a fire when the whole house is ablaze.

There are various ways in which an abdominal inflammation spreads:

1. In the first group there are present all of the symptoms of a mild generalized peritonitis, often without any very sensitive spot to

give a clue as to the origin of the mischief. Often the patient will be unable to locate the initial pain and frequently a pain about the reflexly central umbilicus is all that is present. Laparotomy reveals a serous or slightly turbid exudate which is odorless and contains leucocytes but no organisms. In a few hours or days this type has an abatement of general symptoms, but the spontaneous and pressure pains progressively limit themselves to the area which was the original seat of the mischief. Here an abscess is forming and spontaneous cure may take place either by absorption or rupture into the bowel.

2. In the second group the early symptoms resemble those given above, but the peritoneal reaction is more acute. Later the peritonitis diminishes in some places, in others fibrinous exudates form, whereas at the periphery of the abdomen there are often formed encapsuled abscesses, entirely independent of the original focus of inflammation.

3. In other cases the general peritonitis subsides, the inflammation localizes, and a fresh general peritonitis develops, due either to the rupture of the primary or of one of the peripheral abscesses.

4. The most severe group is that where the serofibrino-purulent form merges into the diffuse purulent form, and here the clinical symptoms depend more upon the increased virulence of organisms and the low bacteriolytic or opsonic powers than upon the anatomical course of the peritonitis.

In diagnosis the previous history is very valuable. The patient with recurrent appendiceal, gall bladder, or renal colic can often localize the trouble. But masked histories are often obtained in criminal or spontaneous abortions. If some general disease has preceded the peritonitis, we should think of a typhoid perforation occurring in the course of an undiagnosed typhoid fever.

Age and sex are important. In the male up to the age of 20 the vermiform appendix should be the first thought, even though the pain has not started on the right side. After 20 perforated gastric or duodenal ulcers, or renal colic should be thought of in addition. When the patient is 40 to 50 always consider the gall bladder, as it is more often at fault than the appendix.

In the young female have in mind pneumococcal peritonitis, which is rare among boys, and perityphlitis, which often develops independently of the vermiform appendix. At puberty think of beginning menstruation. After puberty, with a ruptured hymen, all the inflammatory conditions which may start in the sexual organs, as well as the various abnormalities of pregnancy, must be considered. An intact hymen points to appendicitis in doubtful cases.

The physical examination is begun with a general view of the entire patient. A peaceful countenance is reassuring, while we are fearful

when the patient is restless or states that he feels well while his pulse is thready, his face and ears are flushed, and when cyanosis and jaundice proclaim a well-advanced toxemia. Rapid, shallow breathing with accessory respirations denote progressing peritonitis, while quiet painless breathing means limitation. As Dr. John B. Murphy, of Chicago, said: "A full pulse, slow in relation to temperature, is a good sign; a small soft pulse, rapid in relation to the temperature is of bad import; a pulse of normal amplitude, but soft and rather dicrotic, indicates an inflammatory focus in the abdomen not yet overcome, but the age of the patient must always be considered when evaluating the pulse rate."

In the abdominal examination always first empty the bladder with a catheter, as a full bladder is often mistaken for an effusion. This catheterized urine is examined for pus and blood. Slight blood commonly occurs in appendicitis. Bile pigment suggests disease of the bile ducts, while sugar suggests pancreatic trouble. Meteorism is more difficult to detect in the female. It is well always to use the one-fingered palpation—percussion as well as ordinary percussion—as thus a cause of dullness can be felt as well as heard. A localized metallic note is an important sign of strangulation, a kink, or of local peritonitis, and the same holds true of circumscribed crepitations, or a peristaltic metallic note.

Palpation must be very cautious, as the protective wall of an abscess can be easily broken down. Very important is the involuntary muscular defense rigidity which is most marked over the site of trouble until the peritonitis becomes generalized. Often the lumbar muscles alone are rigid in retrocaecal or pelvic appendicitis. Expressions of pain which nervous people proclaim when examined should not mislead. In real peritoneal pain more suffering is revealed when the hand is suddenly removed after gentle pressure.

In the female, a rectal and vaginal examination should always be made to ascertain the condition of the female generative organs.

Regarding the white blood corpuscles, a great leucocytosis probably indicates an inflammatory disease, but some of these, as typhoid, have a normal or diminished count. As Kocher said, the main thing in appendicitis is not to demonstrate a hyperleucocytosis, but to prevent its onset by early operation. However, a leucocyte curve is of value for a surgeon in deciding whether a late case of appendicitis requires operation, or whether a second operation is necessary in the course of a suppurative disease of the abdominal cavities.

A syndrome of acute and often localized pain, vomiting, fever, leucocytosis, and involuntary or voluntary rigidity with tenderness usually denotes a surgical condition, and this syndrome is very common and helpful in early diagnosis.

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The conditions found upon physical examination and from which we construct a diagnosis may be classified as follows:

(*a*) Symptoms of pain without many perceptible changes.

(*b*) Symptoms of pain, with signs of general peritoneal irritation without definite localization.

(*c*) Peritoneal irritation with circumscribed changes.

(A) SYMPTOMS OF ABDOMINAL PAIN WITHOUT MANY PERCEPTIBLE CHANGES.

Here we have spontaneous pain and local tenderness, often without rigidity. There have to be considered a mild attack of appendicitis, renal or biliary colic, mucous colitis, some disease of the female generative organs, acute intestinal obstruction, respiratory diseases, spondylitis, tabetic crises, and hysteria.

Renal colic shows a normal or enlarged kidney, sensitive to pressure, with marked reflex contraction of lumbar muscles. Pain is of two kinds. (*a*) Dull pain in the loin, associated with local tenderness on pounding the back over the kidney; (*b*) renal-colic pain; cutting, very severe, lasting with intermissions for a few hours. It radiates to testis, penis, or labia. Urine shows a large amount of blood, occasionally stones, some pyuria. Occasionally there is temporary anuria. X-ray examination shows the oxalate type of stone as shadows.

Dietl's crises in floating kidneys are characterized by crises of severe pain, fever, collapse, vomiting, scanty urine containing blood, pus, uric acid, and oxalic crystals, followed by a great flow of urine. Bimanual examination shows a sensitive, kidney shaped, variably movable tumor.

Pyelitis shows large amounts of pus and some blood in urine. Pain more localized on the side of the affected kidney.

Gallstone colic has a sudden onset in which pain is severe and colicky, and begins at a point just internal to the outer border of the rectus and at level of or above the umbilicus. There is always a tender gall bladder, and the jaundice, which occurs in 15 per cent of cases, and which follows the colic, is always a foreign body jaundice. Röntgen rays at present show stones in about 80 per cent of cases. There are nausea and vomiting with chills, fever, and a leucocytosis. It is rare to find a cholecystitis without a gallstone which causes acute abdominal pain. Gallstone colic may be confused with duodenal pain; but gallstones usually occur in females and duodenal ulcers in males.

Mucous colitis usually occurs in patients with hysteroid stigmata. The pain is either ileocæcal or over the descending colon. It is paroxysmal, colicky, and periodic. Not much rigidity is present, rarely a fever or leucocytosis, and there is a history of constipation with occasional passages of hard stools covered with mucous casts of bowel and tenesmus.

Various types of gastroenteritis rarely confuse because of the marked diarrhea and the general character of the complaints as well as the short course of the disease.

Intestinal obstruction.—The vague pains caused by adhesions, by anomalies of position and of form belong in this group. If the history and skiagram do not clear up the diagnosis, the laparotomy on a future well-developed intestinal obstruction will. In this group belong also the vague pains of a Jackson's ileocæcal membrane, three of which I have removed since being in the naval service, and those of a Lane's kink.

Tabetic crises occur usually in those over 40 who give a history of a luetic infection and frequently of positive blood or cerebro-spinal fluid Wassermann tests. There may be a marital history of paralysis or miscarriages. There are present the girdle sensation of pressure, the lightning pains, vesical disturbances, inequalities and irregularities of the pupils with the Argyll-Robertson pupil, loss of patellar knee jerks, a positive Romberg equilibration test, and later the stamping heel gait.

Vertebral disease, either simple, infectious, tuberculous, or malignant, rarely causes serious diagnostic difficulties.

Pneumonia or pleurisy, especially in little children, often have referred pain in the abdomen, but physical signs in the chest must always be sought and are usually present then or shortly afterwards. Thoracic pain, cough, rapid difficult breathing are often present.

Hysteria is suspected when there is a striking contrast between the complaints made and the actual conditions found. There are usually other signs.

Lead colic should always be thought of. There is history of occupation, basophilic degeneration of red blood cells, lead line on gums, constipation, etc.

(B) DIFFUSE PERITONITIS WITHOUT LOCALIZATION.

In this group the symptoms of fever, rapid pulse, general tenderness, an effusion either free or badly localized, a rigidly contracted abdominal musculature, or a distended abdomen, all tell us of acute peritoneal inflammation. No longer can nervous disease or colic be suspected. Here obstruction can be confused with peritonitis.

Peritonitis.—Sudden onset of pain which is at first diffuse and later localized more to focus, vomiting follows, temperature slightly raised, rapid pulse, shallow thoracic breathing, no abdominal distention but tenderness and muscular rigidity. Tenderness either over one or both lumbar regions. Neither flatus nor stools pass, no visible peristalsis. Pain is constant, dull, varies in severity, but never ceases completely. Usually effusion is demonstrable. The knees are drawn up and the head flexed. There is a higher leucocytosis and collapse with peritonitic facies are present.

Acute intestinal obstruction.—Onset also with abdominal pains and vomiting; pulse quiet and full, however; temperature normal; breathing not accelerated nor shallow. Abdomen slightly distended; during periods of quiescence it is not tender to pressure nor percussion; slight abdominal rigidity. No passage of flatus nor stools. Paroxysmal attacks of pain occur, during which peristalsis can be seen if the abdominal wall is thin, and this attack rarely lasts a minute. Any bloody mucous stools cease after several evacuations. One often can feel the incarcerated hernia, or the sausage-shaped tumor of an intussusception. Effusion is very rare with less early general prostration.

I have seen several cases of ileocæcal tuberculous peritonitis, which, except for leucopœnia, could not be differentiated from an acute appendicitis.

Mesocolic appendicitis with an abscess between or behind the coils of small intestine may be confused with general peritonitis unless the whole course of the illness is considered.

Acute pancreatitis has usually a history of gall bladder trouble with colic and icterus. Onset is fulminant and overwhelming with very quick and profound collapse. The pain is epigastric, very sudden in onset, is the most agonizing pain in the abdomen and may be constant or paroxysmal. There is epigastric abdominal distension.

Perforated gastric or duodenal ulcer has a history of chronicity of epigastric pain, eructations, nausea and vomiting, with pyrosis extending over years, and having periodicity in the spring and fall. The pain has had a definite relation to meals coming on from one-half to one and one-half hours after meals, is burning, and is relieved by vomiting and alkalies. Vomiting has occurred at the height of the pain, and the vomitus is highly acid and contains large amounts of blood periodically, except duodenal ulcers which show varying amounts of stool blood. Hyperchlorhydria may have been demonstrated. At perforation the symptoms are those of peritonitis with most of the findings in the epigastrium.

Embolism of superior mesenteric artery.—There is usually a left-sided heart lesion. Onset is sudden with intense abdominal pain which is persistent, dull, deep; effusion, bloody stools with retension of flatus and vomiting of lumps of blood are present.

Typhoid perforations rarely cause a very acute abdominal pain.

(c) LOCALIZED PERITONITIS.

When there are evident symptoms and signs pointing to a localized focus our diagnostic task and surgical judgement are much easier whether there are general symptoms or not.

Epigastrium.—The gradual or sudden perforation of a gastric ulcer or rarely of a cancer is the most frequent cause of epigastric inflammation. Less frequent are pancreatitis or hepatic abscess.

Right hypochondrium.—Gall bladder and bile duct stones and inflammations are the commonest causes of pain in this area except in the Tropics where abscess of the liver is the most frequent occurrence. Luetic hepatitis of the gummatous interstitial type frequently simulates an acute gall bladder, and a close history and, if time permits, a Wassermann should be taken and made. Rupture of a duodenal ulcer is relatively rare. Occasionally an incompletely rotated cæcum with its long vermiform appendix is found in this region.

Left hypochondrium.—Perforated gastric ulcers are nearly always the foci. Splenic abscess is very rare. Herniæ beneath the ligament of Treitz are sometimes seen. The secondary abscesses of an appendicitis often occur in or travel to the left deep hypochondrium.

Lumbar regions.—The kidney has to do with retroperitoneal inflammations, or occasionally a retrocæcal appendix. If there is evident peritoneal involvement, the appendix is usually the focus. Parametritis often extends toward the lumbar region.

Lower abdominal region.—Any inflammation here should always suggest either an appendicitis or trouble in the generative tract. In males, even though the trouble is chiefly left-sided, we must think of appendicitis or more rarely an acute seminal vesiculitis or sigmoiditis. In females think also of salpingitis, parametritis, extrauterine pregnancy, of the gall bladder, and of beginning menstruation.

Appendicitis is the most common surgical cause of abdominal pain. There is a sudden severe pain in the right lower quadrant and early about the umbilicus. Nausea and vomiting follow the pain in a few hours. There is involuntary rigidity over the point a little above McBurney's and often over the whole right lower quadrant, including the right rectus muscle. The tenderness is first generalized but later localized over the appendiceal area. Fever of 101° to 102°. Leucocytosis of 12,000 to 25,000.

Salpingitis gives a history of gonorrhea, abortion, or instrumentation. Pain is usually slight, bilateral, more gradual in onset, and the area has been sore and tender for some time; it is low down. Rigidity, if present, is slight. Bimanual shows one or two sausage-shaped and tender masses lying on either side of but connected with the uterus and often fixed behind it. If unilateral, a pyosalpinx is usually left-sided, though it may be complicated by an appendicitis. There is an increased vaginal secretion with a variable hemorrhage. There are chills, fever, and leucocytosis.

Ruptured ectopic pregnancy gives a history of something unusual about the last menstrual period, either too short or too long or more

painful; with the atypical symptoms of pregnancy or of a previous ectopic gestation, with missing of one or two periods, and irregular hemorrhages from vagina with cramplike pains in lower abdomen. A previous bimanual may have shown a slightly tender, boggy, pulsating, sausage-shaped, unilateral mass to the side of but not connected with the uterus and the cervix often pushed upward and forward. At time of rupture there is sudden sharp and severe unilateral pain, with a bloody vaginal discharge, and the woman usually faints and has symptoms of shock and hemorrhage. A lateral swelling may be felt and vomiting and slight fever of 100° to 101°, but without rigidity, are usual. After rupture the needle and finger detect a bloody tumor in the posterior fornix and the cervix is pushed upward and forward.

Twisted pedicles of ovarian cysts give history of menstrual disturbances. The tumor is sharply defined, usually central, quite large, elastic, fluctuating, low in the pelvis, and vaginal examination shows its closeness to uterus. Pain is very severe and increasing.

Sigmoiditis.—Symptoms of colitis, diarrhea, bloody and mucous discharge with a sausage-shaped swelling over sigmoid. Perforated Meckel's diverticulum is very rare.

Cases of abruptio placentae and of uterine rupture are usually evident, and parametritic abscesses are gradual in development, while diverticulitis of the colon is very rare.

Of even more importance than exact diagnosis in acute abdominal pain is surgical judgement. In cases of peritonitis we must remember that all cases do not present a typical clinical complex. At times on doing a laparotomy we find the intestines swimming in pus, even though clinically the case did not appear serious. The pulse remains full, and the involuntary abdominal rigidity is slight. Vomiting is absent, as is intestinal peristalsis, and, despite the poor prognosis, the patient recovers. There are two good pathological reasons for this. Often the peritonitis is not so generalized as it appears to be. Although the convolutions of the small intestine are bathed in pus, the spaces between the loops are not infected, being protected by omentum and adhesions. Secondly, the pus organisms are of slight virulence very frequently. In children the pneumococcus is comparatively harmless, and although the case to us at operation looks as though it must prove fatal, it recovers. So also other microorganisms may be equally innocuous in rare instances. One need only recall cases of acute peritoneal sepsis which prove fatal before pathological changes have had time to form in the serous membrane to realize that prognosis of a case of peritonitis depends more upon the virulence of the microorganisms than upon the extent and intensity of the anatomical pathological changes.

A McBURNEY INCISION FOR EVERY APPENDIX.

By L. R. G. CRANDON, Surgeon, United States Naval Reserve Force.

A newcomer into the Medical Department of the Navy is impressed and pleased with the obvious policy of the department, not only to allow, but to encourage individual surgeons to follow their own methods of treatment. Assuming that all such methods are within safe limits, they are further checked and guided by the practice of frank conference and discussion, not based upon rank necessarily, but rather upon free expression of professional opinion by surgeons of all grades.

Differences in surgical technique, however, may signify only inherited tradition, early training, or merely custom, and may not always represent thought and conviction.

The technical differences in methods of incision for appendectomy is one of the most important examples of need of clear thinking and conviction. In one naval hospital the principal operating surgeon was educated in a right rectus technique, and he and all his juniors operate only that way. In another naval hospital the McBurney method is advocated and followed for clean cases; in a third the gridiron incision is used for all cases.

This paper is a brief plea for the last course, namely, the use of the muscle-splitting (McBurney) incision for all appendicitis cases in the Navy.

The details, as used at the United States naval hospital at New London, are:

The skin over, or slightly external to, McBurney's point is pinched vertically by left thumb and index of operator, while, vertically below, the left thumb and index of the assistant pinch the same fold of skin. Incision is then made on this pinched fold of skin transverse to the long axis of the body, through skin and fat.

The (aponeurotic) external oblique is punctured with closed, sharp-pointed scissors, which, by opening them, will then split the fibers, cutting none.

Similarly the closed scissors stab the internal oblique, tear the fibers apart, then the two index fingers of the surgeon tear open internal oblique and transversalis, each along its own lines of cleavage.

The peritoneum is cut by scissors transversely and, therefore, parallel to and beneath the skin incision.

The incision, as a whole, can be enlarged by cutting skin at either end where room is desired, then two fingers of each hand, inserted through the whole depth of the wound, can stretch it open, each layer tearing along its own fibers.

The advantages of the right rectus incision are that it is easier to make, that it can be made big enough for both hands and that through it an error in diagnosis may be corrected, though in men this should be a rare event.

The disadvantages of the right rectus incision are that—

1. It is not over the appendix.

2. It exposes small intestine and that through this clean region one must enter an infected iliac fossa.

3. For drainage, it opens an indirect path, with a large granulating area to close.

4. Hernia, especially after drainage, is not infrequent.

The disadvantages of the McBurney incision are:

1. It is more difficult to make.

2. It is not possible to make a complete abdominal exploration through it (this is rarely needed in men).

3. More skill and care are necessary to maintain drainage through it. (One should drain in case of slightest doubt; the original wick not to be touched for full five days.)

The advantages of the McBurney incision (as described) are:

1. The transverse skin incision (Weir) is the diagonal of the square made by the gridiron formed by external and internal oblique muscles, and therefore gives the greatest opening for the smallest incision. (One inch is enough for nearly all cases, though it can be made 2½ inches if necessary.)

2. It is always directly over cæcum, external to and below which the appendix is in 85 per cent of all cases; no small intestine should be seen during the operation.

3. The field exposed is thus anatomically limited to the right iliac fossa.

4. Whether drained or not, every muscular action of the abdomen tends to close the split muscles and hernia is impossible.

5. All closed cases are up on their second and third day; all drained cases in from 7 to 10 days; practically all cases can be discharged to hardest duty at end of 28 days.

These conclusions are based on over 6,600 cases performed by the writer personally. Less than twenty times has an extension down along right linea semilunaris or a median incision been necessary for unusually placed appendix or pelvic complications or wrong diagnosis.

In brief, this transverse muscle-splitting incision is both anatomically and pathologically good, and insures young men in the service the *muscular integrity of their abdominal walls, an invaluable asset in the strenuous life of the Navy*, as well as in industrial life.

WHAT EVERY YOUNG NAVAL SURGEON SHOULD KNOW.

By H. C. Curl, Medical Inspector, United States Navy.

In a public address the Surgeon General once emphasized the need for specializing in branches other than surgery, showing that many other lines of work are of equal importance.

In telling of the need for men trained in physical diagnosis, hygiene, bacteriology, and other special branches of medicine, he voiced, I am sure, the opinion of those of us who have been in the service for some time, an opinion which will be appreciated by the younger members of the corps when they have become more familiar with service conditions and needs.

The writer has served for a good many years in naval hospitals and has worked with scores of medical officers, many of them most excellent men. In watching and studying their work he has formed an opinion of what might be called the "standard" type of efficient medical officer.

He should be, first of all, a good all-around man, and as a second qualification he should on some one subject be a little more proficient than most of the other members of his corps. Particularly in hospital work, though also at sea, the man who has specialized until he takes no interest in general work, while valuable in his line, is not as useful as the good all-around man who does most things fairly well.

A "dependable" man who knows his heart and lung work, who can use a cystoscope for routine examinations, work up his material in the laboratory, and treat a fracture well, is likely to have a wider range of usefulness than the man who can do only nose and throat work. But if he is an all-around man with the *added* ability to do special work, he will be much more valuable, will be available anywhere, and can be depended upon to do what is necessary under all conditions.

To learn to remove tonsils and do submucous resections is not in itself a matter of very great difficulty; to differentiate between pneumonia and pleurisy needs only care; to use the cystoscope fairly well is not a matter of extraordinary skill but of practice and patience, and to do an uncomplicated appendectomy or hernia is one of the easiest things in surgery.

Having been particularly interested in surgery, I want to propose what might be called the *minimum* requirements for the average naval surgeon, not specializing in surgery.

I must leave to the specialists in other branches the determination of a *minimum* of attainments for their work.

We must presuppose such a thorough, practical knowledge of asepsis and operating-room technique as may be secured by an interneship in any good hospital.

As to operations which we all should be able to do, and do in emergency with reasonable skill, the following are essential:

(1) Appendectomy: Of all emergencies in the Navy acute appendicitis is the commonest, and every junior man in the Medical Corps should have an opportunity to do a few appendectomies under the direction of an experienced man. To assist at these operations is of

benefit, but to do the operation is a hundred times better. Every man in the Medical Corps has or will at some time be called upon to do this work in an emergency.

(2) Mastoid drainage: Acute mastoid inflammation is an emergency not so frequently met with, but which, when it does occur, permits of no delay. To clear out the mastoid and drain the middle ear without going into the lateral sinus is not difficult.

(3) Simple stomach and intestinal work, such as we find in many gunshot wounds of the abdomen, typhoid perforations and upper abdominal diseases: To know well one type of intestinal suture will enable the surgeon to handle many emergencies of this sort and give the patient his only chance.

(4) To trephine the skull, elevate depressed bone, and stop hemorrhage, when indicated, is often the only means of saving the patient and must be done without delay.

(5) A good amputation: The necessity for this work is obvious.

This list is not long; the steps of the operations and the anatomy involved are easily learned and retained, and certainly the mastery of these subjects is a part of the equipment of my "standard" man.

I believe every possible chance should be given to junior officers to do surgical work under the immediate direction of the operating surgeon. The man who has done a large number of appendectomies does not need the experience, but the man who has done none must do his first operation some time, and how much better for him and the service if he does it under the direction of an experienced operator. So these few operations are among the things every young naval surgeon should know.

PREVALENCE OF SPYHILIS IN HAITI.

By F. X. KOLTES, Surgeon, United States Navy, Medical Director, Gendarmerie d'Haiti, and A. ALBRECHT, Chief Pharmacist's Mate, United States Navy, Lieutenant, Medical Service, Gendarmerie d'Haiti.

The medical man who visits Port au Prince and remains long enough to note the physical appearance and habits of the people and learn something of the civic and sanitary conditions existing there, must soon be led to suspect that when infectious diseases gain an entrance there they have a clear field for propagation unchecked by any human agency of prevention. After a stay of over two years in Haiti we have found these suspicions confirmed.

Haiti has about 2,000,000 inhabitants, mostly pure black, the density of population being about 200 to the square mile. Three-quarters of the people live in the country, among the mountains and valleys of the interior. The rest live in the cities, which generally are situated on the seacoast and vary in population from 4,000 to 100,000.

Nearly all the diseases which ordinarily affect the Tropics of the Western Hemisphere are found in Haiti. There are, however, a few notable exceptions to the list, comprising diseases characterized by high mortalities, the absence of which for many years probably permitted the steady increase of the Haitian population. Principal among these are smallpox, yellow fever, cholera, and, to a great extent, dysentery. Intestinal parasites, including hookworm (infection about 20 per cent in small groups examined), are very prevalent, but these do not cause marked symptoms, one seldom seeing such clinical pictures as were described in Porto Rico, which seems to bear out the theory of the relative immunity of the pure black to the symptoms of hookworm disease.

In a general way we consider that the diseases causing the greatest number of deaths are tuberculosis, infantile disorders, and malaria, all three of which have their highest morbidity in the cities where the death rates are highest. One sees relatively more old people in the country, which bears out the supposition of a lower death rate there in spite of the fact that it is chiefly in the rural districts that so many infants perish from tetanus infection of the umbilical cord.

In considering the effect of diseases upon a community in the broad sense we may divide them into the following two classes, viz, diseases characterized by a certain immediate mortality and diseases characterized by the evil after effects exerted upon the physical condition of the individual and the race. In the latter class can be included the venereal diseases, all of which, especially syphilis, are extremely prevalent in the cities of Haiti.

With a view to gaining an accurate idea of the extent to which syphilis affects the inhabitants of Port au Prince, we selected three groups of persons (the only ones available for the purpose at this time) and examined their blood for the Wassermann reaction. We furthermore obtained some data from the presence of physical signs at the time of examination and elicited such histories as were obtainable under the circumstances, for the purpose of determining to what extent the disease is congenital or acquired.

The first group comprises practically all the gendarmes stationed in Port au Prince. Of this number, about a hundred were men who had just been recruited, while the remainder had served for varying periods of time up to nearly two years. This subdivision was made in order to determine what influence soldier life—carrying with it regular pay and a certain amount of affluence—had upon the incidence of syphilis among them. As, however, we found no material difference in the two subclasses, the results need not be given separately.

The second group consisted of prisoners confined in the penitentiary.

The third group consisted of boys, ages from 5 to 12 years, from the Boys' Industrial School, Port au Prince.

The tests were made in the laboratory of the Gendarmerie Hospital of Port au Prince by Lieut. Albert Albrecht, S. M., G. d'H. A modified Emery technique was used. Two tubes only were used for each test. In the front tube 4 units of 1/30 dilution of antigen and 1 unit of patient's serum; in the second tube, 4 units of salt solution and 1 unit of patient's serum. Serum was of course added to the salt solution tube first and then to the antigen tube. The pipette was then washed three times with salt solution before proceeding to the next specimen of serum. Before the addition of any serum the salt solution and antigen solution were measured out. The racks were then placed in the water bath at 38 C. for half an hour. Four units of hæmolytic system were then added to each tube and the racks again placed in the water bath at 38 C. for one hour and the final results read.

The test tubes used were 5/16 of an inch, internal diameter, and the hæmolytic system was added to all tubes without washing the pipette, care being taken that the pipette did not touch the sides of the test tube or its contents. The tubes were then gently tapped on the bottom to evenly distribute the hæmolytic system.

This method of adding the hæmolytic system is a great time saver, especially when one is doing a large number of tests.

The *hæmolytic system* was prepared by soaking 350 square millimeters of amboceptor paper in 5 mils of salt solution, shaking thoroughly for 15 minutes, filtering and adding it to 0.2 mil of red cells that had been collected in 2 per cent sodium citrate salt solution and washed with salt solution five times. It was then placed in the water bath at 38 C. for half an hour.

Antigen.—1/30 dilution of Noguchi acetone insoluble lipoid was used. Numerous controls were made with this antigen from time to time and normal serum never showed inhibition of hæmolysis in 1/15 dilution.

Amboceptor.—An antihuman red cell amboceptor prepared from the rabbit according to the method of Noguchi was used. We were fortunate in making a very strong amboceptor; 200 square millimeters added to 5 mils salt solution and 0.2 mil washed red cells produced perfect hæmolysis in the salt solution controls; however, 350 square millimeters, as stated above, was used for making 5 mils of hæmolytic system in this series of tests.

Complement.—The active complement normally present in the human serum was used. In standardizing amboceptor and antigen pooled serum from three people was used.

Blood specimens were all collected in Wright tubes on the morning we did the tests. No specimen of serum had been collected longer than four hours when the test was completed.

TABLE I.

	Number examined.	Wassermann positive.	Wassermann negative.	Per cent positive.
Gendarmes	450	315	135	70

TABLE II.

	Number examined.	Wassermann positive.	Wassermann negative.	Per cent positive.
Prisoners:				
Male	243	167	76	69
Female	57	38	19	67
Total	300	205	95	68

TABLE III.

	Number examined.	Wassermann positive.	Wassermann negative.	Per cent positive.
Industrial School boys	100	79	21	79

The combined results are given in the table below:

TABLE IV.

	Number examined.	Wassermann positive.	Wassermann negative.	Per cent positive.
Three classes combined	850	599	251	+74

Out of the total positive Wassermann, 501, representing 80 per cent of the whole, showed complete inhibition of hæmolysis, the remainder showing something less than complete inhibition. There is, of course, a larger percentage of syphilis in these groups than is shown by this series of complement fixation tests, as old cases of syphilis may show a negative test even though the men still have the disease. Luetin tests and complement fixation tests on spinal serum would probably have increased our positive percentage very considerably.

That the cause of these Wassermann positives is syphilis and not yaws, there can not be much doubt. While yaws is found here to the extent that one sees a case now and then in the cities (it is more common in the country), the great preponderance of the former

disease noted in the course of routine work makes it certain that yaws was a very minor factor in the results. This is certainly the only conclusion that can be drawn from the results of the survey of the small boys, they having been under observation for a considerable time and being known not to have yaws. Leprosy, which is considered by some to cause a positive Wassermann reaction, can be excluded in our cases on account of the absence of any of its symptoms.

The attempt to obtain histories of primary and secondary lesions was unsatisfactory, because these matters make but little impression upon a primitive people and are often soon forgotten.

From the gendarmes we secured a history of a "sore" in 52 per cent of the positive cases. Some of these no doubt were chancroidal and gonorrheal complications. It is still more difficult to secure a reliable history of a secondary rash, it being so inconspicuous on black skins. No particular value can therefore be placed upon the figure obtained, which was 34, representing about 6 per cent of the positive Wassermanns. However, if it be difficult to obtain direct evidence from the adult cases, the high incidence of syphilis in the group of boys whose youth precludes the possibility of their having acquired the disease through venereal exposure shows a tremendous amount of congenital transmission of syphilis.

As regards signs and symptoms present in our cases, we examined each patient when the blood was taken, giving special attention to those which are more or less diagnostic. The gendarmes, of course, showed no open or conspicuous lesions—excepting the few who became infected recently. A great many of the recruits who presented themselves possessed such diagnostic stigmata as epitrochlear enlargement, blotchy skins, etc., but these very common defects had to be disregarded altogether, else we could never have secured a full complement for the organization.

TABLE V.—*Groups I and II.*

	Wassermann positive.	Double epitrochlear.	Mucous patches.	Leg ulcers.	Sore.
Gendarmes	315	72	7	10	.....
Prisoners	205	34	1	8	1

TABLE VI.—*Positive Wassermanns of the Maison Centrale.*

	Total positive.	Double epitrochlear.	Tibial nodules.	Hutch. teeth.	Leg ulcers.
Boys	79	39	7	2	6

Tables V and VI show less than 50 per cent of double epitrochlear enlargements and almost negligible numbers of the other signs upon which we commonly depend in routine examinations for syphilis. Evidences of visceral syphilis were not systematically sought for during the course of this survey because it would have necessitated prolonged examinations impossible under the circumstances, and any statements made by us upon the subject of symptomatology are no more than impressions gained from routine medical work. Among these impressions are the frequent varioloid character of the secondaries, the frequent iritis in mulattoes—this often in spite of vigorous mercury treatment—and the rather common picture of painful rheumatoid affections, involving the thigh and leg muscles, which always show a positive Wassermann and clear up after a few intramuscular injections. As regards the pathological changes that occur in later life we can venture no statement, excepting to say that we have not met with any cases of locomotor ataxia or paralytic dementia.

The general average of hemoglobin estimates (Tallquist) for all groups was 84 per cent, with only five falling below 70, this high average existing in spite of the presence of chronic malaria and intestinal parasites in a considerable number of the patients. Summing up what has been discussed regarding the effect of syphilis upon the physical condition of our positive cases and remembering that practically none of them was sick in the ordinary sense of the word and had never had treatment, it seems to us that there exists in them an unusual ability to hold the disease in abeyance.

We have often wondered, therefore, bearing in mind the great antiquity of syphilis in this island, whether a racial immunity may not have developed in the people of Haiti. Whether or not it can be proved that the explorers of the fifteenth century were the first to see the disease, we know positively that many of the ancestors of the Haitian people of to-day had already arrived here before the year 1500, and therefore become infected. Perhaps the transmission of the disease through one race during over 400 years may have resulted in a partial immunity, manifested by the ability to resist the appearance of many of the symptoms which characterize the later stages of the disease. Whether or not an unusual degree of immunity exists, there is no doubt that syphilis has distinctly left its mark upon Haiti in having contributed to a lowering of the physical, mental, and moral standards of the inhabitants, manifested by a lack of bodily vigor, laziness, and "dopiness," inclination to sleep at all times, inability to perform tasks that require concentrated effort, stupidity, a universal tendency to thievery and beggary, lack of civic honesty, cruelty to man and animals, absurd presumptuousness, and a want of self-respect shown in their daily habits and costumes. It is, of course, not contended that all of

the above shortcomings are the direct result of syphilis, nor that they all, or even any of them exist in all Haitians; but that the deleterious effect of its toxins has been an important factor in this moral disintegration we believe to be true. Therapeutic tests seem to bear out this supposition.

We have given several thousand injections of mercury to gendarmes, to which they have responded in a remarkable manner; not to the extent of having been cured of thievery by mercury, for example, but by releasing, as it were, the normal physical and mental attributes which had been lying dormant in half sick bodies for an indefinite number of years.

Among the effects of syphilitic infection we generally expect to find large infant mortality and frequent cases of sterility and stillbirths. We have not made investigation of this subject and are not prepared to say how greatly these factors have affected the normal attrition of population. The population of Haiti, in spite of continuous revolutions, lack of sanitary precautions, and emigration has at least held its own, if it is not increasing, so that it can be stated that syphilis has not had sufficient influence to swing the balance over to the side of depopulation.

In this connection it is vitally important to know to what degree the results of our investigation of the three groups are indicative of the prevalence of the disease throughout the country. These groups are not, of course, wholly representative, yet the singular approximation of the figures obtained is very suggestive of their being a fair index for the whole, especially as all three classes were recruited from towns as well as from the country.

As regards the probable incidence of syphilis in the better class, we may say that while there is a distinct social demarcation between upper and lower classes, we believe, for various reasons, that from the viewpoint of the epidemiology of this disease, the population is more homogeneous. For instance, there is considerable intermingling "sub rosa" between the classes, brought about by reason of loose marriage relations of the upper class male and the almost total absence of marriages in the lower classes. Besides, many of the well-to-do upper class nearly white males live, as is common throughout the West Indies, in a state of virtual polygamy; that is to say, they have a legal wife besides one or more concubines, each one of whom has a family of children and each her own establishment. We know of one man in Port au Prince who is reputed to have altogether 60 children.

It is not difficult therefore to understand how syphilis could permeate to an equal degree the entire population, and, if its prevalence is really indicated by our results, it is an especially serious problem

here, both for the natives themselves and for the forces of the American occupation which now is definitely established in Haiti.

The Haitian-American treaty of 1916 provided for the establishment of a gendarmerie of native troops with American officers. The purpose of this force is, in the main, the preservation of peace and the protection of the individual rights of the citizens of Haiti. While its prescribed functions have been well carried out during its brief existence, it is recognized amongst its officers that the gendarmerie has done more than what is merely demanded of it by the treaty, chief of which being its service as an example to the Haitian people of honesty of administration, and efficiency as a military force drilled in discipline and alert in attention to duty. While it is quite impossible at this time to stamp venereal disease out of the country, the medical department of the gendarmerie has realized the necessity of having a healthy personnel, both for its value as an object lesson as well as for military efficiency.

The Wassermann survey of the gendarmerie was at first incidental to a plan of investigation of the personnel for venereal disease, malaria, and intestinal parasites. When the extraordinary prevalence of syphilis was revealed, we felt the importance of giving the matter our special attention. A systematic plan of treatment was instituted, with what success we hope to record in a future report.

WITH DESTROYERS IN THE WAR ZONE.

By L. H. Williams, Assistant Surgeon, United States Navy.

In view of the noteworthy work of the American Naval Expeditionary Force operating in European waters it will perhaps be of nterest to know something about the Medical Corps as represented on the United States destroyers.

Before war was declared there was assigned to each destroyer one chief pharmacist's mate or pharmacist's mate first class, who did first-aid work and took all cases requiring diagnosis and treatment to the medical officers of "mother" ships.

The exigencies of war and the conditions under which the destroyers are now operating have rendered it advisable for each destroyer to have a medical officer in addition to the hospital corpsman. This enables each destroyer to act more as an independent unit working in conjunction with the "mother" ships.

The "mother" ships are well equipped for surgical cases and non-infectious diseases occurring in the flotilla, while infectious diseases are cared for ashore in a hospital manned and officered by our allies.

As the medical officers of the "mother" ships are fully occupied with medical examining boards, operations, and care of the sick

generally, their duties are essentially like those of medical officers on any battleship and need no amplification or description here. Though their work is exceedingly interesting, being carried on so near the scene of operations, yet it is with the medical officers serving on destroyers, the pioneers of the Medical Corps in this war, who are constantly at sea and are undergoing the trials of modern sea warfare that this article is concerned.

During the past six months the destroyer flotilla has been most active in saving ships and rescuing merchantmen whose vessels had been sunk by submarines, as well as in carrying on a successful offensive against submarines. In all these operations the medical officers have played a part of increasing responsibility.

The life and duties of the medical officers serving on destroyers are very different from what they would experience on battleships or ships not in the theater of war. On a battleship the medical officers are in a sense out of touch with the executive branch and have little or no information of what operations are to be carried out till these are well under way or completed. This is not the state of things on a destroyer, for here the medical officer shares with the other officers a complete knowledge of the ship's movements, what enterprises are to be attempted, and all matters of interest concerning known enemy operations. Many hours are spent upon the bridge where he sees the action which may decide the fate of his own ship or that of the ship under her protection. He knows that always while on patrol or convoy duty there is the lurking danger from mines or submarines and the possibility of combat with an enemy raider. One day he realizes the fierce atavistic joy of the man hunt when his ship is chasing an enemy submarine; the next he feels his heart bound at the sight of brave faces that force a smile through their agony as the destroyer comes to the rescue of the survivors of torpedoed merchantmen or men-of-war, in frail boats or rafts, at the mercy of the sea.

The medical officer's first duty is to keep the crew physically fit to resist the cold and wet encountered and to endure the nervous strain inevitable under the circumstances under which the destroyers are operating. Though the men are kept in as good physical condition as possible, life on the destroyers is very hard and trying, owing to the ceaseless roll and pitch of the ship, the never-ending toil of keeping the ship ready for any call, the constant watchfulness necessary, and the consciousness of hidden danger. These have an inevitable effect on officers and men after a week or so at sea, so that a day or two in port becomes necessary to refit the personnel and ship after such continuous strain.

After the routine sick calls of the day are finished, the medical work is essentially emergency. The medical officer must be ready

for emergencies not only on his own ship but those which may come from other sources. The facilities for emergency work on destroyers is at present exceedingly limited. Only one pocket case is now available on most destroyers.[1] A few have the field expeditionary case, which should be allowed all destroyers with a medical officer.

The available equipment for emergency work is easily kept in readiness, so that the medical officer formerly had considerable unoccupied time. This was quickly put to good use in various ways. On some destroyers the medical officer has charge of the decoding staff and stands a regular watch, while on others he helps with the commissary department as well. First-aid lectures are given at frequent intervals.

It is not an infrequent occurrence for the medical officer to render aid to survivors picked up by his ship. This is happily becoming more rare since the convoy system has been more widely adopted. Often these rescued men are suffering from wounds received by shells, or the result of the exploding torpedo in addition to the exhaustion due to exposure. One medical officer saved the lives of three sailors suffering from badly lacerated body and arm wounds, the result of shelling by a submarine. Another rendered valuable aid to several survivors who had been five days on a raft without food or water.

These are extreme cases. The mildly shocked cases, those unable to walk or speak when first rescued, are able after a change of clothing and the employment of stimulants to regain their strength in a few hours and are none the worse for their experiences. Some cases require hypodermic injections of strychnine and caffeine in addition to other attention before they are revived.

When his own ship was torpedoed, with one man killed and five injured, the medical officer was able to save the lives of the severely wounded. This ship did not sink. Another was not so fortunate when torpedoed, as the ship went down in five minutes and no medical work could be done, owing to the confusion and darkness. This medical officer was on a raft for 14 hours in midwinter before being rescued. Recently when a destroyer captured a submarine the wounded among the crew were cared for by a destroyer medical officer before they were brought to the base.

On the medical side the experiences are less interesting, though already two cases of pneumonia have been treated by one medical officer for several days on a destroyer before it was possible to reach a hospital. A few contagious diseases, as mumps and measles, have been encountered, but prompt isolation prevented their spread. One case of cerebro-spinal meningitis has occurred, which ended fatally.

[1] This article was written early in 1918. The outfit of instruments now depends on the medical personnel attached to a torpedo boat.

It is as little as can be done in an article of this nature to mention the way in which the chief pharmacist's mates or pharmacist's mates first class serving on destroyers are performing their duties under war conditions. The hospital corpsman on a destroyer is a very busy man. He acts as assistant to the medical officer, stands a decoding watch at sea, and in addition is assistant to the commissary officer. Only the best men in the corps should be assigned this duty, as the responsibilities are large. Most of them now on destroyers perform all duties assigned them in an exemplary manner.

Aside from the important medical duty encountered when operating in the war zone, the destroyers offer opportunity for the most exciting and interesting experiences that can occur to a person in the Navy at present.

Though the preponderance of allied war ships keep enemy surface craft from venturing far from their bases, they are unable to keep the submarine from searching the sea on its mission of destruction without warning. This submarine warfare necessitates that all navigation be carried on without lights, which greatly increases the risk of collision. Already three medical officers have been in collisions at sea. One has had the experience of having his ship rammed at night and sunk to the water's edge in three minutes. The ship was saved by the heroic efforts of part of the crew who remained on board and endured the cold and danger throughout the night.

The incidents and experiences related above as occurring to medical officers on destroyers in the war zone are but a few among the many daily occurrences. The duty is intensely interesting and arduous.

PSYCHIATRIC MATERIAL IN THE NAVAL PRISON AT PORTSMOUTH, N. H.

By A. L. Jacoby, Passed Assistant Surgeon, United States Naval Reserve Force.

With the large increase in the personnel of the Navy incident to the present war, there has likewise been a great increase in the prison population of the Navy, until the number of general court-martial prisoners to be cared for at Portsmouth, on February 1, 1918, was 1,646, an increase of over 650 per cent since April 1, 1917, and the population is increasing at the rate of about 200 per month. The monthly increase, at the present time, practically equals the total population on April 1, 1917. Nothing concerning the loss in a military way need be said here, except that this number represents the complement of one of our largest battleships and two destroyers in addition.

The naval prison is exactly similar to any State prison in that its inmates are there because they did something which the law says they must not do. The character of the man himself and the reasons for the commission of the forbidden act are too frequently not con-

sidered when he is sent to prison. An offense, military or moral, may have been committed for any number and variety of reasons, and there is in every case a reason. Very frequently, indeed, the act represents the more or less natural conduct of a disordered mind. The percentage of the mentally abnormal amongst prison population in general has been variously given by different writers. White (White, Wm. A., "Principles of Mental Hygiene," Macmillan Co., p. 143) says: "A considerable proportion of the prison population are, however, not normal in their developmental possibilities. Upward of 50 per cent as they are admitted have demonstrable disease at the central nervous system level. That is, they are mentally defective, psychotic, or have gross central nervous system disease, such as arteriosclerosis or syphilis. This does not include bodily diseases other than that of the central nervous system."

Psychiatric examination of naval prisoners was instituted about November 1, 1917, and the work had been undertaken, from the investigator's standpoint, as an attempt to, first, determine the incidence of nervous or mental disorder in general court-martial prisoners, and, secondly, to reach, if possible, a method of reducing the economic loss occasioned by military delinquency. The methods employed in the examination of the 150 cases here cited have been as thorough and complete as is possible, without too great interference with the routine of the prison. A careful family and previous history was taken from the prisoner himself, and, where possible, corroboration of the facts given was obtained by correspondence with institutions where the man had previously been confined. The measure of intelligence used is that of Terman, with certain natural omissions for men who had previously passed an examination at the recruiting station. Each case was examined neurologically, as well as psychiatrically, and, in many doubtful cases, a period of observation in the naval hospital was used in reaching a diagnosis. Special examinations, e. g., cerebro-spinal fluid, eye grounds, Wassermann, X-ray, etc., were used whenever indicated. The possibility of malingering is always to be borne in mind when dealing with the psychiatric problems of prisoners, and it is thought that these rather thorough methods serve to practically eliminate that factor.

In this series 3, or 2 per cent, appeared for examination on their own initiative; 75, or 50 per cent of them, were referred for examination by some official of the prison, usually one of the physicians who make the routine physical examinations upon admission; the remaining 72 cases, or 48 per cent, were not referred, but taken in routine as they were admitted. Twenty-five different offenses are represented, and these are shown in Table 1. It will be noted that the total number of offenses shown is greater than the total number of cases. This is due to the fact that certain men were sentenced for more than one offense.

TABLE 1.

Offense.	Number.	Per cent.
Desertion	53	31.9
Absence over leave	37	22.2
Scandalous conduct tending to the destruction of good morals	11	.6
Absence without leave	9	.5
Assault	8	.4
Sodomy	7	.4
Conduct to the prejudice of good order and discipline	6	.3
Disobeying lawful order of superior officer	5	.3
Drunkenness on duty	5	.3
Theft	5	.3
Sleeping on post	5	.3
Threatening to strike superior officer	2	.1
Murder	1	.06
Fraudulent enlistment	1	.06
Leaving post before being regularly relieved	1	.06
Striking and wounding a person in the Navy	1	.06
Absent from station aboard ship	1	.06
Forgery	1	.06
Refusing to obey lawful order of superior officer	1	.06
Destruction of public property	1	.06
Unlawful possession of property belonging to another	1	.06
Breaking arrest	1	.06
Neglect of duty	1	.06
Using obscene and profane language toward another person in the Navy	1	.06
Falsifying accounts	1	.06

It will be seen from the table that somewhat more than half, about 56 per cent, of the total offenses are of a military nature and are not of the character which would bring the individual into a civil court.

The division of the cases by the length of their service, i. e., the time elapsed between date of enlistment and date of arrival at the prison (not the date of the offense or the date of the trial) showed 50 to have had less than six months' service, 49 more than six months and less than a year, and 51 to have had more than one year.

Table 2 shows the cases by diagnosis.

TABLE 2.

Diagnosis.	Number.	Per cent.
Subnormal	34	22.6
Hysteria	18	12.0
Dementia precox	3	2.0
Manic depressive insanity	2	1.3
Anxiety neurosis	2	1.3
Paranoid state	1	.6
Depression (undifferentiated)	1	.6
Epilepsy	2	1.3
Chronic alcoholism	6	4.0
Cerebro-spinal syphilis	3	2.0
Psychopathic personality	8	5.3
Constitutional inferiority	9	6.0
Congenital syphilis	1	.6
Neurological:		
Tabes dorsalis	1	.6
Nerve injury	1	.6
Migraine	1	.6
Unclassified	7	4.6
No psychiatric condition	50	33.3

The proportion of nervous or mental disorders is thus seen to be two-thirds of the total examined. Even in this relatively small series of cases the proportion of the abnormal coincides closely with King's observations. He found in 1,000 prisoners that 65.4 per cent fell into abnormal groups. (King, Edgar, "The Military Delinquent," Mil. Surg. 37, Dec. 1915, pp. 574–578.)

SUBNORMAL.

In this group of 34 cases 17 different offenses appear; 6 of the group were sentenced for more than one offense. Of the total offenses 70 per cent were of a military nature, and 85 per cent of them were in the nature of conduct to be expected of the feeble-minded. For example, a boy 19, four months in the service, in leaving his ship for the usual overnight liberty, asks one of his companions if "it would be all right for him to go home for a week," and when his shipmate replies that he "can if he wants to," stays home a week and returns to find himself charged with absence over leave. This particular case grades about 9 in the intelligence tests, and the observation of his conduct in the prison would certainly not place him higher than that level. Five of these cases could not possibly be graded above the 7-year level. One was examined who can not write his full name. This large group, 22.6 per cent of the whole, should be eliminated at the recruiting station or at the training station.

HYSTERIA.

The second largest group is composed of the hysterics, and 5 of the 18 cases, or 2.7 per cent, may be said to have developed in the prison. Two of these are "twilight states," often described among prisoners, and sometimes classed as prison psychoses. They are included here for the reason that the hysterical basis is so prominent in them. It is of interest to note that the 5 cases developing in the prison were sentenced for moral offenses, while the remaining 13 are in prison for military offenses. None of this group was sentenced for more than one offense, and 10 of them are serving sentences for desertion. Eleven of the 18, or 61 per cent, are considered so gravely affected as to be of no use to the Navy, while 7, or 39 per cent, are regarded as useful, if handled understandingly aboard ship. In these 7 cases it is highly probable that the offense might not have occurred had the nature of the man's disorder been understood aboard his ship. The same degree of professional consideration is due one of these men, when he seeks advice about his nervous symptoms, as is shown a patient with gonorrhea, for instance. It too frequently happens that he is told that it is all his imagination, and the word is passed, usually by members of the hospital corps, that he is a "nut," with the ultimate result that the patient seeks relief in running away, feeling, as he does, that he is not understood.

DEMENTIA PRECOX.

The three cases of dementia precox call for no special comment, except that each case was definitely advanced upon admission to the prison. Two of them were in the service less than six months, so that it is very probable that they were insane when they enlisted. The third case developed in the Navy, and his offense occurred after the onset of the disease.

MANIC DEPRESSIVE INSANITY.

One of these cases is in the hypomanic phase, and the other is in the depressed phase. Both have histories of previous attacks before enlistment.

ANXIETY NEUROSES.

One of these cases developed in the service prior to the offense for which he was sent to prison. His offense is desertion, and it occurred in an attempt on his part to find relief for his miserable state of mind. The other case developed in the prison.

PARANOID STATE.

This case developed in prison, out of the man's attempt to justify the situation in which he found himself when he came to prison.

DEPRESSION (UNDIFFERENTIATED).

This man deserted in reaction to definite delusions of a persecutory nature. His psychosis had its onset after he had been in the service over five years.

EPILEPSY.

Two cases, one showing attacks of grand mal and one of the petit mal type, were found in subnormal boys. Both have had frequent attacks since infancy.

CHRONIC ALCOHOLISM.

The cases diagnosed chronic alcoholism are all men between 24 and 34 years of age, older than the average of the prisoners. Each has a history of long-continued excess, and two of them had been committed as inebriates to State hospitals before enlistment. All of them show signs of organic brain change.

CEREBRO-SPINAL SYPHILIS.

Each of these cases contracted syphilis in the Navy, and each has positive cerebro-spinal fluid findings. In each of them there are neurological signs, which first attracted attention to the case.

CONGENITAL SYPHILIS.

The one case of this condition is so stigmatized as to attract attention on sight. He is below normal in intelligence, and has positive cerebrospinal fluid findings.

NEUROLOGICAL CONDITIONS.

Here are included one case of tabes dorsalis, one of a partial, flaccid palsy of one leg, with marked trophic change, resulting from a nerve injury in childhood, and one case of migraine. All of these men are in the class of less than six months' service.

UNCLASSIFIED CONDITIONS.

In this group are included seven cases of very definite abnormality of the mental processes, but in which, an exact diagnosis did not seem possible. Six of the cases existed prior to enlistment and one developed since admission to the prison. All but two enlisted since the declaration of war.

PSYCHOPATHIC PERSONALITY.

Among the eight cases are six of the type often alluded to as moral imbeciles, one of the type usually called psychopathic exaltation, and one case of psychopathic depression. Only one of this group had been in the service more than six months, and each of them would easily be excluded at the recruiting office, after a very short examination.

CONSTITUTIONAL INFERIORITY.

There have been included in this group those individuals showing a moderate degree of intellectual inferiority and giving long histories of repeated offenses. All of them show serious defect in the emotional field. A large relative proportion of the serious offenses appear here; three cases of sodomy, one of theft, and one of assault. This group can be eliminated at the training station.

NO PSYCHIATRIC CONDITION.

In the group of 50 cases, classed as having no psychiatric condition, are 16 cases of temperamental difficulties, through which they have shown themselves to be unfit for the service, but there seemed insufficient evidence of any disorder to classify them in any of the other groups. Among the causes assigned by the men of this group for their commitment to prison, alcohol stands out most prominently, being given in 20 per cent of them; a "bad gang" appears next in 14 per cent; and "women" in 10 per cent.

CONCLUSIONS.

The real value to the service of the expenditure of energy in ascertaining the mental state of its prisoners lies chiefly in directing us to a method of saving what is otherwise an economic loss. In this series of 150 cases, 81, or 54 per cent, are men who clearly should have been eliminated at the recruiting or training station; 19, or 12 per cent, developed a mental disorder after enlistment. For the reduction of the prison population by one-half, then, a reasonably careful psychiatric examination at the beginning of the man's career in the Navy is necessary. This examination need not be directed toward an

exact diagnosis, but it should be in the hands of men trained in dispensary psychiatric work. Only a few minutes per man is required to detect the vast majority of this class, probably 80 per cent of them.

For the elimination of the 12.6 per cent which develop abnormalities of mind in the service a psychiatric examination should be made of every man awaiting trial by general court-martial before his trial. If he is found abnormal, he should be discharged from the service or sent to a psychopathic hospital, depending upon the result of the examination. It may be said that such a practice might act contrary to the deterrent principle of punishment as a part of military discipline; but surely the harm done in committing an insane man to prison far outweighs any objection on that score. Such examination may, at times, be impossible because of the location of the trial, but whenever possible it should be done. As a most valuable aid in this connection a note should be made in the health record of any man when he shows any peculiarity of conduct, no matter how trivial it may seem at the time. A note made in one health record aboard ship described peculiar conduct, then of very slight importance, but suggestive of a beginning psychosis. Four months later the man was tried at a navy yard and sentenced to the prison, where, upon arrival, he is a well-developed case of dementia precox. The most superficial examination before the trial might easily have convinced any medical officer of the existing psychosis, particularly with the aid of the previous note.

There should be at the prison an adequate psychopathic ward for the observation of suspects, and every man admitted should be examined neurologically and psychiatrically, as well as physically. Here the work should be done most thoroughly in order to eliminate possible malingering. Cases, abnormal when enlisted and hopeless so far as usefulness to the service is concerned, should be discharged as soon as possible, consistent with work of a character which reduces errors of diagnosis to a minimum; provided, of course, that they are not likely to become public charges. Those of this class, which require public care, should be sent to hospitals in the State from which they come. Psychoses developing in the prison should receive hospital care, and to the very small proportion in which the psychosis is of such a nature as probably to destroy the social usefulness of the individual after his sentence has expired there should be given a discharge before this usefulness is too greatly impaired.

In time of war, when all forms of energy must be conserved to the utmost, it is most highly desirable to eradicate expensive, nonproducing elements of the service personnel. It is a common observation aboard ship that this element forms roughly about 20 per cent of the ship's company. They are the men constantly on report and it is practically the same group which is always at sick call. The remainder of the men are striving hard and earning their full pay

every day. The undesirable portion tends to gravitate toward the prison or hospital, where they are a further expense. Much is possible to be done toward the reduction of that expense by the elimination of them as soon as possible in their naval careers.

THE HISTORY AS A MEANS OF DETECTING THE UNDESIRABLE CANDIDATE FOR ENLISTMENT WITH ESPECIAL REFERENCE TO MILITARY DELINQUENTS.

By A. W. STEARNS, Passed Assistant Surgeon, United States Naval Reserve Force.

That there is a need of a more satisfactory method of detecting undesirable candidates, and so of preventing their enlistment, is evidenced by the following statement from the report of the Judge Advocate General of the Navy for 1912 (p. 13):

DEFECTIVES.

Though the examination of prisoners is continued with much the same results as heretofore noted, no test has been developed of sufficient accuracy to be of very great practical use in recruiting in the direction of keeping out of the Navy those defectives who eventually find their way to prison.

The extent of the disciplinary problem in the Navy is further shown in the same report by the following:

Page 28 * * * the tables show that general and summary courts-martial and deck courts reviewed constitute a fixed percentage of the men in the naval service; general courts-martial approximately 2 per cent; summary courts-martial approximately 12 per cent; and deck courts approximately 9 per cent.

These figures do not include appearances at mast, which outnumber all others. The loss to the service through delinquency or lack of ability is shown by the following table (p. 10):

Discharged as undesirable for inaptitude or with ordinary discharge not recommended for reenlistment	756
Discharged with dishonorable discharge	1,000
Discharged with bad-conduct discharge	2,296
Total prematurely discharged	4,052
Total deserters for fiscal year	1,681
Grand total	5,733
Total number of men handled during fiscal year	72,885

From this it appears that 7.86 per cent of the total number of men handled are prematurely lost to the service. In other words, in order to get 100 men who will be of use to the Navy it is necessary to enlist 108. With a personnel of 250,000 this waste becomes appalling, for if outfit alone is considered, costing $60 per man, the waste would be $1,179,000 per year. If one adds to this the other expenses involved in recruiting and training these individuals, nothing more would seem necessary to arouse those in authority to take immediate steps for the more careful selection of recruits.

That there has always been a close relation between military service and delinquency can not be questioned. In former times this was taken as a matter of fact, and though fortunately the tendency has been for the better, there is still a popular impression that military service is an asylum to which rogues may flee.

The following newspaper clippings show the attitude of police courts toward the problem, and popular opinion is to quite a large extent formed and expressed by newspapers. These are merely casual clippings extending over a period of less than a month.

From a California paper:

Nov. 21. Bootlegger, promising to join Navy, is released. H. F., of C., pleaded guilty to "bootlegging," but asked to be allowed to join the Navy. He was released on his own recognizance and told to enlist.

Dec. 8. Paroled to enlist. Paroled from the * * * jail in order to become an aviator * * *, R. W., sentenced to a year for passing bogus checks, was rejected because of weak eyesight. W. declared that he would enlist immediately in another branch of the service.

Dec. 16. Thief dismissed so that he might join the Army. D. F. pleaded guilty here to-day on a charge of petty larceny * * * but an indictment against him charging forgery in the second degree was dismissed so he might enlist in the * * * of the United States Army. The magistrate said if F. actually entered the Army he would suspend sentence. (Rejected.)

Dec. 14. Ex-soldier is rum peddler. C. A., recently discharged from the United States Army * * * pleaded guilty to giving soldiers liquor. * * * Judge H. continued the case until Saturday, and in the meantime A. will try to reenlist in the Army.

From a Massachusetts paper:

Nov. 21. Ready to enlist, but court decides defendant must provide for wife and child.

Dec. 12. (Same case.) M. J. R., who was found guilty a few days ago on a charge of neglect of his wife and family, was called on continuance and given a suspended sentence of four months, with the understanding that he join the marines within a week's time.

Nov. 22. The next case was A. R., who in 1912 was arrested for breaking and entering. The young man's sister was on hand to plead his cause and assured the court that if given a chance he would join the Navy. He was allowed to get by on a fine of $25.

There is also a belief among us that military discipline will reform an incorrigible, and this belief is held by some officers who have never analyzed the problem. Modern advance in knowledge concerning delinquents has shown that they require a maximum of personal attention by those having them in charge. While *as a group* enlisted men have a maximum of supervision, there is no time to supervise *individuals*, and all will admit that in the present crisis military efficiency should not be hampered by these problem cases.

Following the above recital, it is fair to inquire as to present methods of recruiting to see what attempt, if any, is being made to exclude the socially unfit from the ranks. In an attempt to get only physically fit, the pendulum has swung far, till now it is almost true that recruits are selected solely on the basis of physical examination, and this

without adequate history, the first requisite for forming medical opinion. To be sure, the candidate is asked to fill out an application blank. This might be useful if properly used; but from inquiry in many directions, the filling out of this blank seems to have become entirely perfunctory. The questions on the blank bearing upon the problem of nervous and mental disease and delinquency follow:

Time at school, ... Age at time of leaving school, ... What is your trade, or at what have you been employed since leaving school? ..... Name and address of references, ... Have you ever had fits, internal piles, syphilis, bed wetting, insanity, stricture, or private disease, or been a victim of the drug habit? ..... Do you drink intoxicating liquors? If so, to what extent? ..... Have you ever been arrested? If so, for what? ..... Have you ever been in the reform school, or jail, or penitentiary, or have you ever been convicted of any crime? .....

The presence of the above questions in the application show that their need has been recognized; but any man who has practiced medicine or who has dealt with the class of people which the above is meant to detect, and so, I presume, exclude, will recognize at a glance the folly of hoping to get material facts from the perfunctory filling out of the above by the candidate himself, or by a petty officer in the presence of other candidates. Those who will write the truth do not need the above questioning, and those who need the above questioning will not write the truth. However, when a man is questioned alone, face to face, by a trained person interested in getting positive information, the facts can be obtained in a vast majority of cases, as will appear below.

During the past few months the writer has been interviewing every recruit at a naval training station. The method and general results in a series of 2,000 cases have been published in another paper, in the Journal of the American Medical Association. For the most part but a minute or two has been taken for each recruit, though when a clew was found more time has been available.

The following 20 cases, constituting 1 per cent of the whole series, are given in very brief abstracts. They are selected cases, taken to illustrate the point at issue, and not because of their outcome, and they are by no means all of the undesirable or abnormal in the series, but are the 20 most striking cases.

(1) H. W. A. No. 6119. Age 18, A. S. Seventh grade at 14 years. No regular occupation. At 12 sent to G. J. Reform School. Discharged for assault on teacher. Sentenced to the W. State Reform School. There until just prior to enlistment. Three arrests for running away. Diagnosis, defective delinquent. Outcome unknown.

(2) R. A. No. 1755. Age 20, A. S. Seventh grade; 2 years in sixth. No regular employment. For past two years a freight car

vagrant, begging and stealing a living. Denies arrests. Diagnosis, feeble-minded. Outcome: Bad conduct discharge for immoral conduct two weeks after enlistment.

(3) F. B. No. 1760. Age 21, A. S. Fifth grade at 15 years. For past six years a vagrant, one week being longest steady employment. In the Navy before; deserted and sentenced to Portsmouth Naval Prison. Discharged. One year in M. Reform School. Arrested for vagrancy at 17. Diagnosis, feeble-minded. Has run away three times, but has either surrendered or returned prior to being called a deserter. While away, swindled a local Y. M. C. A.

(4) H. B. No. 15. Age 18, A. S. Third year at high school. No regular occupation. Arrested in 1914 for burglary. Since; 9 arrests for forgery, incorrigibility, and burglary. Sentenced to W. Reform School. Returned to court as incapable of reform on October 18, 1917. Enlisted in Navy the next day. Diagnosis, no mental disease, but obviously unstable and neurotic. Reform school gives bad report and can not recommend for service. Bad-conduct discharge on account of record. Arrested one month after discharge from Navy. Alleged to have passed 150 bogus checks.

(5) J. A. B. No. 1776. Age 28. F. 3 C. Married and separated. Fifth grade at 18 years, and two years in each grade. No regular occupation. Discharged from the United States Army in 1911 under an assumed name. Can not give reason. Bad-conduct discharge from United States Army in 1916 for desertion. Since has served 15 days in prison for disturbing the peace. Diagnosis, feeble-minded. Transferred.

(6) I. C. No. 821. Age 33. Sea. Single. Fifth grade. A sailor. A drunkard. Came to station deeply intoxicated after a spree. Denies arrest, but admits chronic alcoholism. Diagnosis, chronic alcoholism. Deserted a few weeks after enlistment.

(7) C. E. C. No. 1296. Age 20, A. S. Seventh grade at 14 years, two years each in first and second grade. No regular work. Vagrant for the past two years; riding all over the country on freight trains. Denies arrests, though states he has frequently spent night in jail for lack of other place to sleep. Diagnosis, undetermined. Attitude suggests dementia precox or psychopathic personality. Transferred.

(8) G. D. E. No. 1884. Age 19, A. S. Single. Sixth grade at 14. No regular work. Freight car vagrant for the last four years. Has served in an institution, but claims not to know the name. Denies arrests. Diagnosis, feeble minded. Reported slow in drill.

(9) J. J. E. No. 1973. Age 19, A. S. Single. Eighth grade at 12 years. For the past three and one-half years has been riding about country on freight trains. A hobo for the last three years. Denies arrests. Diagnosis, undetermined. Stammers, and is obviously peculiar. Transferred.

(10) F. H. No. 1978. Age 21. Single. F. 3 C. Seventh grade at 14 years. No regular work. A vagrant for several years. Arrests in Buffalo, Detroit, Cleveland, Chicago, Akron, Ohio, etc., always for vagrancy. Diagnosis, undetermined. Has an ankylosis of left elbow joint, which he concealed from examiner. Two weeks after arrival, says he feels fidgety, and doubtful if he can make it. Transferred.

(11) E. L. No. 1710. Age 18, A. S. Single. Seventh grade at 16, two years in third grade. No regular work. Riding freights continuously for past four years. One arrest for vagrancy. Diagnosis, feeble-minded. Bad-conduct discharge for immorality and stealing two weeks after arrival.

(12) E. E. M. No. 779. Age 23, A. S. Single. Fourth grade at 14, two years in third grade. No regular work. Expelled from school for quarreling with teacher. One arrest for robbery. No mental disease made out. Transferred.

(13) R. M. No. 37. Age 29. Landsman for baker. Divorced. Fourth grade at 15. Odd jobs as a barber. Deserted wife six months after marriage. Two arrests for fighting, once as a suspicious character. Diagnosis, subnormal. Discharged for fraudulent enlistment.

(14) J. H. M. No. 786. Age 33. Landsman for cook. Married. Seventh grade, two years in the fourth. Several arrests for vagrancy, and served eight years in the I. State Penitentiary for burglary. Married and left a pregnant wife with no support when he enlisted. Diagnosis undetermined. Looseness of thought and manner, and religiosity suggest dementia praecox. Wrote unauthorized letter to President. Transferred.

(15) J. M. No. 1759. Age 18. A. S. Single. Seventh grade at 16, two years in first and second grades. No regular employment. Arrested at 16 for fighting, and before that for truancy. Arrests at Toledo, Ohio, and Oklahoma City for vagrancy. Riding freights for past year. Diagnosis, feeble-minded. Transferred.

(16) L. O. No. 105. (An assumed name.) Age 18. A. S. Single. Eighth grade in reform school. No regular work. For past two years in industrial reform school on account of trouble with parents. Such a liar that history is unreliable. Diagnosis, constitutional inferiority. Medical survey following an assault.

(17) M. P. No. 946. Age 18. A. S. Single. Seventh grade, repeated two classes. No regular work. In charge of parole officer when enlisted. Rode from Iowa to Texas on top of a passenger train, fell off and broke his arm. Concealed this and enlisted. Diagnosis, feeble-minded. Medical survey. Ununited fracture of radius.

(18) A. T. No. 1479. Age 18. Single. Eighth grade, two years in the seventh. Odd jobs only work. Arrests for truancy and running away from home. Short time in detention home. Diagnosis,

defective delinquent. Bad-conduct discharge for stealing two weeks after enlistment.

(19) P. V. No. 1769. Age 21. A. S. Single. Fifth grade at 13, two years in fourth. Odd jobs. One year in a truant school. Diagnosis, feeble-minded. Deserted month after enlistment.

(20) H. H. W. No. 1846. Age 20 (actual age 17). A. S. Single. Eighth grade, two years in fifth. No regular work. At time of enlistment a deserter from United States Army. Three previous arrests, one for speeding, one as a suspicious character, one for assaulting an officer in a saloon. A vagrant at time of enlistment. Diagnosis, defective delinquent. Deserted within three weeks of enlistment.

On account of rapid transfer it has been impossible to follow all cases, but the above list includes 80 per cent of the bad-conduct discharges and 45 per cent of the desertions from this station during the past quarter. The number is too small to warrant the drawing of wholesale conclusions, but indicates the relation of mental disease to delinquency. It will be noticed that all cases occur in the classes of recruits which are unskilled. In other words, in any group where discrimination is made in enlistment, undesirables are eliminated The above histories, taken from the patients themselves with no coercion, show the recruits to have been a failure in civil life, and so there is every reason to predict their failure in a military career. It seems proper to make certain recommendations from experience in taking several thousand such cases.

(1) All courts should be warned against conniving in the enlistment of socially irresponsible people.

(2) A brief social history should be taken by an interested and skilled person on every applicant for enlistment. To do this will require some special skill, and it is too much to expect that an untrained enlisted man will do it well. Such a person should have some training in social investigation and might very well be a social worker.

(3) Whenever, in taking such a history, the applicant is far from home without adequate explanation, or gives a history of backwardness in school, low economic efficiency or delinquency, his case should have special investigation.

(4) Such special investigation should include at least a police report, investigation of references, and mental examination. All of this could be done by a neighboring psychopathic clinic, if such is at hand, and would be required in less than 5 per cent of the applicants.

(5) Whenever there is found to be a history of backwardness in school, irregular employment, and delinquency, the applicant should be rejected forthwith, for there is very little chance of his being desirable.

(6) The principal of specialization must be more adequately recognized if a high grade of psychiatric work is to be expected.

HISTORICAL.

A QUAKER PRODIGY.

THOMAS YOUNG, M. D., 1773–1829.

It is with good reason that the world is skeptical about the permanence of virtue in young paragons like the youth portrayed in "Sandford and Merton," and we liberally discount the final success of all those juvenile mathematicians, calculators, and inventors whom newspapers and the cheaper magazines exploit from time to time. Except when they are musical, how rarely do infant prodigies grow up to fulfill the early promises of achievement which astonished the neighbors and made parental hearts thrill with joy and pride. We wonder what becomes of the abnormal little creatures, for they cease to be mentioned even in the chronicles of their native towns. They must atrophy, undergo some process of involution, be self-digested, die intellectually, for of course they do not mature.

The slow-moving world, with its painful, laborious advances and its often questionable improvements, would unexpectedly dash ahead by the most terrifying leaps and bounds if time really brought to fruition the phenomena portended by infant prodigies. How fatal this would be to the honest, plodding endeavor on which we rely for the accomplishment of life's serious tasks. How each successive generation would loll in supine idleness, waiting for the birth of a genius and expecting progress as the easy gift of that genius, and how terrible would be the retrogression, what lacunæ would threaten, when there was an undue interval between meteors.

But because all general postulates have to be modified, and since rules are best illustrated by their exceptions, history furnishes occasional examples of youthful precocity that did not end in disappointment. Because international law and belligerent rights are so much in the public eye to-day, we may appropriately cite Grotius, the Dutch publicist, who attempted to create an international conscience, as a case in point. Huig van Groot, or Hugo Grotius, of Delft, Holland, wrote good Latin verses at 9, and at 12 years of age had fitted himself to enter the University of Leyden. When only 15, Grotius served as member of a diplomatic mission to France. By the time he was 20 he had edited versions of Cicero, written Latin dramas of merit, and been selected by the United Provinces to put into book form the story of their long struggle with Spain.

Grotius was 21 when he composed his famous treatise "De jure prædæ," and four years later became advocate general of the fisc for Holland and Zealand. Grotius was a remarkable instance of unusual ability manifested early and developing progressively through life. The most substantial basis of his claim to the notice of posterity is the work entitled "De jure belli," printed in his forty-second year. In the form in which it was published this was indeed the work of mature years, but the essential ideas therein set forth had been amply foreshadowed in the more exuberant and less guarded utterances of early manhood. It has been said that "in the annals of precocious genius no greater prodigy" than Grotius has been recorded. We invite the reader's attention to the accomplishments of Thomas Young, and claim that this member of the medical profession comes nearer justifying the title of universal genius than any other personage of whom we possess a veracious record.

Thomas Young was the first of 10 children born to Thomas and Sarah Young, worthy Quakers of Somersetshire. He was carefully and strictly brought up according to the tenets of this sect, and, though later in life he diverged from their mode of worship and practice of religion, he ever remained a devout Christian and readily recognized the valuable aid to the development of character and mentality which he owed to the Quaker rule.

A catalogue of Young's accomplishments would make dull reading, yet his life is so crowded with achievements worthy of record that it is impossible to do more than advert to them in the limits of a magazine article. Young's biographer and the principal authority on his life and work is Dean Peacock, of Ely,[1] who, writing 25 years after Young's death, scarcely finds sufficient room in 500 octavo pages to set forth the permanent contributions to science made by the subject of the memoir, and has no place for those details of the daily life and personal habits of the great man which for many readers possess far more charm than the exhaustive exposition of titles to fame. However, no contemporary of Young who appreciated his talent and realized to what an extent he had been misunderstood and underestimated by the bulk of his contemporaries could conscientiously have diverged from the task of establishing Young's position in the scientific world for the sake of presenting us with a picture of the man's personality. Besides, Dr. Peacock's work was undertaken at the earnest solicitation of Mrs. Young, who was naturally far more desirous of having her husband's reputation set on a solid foundation than of furnishing entertainment to the general reading public by the recital of all those minor incidents, peculiarities, whimsical sayings which give popular charm to biography.

[1] Life of Thomas Young, M. D., F. R. S., etc., by George Peacock, D. D. John Murray, Albemarle Street, London, 1855.

Though it is clearly not the biographer's primary intention to throw any sidelights on the character and personality of the great man, yet we learn from him that he was simple and unostentatious, supremely modest in estimating his own ability, and different in many ways from the popular conception of a scientific genius. Young was fond of dancing and horseback riding and enjoyed mixing in society. He was not overbearing or sententious in the expression of his opinions, but on the other hand he was not above feeling a certain relish in startling his hearers by some unexpected statement, and he greatly delighted in an argument and could stick to a point with truly British obstinacy. Nothing in Young's life suggests that he considered himself endowed with unusual mental powers. He invariably ascribed his success to persistent, untiring labor and to the determination to go to the bottom of every subject whose investigation he undertook. Young was frequently inveighed against, constantly misrepresented, often misquoted, and was fully appreciated only by the few, but his spirit was never embitterd, he never departed in public or private utterance from that courtesy, dignity, generosity, liberality, patience which mark the great mind, the perfect gentlemen, the true Christian. It is seldom that the dispassionate and critical eye of a succeeding generation can read the epitaph of a great man without suspecting that the encomiums bestowed upon the dead were inspired by family love and the admiration of friends, rather than by the unbiased judgment of his contemporaries, but the tablet in Westminster Abbey, set up to the memory of Thomas Young, seems to say too little rather than too much.

Sacred to the memory of

THOMAS YOUNG, M. D.,

Fellow and foreign secretary of the Royal Society,
Member of the National Institute of France;
A man alike eminent
In almost every department of human learning.
Patient of unintermitted labour,
Endowed with the faculty of intuitive perception,
Who, bringing an equal mastery
To the most abstruse investigations
Of letters and of science,
First established the undulatory theory of light,
And first penetrated the obscurity
Which had veiled for ages
The hieroglyphics of Egypt.

Endeared to his friends by his domestic virtues,
Honoured by the world for his unrivalled acquirements,
He died in the hopes of the resurrection of the just.

Born at Milverton, in Somersetshire, June 13th, 1773,
Died in Park Square, London, May 10th, 1829,
In the 56th year of his age.

Thomas Young as a boy was not a bookworm, pure and simple, but, having apparently been born with an insatiable thirst for knowledge of every kind, he had little or no time for the ordinary pastimes of youth, and apparently it was not until he had reached adolescence that he found the leisure necessary for social intercourse with his fellow men. At 2 years of age Young was able to read with considerable fluency. By the time he was 4 he was familiar with Watt's Hymns and had read the Bible through twice. According to his own testimony Young at 6 had learned the whole of Goldsmith's "Deserted Village" by heart (he accomplished this in odd moments in a period of six weeks), but his grandfather has testified in writing that Young repeated the poem to him correctly, with the exception of a word or two, before he was 5. Young was a great favorite with his grandfather, who did everything in his power to encourage the boy's love of learning and to direct his taste for study into the proper channels. "I well recollect," said Young, "the distich which he used constantly to repeat to me,

> 'A little learning is a dangerous thing,—
> Drink deep, or taste not the Pierian spring.' "

At the age of 7 Young was studying Latin, Greek, and mathematics. Referring to a capable teacher under whose influence he passed when about 13 years of age, Young says:

> He had made also an electrical machine, which I very frequently used. I was in the habit of grinding and preparing various kinds of colors for him, which he used to sell to the boys and to others; from him likewise I learned the first principles of drawing, and copied under his directions several specimens from the copperplates of a book entitled The Principles of Design. He was also a bookbinder, an occupation in which I assisted him. After he left the school I succeeded to some of his employments and perquisites, and I used to sell paper, copperplates, copy books, and colors to my schoolfellows, by which means I contrived to collect in 1786 as much as 5s., which, added to 10s. 6d. given me by my parents, enabled me to buy some Greek and Latin books, which were sold to me by Mr. Thompson at extremely low prices, and likewise Monotanus's Hebrew Bible, for which I gave 5s.; for I was at that time enamored of oriental literature, and I had already read through Buxtorf's Compendium, and Taylor's Tract at the end of his Concordance; and before I left Compton School I had succeeded in getting through six chapters of the Hebrew Bible.

Before the age of 14 Young had taken up the study of Hebrew, Chaldee, and Syriac, but he gradually abandoned Oriental languages and concentrated his attention on Greek and Latin, French, Italian, mathematics, natural philosophy, botany, entomology, and English literature. "The number of books which he read was very small, but he adhered strictly through life to the principle of doing nothing by halves. Whatever book he began to read he read completely and deliberately through; whatever study he commenced he never abandoned; and it was by steadily keeping to this principle, a most important one in education, that he was accustomed, in after-life,

to attribute a great part of his success, both as a scholar and a man of science."

Young was a great favorite with his uncle, Dr. Richard Brocklesby, a prominent physician of London, who made him his protégé and exerted himself in every way to prevent the young man from being spoiled, either by the consciousness of his ability or the wonder and adulation which he might provoke in others.

It was, perhaps, a fortunate circumstance for him that the modest station in life of his parents and connections, and the severe habits of the sect to which they belonged, saved him in some degree at least from the misfortune of being paraded as a prodigy; a fate to which wonderful boys have been more or less commonly exposed, in order to gratify the impatient vanity and ostentation of their friends. (Peacock.)

When Young was about 16 years of age his studies were interrupted by a serious illness "which seemed to threaten consumption." The patient was twice bled, and strictly confined for a period of two years to a diet of milk, buttermilk, eggs, vegetables, and very weak broth.

When Young was 19 his general education at school ceased. By this time he wrote fluently in Latin and Greek and was more than ordinarily well versed in the subjects already catalogued. Dr. Peacock ascribes Young's success later in life "to the peculiar constitution of his own mind; to his great industry; to the conviction, which he always felt, that what one man had accomplished another might accomplish also; to the determination of mastering every branch of knowledge whose acquisition he thought necessary or desirable.

"He had little faith in any peculiar gifts of genius, believing the original difference between human intellects to be much less considerable than it was generally supposed to be. His temper, also, in early youth was singularly unruffled and tranquil; he had no boyish tastes or amusements; he was seduced by no dreams of the imagination from the assiduous cultivation of the understanding."

In the autumn of 1792 Young commenced the study of medicine in London, influenced by the example and wishes of his uncle, Dr. Brocklesby. In 1793 Young presented to the Royal Society a memoir expressing his views on the capacity of the eye to change its focal length so as to be adapted for far and near vision. Young claimed that these changes occurred in the crystalline lens through the action of minute muscular fibers, which he fancied that he had discovered during the course of the dissection of the eye of an ox. The memoir was published in the transactions of the Royal Society, and on the strength of it Young was elected a fellow of the society in the following year.

While wrong in his contention that the focal changes of the eye were due to muscular fibers in the lens, Young was so absolutely in keeping with the ideas of his own time that John Hunter, the greatest physician of his day, immediately claimed the discovery as his own

and charged Young with plagiarism, but died before he had completed the lecture designed to set forth his views. The experiments of Hunter's successors seemed to prove that in the adjustment of the eye to different distances it is the curvature of the cornea and the length of its axis and not the crystalline lens which is changed. This startling announcement at first induced Young to withdraw his original opinion, but, later, after painstaking experiments and carefully measuring many eyes—both those which had been operated on for cataract and those which had not—he *returned to his original contention that accommodation for far and near vision depended on changes in the lens.*

In October, 1794, Young took up the study of medicine at Edinburgh and a year later went to Germany and matriculated at the medical school at Göttingen. Here, in addition to his medical studies, Young went in extensively for drawing, dancing, and equitation. He was passionately fond of horseback riding, and this fact, combined with his great muscular power, accounts for the marked proficiency which he attained. The riding schools of Göttingen were at that time second only to those of Turin, and Young found there opportunity to engage in the most daring and difficult feats. Writing to his uncle at this time, Young says: "I have this morning been upon the back of the Springer. To mount this terrestrial Pegasus is considered here something like *summi in re equestri honores*, and is seldom attained without long practice. I finish my lessons this week, and look back with satisfaction on the health and amusement which have repaid my time and money. It might, perhaps, be more useful to me to take some instructions how to sit in a doctor's chariot; but it is impossible to possess any qualification which one may not want, and capabilities are but light burdens. We have another fashionable exercise, which I think adequately corresponds to the athletic schools of the ancients—vaulting on a wooden horse in various positions; and I am much more known among the students for excelling in this than for writing Greek, of which they have little knowledge and not much respect."

Young was 23 years of age when he passed his examinations and was created Doctor of Physic, Surgery, and Midwifery by the faculty of Göttingen, after submitting the necessary theses and dissertations and undergoing an oral examination at the hands of four examiners, who sat round a table loaded with cakes, sweetmeats, and wine, of which they partook liberally while quizzing the candidate on surgery, anatomy, materia medica, physiology, and other branches of professional knowledge. "On the 16th July, he proceeded with his *praeses* (Wrisburg) and his two opponents (Weber and Nöden) to the summer auditorium, where he read a short thesis, called a *lectio cursoria*, the subject of which was the human voice; disputed according to the

forms; was complimented on his performance; and, after reading something like a prayer, was married to Hygeia, and created Doctor of Physic, Surgery, and Midwifery.

"The only fragment of this *lectio* which has been preserved is printed at the end of his dissertation, professedly with a view of filling up some pages of the last sheet, which would otherwise have remained unoccupied. We there find an alphabet of 47 letters, designed to express, by their combination, every sound which the organs of the human voice are capable of forming, and thus adaptable as an alphabet for all languages. It is distributed into 16 pure and 5 nasal vowels; 10 pure, 3 nasal, and 1 mixed, semivowels; 3 explosives, 6 susurrants, and 3 mutes. Whatever were the bases upon which this scheme was formed, it is evident from reference to it in his correspondence, that it was much in his thoughts; and he assures us that it was in connection with inquiries upon the powers of vocalization of the organs of the human voice, and in order to form a perfect conception of what a sound was, that he was conducted through a series of experiments and observations on the theory of the formation of sound and the laws of its propagation, to the consideration of analogous propositions respecting the theory of light, which became the foundation of his greatest discovery."

After a year's travel in Germany Young returned to England and became a student at Cambridge. In this same year he was elected fellow of the Linnaean Society on the strength of his description of a new species of opercularia—a plant from Australia.

Dr. Young began the practice of medicine in London in the year 1800, and continued an active practitioner up to the time of his death from calcareous degeneration of the aorta in 1829, but in spite of earnest effort and many real sacrifices to that end he never became what is commonly called a successful physician. The reasons for his failure are not discreditable to him nor are they hard to understand. The youthful years devoted wholly to study and lacking the ordinary pursuits and associations of boyhood could not fail to influence later life, and to some extent to unfit him for the quick understanding of the peculiarities of human conduct and put him out of ready sympathy with the mental side of his patients. Another reason for Young's failure to become popular as a medical father confessor to the well-to-do of the London world was that in him "the native hue of resolution sicklied o'er with the pale cast of thought" made no appeal to those patients whose confidence can only be won by a studied bedside manner and all those tricks and devices which are necessary to make the practice of medicine a paying business. It is interesting in this connection to note that, though not popular with patients, Young was sufficiently, nay, distinctly successful in the treatment of disease. In 1811 he was elected one of the physicians

to St. George's Hospital and retained this position to the end of his life. The apothecary of this hospital is reported to have made the remark that more patients were discharged cured from Dr. Young's service than from that of any other of the attending physicians, though they all outranked him as a fashionable physician and were credited with a greater capacity for *energetic* treatment. A testimony of similar tenor was given by Young's successor on the staff of the hospital.

Vigorous practice was the rage in Young's day, and a man who waited patiently on nature and deemed it his duty to take no steps that were not based on careful observation naturally passed for a mere philosopher, an indifferent healer, by comparison with that lively, bustling school, whose free use of calomel and prompt recourse to the lancet always insured immediate and visible results of one kind or another. Dr. Young was aware of his failure to measure up to the standard of popular requirements and appreciated that to be known as a dabbler in science, an investigator, a man of hobbies, could not fail to be prejudicial to his reputation as a practical physician. It was for this reason that not a few of his scientific reports were made anonymously, and it was on this account also that he resigned from his position as professor of natural philosophy at the Royal Institution. His very abilities seemed to disqualify him for the position of teacher. His hospital clinics were poorly attended, and he was extremely unpopular as a teacher, because his grasp of every subject was so comprehensive and rapid that his scholars could not keep up with him. He failed utterly to appreciate their difficulties and seemed constantly to slur over those very topics on which they were most anxious for him to dwell at length. All things considered, however, it is fortunate that, owing to his gentlemanly but cold demeanor, his reserve, his entire lack of that air of solicitude so dear to the patient, Dr. Young had ample time to prosecute those studies and researches which resulted in such real and tangible benefits to the progress of science.

In 1813 Dr. Young published his Introduction to Medical Literature and system of Practical Nosology. The appendix to this work contains a "Sketch of animal chemistry" translated from the Swedish of John Jacob Berzelius, one of the chief founders of the chemical theory of radicals and the successor to Lavoisier in the establishment of a system of chemical nomenclature. Young had no knowledge of the Swedish language until the desire seized him to become acquainted with the works of Berzelius. As Dr. Peacock very forcibly puts it: "A grammar and dictionary, a knowledge of German and of the general structure of languages, aided by a perfect familiarity of the subject, and his usual sagacity were sufficient to guide him" in this undertaking. That the translation was well done and satisfactory

to Berzelius is amply demonstrated by the letter of that illustrious chemist in which he thanks Dr. Young for the service rendered him and felicitates him on the scholarly accuracy with which the work was done.

Before this, however, Dr. Young had published an essay "On the Theory of Light and Colors," "An Account of Some Cases of Production of Colors," and "Experiments and Calculations Relative to Physical Optics." It is to the contents of these memoirs that Young owes his place in the temple of fame. Up to this time Newton's corpuscular or molecular theory of light had been practically undisputed for two centuries, a remarkable illustration of how in science, just as much as in religion, men's minds may be subjugated or blinded by authority. While Huyghens had conceived an adumbration of the idea of undulations, it was Young who in the study of colored rings established the principle of the interference of light, which was later confirmed and popularized by Augustin Jean Fresnel and served to establish the undulatory theory of light. As a matter of fact, in regard both to interference and diffraction, Fresnel's careful work, mathematically more complete than Young's demonstrations, had been anticipated by the latter by a number of years, as Arago has testified. In a letter to Dr. Young, accompanying a presentation of a Memoir on Polarized Light, Dr. Fresnel uses the following graceful language: "But, if anything could console me for not having had the advantage of priority, it is that it has brought me into contact with a philosopher who has enriched physical science with so great a number of important discoveries, a circumstance which has not a little contributed to increase my own confidence in the theory which I have adopted." In 1825 Fresnel was elected one of the 50 foreign members of the Royal Society on the strength of his important discoveries relating to light and heat, and in 1827, just as Fresnel was receiving the Rumford medal, Dr. Young was elected one of the foreign associates of the Academy of Science, Paris, in the place of Volta.

It is a curious and noteworthy fact that while Dr. Young's writings on philology were fully appreciated in Great Britain, and, while his work in connection with the interpretation of the Rosetta stone was championed and gloried in by his compatriots, some of whom may even have been tempted to exaggerate his accomplishments in deciphering hieroglyphics, it was from two Frenchmen, Arago and Fresnel, that he received the most valuable recognition and indorsement in regard to his optical discoveries. Lord Brougham, writing at length in the Edinburgh Review, poured scorn and contempt upon Young's hypotheses, and so effectively held him up to the derision of his countrymen that for years Young received no credit for what he had done. It is true that Young replied to the

bitter attacks made upon him in the Edinburgh Review, and amply vindicated his position and rebutted the charges of his adversary, but no steps were taken to promote the circulation of his printed answer, and it attracted little or no attention and had scarcely any readers; in fact, it is said that only one copy of his justification was ever sold! It would seem very remarkable that the scathing attack of the Edinburgh Review should have succeeded in discrediting Young's work for a number of years, were it not for the fact that the whole subject of his investigations was too abstruse and too difficult to appeal to the general reading public, and even the small and select body of scientific men were thrown off the scent by the ease with which Young handled his subject, and by his failure to use the more elaborate methods of demonstration, which he would, doubtless, have employed had the problems been as baffling to him as they were to the majority of his contemporaries.

It must not be supposed, however, that Young was lacking in friends and supporters. On the contrary, some of the ablest and most talented men of his day were numbered among his admirers and backers, of whom may be mentioned Sir Walter Scott, Humboldt, Canning, the Duke of Richmond, and Sir Humphrey Davy.

Dr. Young's archæological and linguistic researches, his contributions to the Quarterly Review and the Encyclopedia Britannica may be passed over with the brief comment that they were works of a high order, which served in some measure as a preparation for the greater achievements connected with his interpretation of Egyptian hieroglyphics, but they must be taken into account, also, as evidences of his great versatility.

When Napoleon Bonaparte entered upon his famous campaign in Egypt, in 1798, he had with him numerous artists and archæologists who undertook researches in the history of the country. In 1799 Broussard, an army engineer, stumbled upon a small stele or shaft of black basalt a few miles from the town of Rosetta, in the vicinity of Alexandria. Carved upon it was a decree of praise for Ptolemy V and his wife, Cleopatra, voted by the priests assembled at Memphis. The decree is written in Greek, in hieroglyphic or hieratic characters, and in the demotic or enchorial. Unfortunately, while the Greek and demotic versions were in a fairly good state of preservation, a considerable part of the hieroglyphic text was badly mutilated, which added enormously to the difficulty of deciphering. At the conclusion of the Greek inscription it is stated that the other two inscriptions have the same meaning.

At the cession of Alexandria, in 1801, this now world famous stone was acquired by the British Government and was set up in the British Museum, becoming the key to all subsequent scientific investigation of ancient Egypt. Among the first scholars to turn their

attention to the Rosetta stone (1802) were J. D. Akerblad, a Swedish orientalist attached to the embassy in Paris, and Silvestre de Sacy. Neither advanced very far. In 1814 Young attacked the problem, utilizing the very limited discoveries made by the two earlier investigators. A report of what he accomplished, with his conjectural translation of the enchorial inscription was printed anonymously in 1815. It is interesting here to note that already at this time de Sacy wrote to Dr. Young, cautioning him about the probable unethical behavior of Champollion and of the strong likelihood that he would pretend to priority in any successful future translations of the Rosetta stone. It is not easy for a person with no pretense to Egyptian lore to determine the proportion in which credit should be given to Dr. Young and to Champollion. Unfortunately, during the lifetime of these men, each a scholar of eminence and renown, their claims were championed by their fellow-countrymen on strictly national lines, as if France and England were seeking to claim the honor of having found the key to the interpretation of the Rosetta stone. This much can be positively affirmed. Champollion was an Egyptologist. His interest in Egypt dated from when he was 10 years old. His entire life was devoted to the most painstaking and profound study of everything relating to the subject, and the example of his industry and his truly wonderful attainments did more to put this branch of learning and research on a solid foundation than the combined efforts of all his contemporaries. He is undoubtedly entitled to the credit of finally and fully deciphering the Rosetta-stone inscriptions. On the other hand it seems incontestable that Champollion had scarcely advanced much beyond Akerblad, and, also that he was following that scholar's line of research until Young's discoveries and Young's method of attacking the problem came to his knowledge. Those discoveries and that method were immediately taken advantage of by Champollion, who, with this as a foundation, attained the most brilliant and marvelous results. Whether or not the great Frenchman was guilty of a certain disingenuousness and lack of candor, the present writer can not say, but there was documentary evidence to show that some of his compatriots thought him not above suspicion. There is good ground for believing, too, that Young was the first to appreciate the value of the phonetic signs. He announced that the demotic characters are not alphabetic but symbols originally derived from hieroglyphics which are themselves not words but phonetic signs, conclusions which Champollion announced five years later as originating with him. Young identified but a limited number of hieroglyphics, and, through lack of time or desire to devote the great amount of time that would be necessary to success, he did not utilize, as he might have done, the valuable aids to interpretation which he had himself originated. Young lacked the opportunities

and facilities available to Champollion. Young was a practicing physician, a visiting attendant at a large city hospital and interested in a wide variety of other studies. Champollion, on the other hand, was a professed Egyptologist, whose one purpose in life was to further the accumulation of knowledge on the one subject of his chosen career.

It now remains to summarize briefly the other lines of research with which Young busied himself. He was the first to offer a plausible explanation of color blindness, and his theory was adopted and elaborated by Helmholtz, who pronounced his forerunner "one of the most clear-sighted men that ever lived." He gave the first description on record of astigmatism. He was an authority on shipbuilding, gas illumination, and life insurance. He served for a long time as superintendent of the Nautical Almanac and secretary of the board of longitude. He was secretary to the commission for ascertaining the length of the seconds pendulum. He was an authority on the subject of tides.

In conclusion it remains to be said that Thomas Young was in person "the handsomest of all the great physicians," and he was by long odds the best educated man of his time. His love of the classics, and especially of the Greek language, was a source of pleasure to him through life. He was married in 1804 to Miss Elizabeth Maxwell, a lady of good family and standing. The marriage was an extremely happy one. Toward the close of his life Dr. Young and his wife traveled extensively on the Continent of Europe, their sojourn in Italy being particularly enjoyed. The following retrospect contained in a letter to a friend is highly interesting: "I do not believe that you are much the older for anything that occurred when you were a boy; nor do I think that I should have been the worse in health if I had been less rigid in my regimen. It is well for me that I have not to live over again; I doubt if I should have made so good a use of my time as mere accident has compelled me to do. Many things I could certainly mend, and spare myself both time and trouble; but, on the whole, if I had done very differently from what I have, I dare say I should have repented more than I now do of anything; and this is a tolerable retrospect of 40 years of one's life. I have learned more or less perfectly a tolerable variety of things in this world; but there are two things that I have never yet learned, and I suppose never shall—to get up and to go to bed. It is now past 12 o'clock, but I must write for an hour longer."

One of the oldest and most valued of Dr. Young's friends, Hudson Gurney, said of him: "Dr. Young's opinion was, that it was probably most advantageous to mankind that the researches of some inquirers should be concentrated within a given compass, but that others should pass more rapidly through a wider range—that the faculties of the mind were more exercised, and probably rendered

stronger, by going beyond the rudiments and overcoming the great elementary difficulties of a variety of studies than by employing the same number of hours in any one pursuit—that the doctrine of the division of labor, however applicable to material product, was not so to intellect, and that it went to reduce the dignity of man in the scale of rational existences. He thought it so impossible to foresee the capabilities of improvement in any science, so much of accident having led to the most important discoveries, that no man could say what might be the comparative advantage of any one study rather than of another; and though he would scarcely have recommended the plan of his own as the model of those of others, he still was satisfied in the course which he had pursued.

"It has been said that the powers of imagination were the only ones of which he was destitute. From the highly poetical cast of some of his early Greek translations, this is at least doubtful. It might, perhaps, have been said more justly that he never cultivated the talent of throwing a brilliancy on objects which he had not ascertained to belong to them. Dr. Young was emphatically a man of truth. The truth, the whole truth, and nothing but the truth was the end at which he aimed in all his investigations, and he could not bear, in the most common conversation, the slightest degree of exaggeration, or even of coloring. Now, all exercise of what is ordinarily called imagination is the figuring forth something which, either in kind or in degree, is not in truth existent; and whether originally gifted with this faculty or otherwise, Dr. Young would, on principle, have abstained from its indulgence.

"To sum up the whole with that which passes all acquirement, Dr. Young was a man, in all the relations of life, upright, kind-hearted, blameless. His domestic virtues were as exemplary as his talents were great. He was entirely free from either envy or jealousy, and the assistance which he gave to others engaged in the same lines of research with himself was constant and unbounded. His morality through life had been pure, though unostentatious. His religious sentiments were by himself stated to be liberal, though orthodox. He had extensively studied the Scriptures, of which the precepts were deeply impressed upon his mind from his earliest years; and he evidenced the faith which he professed in an unbending course of usefulness and rectitude."

EDITORIAL.

YANKEE VOLUNTEERS.

While we realize the likelihood of an artificial and inaccurate element in public statements about personal concerns, in letters supposedly private but really written for publication, in autobiographies, confessions, and private journals, nevertheless such speeches and writings as claim to give the hearer or reader a peep into the human heart and a view of the secret springs of action have an undying fascination. We know that our most intimate associates constantly harbor thoughts and fancies to which we shall be strangers ever. In unusual situations when there is no time to deliberate on a course of conduct we do things on the spur of the moment at which we ourselves are surprised; things which seem to prove that there are forces working within us of which we are entirely ignorant. History shows us only the externals of men and events. The motives and causes are usually matters of conjecture. Writers of fiction even when giving loose rein to their imaginations seldom dare to present human nature as it really is.

Hence anything purporting to be a human document is sure to have a multitude of eager readers. Rousseau did not need to be a philosopher and a conspicuous figure at a critical moment in the development of human thought for his "Confessions" to become popular, and the numberless individuals who reveled in the journal of Marie Bashkirtseff were little concerned with her station in life or her accomplishments in the world of art, demanding only the assurance that her pages contained the spontaneous effusions of a real and not an imaginary person. Not only is fact stranger than fiction, but it is infinitely more interesting, and if the school of "realists" had the wit to leave out the vulgar and unessential details which some unexplainable, inherent vice compels them to introduce into every novel and every picture they would have a universal following.

A medical officer from one of our most frequented recruiting offices has furnished the appended list of answers given by recruits to the question, "Why do you want to enlist?"

"I don't know." This man was probably capable of more accurate processes of thought and analysis than might appear to superficial view.

"Well, I got no idea except I don't want to be taken away. Better go before I'm sent."

"Might as well go now as to let 'em pull me in."

"Well, I wanted to get away from that draft."

"I wanted to volunteer before the draft."

"Might as well go as get drafted."

"I got to go. Got to go some time; might as well go now."

These references to the draft are significant of widespread misconceptions of a citizen's obligations.

"Well, nothing. I don't get along with my brothers good, see?"

"One thing in my life I want to do is to live down that bad-conduct discharge." ("Out, damned spot.")

"Don't want to get drafted in the Army. That's all."

"It's something everybody's got to do now, and I'd like to get into the Navy rather than the Army."

"Want to do something for my country. What's the use of staying around home and let all the other guys go?"

"Just to go in, in an ordinary way, like anybody else." (A somber modesty this; patriotism that does not demand the seal of a commission.)

"I think it's my duty."

"Got a lot of friends in already and I'm not fixed any of the best where I am." ("Behold an Israelite in whom there is no guile.")

"I want to get the experience; that's all." (Physicians please note.)

"I'm out of work and ain't got nobody here. I live in Oklahoma." (Somewhat of a humorist.)

"Just feel like going in. Want to get away from the saloon business." (Coming events cast their shadows before.)

"Being as there's war I want to fight for Uncle Sam."

"Well, just to serve my country."

"I see all the other fellows going in and I want to, too." (Man is a gregarious animal.)

"I want to fight for my country; always have, but father wouldn't let me before I was twenty-one."

"Just to be a patriot like the rest of 'em, I suppose."

"I want to be an electrician."

The following are unsolicited testimonials for the naval service:

"A fellow I roomed with in Bridgeport told me it was all right in there."

"I think it's a good place because there ain't no strikes there. I'm a plumber and want steady work."

"I think I could do better work in the Navy."

"I had an inclination to join the Navy because I've seen fellows after they had been in."

"Why, so I can learn something. I think the Navy is better that way than the Army."

"It's a good change from bookkeeping."

"To be more trained. That's all."

"Well, I belonged to the artillery. I'd rather be in the Navy. I've got a couple of friends in there and they say it's very nice in there."

"I expect to learn radio."

"To better myself."

"To make a man of myself."

"I've got a brother in it."

"A few friends of mine joined and so I want to, too."

"I can go in as a fireman and when I come out I can have a good business because they learn you in there."

The following answer frankly suggests very mixed motives:

"I like the life. I can make more money in there and learn a trade."

Equally candid is the answer: "Well I haven't got a job."

We get a flavor of the flotsam and jetsam of life in such answers as these:

"Just want to join, getting sick of everything. That's all." "I don't know. I've done quite a little bit of traveling and I'd like to do some more." "I can't do nothing at the present time and I want to go and fight." "I think I might be better off." "Because I lost my parents." "I'd sooner go in there than hang around." "I want to get away from the gang I'm hanging out with." "I was talking to a fellow yesterday and he said it was pretty good." "I think I've got to go in. My mind has been on the Navy ever since I left school." "I've been out of work three months and I'm tired of it." "Just for a pastime." "Out of work." "I just saw the signs all around and thought I'd help the country. That's all." "I was out of work first time I tried and I ain't been working since, and now they're going to draft me." "I've got no people and I thought I could get in." "Just for the excitement of it." "I have no home and no people and I want to go."

We group together the answers that intimate a higher motive and through their very simplicity and ingenuousness bear the stamp of truth:

"Just to fight." "Well, I asked my mother and she said I could." "Just to serve my country." "They need men." "Can serve my country and learn a trade at the same time." "I think it's my duty." "I want to serve my country." (The man was known to have a good job.) "Well, it seems to be the time of need." (This boy is descended from a soldier of the Revolutionary period.) "My father told me to enlist." "So I can be of use to somebody." "Why, so I can be of some service." "To do what I can. That's all. Father told me to come down and enlist." "To be patriotic and serve my

country. I'm subject to the draft and want to get into the Navy before they get me into the Army." "Just to fight for my country." "To serve the Nation." "I thought they needed me." "A lot of the fellows in my block went in." "Primarily to serve in the war. Not so much for education because I've had one year in college." "I hope to have the opportunity to redeem myself after my bad-conduct discharge." "It's hard to explain; I think it's my duty and I want to do it." "For patriotism, sir."

It would be interesting to know the name and nationality of the candidates quoted in this hasty search for the actuating influences that guided them to the recruiting office. On the Continent of Europe we have an expansive and outspoken race wholly free from that great defect of the Saxon, *mauvaise honte*. For an Italian or Frenchman to speak of his love of country is as natural as for him to kiss his whiskered chum good-by at a railway station. If we fall short of the excess of reserve that characterizes the Britisher in society and makes him dread American effusiveness, we equal him in our horror of professing fine sentiments. We prefer the cold word "duty" to the more glowing "patriotism" or "love of country," and the old spread-eagle oratory of Fourth of July celebrations is very much out of fashion. We squirm in our seats when public speakers tend to get mellow and slop over about their country. The guess may be hazarded that many of those who frankly professed themselves patriots were Latin or Kelt, and it is more than likely, too, that many a man who thought he was honest in giving, as a reason, need of employment, a desire to learn, the longing for a change of scene, was unconsciously acting from motives of a high and noble order. Our young American has the sentiment of patriotism, but is not sentimental and does not wear his heart on his sleeve. He might whistle the Marseillaise, but who can imagine him bursting into song with "My country, 'tis of thee," even in the solitude of an ambrosial forest? The curt and matter of fact phrase "do my bit" has come across the water and is an ideal mask for the most compelling of worthy motives. For many of the men enlisting to-day the war is still a remote thing, and the danger to life, the country's grave peril, is so dimly apprehended that they would feel foolish if they tried during the ordeal of the recruiting examination to lay bare the things of which they can scarcely bring themselves to speak to father or mother.

Thackeray composed one of the least meritorious of his ballads inspired by a newspaper statement that nine-tenths of the men in a certain company confessed to having enlisted for Civil War service because of a love affair *manqué*. Had he lived in our day there would have been no excuse for his "Yankee Volunteers."

THE VALUE OF THE OPPOSITION.

If Marius and Sulla, with their respective followings, could have been rival members of the same government, associated in the administration of public affairs and dividing the responsibility for them instead of alternating in the possession of supreme power, the last days of the republic would not have been marked by proscription, murder, and bloodshed, for Rome attained greatness during the centuries marked by the constant civic contentions between plebeians and patricians, and declined during the period in which centralized power was increasingly yielded by a subservient senate and people to emperors styled "divine."

England, without a written constitution, has given to the world both the idea and the concrete example of constitutional government, a government evolved out of the long struggles between kings and barons, Lords and Commons, Whigs and Tories, Liberals and Conservatives, at the cost of but a single monarch's head. That people is indeed to be pitied whose government has not its rival parties and factions. Annoying and hampering though a powerful minority may be when some definite legislation is urgently needed, and almost universally desired, still a critical, obstructing, recalcitrant minority is the indispensable, automatic safety device of popular government.

An occasional schism in the church has compensating advantages. Heresy makes orthodoxy thoughtful as well as devout and honest; humble, intelligent doubt purifies and spiritualizes faith.

In medicine rival schools and doctrines are essential to progress, and even the charlatan and quack may possess nuggets of truth which the legitimate practitioner should not disdain to utilize if they will work ultimate good to his patients. Old crones, monthly nurses, housewives, if intelligent enough to be accurate observers of natural phenomena, often make suggestions which merit at least the consideration of the physician. J. Marion Sims learned this in the early days of his practice, when an old colored mammy proved herself superior to him in a matter of prognosis.

A mind open to conviction, the capacity to grasp what Herbert Spencer calls "the soul of truth in things erroneous," the docile spirit willing to be taught by simpleton, child, and dotard, if they have something valuable to impart—these are the attributes of the scientific man, and to be able to learn from rivals and enemies is not greatness, but merely a proof of not being small.

When Samuel Christian Friedrich Hahneman at the beginning of the last century formulated a system of medicine based on experiments on his own person and on some of the doctrines of that original thinker, popular idol, most lovable vagabond and archquack,

Paracelsus, he gave nothing of direct value to the world, because his treatment was directed essentially to the symptoms and not to the causes of disease. Indirectly, however, he conferred a benefit upon humanity by creating a conservative school of dosing, compelling the favorers of copious draughts and drenches to look to their laurels and reform their methods. The increasingly simple therapy of our day is not derived from homeopathy, but undoubtedly the practical success of many of the followers of Hahneman, who himself died a millionaire, has emphasized the reliance which must be placed on nursing, food, and general regimen, since we reject the efficacy of infinitesimal dilutions, essentially different from preferring a minute dose of alkaloid to the pint of decoction of the bark.

The man or woman, well provided with this world's goods, who had no serious bodily ailment and yet was made miserable by constantly focusing the mind on self and magnifying every trifling physical discomfort, who had perhaps acquired the vicious habit of taking medicine for anything and everything, was sure to be highly insulted if the doctor declined to write a prescription and advised golf and settlement work instead. Christian Science, so called, has reclaimed many of these unfortunates and emphasized for the physician the important fact that imponderable remedies are often superior to herb and mineral. It has popularized the fact that a little self-control and the cultivation of a Spartan spirit is, in the long run, better than a constant resort to aspirin and its congeners. If a certain number of the devotees of the new cult succumb annually to untreated appendicitis, their loss is counterbalanced by the tonic effect which such instances produce on the general public, characterized in the main by a good deal of horse sense. The conscientious physician, free from a blind faith in a multiplicity of drugs and only too glad to practice preventive medicine, finds it increasingly easy to say: "Madam, the tonic you need is oxygen and exercise," or "Stop the candy and save on cathartics." The public, ever ready to pronounce a doctor indifferent and unsatisfactory, is becoming accustomed to the idea that he can earn his fee by good advice as well as by written prescriptions. As the homeopath encouraged the small dose, so the Christian Scientist tends to promote a drugless therapy and preventive medicine.

We owe to the chiropractors and osteopaths a fresh and striking example of the cardinal error, common to all ages, of trying to make a panacea out of a measure of great usefulness in a limited field. They should constantly remind us of the danger of riding a willing horse to death. Every advance in medicine, every discovery, every diagnostic device, every scheme of treatment, which has a promise of usefulness when thoroughly understood and used with discrimination, finds at once its overenthusiastic champion ready to discard conservative practices, sanctioned by reasonable success, in favor of

a new method giving more promise than assurance of solving long-studied problems. Tuberculin, X-ray, salvarsan, radium, the Wassermann test, even quarantine and disinfection, all suggest themselves at once as examples of measures of great value, which at one time or another have been employed with as little judgment as the advocate of local treatment displays when he proposes to cure lumbago, a dislocated vertebra, and a duodenal ulcer by one and the same method. It is not so many years since the germ theory of disease so possessed our minds that we not only neglected but scornfully discredited the factors contributory to germ activity in a violent reaction from the teachings of previous generations in which too much was ascribed to mere circulatory disturbances.

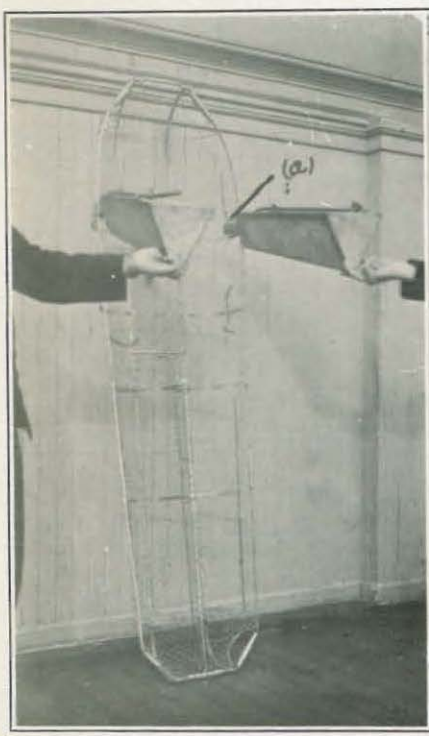
The ignorant, specious opponent of vaccination is responsible for many a death from smallpox, but he has undoubtedly done much good by compelling us to be more careful. The deaths from tetanus following vaccination are all ascribed by him to vaccination on the *post hoc ergo propter hoc* principle, whose acceptance, alas, is not confined wholly to the man in the street. The menace of tuberculosis and syphilis is faced every day in a thousand unperceived, unappreciated ways and with a fool's temerity where the risk is evident by many a man who is loud in his denunciations of serums and vaccines. But, as we dispassionately survey the progress of medicine, justice compels us to recognize our obligations even to these misguided advocates. It is in part due to their attacks that vaccine is now manufactured from cattle not susceptible to syphilis, from cattle carefully tested for tuberculosis; that it is manufactured under Government supervision; that animal inoculations rule out the danger of tetanus; that we are increasingly careful to perform the little operation of vaccinating with scrupulous attention to cleanliness.

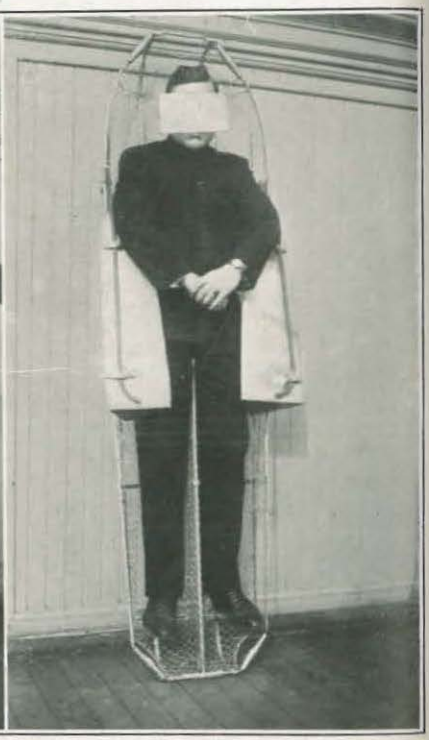
Not only then are we to refrain from bitterness or hostility toward those who seem to hamper our honest efforts to improve the condition of our fellow men along the lines indicated by well demonstrated facts, but we must force ourselves to recognize without partiality or prejudice that even the most unenlightened opposition has an essential place in the scheme of human development. The ever-present danger for those who have a great deal of right on their side is the assumption that they are wholly right. The preponderance of injustice in criticism must not blind us to our own liability to error. If we are honest, we are bound to see in the rise of many schools of special treatment a proof that scientific medicine is prone to neglect useful though minor adjuvants to recovery.

It remains to be said that a spirit of fairness and justice is not incompatible with devotion to principle. We must not confound broadmindedness with supine indifference to noxious activities, nor permit our laziness or timidity to masquerade as tolerance.

Fig. 1.—Kopak jacket. Useless.

Fig. 2.—Air chamber. Successful.





Figs. 3 and 4.—Stokes's stretcher fitted with air chambers.

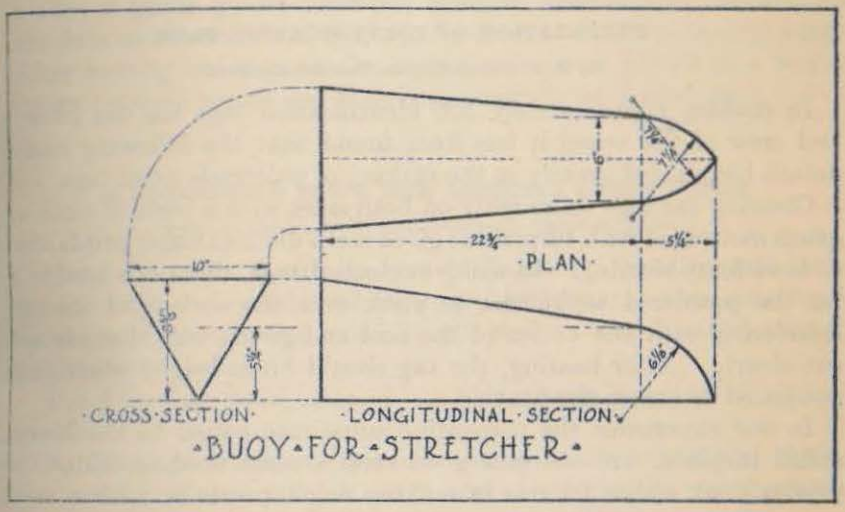
SUGGESTED DEVICES.

AIR CHAMBERS FOR THE NAVY STRETCHER.

By J. A. B. Sinclair, Acting Assistant Surgeon, United States Navy.

On January 12, 1918, in Puget Sound, with one kopak jacket on the "patient" in regular way, another inside of the stretcher in the same position as the first (but with arms not passed through armholes), and a third around outside of stretcher, the tout ensemble was dropped over the side.

The jackets did not adequately suspend the patient contained in the Stokes stretcher, nor did the two assume a correct or comfortable



position, as the feet tended to back away and the face to dip forward into the water, requiring the patient to take his head out of the usual position in the stretcher and elevate it as high as possible to prevent an "eyefull." For the purpose in view it was clear that kopak jackets were useless. (Fig. 1.)

On February 1, at the same place, having had the ship's carpenter make two galvanized-iron air chambers, as shown in the accompanying illustrations and drawing, an overboard experiment was made. The result is shown in figure 2. There was no "dipping," the position was upright and vertical, and the sense of security striking, while the use of the arms was not impeded.

Conclusion: Air-chamber attachments to the Stokes stretcher are practicable and cheap, being made from scrap galvanized iron by the ship's carpenter. Similar chambers of sheet tin may be made at even less expense.

The average weight of six stretchers supplied to this ship is 26.75 pounds. Weight of stretcher (experimentation), 25.50 pounds. Length of tanks, 27 inches (mean). Capacity of tanks, 860 cubic inches each. Capacity of both tanks, 1,720 cubic inches, approximately 1 cubic foot. Distance of tank hinge or fulcrum (*a*) from extreme forward end or head of stretcher, 24 inches. Total buoyancy of two tanks in salt water, 64 pounds. Weight of stretcher used, 25.50 pounds. Weight of two tanks or chambers with iron rod arms, 14.50 pounds. Weight of stretcher with tanks, 40 pounds.

Buoyancy required to sustain average patient, in salt water, 20 pounds. Tanks are readily detachable from stretcher.

PREPARATION OF IDENTIFICATION TAGS.

By M. A. STUART, Surgeon, United States Navy.

In making approximately 500 identification tags for the officers and crew of the vessel it has been found that the following minor details have aided greatly in the making of uniformly good tags.

Cleaning the tags thoroughly on both sides with a piece of cloth or gauze moistened with turpentine gives more distinct finger prints that etch without blurring. In using uncleaned tags, there is a tendency for the powdered asphaltum to stick over the surface of the tag, interfering with the action of the acid and giving tags that are not cut clearly. After heating, the tag should be as bright where it is not inked as before the heating.

In our experience the turpentine substitute issued to the Navy, called turpinet, will not give good results when used to dilute the printer's ink either for use in making finger prints or with a steel pen. There is a tendency for the turpinet to spread on the metal beyond the ink, forming a moist zone around the markings or between the lines of the finger prints to which the powdered asphaltum will adhere preventing the action of the acid and giving blurred finger prints and markings in the finished tag.

In the etching process, we have attached each tag to a piece of ordinary Medical Department string with a single tie and suspended them in the ordinary wide-mouth bottles of about 700–800 mil capacity, such as sodium bicarbonate or boric acid is issued in, so they are just clear of the bottom, securing the strings on the side of the bottle, one by one, as the tags are placed, with a piece of adhesive plaster. The advantages of this method are economy of acid, ease of handling, absence of air bubbles on the surface of the tags (bubbles

are removed mechanically as formed by bubbles below), no slopping of acid from trays in a ship under way, no corrosion of metal containers, solution and tags can be gently agitated without difficulty, and each tag is suspended in the acid solution, allowing free and equal action of the acid on both sides at the same time.

In using a bottle of the size mentioned above, 30 tags can be easily etched at the same time, using about 180 mils of the acid mixture or 60 mils of nitric acid. It has been found that when the tags are fully etched the acid mixture, which will have a dirty turbid green appearance, should be thrown away, as the salts formed during the reaction interfere with the etching of another batch. Should the action of the acid stop before etching is complete a few mils of HCl will continue the process.

In making large numbers of tags a little teamwork can be developed that will speed up production, as one man can make finger prints, dust on the powdered asphaltum, send the tag along with a slip of paper giving necessary data to another man, who enters the data on the reverse of the tag, dusts with the powder, and heats. After heating the tags can be etched at once or placed in a box in layers between paper and etched successfully at a later date.

A SUGGESTION FOR A NEW HOSPITAL CORPS POUCH.

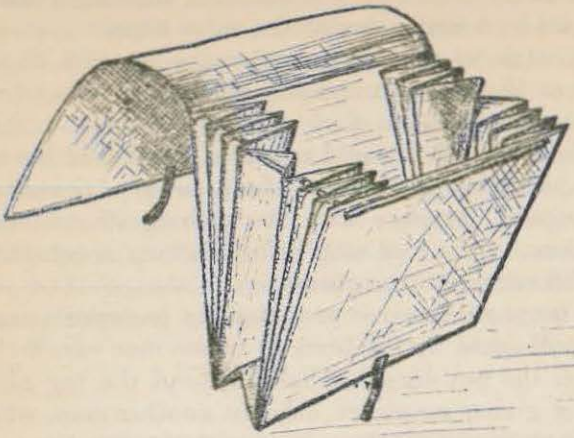
By W. E. Eaton, Passed Assistant Surgeon, United States Navy.

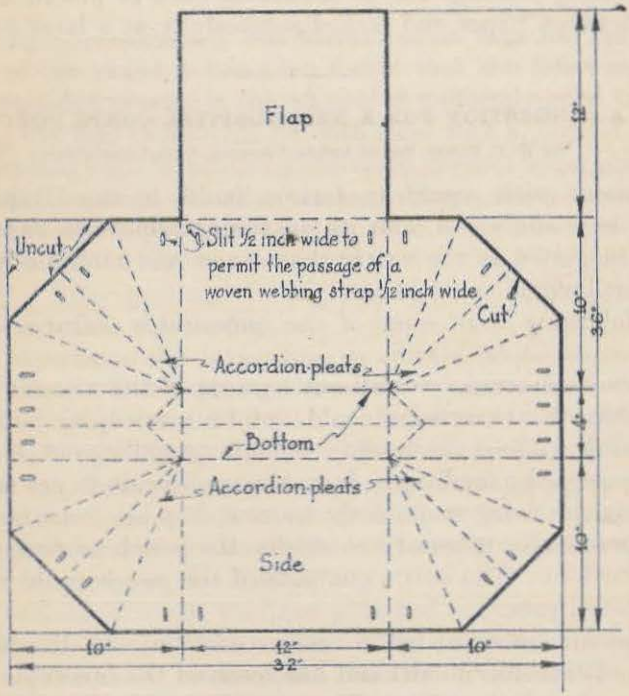
Compiaint with regard to certain faults in the Hospital Corps pouch, large and small, and its unsatisfactoriness on expeditionary service suggested to the writer that a new and more useful pattern might be devised.

The following were some of the undesirable features of the old pouch:

It permitted articles to fall out because of the manner of closing the pouch. Extra articles could not be carried, as no expansion was possible without the liability of contents spilling out, and because of faulty securing facilities. It was very difficult to get articles out of the pouch, owing to its deep, narrow, box-like construction, and it was practically necessary to empty the pouch to find something on the bottom. The entire contents of the pouch could not be exposed to full view.

The pouch described below seems to obviate all the undesirable features of the older model and has received the favorable comment and indorsement of medical officers and hospital corpsmen who have been or are now on expeditionary duty. It is constructed on the general idea of a bag with a purse string. The pouch is closed by a draw strap which also serves as the means of carrying it, and therefore the heavier the load the more securely is the opening of the




Flap
Uncut
Slit ½ inch wide to permit the passage of a woven webbing strap ½ inch wide
Cut
Accordion-pleats
Bottom
Accordion-pleats
Side
10"
12"
10"
32"
12"
10"
4"
10"
32"

·PLAN·

pouch held. A flap with securing tapes adds to this security. It is possible by this arrangement to open the pouch flat upon the ground or table and completely expose all contents to view, and subsequently by pulling upon the draw straps the contents are gathered together within and the pouch closed with expedition. The draw strap is so placed as to produce two long flat sides, upon which may be placed pockets for the equipment of the pouch, and the ends gathered in an accordion-pleat arrangement.

The description follows, from which it may be easily constructed on board ship or by the expeditionary force.

SPECIFICATIONS.

For a new "catch-all" type of Hospital Corps first-aid pouch to be slung from the shoulder or otherwise by a strap which also acts as the draw string.

The pouch consists of a rectangular body or bag 12 inches long by 10 inches deep, with a bottom 4 inches wide, and accordion pleated ends, to be covered by a flap attached to one side, all to be closed and held secure by a draw strap passing through suitably located slits, the strap also to act as a means of carrying either from the shoulder, belt, or saddle, etc., the strap to be one-half inch wide of woven webbing and equipped with a sliding wider portion as a rest when over the shoulder.

The material forming the pouch may be cut from one piece of goods, which should be of strong, serviceable texture and olive-drab or khaki color.

The pattern should be designed in such a way that the greatest length, including the portion forming the flap shall be 36 inches, the greatest width 32 inches and the portion forming the flap 12 inches square placed centrally on one side. The greater portion of the pattern therefore will be 32 by 24 inches, and as an extension of the latter dimension, there will be a flap 12 inches square.

The body or bag portion shall be folded across the greatest length in such a way that there will be two portions 10 inches wide (to form the sides) separated by a portion 4 inches wide (to form the bottom). The piece is now opened out flat and then folded across the folds just made (above) in such a way that there shall be a central portion 12 inches wide (and continuous with the flap) separating two portions each 10 inches wide. These two latter 10-inch-wide portions will now be seen to consist of two areas, each 10 inches square separated by an area 4 inches by 10 inches.

The 10-inch square areas are now folded diagonally into four equal parts, and the 4-inch area is folded longitudinally in two equal parts. All folds just made will now be arranged in such a way that accordion pleats are formed and the ends of the pouch brought into position, causing the sides to oppose each other.

We now have a pouch with sides 12 by 10 inches, a bottom 12 by 4 inches, and accordion-pleated ends. The points of two pleats at either end project beyond the top (opening) edges of the pouch when completed. These protruding points should now be cut off even with the top (opening) edges. The flap may now be folded over the opening, and by collapsing the pleated ends and folding the bottom longitudinally at its center a flat folded article is obtained.

At a point about one-half to three-fourths inches below the top (opening) edges and about 1 by 1¼ inches in from the ends (at a point which makes it possible to pass through all pleats) a perpendicular slit shall be made through all layers of the goods sufficiently large to permit of the easy passage of a woven webbing strap one-half inch wide, the edges of the slit to be worked around with a buttonhole stitch.

The strap shall be made of woven webbing one-half inch wide and sufficiently strong, heavy, and serviceable. The strap shall pass through the slits above mentioned and be just long enough to permit of the pouch being opened flat upon the

ground or table and to permit of suspending the pouch over the shoulder for transportation purposes. The strap when pulled through the slit shall securely close the opening and withhold all contents from spilling out under all circumstances. When properly adjusted contents can not shake or fall from the pouch and the pouch may be readily and quickly closed by simply pulling upon the strap allowing the pouch to assist by its weight and contents.

A sliding portion of webbing about 1½ inches wide and about 6 to 8 inches long, having a slit at either end for the passage of the strap, shall be fitted to the strap as a rest upon the shoulder when the pouch is thus suspended.

The flap shall be secured by a piece of tape sewed mesially at its lower edge and also that of the bottom of the bag.

All edges of the goods shall be taped around with tape of light weight about one-half inch wide.

A stiffening strip of thin metal, preferably steel, about one-half inch wide and long enough to extend between the slits, through which passes the draw strap, should be placed just below the top edge and on the inside surface of the front and back sides. The metal strip should be covered over and held in position by a narrow tough piece of tape sufficient in size for the purpose.

Pockets for the retention of the various articles to be placed in the pouch should be securely stitched to the front and back sides.

CLINICAL NOTES.

TABULATION OF PNEUMONIA SYMPTOMS.

By R. W. Holbrook, Passed Assistant Surgeon, United States Naval Reserve Force.

Reports coming from various Army and Navy camps coincide somewhat with the experience at the United States Naval Hospital, Great Lakes, Ill., in that the pneumonia peak was reached in the period of February 15 to March 15, both in number of cases and virulence of organisms. The following classification of symptoms is of interest in that the cases come from widely separated regiments:

History of irritated throats previous to admission	40
Chill	40
Acute localized pain in chest	38
Known temperature before admission	34
Headache	22
Vomiting	16
Pain referred to abdomen	9
Meningeal irritation	8
Albumen present	7
Rusty sputum 1st day after chill	4
Rusty sputum 2nd day after chill	26
Rusty sputum 3rd or more days after chill	13
Localization of consolidation:	
Right lower lobe	21
Left lower lobe	14
Entire left	1
Double	7
Hemolytic streptococcus (blood cultures)	14
Empyema	14
Drainage and subsequent involvement of opposite side	4

A CASE OF ACUTE ANAPHYLAXIS.

By C. W. Carr, Passed Assistant Surgeon, United States Navy.

E. S. H. was admitted to the United States Naval Hospital, Great Lakes, Ill., at 10.30 p. m., December 23, 1917, with a history of a sore throat for the previous 12 hours and of being weak and shaky since 8 o'clock. Examination showed a slight, grayish membrane over the upper part of the posterior pharyngeal wall.

At 11 p. m. his temperature was 103 F., pulse 120 and respiration 24 and the membrane had spread over both tonsils. A smear and culture were taken of the membrane, both of which later proved positive to diphtheria. E. S. H. denied having had any serum treatment given to him in any sickness before or ever having any respiratory trouble when he was around horses.

At 12.45 a. m. 10,000 units of diphtheria antitoxin was given. In five minutes symptons of respiratory distress began to develop and patient became very restless and apprehensive. The respiratory symptoms became progressively worse and patient more and more cyanotic until voluntary respiration ceased at 12.55 a. m. 10 minutes after the antitoxin was administered. Artificial respiration, oxygen and stimulants had not the slightest effect. The heart beat weakened and finally stopped at 1.10 a. m.

In order to verify E. S. H.'s statement his mother was written to and asked if her son was ever subject to hay fever or asthma or had any trouble when around horses. She replied that her son had no trouble when around horses but that since he was a child cats caused attacks of sneezing whenever they came in his vicinity. He also was troubled with hay fever every fall until last fall, when he was on the Lakes and escaped his usual autumn attack.

A DEATH FROM SALVARSAN.

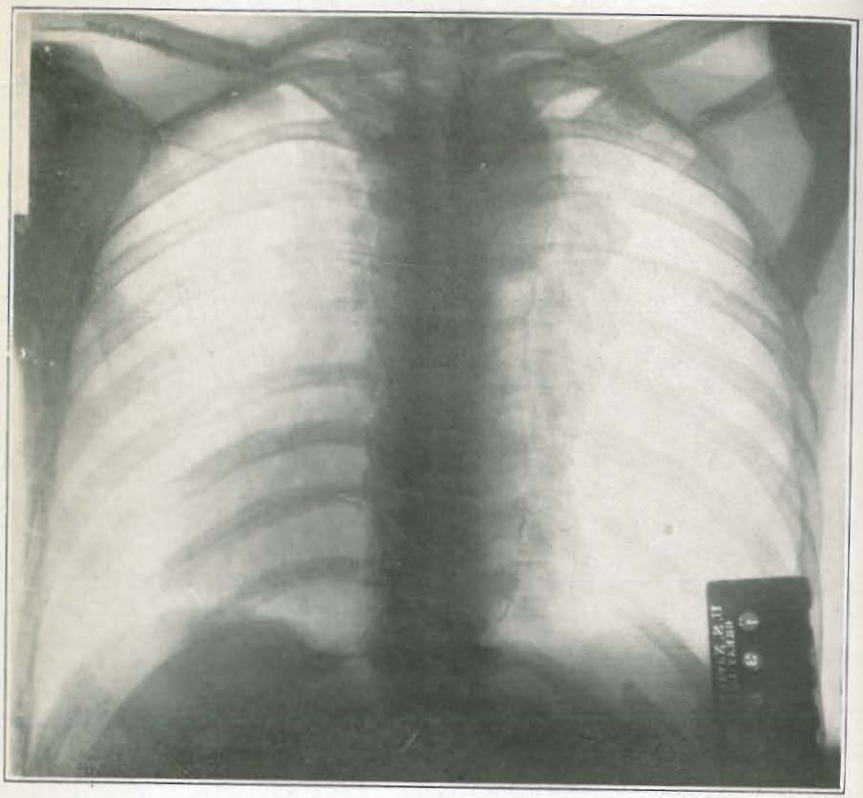
By F. B. McNIERNEY, Assistant Surgeon, United States Naval Reserve Force.

When this patient was admitted he had a typical chancre on penis with characteristic syphiloderm and general adenopathy following. Wassermann tests were taken, one weak positive February 11, another positive 4 plus February 14. He received in all four injections of salvarsan 0.6 grams of the new product manufactured in the United States of America under German formula.

The first two injections were without any marked reaction while he had a little vomiting following the third administration. After the fourth dose he had hardly any discomfort and was about the ward in 10 minutes.

Four days after this final dose of salvarsan the patient complained of severe abdominal cramps and vomited frequently during the day. A diarrhea set in lasting several days and the vomiting persisted until the end. This was projectile in type with no nausea. The vomitus finally consisted of thin fluid and some mucus, all bile tinged.

He had abdominal tenderness which passed away and there was distension of the bladder due probably to lack of nervous stimulation to bring on act of urination. Catheterization was continued until the end. Urine after several examinations showed nothing of importance except late in his illness when a trace of albumen was discovered.



Abscess of mediastinum before rupture.

Examinations of blood and cultures of the same gave no special evidence for diagnosis.

His continuous vomiting acted like an arsenic poisoning and when he began to develop languor with signs of nerve degeneration, probably central, we were more convinced of his condition. First his reflexes became slow, the knee jerks responded weakly and ankle clonus was not a normal result. Pupils were sluggish in their response to light. Although equal, they were only partially dilated most of the time. His temperature was never elevated and descended to subnormal due to exhaustion, while his pulse rate was about 90, moderately full, and keeping fairly strong to the end.

A chest condition presented itself about the third day of his illness which resulted finally in hypostatic congestion of the lungs and a bronchitis giving him much trouble due to mucus in the throat which caused him in his weakened condition to gag frequently in attempts to remove the material.

His marked lassitude and poor response to stimulus gave way to a paralysis of both limbs and almost lack of skin sensitivity. Bladder as stated could not be voluntarily emptied and there were involuntary bowel passages. He responded when spoken to very slowly and could hardly use arms unless helped.

The final picture was complete loss of consciousness and general helplessness ending an illness of six days.

This condition appears to be an acute poisoning from this new salvarsan, which acted as an arsenic destruction of brain and nerve tissues. The vomiting was no doubt central as no other cause could be determined for that symptom and the diarrhea.

A CASE OF ABSCESS OF MEDIASTINUM.

By A. G. SUND, Assistant Surgeon, United States Naval Reserve Force.

W. G. S. was admitted to the United States Naval Hospital Great Lakes, Ill., February 11, with an undetermined diagnosis from the sick bay of his regiment. He had complained for a week previously of a severe sore throat, anorexia, dysphagia, and weakness. On admission his oral pharynx showed only a very slight general injection; there was no tonsillar involvement. His daily temperature ranged from normal in the morning to 103 F. in the afternoon. He carried his head well forward, saying that bending his head backward seemed to stretch something in his upper chest and cause him pain. His most comfortable posture was in bed, lying on his left side, with his head brought well forward.

Examination showed him to be rather emaciated, anemic, and to have a septic look. The head showed nothing. The neck was stiff, as described above; the cervical glands showed slight enlargement and tenderness. There was no trachael tug. The lungs were nega-

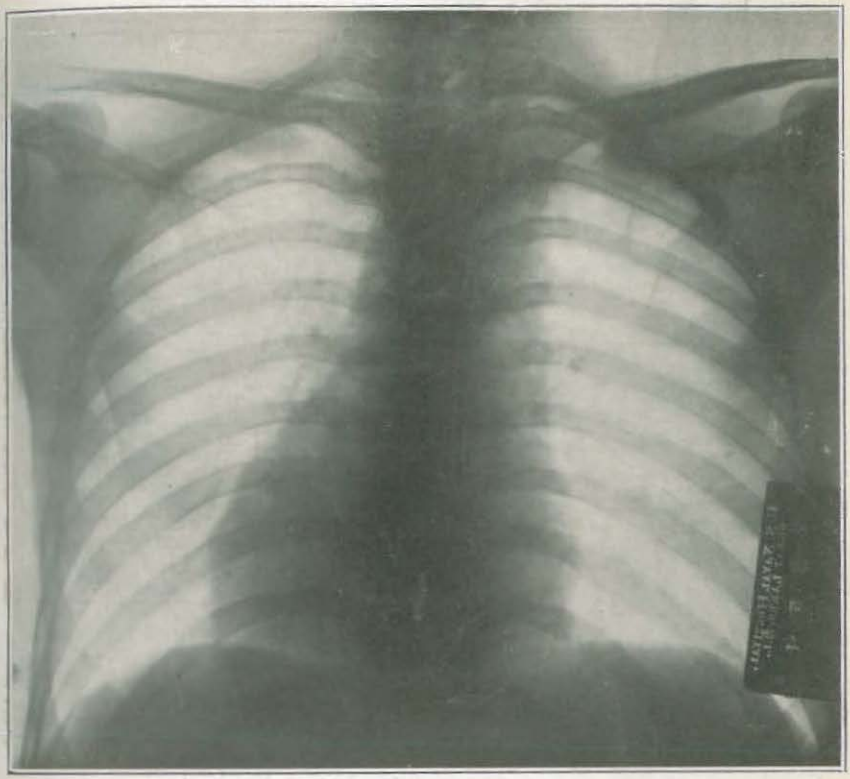
tive. The heart dullness extended on the left to the nipple line in the fifth interspace; auscultation was negative. The supracardiac dullness was definitely increased, measuring 9 cm. in the second interspace—5 cm. to the left and 4 to the right. Posteriorly an area of dullness was found in the right interscapular space, at the level of the fourth, fifth, and sixth dorsal spines. Nothing could be found by auscultation. The two radial pulses were equal and synchronous. The abdomen and extremities were negative. There was no general adenopathy.

The blood showed 4,232,000 red cells, hemoglobin 90, and 18,300 leucocytes, with 87 per cent polymorphonuclears. The urine was negative. The sputum showed no tubercle bacilli. The Wassermann was negative twice. Blood pressure, 125–180.

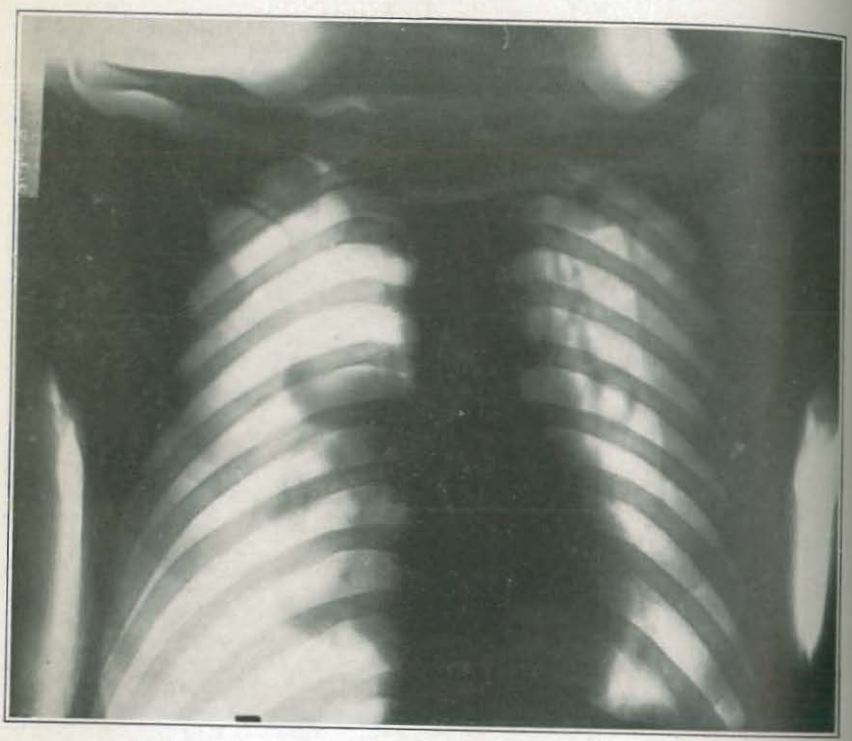
The stereoscopic examination showed a mass the size of an orange in the right superior mediastinum on a plane posterior to the heart. It did not pulsate and did not move, but seemed to displace the great vessels slightly toward the left. A barium suspension passed the tumor without showing any constriction or deviation of the esophagus, although the patient complained of pain as it passed by. The lung fields and hiluses were normal.

The diagnosis then rested between lymphadenitis and abscess of the mediastinum. The patient was put to bed, given a liquid diet and potassium iodide in doses of xx minims of the saturated solution t. i. d., and deep pharyngeal swabs of silvol. This condition remained unchanged for two weeks, except that a constant dull pain, referred to the area of the manubrium developed and the leucocyte count rose to 28,500, with 85 per cent P. M. N. Codeine had to be given a few nights to give relief from the pain. Heat locally also seemed grateful to the patient.

In the evening of March 4, without any apparent immediate cause, and not preceded by any special symptoms, the patient suddenly gagged, and brought up through the esophagus about a pint of fairly thick, white pus, streaked with blood. The patient immediately felt relieved from the constant dragging pain in his chest, and the temperature dropped to 97°. Examination of the pus showed a preponderance of the pus cocci, but cultural studies were impossible because of contamination from the mouth and the receptacle. No tubercle bacilli or débris suggestive of a cold abscess were found. The abscess discharged slightly for two days, at the end of which time an Einhorn tube was passed into his stomach for feeding. The tube was retained in place for a week, when the temperature began to rise gradually to 101 F. The tube was removed and the temperature became again normal, and has remained normal since. An X-ray one week after the rupture showed the mass gone. There was no evidence of pathology of the esophagus. At this date—three



Abscess of mediastinum after rupture.



Spontaneous pneumothorax showing collapsed left lung.

weeks after rupture—the patient is up and about, there is no complaint, no symptoms, and the leucocyte count is down to 12,000, and he takes solid food without discomfort.

A CASE OF SPONTANEOUS PNEUMOTHORAX.

By A. G. Sund, Assistant Surgeon, United States Naval Reserve Force.

E. M. D. was admitted February 14, 1918. He had been taking a shower bath and changed quickly from hot to cold water. This caused a sudden gasp, following which he felt a severe, sharp pain in the upper left chest, and became markedly dyspneic. He sat down on a chair for a while and was then able to dress and walk over to sick bay, from which he was sent to the hospital.

Examination showed a well developed, well nourished man of good color, complaining of dyspnea and a dry irritating cough when lying on his left side. The chest was well formed, both sides expanded equally on respiration. The right chest was negative throughout. The left chest showed absence of vocal fremitus, and a hyperresonant percussion note extending down to the lower costal margin. The cardiac dullness was displaced downward and to the right, the maximum impulse being in the epigastrium. Auscultation of the heart gave distant sounds at the apex, the second pulmonic sound was accentuated. Auscultation of the left chest gave absence of the breath sounds, very faint voice sounds, and absence of whispered voice sounds. No succussion sounds were present, and the coin-test could not be elicited.

Fluoroscopic examination showed the dense shadow of the left lung at the hilus. There was no sign of fluid or of pathology in the right lung. (See illustration.)

There was no family history of tuberculosis and the patient had never had a chronic cough. The respirations the first week averaged 20, the pulse 88, and the temperature varied between 98° and 98.6 F. The blood and urine examinations were negative. Only two specimens of sputum were obtained and they were negative for bacillus tuberculosis. Diagnosis: Closed, spontaneous pneumothorax.

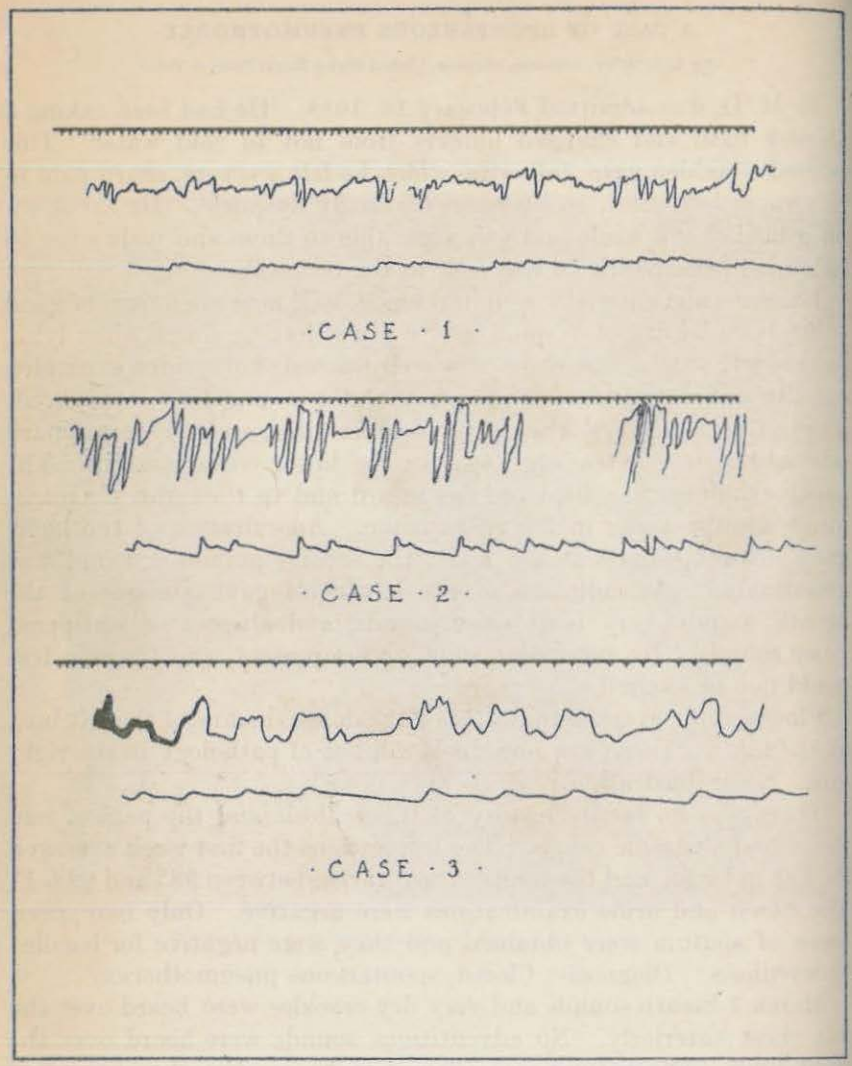
March 1 breath sounds and very dry crackles were heard over the left chest anteriorly. No adventitious sounds were heard over the right lung. The patient was allowed to be up, but the amount of exercise restricted.

The dyspnea became less marked from day to day, and the breath sounds became audible farther down. March 15 the physical findings were the same on both sides of the chest, and the X-ray showed the left lung completely expanded. (See illustration.) At the present time there is no complaint, and the pulse, temperature, and respirations are normal.

HEART BLOCK AND DROPPED BEATS. REPORT OF THREE CASES.

By N. H. CLARK, Surgeon, United States Naval Reserve Force.

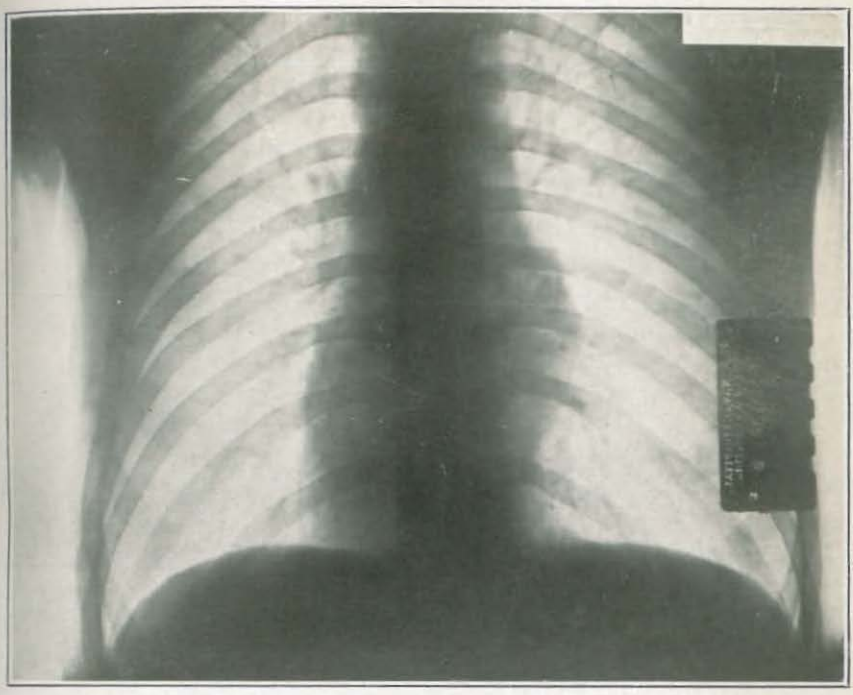
These cases were studied at the United States Naval Hospital, Great Lakes, Ill.



Heart Block and Dropped Beats.

Case No. 1. R. B., admitted with diphtheria. Severe case. Antitoxin administered intravenously. Local symptoms disappeared. Myocarditis. Heart block. Patient died. Pulse rate before death, 30.

Case No. 2. G. B., admitted with otitis media, acute. Developed acute rheumatic fever with acute endocarditis. January 31, 1918, dropped beats. Normal rhythm after February 16, 1918, until medical discharge.



Fully expanded lung after pneumothorax.

Case No. 3. C. P., admitted to hospital March 18, 1918, with lobar pneumonia, endocarditis, dilatation of right heart, dropped beats, pulse rate 56.

The above records were made with the Mackenzie polygraph. The upper tracing is from the jugular, the lower from the radial pulse; (*a*)=the auricular beat. Each *a* should be followed by a pulse wave Where this fails, the impulse or stimulus, has been blocked.

STREPTOCOCCAL EMPYEMA.

By A. E. YOUNIE, Passed Assistant Surgeon, United States Navy.

During the past year a large number of cases of empyema have developed in the United States Naval Hospital, Great Lakes, Ill., following measles, broncho-pneumonia, lobar pneumonia, and occasionally scarlet fever. These cases have all been characterized by an insidious onset, extreme toxicity, and the presence of a hemolytic streptococcus in the pleural exudate.

The first indication of this extremely grave complication is, in the majority of cases, the characteristic temperature curve from subnormal to 101° in the morning with an afternoon and evening rise to 102° or 104°. This is generally accompanied by a gradual rise in pulse and respiratory rate with light delirium at night. Careful physical examination at this time may show no signs of fluid in the chest. Later of course, the characteristic dullness or flatness (which may or may not change with posture), decreased breath sounds, and diminished vocal and tactile fremitus appear.

As the patient's chances for recovery depend largely upon the prompt recognition of the condition with immediate drainage, the necessity for routine examination for signs of fluid, with prompt exploratory puncture of all suspicious cases, is obvious. Fluoroscopy is an invaluable aid in making an early diagnosis.

The prognosis in cases drained early is fairly good, providing the primary disease has not made too great an inroad upon the patient's vitality. In a certain percentage of cases, however, notwithstanding early and thorough drainage, death occurs from profound toxemia, pericarditis, myocarditis, mediastinitis, or general peritonitis. The pericarditis, myocarditis, and mediastinitis are probably due to a direct extension of the infection, being more common in left-sided empyema. The peritonitis would seem to be hematogenous in origin, there being no special involvement of the diaphragmatic peritoneum, while blood cultures are uniformly positive.

All cases with peritoneal involvement have been fatal, death occurring in from 12 to 36 hours. Peritoneal drainage has had no effect in either hastening or prolonging the end. The following case report is of interest in showing the profound systemic toxemia pro-

duced by the hemolytic streptococcus, death occurring from uncontrollable hemorrhage.

Y. J. F., admitted to hospital January 25, 1918, with diagnosis of pleurisy serofibrinous, left. Pulse 120, temperature 102°, respiration 44. Diagnosis changed to pleurisy suppurative January 26, 1918. Eighth rib posterior axillary line resected under local anesthesia, 800 c. c. thin lemon-tinted fluid containing numerous pus cells and streptococci evacuated. Continuous irrigation with 1–1000 hypochlorite solution for 48 hours when return fluid became clear.

February 1, 1918: Pulse 96, temperature 98.6°, respiration 25, less septic, condition apparently favorable. During the entire month of February drained freely, but irregular afternoon fever persisted. March 1, chill with fever 104°, developed nausea, distension, and light delirium. March 2, temperature normal, distension relieved, comfortable. March 9, nausea, regurgitated without warning or apparent effort over 500 c. c. fresh blood. March 10, second gastric hemorrhage, died.

Autopsy findings: Left pleural space almost obliterated, lung being very well expanded, plastic pericarditis and mediastinitis with a small pocket of pus in mediastinum. Oesophagus normal, stomach and duodenum almost completely filled with fresh blood clot, mucous membrane of stomach and duodenum congested with no gross lesions. Apparently the severe hemorrhage was due to an endothelial-lysis of capillaries similar to that occuring in yellow fever.

The treatment in all cases of empyema from whatever cause is, of course, immediate drainage, best accomplished by rib resection under local anesthesia. The operation is absolutely painless and produces little or no shock, the patient leaving the operating room in better condition than when he entered, in the great majority of cases. The point selected for drainage depends upon the location of the fluid, but generally the seventh rib in the mid-axillary line or the eighth rib in the posterior axillary line is chosen. If the posterior axillary line is selected, the incision should be made at right angles to the rib in the direction of the fibers of the Latissimus dorsi, as recommended by Binney. The muscle fibers are separated, the wound retracted, and from 1 inch to 1½ inches of rib resected in the usual manner. After placing silkworm gut sutures for closure of muscle and skin, the pleura is opened very carefully to avoid injury to adherent lung or diaphragm and the pus evacuated slowly. After exploring with the finger for pus pockets, etc., drainage tubes are inserted, stitched into place, and the sutures previously introduced tied.

Our first series of cases was treated by simple drainage, the mortality being very high, but during the past 10 months all cases of streptococcic empyema have been placed on continuous irrigation immediately after operation, a 1–1,000 hypochlorite solution giving the best results. This is carried out by introducing two fenestrated rubber tubes and stitching in place. One tube is connected up with a reservoir and the solution allowed to run in at the rate of 20 to 30 drops per minute. The other tube is connected to a long tube which drains into a bottle beneath the bed. This arrangement favors lung expansion, as the tubes are surrounded by gauze covered with vase-

line, and there is practically no leakage of air through the wound. The solution in the reservoir is kept at a temperature sufficiently high so that the solution enters the pleural cavity at body temperature.

In from 24 to 72 hours the return drainage, which at first contained large quantities of pus and fibrin, becomes clear, when continuous irrigation may be replaced by simple drainage with daily irrigation until the discharge becomes serous, when a gauze wick may be substituted and the opening allowed to close.

Since using this postoperative treatment the mortality rate has been very materially reduced and the period of convalescence shortened. We have never seen any evidence of pleural shock, which is said to occur following irrigation of the pleural cavity when this method is used. On the contrary, the continuous irrigation is very grateful to the patient, preventing cough and pain. We have also reduced the size of drainage tube used, a medium-sized tube giving free drainage with less tendency to the production of extensive pneumothorax.

Deep breathing and blowing exercises are a valuable aid in favoring lung expansion and the obliteration of the pleural space, but should not be used until all signs of cardiac weakness and respiratory embarrassment have disappeared.

Fluoroscopic examinations at frequent intervals during convalescence are of great value in detecting premature adhesions with the formation of pus pockets. Should these occur, they can be gently broken up and the pus liberated under direct screen observation by introducing a silver male catheter bent to the proper curve.

The solution we have used for local anesthesia with entire satisfaction is a one-fifth per cent eucain hydrochlorid in normal salt solution, to which 20 drops of adrenalin to the ounce are added when used. The tissues should be thoroughly infiltrated, using 30 to 40 c. c. solution and at least 10 minutes should elapse before making the primary incision. When the periosteum is reached, a few drops of a one-half per cent cocain solution injected along the upper and lower borders of the rib will render the periosteal stripping painless.

A BULLET IN THE APEX OF THE RIGHT LUNG; ITS ACCIDENTAL DISCOVERY AFTER THREE YEARS.

By F. J. Dever, Passed Assistant Surgeon, United States Naval Reserve Force.

A fireman, third-class, admitted to the United States Naval Hospital, League Island, Pa., in December, 1917, complained chiefly of pain in both scapular regions, dyspnea on exertion, and of occasional slight cough without expectoration. He was pale, and his general appearance suggested bodily weakness.

A study of the family history revealed the fact that his father, a sister, and two paternal uncles had died of pulmonary tuberculosis.

The patient stated that he had never been ill until October 25, 1914, when, while in the country, he was wounded by a bullet accidentally discharged from a revolver which he had placed, muzzle pointing upward, in the right side pocket of his coat. The shock of the injury did not cause him to fall, but he felt as though "the wind had been knocked out" of him. He lay down for a short time, then boarded a trolley car for a 20-minute ride to a hospital.

There were no symptoms to indicate the course the bullet had taken and there was no wound of exit. The wound of entrance was in the eleventh interspace about 2 inches back of the right posterior axillary line.

Immediately after entering the hospital a surgeon made an incision over the wound of entrance and another directly opposite in the anterior abdominal wall. The patient states that the doctor told him the bullet had been removed. There was some cough. About four weeks after the accident he began to expectorate brown-colored sputum, which was never examined. About two months after the shooting a small quantity of blood was expectorated. Four months later, while in bed, a paroxysm of cough occurred and he expectorated approximately 3 ounces of blood. His weight was gradually increasing and he felt well.

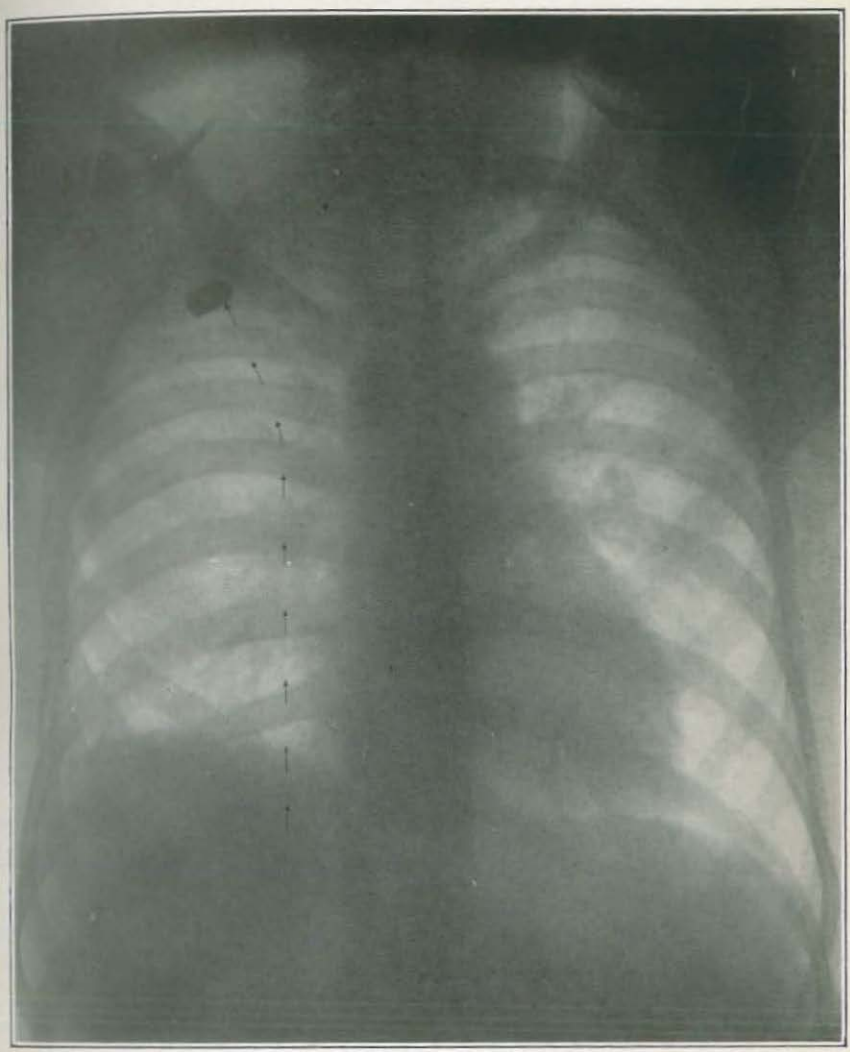
No further bleeding occurred until December, 1916, when one or two tablespoonfuls of blood were coughed up after he had helped to lift a roll of rubber weighing 150 pounds. No attention was paid to this hemorrhage as he still felt perfectly well.

In April, 1917, he enlisted in the United States Navy as a fireman, third class. After five or six months, most of which time he was detailed as engine-room messenger, dyspnea began and increased in severity. Because of an otitis media he was sent to the sick bay and subsequently transferred to this hospital.

Physical examination revealed a pasty complection with pallor of the conjunctivæ and gums. The area of heart dullness was increased to the left; the apex beat was palpable in the fifth interspace in the left midclavicular line. No thrill could be detected. A distinct mitral murmur transmitted toward the axilla was audible. Examination of the left lung was entirely negative. In the right supraclavicular and supraspinous fossæ percussion resonance was impaired, the breath sound was feeble and râles were not heard. The excursion of the diaphragm on the right was much less than on the left side.

The physical signs at the right apex we supposed were due to either a healed or latent tuberculosis. Because of the two scars and the statement of the patient that the bullet had been removed the history

Dever—Bullet in lung.



Bullet in apex of right lung.

of the shooting was dismissed as having no bearing in the case. What then was our surprise on finding at X-ray examination a bullet in the apex of the right lung, as shown in the accompanying illustration. On the plate the course of the bullet through the lung is distinctly visible and is marked by the picture in arrows.

While in the hospital he rarely coughed, and at no time was there any expectoration. General improvement was noted and the mitral murmur disappeared. When seen three months after his discharge to duty his appearance was greatly improved and he had gained weight.

It is probably correct to deduce that—

(*a*) The pulmonary bleeding recurring during the four months subsequent to the accident was due to a low-grade localized pulmonary infection. As far as can be judged from the statement of the patient no clinical evidence of tuberculosis was observed. If tuberculosis caused the pulmonary hemorrhages, it is fair to assume that a spontaneous cure has occurred as the last hemorrhage was 16 months ago and the patient is now fit for duty.

(*b*) The physical signs at the right apex are due to cicatritial tissue about the foreign body.

(*c*) The mitral murmur was not due to a valvular defect, but was myocardial in origin, disappearing when the heart muscle regained its tone.

This case also illustrates very well the great value of the Roentgen ray as an adjunct to physical diagnosis.

CHRONIC MALARIA, A CLINICAL STUDY.

By W. C. Espach, Passed Assistant Surgeon, United States Navy, and E. E. Moody and C. F. Carter, Assistant Surgeons, United States Naval Reserve Force.

This report is based upon the study of a series of cases of malaria all of which were infected while the men were doing gunboat duty on the Panuco River near Tampico, Mexico.

The cases were about evenly divided between the tertian and estivo-autumnal types, some having been infected with both organisms.

PROPHYLAXIS.

The U. S. S. *Nashville* anchored off Tampico July 8, 1916. The mosquitoes were unusually abundant because of the heavy rains which had been falling, and the city of Tampico was full of malaria. From September 1 to December 31, all told, 1,670 deaths were reported in the city, most of which were from malaria. It is impossible to estimate the number of unreported deaths during this period, but it was probably at least a third that number.

The ship was carefully screened and precautions were taken for the prevention of mosquito bites, viz, leggings, mosquito-net helmets, and gloves were worn by the men on watch and mosquito-net tents were stretched over the beds of the men sleeping on deck. However, *no prophylactic quinine was given.*

Exactly 12 days after the ship dropped anchor the first case of malaria came down. Within 21 days 60 cases had developed. Thirty days later 48 additional new cases were under treatment with a number of reinfections or recurrences as the case might be. All told, for three months, during the period of highest infectivity (July, August, and September), 136 patients and 89 readmissions were treated for malaria. As an illustration of the percentage of infected mosquitoes, a Ward Line steamer, carrying a crew of approximately 50 and no passengers, spent one night in Tampico and had 15 cases of malaria develop in consequence.

Of the *Nashville's* crew none of the commissioned or chief petty officers had reinfections, due unquestionably to their care in following directions to prevent mosquito bites.

To summarize: 67.8 per cent of the entire personnel were infected during the eight months from July 19, 1916, to April 1, 1917. In other words, 32.2 per cent of a crew of 190 did not develop malaria in spite of the fact that no prophylactic quinine was given.

On September 15, 1917, the U. S. S. *Dorothea* reached the Panuco River with a personnel of 77. These men received the same precautionary instructions as the crew of the *Nashville*, and in addition were given quinine sulphate 0.30 at quarters once daily.

Again, 12 days after dropping anchor, the first case of malaria came down. All told, from September 15 to November 29, there were 46 primary infections, which constituted 62.3 per cent of the crew. That is to say, 37.7 per cent escaped infection with the precautions taken on the *Nashville* and the quinine prophylaxis in addition.

TREATMENT.

The total of 182 cases from the two ships received the "Canal treatment," which consists of initial purgation with magnesium sulphate followed by quinine sulphate 0.9 three times a day until the temperature is normal for five days, then 0.6 daily for 10 days. There were 211 readmissions from these cases, of which 56 were unquestionably recurrences, as they were taken with a chill during the first three months of 1917, a period during which there was only one new case admitted. Probably the greater percentage of the rest were also recurrences, but there is no way of determining absolutely whether they were recurrences or reinfections. Two of the cases from the *Dorothea* in spite of receiving quinine by mouth, as outlined above, developed cerebral symptoms, and the blood

being heavily infected with crescents intravenous quinine was given for two or three days. At the end of that time one case, which was in the United States Naval Hospital at New Orleans, was started on the routine treatment. He is included in the classification below.

Twenty-eight cases from the U. S. S. *Eagle* (to which the crew of the *Dorothea* had been transferred) were transferred to the United States Naval Hospital, New Orleans, for treatment for recurrences. Twenty of this number were given the Ochsner treatment which consists of putting the patient to bed after initial catharsis of magnesium sulphate and following with quinine sulphate 0.18 every two hours for 30 doses while the patient is on liquid diet. This treatment was given three times with six-day intervals, during which the patients received arsenic in the form of Fowler's solution in increasing drop doses. Of these 28, three still had plasmodia in their blood at the completion of the treatment and it was repeated. Two of these patients had infection with both the tertian and estivo-autumnal organisms. After the second round of treatment, none of the patients still had plasmodia in their blood.

The following system was established in an endeavor to prove whether the blood of the patients was free from plasmodia before their discharge from the hospital: Six days after quinine was administered the first blood smear was taken; six smears were taken on successive days and, if all these proved negative, after a five-day interval three more smears were taken on successive days. If all nine smears were negative, the patient was discharged as cured.

Twelve patients received a treatment consisting of quinine sulphate 0.6 by mouth every four hours for a period of five days, during which time they were given a soft diet but were allowed to be up and around. These patients were given sodium bromide to control nervousness and Fowler's solution as in the Ochsner treatment. After the completion of three rounds of the treatment, four still had plasmodia in their blood and six had distinct typical chills. All told, 10 of the 12 cases had recurrences. There is no doubt that the cases in the hospital were recurrences from the same infection that they were treated for during December, January and February, a period when there are practically no mosquitoes in New Orleans and no new cases of malaria were reported.

ADRENALIN ADMINISTRATION.

Garin, Sarrouy and Ponget [1] believe that the extreme pallor and lassitude, blanching of the mucosa, emaciation, and anorexia in malaria patients testify to suprarenal insufficiency, and they believe that a very prompt improvement can be secured by the administration of suprarenal extracts.

[1] Suprarenals in Malaria. Progrès Med. par. 39, p. 324.

All of the patients entering the hospital in New Orleans with a diagnosis of malaria presented these symptoms and were divided into three groups. The first group was given 1 mil of adrenalin chloride (1-10,000 sterile solution) subcutaneously every day; the third group was observed as controls receiving no adrenalin; the second group was given 1 mil of adrenalin chloride, 1-10,000 solution every other day. Their weight curves were recorded, their hemoglobin determination made every other day, their red blood counts and blood pressure carefully observed and the results have been plotted diagrammatically. The laboratory determinations, weights, etc., were made by the clinical laboratory men who did not know which men were receiving adrenalin and which were not. This was done in an effort to rule out the personal equation as far as was possible.

It was observed that the red counts were diminished while the men were actually taking quinine. The average of the red counts of all the malaria patients on admission was 3,840,000 after three days of quinine administration, the average of the counts was 3,650,000 and four days later it was 3,880,000.

Chart No. 1 has been plotted to show the average of the hemaglobin determinations of the three groups. It will be seen that the hemaglobin of the patients receiving adrenalin every day reached 90 per cent on the eleventh day after admission and remained there during the entire stay of the men in the hospital, while the men who received adrenalin every other day did not reach 90 until the twenty-first day and the men who did not receive adrenalin at all reached 90 on the thirty-fifth day.

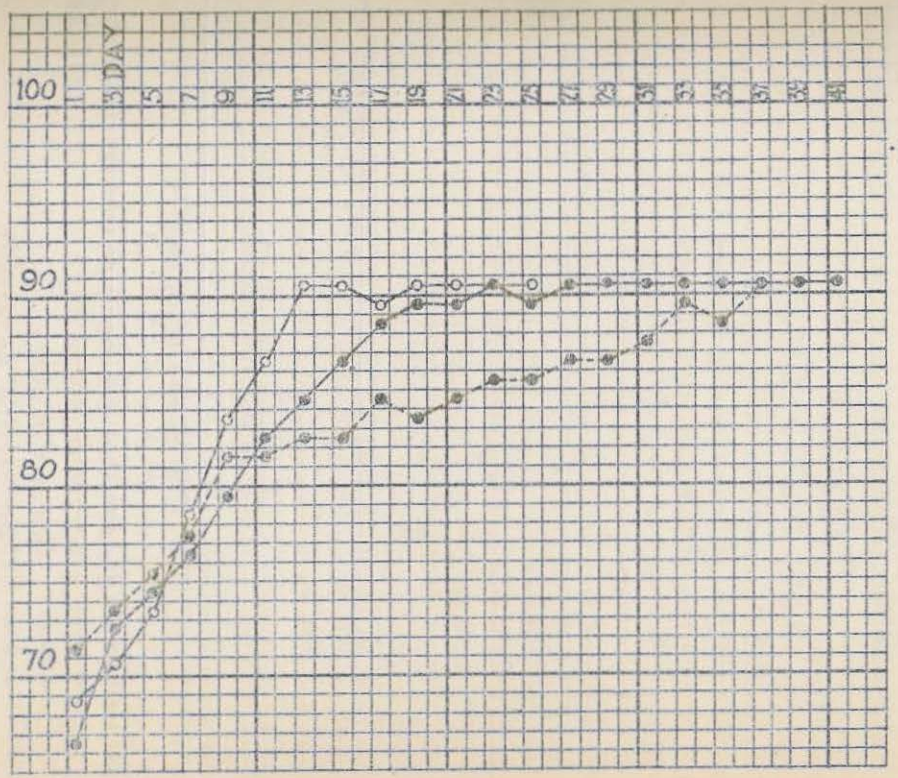
Chart No. 2 shows that there was little variation in the red blood counts of the three groups while chart No. 3 which shows the weight curves of the three groups computed on the initial weight as 100 per cent, shows that in this sense the men who received the adrenalin regained weight more rapidly than those who did not receive adrenalin. It is to be noted that all men who entered this hospital with malaria were from 5 to 20 pounds under their normal weight.

Chart No. 4 shows the average of the blood pressure determinations of the three groups. By looking at the chart it will be seen that the systolic blood pressure remained about the same in all three groups while the diastolic for all patients on admission was much lower than is considered normal and much lower than the average of patients in the hospital at the same time with other diseases.

Care was taken to have the blood-pressure readings made three or four hours after the adrenalin was given in order that the initial effect of the drug would not be recorded.

Jeanselme [1] feels that malaria is rarely cured but is merely rendered latent by vigorous treatment with quinine and arsenic. He says

[1] Malaria, Jeanselme, Bul. de l'Acad. de Méd., Paris, XXVIII 10, p. 21.



·CHART · Nº 1·

·HAEMAGLOBIN·DETERMINATIONS·

-o-o-o-

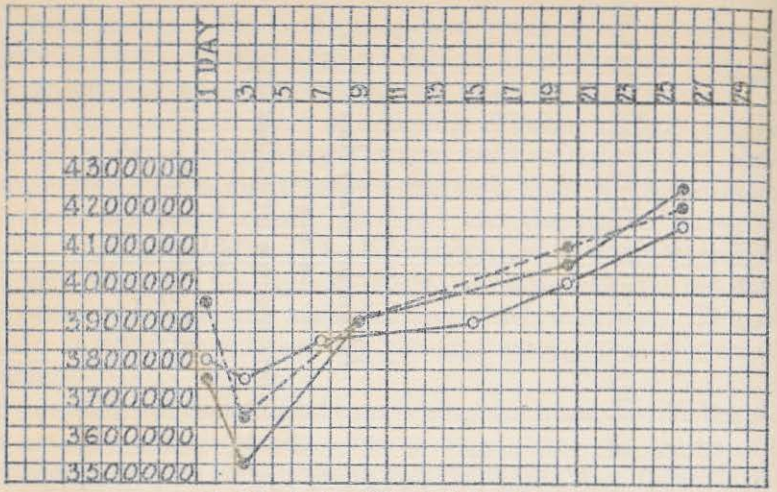
·Adrenalin every day·

-o-o-o-

·Adrenalin every other day

-o-o-o-

·Not getting Adrenalin·



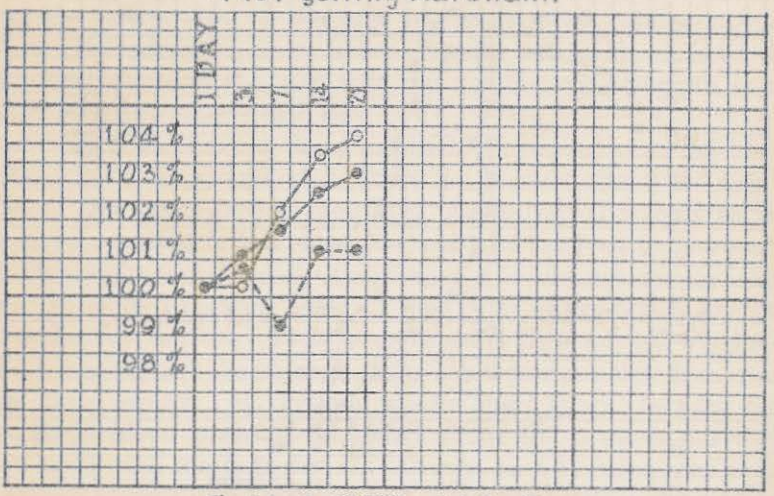
· CHART · Nº 2 ·

· RED · BLOOD · COUNTS · · ·

—o—o—o— · Adrenalin every day ·

—•—•—•— · Adrenalin every other day ·

-·-·-·-·- · Not getting Adrenalin ·



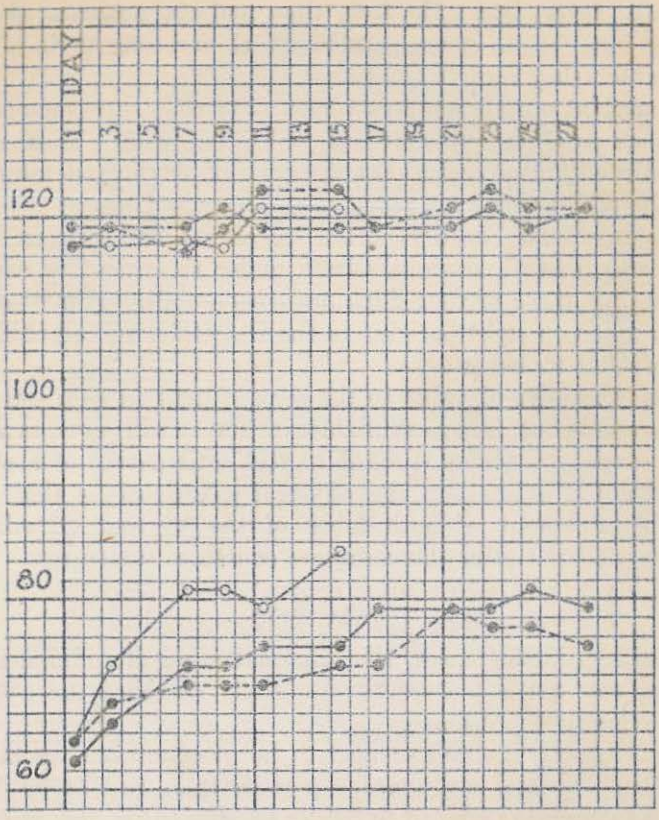
· CHART · Nº 3 ·

· WEIGHT · CURVE · BASED · ON · ADMISSION · WEIGHT · AS · 100 g ·

—o—o—o— · Adrenalin every day ·

—•—•—•— · Adrenalin every other day ·

-·-·-·-·- · Not getting Adrenalin ·



· CHART · Nº 4 ·

BLOOD · PRESSURE · DETERMINATIONS ·

·Adrenalin every day·

·Adrenalin every other day·

· Not getting Adrenalin·

that extreme fatigue or the temporary increase in the total quantity of blood in apparently cured cases by the intravenous administration of 250 c. c. of normal salt solution will serve to bring on a typical attack with chill, fever, etc. He feels that malaria patients should be "farmed out," i. e., given outdoor work for long periods of time during which they receive treatment.

This method of salt administration (250 c. c. intravenously) was tried on six patients who were believed to be cured. These six have been observed for several weeks since receiving the salt solution and one of the six has shown a recurrence.

It has previously been reported by one of us[1] that in cases of malaria which have previously been under treatment, a rise in the pulse rate for three or four days precedes a chill. This observation was also made on eight patients in the hospital who had chills in the course of their treatment.

This is especially of value to the service man on field duty where a microscope is not always available, in that it will serve as an index for the administration of quinine in the anticipation of a chill. It was also noted in making the physical examinations that 11 men showed enlargement of both lobes of the thyroid on admission, which disappeared after the complete course of treatment.

CONCLUSIONS.

1. In this series of cases, the administration of quinine sulphate 0.3 every day did not seem to materially decrease the number of cases developing the disease.

2. The Ochsner method seemed to be most efficient in the treatment of the disease, and greater periods than two hours between dosage of the quinine seemed to render the treatment less valuable.

3. It is possible that the administration of adrenalin chloride in cases with marked anaemia, etc., may hasten their improvement. Certainly this has been true in our series. However, the series is not sufficiently large to allow any definite conclusion on this point. Following up of the method may give some valuable aid to the treatment of malaria.

REPORT OF A CASE OF ERYTHEMA BULLOSUM.

By F. W. HARTMAN, Assistant Surgeon, United States Navy.

Although erythema bullosum is not a rare disease to the skin specialist working in large clinics, it is the more uncommon of the erythema group and is seldom encountered in general practice.

The case under discussion is perhaps more typical than many of those reported because of the various unusual localizations presented

[1] Espach. Clinical notes. U. S. Nav. Med. Bull., July, 1917.

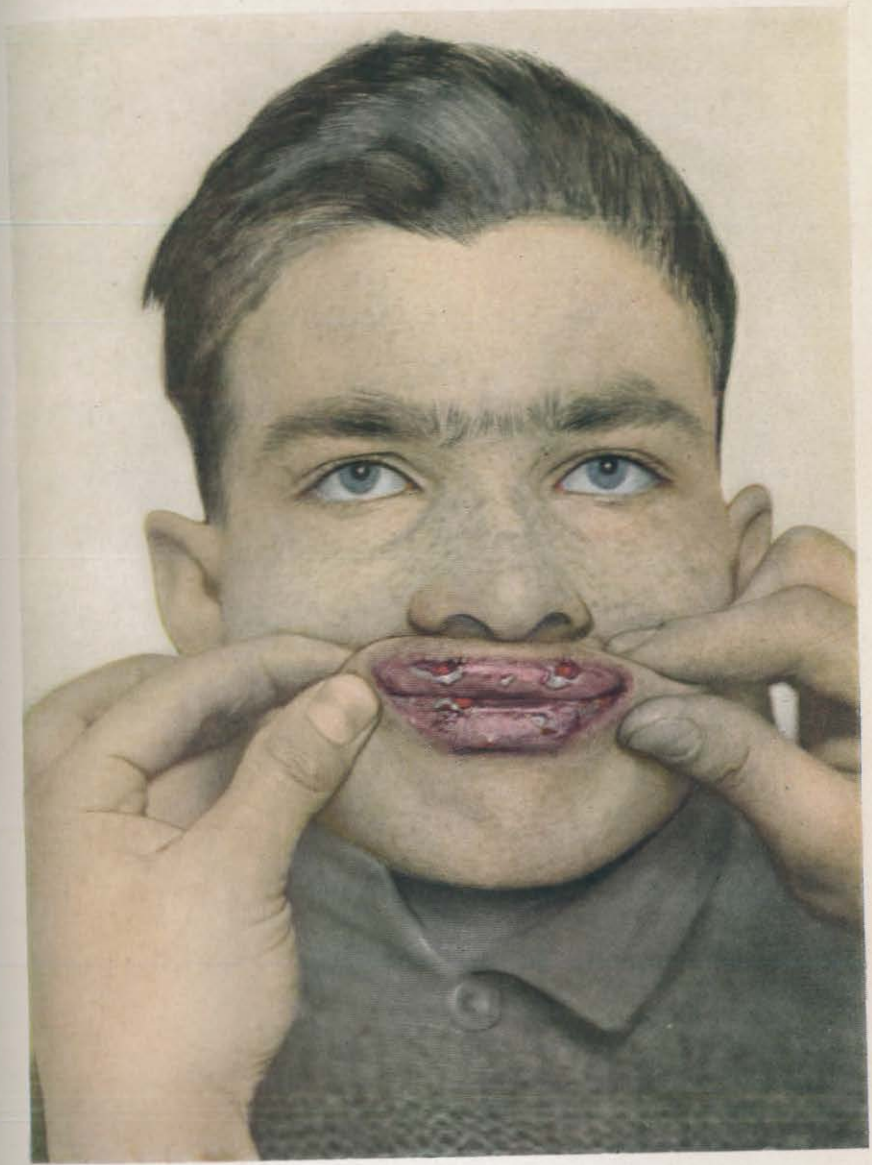


PLATE I.—LESIONS OF THE MUCOUS MEMBRANES APPEARING AT VARIOUS STAGES OF THE DISEASE.

PLATE II.—LATE ULCERATIVE AND SCALY LESIONS: SAME STAGE AS IN FIG 2.

in the same individual. Schamberg mentions almost identical lesions seen in a young colored man as we observe here.

Patient A. B., private, U. S. M. C., age 20 years. Hebrew. *Complaint.*—Skin eruption of hands and stomatitis.

Family history.—Father and mother living and well. No tuberculosis. No cancer. One brother has rheumatism. Three brothers living and well; two sisters and six brothers dead.

Previous history.—Measles and mumps as child. No serious illness since childhood. Head: no trouble with eyes until present illness. Hearing good. Tonsils large and ragged; sore throat during previous attacks. Cardio-respiratory: no shortness of breath, no palpitation, no chronic cough. Gastro-intestinal: appetite good. No nausea or vomiting. No jaundice. No abdominal attacks. Neuro-muscular: muscles of thigh feel stiff and seem to lose power at times. This comes especially before storms and patient is able to predict bad weather on this account. Genito-urinary: no venereal disease. Wassermann negative.

Illness began July 10, 1917, with a feeling of malaise and easily tiring muscles. At times it seemed as if the muscles of the legs would not support patient in walking. Several "sores" were noticed on the mucous membrane of the lips. (Pl. I.) These extended until the entire buccal mucous membrane was involved, bleeding freely and excluding all but liquid food. On the second day "bumps and blisters" came out on the palms of both hands. A diagnosis of dermatitis, unqualified, was entered in his health record with the notation that the lesions of the hands were due to washing with lye water. At the same time the eyes became red and swollen and "watered" a great deal. When tested by the medical officer the photophobia was so severe that the letters on the test card could not be seen. The lesions of the mouth improved first and then the hands so that duty was resumed in four weeks' time.

During the second attack, beginning in September, a diagnosis of dermatitis venenata was entered in the health record. Apparently this was less severe and was not associated with conjunctivitis.

On November 22 patient entered the United States Naval Hospital, Washington, D. C. At this time the lesions had been present for a week and resembled those shown in Plate II and figure 2, except that they were more confined to the palms of the hands. The entire buccal mucous membrane was covered by superficial ulcerations such as seen illustrated on the lips. Around the edges of these abrasions and completely covering them in some instances was a yellowish gray exudate.

Similar irregular superficial ulcers from one-half to 1 cm. in diameter were evenly and symmetrically distributed over the palms and to a less extent over the dorsal surface of the hands. A few bullous

lesions slightly elevated above the surface and gray in color were seen which had failed to ulcerate. Several reddish-blue blotches were present around the wrists and on the backs of the hands which, according to the history, were the site of "blisters and sores" in previous attacks. The ulcerated areas burned and itched almost constantly.

With the fourth attack the patient was again admitted to the naval hospital, and now, for the first time, as it was in its incipiency, the development and course of the affection could be understood. At first there was some injection of the conjunctivæ. Papules the size of a pinhead were seen on the backs of the hands and fingers. These seemed to come out in crops and grow larger, then a vesicle formed at the crest. (P. III and fig. 1.) After several days the exudate in the vesicles was absorbed, leaving the papule capped by a small round scale. Possibly due to irritation the scale was lost, leaving the superficial ulcer which usually became larger. At the end of the second or third week the abrasions rapidly healed, leaving the reddish-blue discoloration mentioned above.

Because of the stomatitis and the skin abrasions confined to the hands seen on entrance to the hospital during the third illness the diagnosis of secondary syphilis was favored until repeated Wassermann tests failed to give a positive reaction. Fox mentions two cases considered to be syphilis which he found to be erythema bullosum. One of these gave a history of four or five attacks of "blisters" on the lips and mucous membrane of the mouth and a macular lesion of the palms of the hands. The second case was similar and had had three recurring attacks. Our case, in addition to the lesions of the mouth resembling mucous patches, showed scaling lesions of the palms resembling papular syphilis of the palms, in which there is marked scaling, as illustrated by Fox. The history of recurring attacks and negative serum reactions should rule syphilis out. This disease must also be differentiated from dermatitis herpetiformis and pemphigus.

During the last stay in the hospital a tonsillitis developed, which left the tonsils ragged and injected. Tonsillectomy was done, the tonsils proving to be deep set and very large, containing crypts plugged with pus. On discharge it was advised that the patient be kept on small doses of salicylates. Now, four months after operation, there has been no recurrence.

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PLATE III.—EARLY BULLOUS AND VESICULAR LESIONS: SAME STAGE AS IN FIG. 1.

Fig. 1.—Early bullous and vesicular lesions.
Fig. 2.—Late ulcerative and scaly lesions.

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A CASE OF ERYTHEMA NODOSUM.

By G. A. GRAY, Assistant Surgeon, United States Navy.

According to the "Detailed statement of diseases and injuries for the calendar year of 1916," appearing in the Annual Report of the Surgeon General, United States Navy, for the fiscal year 1917, only two cases of erythema nodosum were admitted with one case of readmission. The following notes, therefore, may be of interest:

B——, G. A., private, in the band, age 24, was admitted to the sick bay of the regiment at Quantico, Va., on October 29, 1917, with the diagnosis of erythema nodosum. The following history was obtained. *Immediate complaint.* Swollen tender areas on the lower third of the anterior surface of the legs. Constipation. *Onset and course.* On October 21 the patient began to experience a "feeling of soreness" in his left leg. The lesion was of a pale red color and limited to a region about 10 inches long and 4 inches wide. Within its borders were six bluish-red, nonelevated areas about the size of a dime, the color of which faded on pressure. Private B. did not come to the sick bay for treatment until five days later (October 25), when he walked to the dispensary, and showed the lesion described above, but presented no constitutional symptoms. It was dressed with zinc-oxide ointment for two days. The patient did not report again for 48 hours.

His left leg suddenly began to get worse Sunday evening, October 28, while his right leg also became involved at that time. First the small blue-red areas, four in number, appeared, and then an area similar in size and color to that on the left leg developed, only more rapidly. He began to feel feverish and have joint pains, which made it difficult for him to get about. On Monday two men in his company helped him down to sick call. Examination then showed the lesions to be of a deeper color than previously. The distinct round areas within the larger erythematous regions were now firm nodules, about the size of a 5-cent piece in circumference, and with centers elevated about one-fourth of an inch. The entire lesion was very sensitive. Even the jarring set up by some one walking past the bed caused him

discomfort, while pressure applied directly to a nodule was extremely painful and, in the patient's words, "the pain lasted about an hour." He also complained of feeling "bilious" and that his bowels had not moved for two days.

His temperature at the time of admission was 100°. He was put to bed, given a sponge bath, and cathartics. Hot fomentations were applied to the legs. The fever on the day of admission reached 102.6° and then dropped to 100.3° by the following afternoon at 4. Three hours later the temperature had risen to 101°, when a bowel movement occurred, and then it rapidly fell to 99.6°, at which point it remained most of the following day. A light diet, free catharsis, iron, quinine, and strychnine pills, salicylates, and sodium bicarbonate, and continuous hot applications to his legs, brought the fever to normal, and caused the lesions to become less sensitive within a period of five days. In 10 days the patient was discharged to duty, as he was feeling much better and wished to accompany the regiment, which had received orders to break camp. Sixteen days later he was readmitted with a mild exacerbation of the original attack, as he had never fully recovered and had been subject to some severe weather in transit.

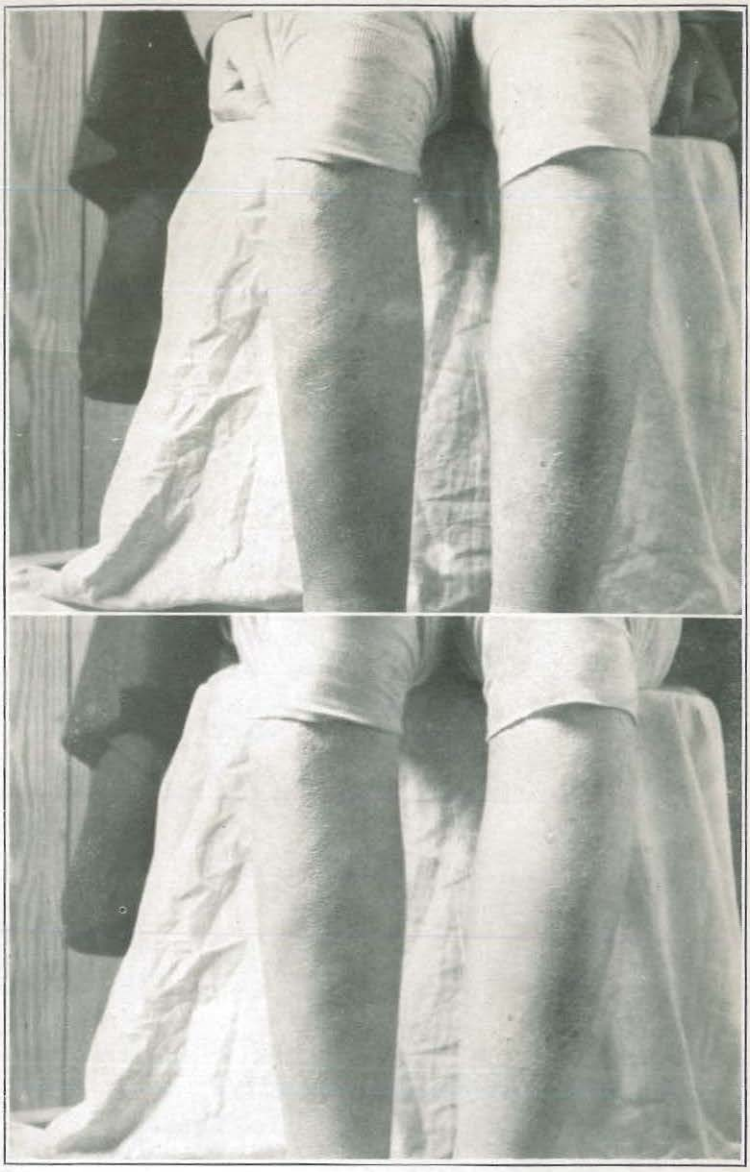
History.—His occupation for the six years previous to his enlistment in the Marine Corps was that of a rural mail carrier, which required him to be out in all kinds of weather.

Family history.—Negative.

Previous illnesses.—Measles, whooping cough, scarlet fever, and typhoid fever. Patient denies venereal disease; has good teeth and has rarely had throat trouble.

Physical examination.—Negative, save for the following cutaneous disorder: The patient has a mild type of ichthyosis simplex, which has been present since he was 1 year old. It gets worse in the cold weather and at times spreads over the entire body, though as a rule localized on the anterior surface of the legs. The accompanying illustrations, taken three days after the patient was first admitted, show the ichthyosis fairly well. The dark patch on the left leg represents the large erythematous area, while the smaller and darker shadows on the right leg represent the nodules of erythema nodosum. This was the best reproduction of the condition that could be obtained.

Etiology.—The fever and joint pains in this case seem to favor the theory that erythema nodosum is an infectious disorder somewhat similar to rheumatism. At the time we were unable to make a differential or leukocyte count. A Wassermann made at a later date was negative. At the onset of the malady we were having very cold weather, and I believe this had a bearing on the etiology. The constipation present favors the theory of its origin being due to an intestinal autointoxication.



Ichthyosis and erythema nodosum.

EARLY CEREBRAL SYPHILIS.

By C. A. Ainslie, Assistant Surgeon, United States Navy.

Patient, J. M., age 27, private United States Marine Corps, entered the United States Naval Hospital, Canacao, P. I., in December, 1917, with a diagnosis of chancroid. A bubo in the left groin was also present. This bubo became worse and was opened and drained on December 10, and slowly healed until on January 30 it finally closed over. There was a small chancroid on the penis which healed about a week after entrance into the hospital. All venereal diseases seem to be more virulent in the Tropics and take longer to heal than in the more temperate climates, and this probably could account in part for the slow healing of the bubo, however a Wassermann test was done on the patient every week to detect a syphilitic infection if present.

As routine in the venereal ward here, all patients have a blood Wassermann test every Thursday; also every Monday an injection of 1 c. c. of a 10 per cent suspension of mercury salicylate in albolene is given in the buttocks. (The mercurial injections seem to hasten the healing of all venereal cases whether syphilitic or not. Latent lues will often, after one or two injections, give a positive Wassermann, and early cases will give a positive test earlier by this method than if no antisyphilitic treatment is given.)

On January 17 the patient first gave a positive Wassermann test. The next day 0.6 gram of salversan was given intravenously, this being followed a few hours later by a generalized macular rash which gradually died away in the next 12 hours. The patient's diagnosis was changed to syphilis on January 20.

January 25 a second 0.6 gram of salversan was given intravenously.

On January 27 at 4 p. m. the patient was standing near a bed, having just gotten up from reading a newspaper, when he suddenly fell over on the bed, almost immediately began to have clonic convulsions and became very cyanotic. The tongue became slightly injured by the teeth and the froth which appeared on the lips was blood tinged. In a few seconds stertorous breathing began, lasted for about an hour and then gradually subsided and the patient fell into a troubled sleep.

A like convulsion occurred at 8 p. m. and another at 2 a. m. the following morning. No localizing symptoms could be made out; no inequality of the pupils; no loss of or exaggeration of any of the reflexes; no paralysis of any part of the body; no twitching of any member, in fact nothing was found which would indicate a localized process in the brain or spinal cord. The patient needed to be constantly watched as he tossed about so much on the bed that he would have fallen to the floor if not constantly watched. Power of speech was totally lost for several days but the patient would turn his eyes toward the speaker if words were spoken with emphasis. Stupor, inconti-

nence and inability to eat were symptoms which were pronounced for three days.

On January 27 the urine was tested and found negative. Kernig's sign persistently absent.

Lumbar puncture done on January 28 and 30 c. c. of spinal fluid removed. There was no increase in pressure; laboratory tests as follows: Globulin positive—cell count done but was not accurate owing to the fact that the acetic acid used to remove the red cells did not do it. This was later remedied by making up some new solution. At this time there was a discussion as to the advisability of giving Swift Ellis treatment but that was not done and it was decided to push the administration of mercury by inunctions, potassium iodide by mouth and salvarsan intravenously.

January 29: Patient semiconscious and restless; 0.2 gram of salvarsan given intravenously.

Answers to questions put to him on January 30 show a very well marked lapse of memory, practically everything that has happened in the last six months being blotted out.

Q. "What year is this?"—A. "1916."

Q. "How long have you been in this hospital?"—A. "Since July 4, 1916."

Q. "Why is your back sore?" (spinal puncture).—A. "Another man and I were over in France and I was shot in the back."

February 4: 0.3 gram of salvarsan given intravenously. Treatment at this time was as follows: Potassium iodide, grains 10 t. i. d.—mercury inunctions every day except Sunday, rest and bath on that day; salvarsan intravenously at short intervals.

February 7: Blood Wassermann negative.

February 11: 0.6 gram of salvarsan given intravenously. One hour later 20 c. c. of spinal fluid were withdrawn by lumbar puncture and tests made. These showed—cell count 1 per c. m.; globulin negative; Wassermann and Lange tests both negative.

February 14: Patient seems to be slowly recovering his memory. He can now recall everything up to December 20 last, but nothing from that date to January 27. He acts and talks rationally and is trying to recall past events. He has no symptoms except a frontal headache which comes on every two or three days and is not very severe.

The case seemed to be worth reporting because of the following features: No syphilitic or other venereal history before the latter part of November, 1917; a negative blood Wassermann until 10 days before the cerebral symptoms came on with such suddenness; the symptoms of acute cerebral irritation with no localizing symptoms; the rapid recovery from all symptoms except a slight occasional headache when antisyphilitic treatment was intensively given.

REPORT OF A CASE OF DIABETES INSIPIDUS.

By E. E. Moody and C. F. Carter, Assistant Surgeons, United States Naval Reserve Force.

Diabetes insipidus is a relatively rare condition concerning which little is known, and there has been a great deal of discussion as to whether it is really a disease of the kidney (1) or a disease of the central nervous system, or a condition in some way related to the glands of internal secretion. Christie and Stewart (2) have proven in a number of cases that by giving posterior lobe extract of pituitary gland they were able to effect a very considerable concentration of urine and produce thereby a fluid of much higher specific gravity than the patient was able to excrete under ordinary conditions. They construe this to mean that, in certain cases at least, the kidney itself is not the determining etiological factor of the disease. Further proof is that there have been no histological alterations of the actual kidney tissue in diabetes insipidus.

Priestly (3) has measured the blood serum and proved that it shows an actual increase in relative volume upon the drinking of large quantities of water and that as a result the serum becomes more dilute and decreased in salt content. Christie and Stewart, working on this basis, found that the relative volume of serum was diminished simultaneously with the decrease in water excretion when the water intake was restricted or posterior lobe extract administered.

Most of the men who have studied the disease have attempted no definite explanation of it, and practically nothing has ever been contributed which is of value in the treatment of the disease.

It is certainly true that the disease itself is practically never the cause of death.

The following case is reported because of the probability of an hereditary tendency and because of the great rarity of such conditions in military service. The patient, E. V. G., 18 years of age, enlisted June, 1917, nothing abnormal having been found when he was examined for duty. He was admitted to the United States Naval Hospital, New Orleans, La., on November 24, 1917, with the following history:

Clinical case.—Bed wetting.

Family history.—Father and brother are very nervous, and there is a history of abnormal frequency of urination in the father and one paternal uncle. The brother, who is 20 years of age, is in the naval service.

Personal history.—The patient has had mumps, measles, and chicken-pox, all of which were very mild and of short duration. He has had no other diseases.

Present illness.—The present illness dates back to early childhood. He has always been obliged to pass urine quite frequently during the day and has been a bed wetter all of his life. The urine has never been highly colored, nor has it ever had a strong odor. The

condition has always been a source of annoyance and inconvenience, as he has practically not missed a night in the past 12 years. However, he did not consider it of sufficient consequence to necessitate his making a statement as to the condition when he was enlisted. He states that this is because he had become so accustomed to it that it did not impress him as being unusually abnormal. In October, 1917, while on ship duty, he came under observation of the ship surgeon, who tried the ordinary simple method of treating enuresis, without any success whatsoever. When admitted to the hospital, the condition was neither better nor worse than it had been for several years.

Physical Examination.—Shows a well-nourished youth. Skin clear and of normal turgor. Ears negative. Eyes present no abnormalities. Pupils equal and react to light and accommodation. Under atropine the eye grounds were found to be normal. The nose shows a slight hypertrophic rhinitis. Throat and mouth negative. Teeth all present and in good condition. There was a marked increase of flow from all of the salivary glands, and the saliva had a faintly acid reaction. Neck: slight enlargement of thyroid gland. Chest: the lungs are apparently normal to percussion and auscultation. There is slight enlargement of the heart to the right (verified by X-ray), but the sounds are normal. Abdomen: left kidney apparently palpable but not tender. Genitalia show no abnormalities. Extremities are negative except that all finger nails have been bitten very close. Blood pressure on admission (stethoscopic), 185–158. X-ray of head shows a normal sella turcica. Red blood count 4,300,000, white blood count 11,000. Hemoglobin 70 per cent. Urine, total quantity for 24 hours 9,300 c. c., specific gravity 1.004, reaction acid, negative chemically and microscopically. An attempt was made to allow the patient as little water as possible, and after two days the total quantity for 24 hours was reduced to 5,190 c. c. The administration of 15 grams of sodium chloride every four hours immediately brought the quantity back to 9,000 c. c. For a short period of time he was given 1/200 grain of atropine sulphate every four hours by mouth without appreciable effect on the total excretion.

It was found that the only method by which the bed wetting, for which he was admitted, could be controlled was by waking the patient at one-hour intervals during the night and even then, on one or two occasions the quantity of urine passed during the night was so great that this method was not effective. A board of medical survey has recommended his discharge as being unfit for service.

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A CASE OF EMPHYSEMA OF CONJUNCTIVA AND SCLERA.

By J. P. ISRAEL, Assistant Surgeon, United States Naval Reserve Force.

This case is reported because of the rarity of the condition and because of its traumatic origin.

G. D., aged 17 years, a civilian employee of the navy yard, was admitted to the United States Naval Hospital, New Orleans, La., on December 12, 1917, complaining of inability to open the right eye after having been struck in the face by an air stream from a compressed-air hose, used to drill rivet holes. While using the machine the hose became detached from the drill gun and the stream of air was directed into his face from a distance of at least 12 inches.

There was no immediate discomfort, but he was unable to open his eye. He was sent to the hospital, and it was seen that the emphysematous condition of the conjunctiva was responsible for his inability to open the eye.

On exposure there was noted a marked swelling of the conjunctiva of the lower lid and eyeball, involving the sclera over the lower temporal quadrant extending to the sclerocorneal junction. There was no involvement of the cornea and no visual disturbance. Distinct crepitation could be felt over the involved portion.

The patient was given douches of 2 per cent boric acid solution and ice compresses were applied. The following day the edema of the lids had subsided to such an extent that he was able to open his eye, and the emphysema of the conjunctiva and sclera was subsiding rapidly.

Four days after the accident the swelling had completely disappeared and the patient was sent to duty.

Neither Fuchs nor De Schweinitz mentions emphysema due to this kind of trauma.

REPORT OF SEVEN CONSECUTIVE CASES OF MASTOID ABSCESS.

By F. A. HUGHES, Passed Assistant Surgeon, United States Naval Reserve Force.

Case No.	Date of operation.	Date when ear ceased to discharge.	Date when wound ceased to discharge.
	1918.	1918.	1918.
1	Feb. 13	Feb. 18	Feb. 28
2	Feb. 22	Feb. 25	Mar. 12
3	Feb. 28	Mar. 3	Mar. 7
4	...do.....	...do.....	Mar. 11
5	...do.....	Mar. 4	Mar. 13
6	Mar. 2	Mar. 10	Mar. 20
7	...do.....	Mar. 16	Mar. 21

The above cases were operated upon and treated under the same conditions, so permit a fair estimate of what can be expected from the method of aftertreatment used, as two of the cases were as un-

favorable for a rapid healing as would be encountered in the service. Case No. 4 had just recovered from a broncho-pneumonia following measles. Case No. 6 on the third day after operation developed a lobar pneumonia on the right side. His temperature continued high until the tenth day, when he passed his crisis and his temperature dropped to normal. After this the discharge lessened very rapidly and stopped in five days.

The treatment used was as follows: Daily irrigations of the wound and ear canal with Dakin's Solution 1 part and hot water 3 parts. Urotropin grains XV t. i. d. internally.

Conclusions: That the method of aftertreatment in these cases materially shortens the period of healing, the patients are more comfortable, and are able to be out of bed sooner than with other methods of treatment.

The average time required to entirely stop the discharge from the ear, through the canal, was 6 days, though most of them stopped in 3 or 4 days. The average time required for all drainage from the wound to stop was 18 days, though one stopped in 8 days. All dressings were discontinued and the wounds healed in from 2 to 4 days after discharge had stopped. All cases recovered with good hearing. Since the above report three more cases have been operated and are pursuing the same course in healing.

TREATMENT OF CEREBRO-SPINAL FEVER.

A review of 138 cases, with a mortality of 21 per cent.

By W. E. GOLDEN, Assistant Surgeon, United States Navy.

The successful treatment of epidemic cerebro-spinal meningitis depends essentially upon the early diagnosis of the case followed by an early and efficient administration of antimeningococcic serum. The serum should be administered both intraspinously and intravenously in amounts sufficient to overwhelm the infection within the first 24 to 48 hours, the mode of administration and the amount given depending upon the clinical type of the case.

The disease may be divided roughly into three clinical types, the systemic type, an involvement of the blood stream with little or no meningeal signs, the meningeal type with clinical signs of the involvement of the coverings of the brain and cord, and the combined type with both systemic and meningeal involvement.

In the systemic type the manifestations are those of severe toxemia bordering on to the typhoid state, the temperature usually is subnormal at the onset, but may rise to extreme hyperpyrexia. I have observed temperatures of 108.6° and 108.9°, respectively, just before death. The pulse is usually between 120 and 150, extremely weak and thready; the respiration from 25 to 40 and usually shallow.

There may be a muttering delirium, but unconsciousness is rare, while in mild types the mind is usually clear. Lumbar puncture usually shows an increase of clear fluid in proportion to the increase in temperature, with normal cell count negative to globulin, and meningococci. Vomiting is the rule and hematemesis is not uncommon. The rash is always present, and may consist of numerous petechiæ over body and limbs, or in very severe cases of hemorrhagic blotches over the entire skin, conjunctiva, and mucus membranes. The blood culture in early cases is usually positive to meningococci.

The meningeal type is characterized by marked signs of meningeal involvement. Rigid neck and marked Kernig's sign are usually present. The reflexes are increased, and Babinski's sign may usually be demonstrated. The patient may or may not be unconscious, although there is always some mental lethargy. Vomiting is the rule and may be projectile in type. The temperature ranges from 99° to 103°, the respirations from 16 to 24 and are usually deep and laborious; the pulse may vary from 48 to 110, is usually full, and strong and is generally in inverse ratio to the temperature. Lumbar puncture reveals a cloudy fluid, under high pressure containing many pus cells, usually positive to meningococci and reacting to the globulin tests.

The combined type is the most frequent and most fatal if not checked by early treatment. The systemic type if not checked in early stages will usually develop meningeal complications. The symptoms are a combination of the symptoms of the two above-mentioned types.

I consider that cerebro-spinal fever is a blood-borne disease, localizing in the meninges as a point of least resistance or predilection, and should be treated accordingly, both systemically by intravenous administration of serum and locally by intraspinous administration. To be successful in the local treatment of the cerebro-spinal symptoms, the means of transportation of the infection must be blocked, and this is best done by intravenous injection of antimeningoccic serum. As soon as the patient is admitted and the diagnosis is made from a clinical standpoint, a lumbar puncture is done for confirmation. If the rough fluid findings indicate it, an equivalent amount of serum—that is, 10 to 15 c. c. less than the amount of fluid removed—is injected intraspinously at the same sitting. The patient is then turned on his back and from 20 to 40 c. c. of serum is injected into the median vein. Undiluted serum is used and may be injected by gravity or very slowly with a piston syringe. There is usually more or less shock following this intravenous administration, and the physician should make it a point not to leave the bedside of the patient in less than 30 minutes after completing the injection. The heart increases in rate and the pulse may become almost imperceptible; the respira-

tions increase in rate and are very shallow and sometimes may cease entirely. Artificial respiration and administration of oxygen has always carried my cases past this stage. This marked cardiac and respiratory involvement, if it occurs, usually begins within 10 minutes after the injection of serum, and does not last as a rule for more than 5 to 15 minutes, and may be followed by a chill, which in turn is followed by an almost uniform rise in temperature of from 2° to 4°. After a few hours the temperature begins to fall and in the majority of cases has reached normal on the second day. As a rule one intravenous injection is enough to curb the systemic infection, as is manifested by the fading petechiæ, which by the second day are usually brownish pigmented spots and have disappeared entirely by the fourth to fifth day.

To clear the meninges of infection more persistent treatment is required, the initial lumbar puncture and injection of antimeningococcic serum is repeated in 8 hours and as much fluid as possible is withdrawn and serum is injected. This is repeated every 24 hours, or oftener if symptoms of increased pressure indicate it, until the spinal fluid is clear, or persistently negative to meningococci both in smear and culture, as I have found several fluids which continued cloudy under repeated treatment, but if left for two or three days until absorption was complete, returned clear and patient made an uneventful recovery.

The danger of withdrawing a large amount of fluid may be discussed. In dealing with young adults, I think that all the fluid possible should be withdrawn, but the drainage should be slow and gradual, and followed by immediate injection of serum. In this manner the release of pressure is gradual, and the vessels dilate slowly with no danger of rupture, and with no symptoms but a severe headache, which is relieved, together with the danger of diapedesis, through the relaxed vessel walls, by the equalization of pressure on the injection of the serum.

A certain general and symptomatic treatment must be carried out in conjunction with the specific serum treatment. Rest is essential and is best obtained by use of morphine or other opiates. Veronal and chloral have been useful in cases not reacting to opiates. Digalen and atropine have been most successful as cardiac and respiratory stimulants. The throat and nasal passages are cleansed three times daily with an oily antiseptic preparation and the eyes irrigated twice a day with boric-acid solution, as a protective measure.

The diet consists of liquids while the temperature is above 101° or in the acute stage, and is supplemented as soon as advisable by a soft diet.

The complications are treated symptomatically as they arise, the most frequent being a serum arthritis occurring from 7 to 12 days

after the first administration of serum. At first the inflammatory stage is treated by immobilization by splint if possible, and later, when inflammation has subsided, massage aids in removing any exudate. An arthritis sometimes is found at the onset of disease, but usually clears up after intravenous injection of serum. Other complications, as otitis media, paralysis of ocular muscles and panophthalmitis, are treated as they arise.

In conclusion I wish again to emphasize the necessity of rapid and efficient administration of antimeningoccic serum in amounts sufficient to overcome infection. This is accomplished by early injection of serum intravenously in conjunction with intraspinous treatment.

Review of 138 cases, from Oct. 30, 1917, to Mar. 20, 1918.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total.
Number of cases	2	5	22	94	11	4	138
Number of deaths	1	1	7	19	.....	1	29

Per cent deaths, 21.

Showing hemorrhagic rash	[1] 83
Received unconscious	[2] 59
Showing rigid neck and Kernig's sign	129
No meningeal sign, but with hemorrhagic rash	9
No meningeal signs, petechiae present, spinal fluid positive to mening	7
No meningeal signs, petechiae present, spinal fluid negative blood culture, positive to meningococci	2
Received unconscious and with hemorrhagic rash	18
Received unconscious, with hemorrhagic rash—died	16

TREATMENT OF FRACTURE OF NASAL BONES.

By E. A. KNORR, Assistant Surgeon, United States Naval Reserve Force.

Fracture of the nasal bones is a fairly frequent occurrence at the navy yard, Norfolk, Va., all the cases reporting for treatment at the yard dispensary being due to direct violence, and the fracturing agent in most cases being a fist. In all the cases treated here both nasal bones were broken. The nasal processes of the superior maxillary bones were involved in prominent noses, but not when the patients were negroes, as in them the nasal processes are less prominent, are rather thick and occupy a more protected position. The line of fracture extends into the bony portion of the nasal septum, and the fracture is compound internally and accompanied by nose bleed. When the fracture is due to the impact of a human fist, it is not likely to be compound externally.

If there is an external wound, apply tincture of iodine and collodion. Place the patient in a chair with a headrest. Steady the

[1] Per cent, 60.1.

[2] Per cent, 42.9.

head by securing a good grip with the arm and applying the thenar emminence of the hand of the free arm against the convex side of the patient's nose, exerting steady, increasing pressure laterally until the bone is pressed into place. A distinct crepitus is felt as the fracture is reduced.

If there is marked depression of the fragments, cocainize the depressed side of the nose by the application of 8 per cent cocain solution, allow 5 minutes for anesthetization and shrinking of the turbinate bodies. Introduce the little finger or, if there is sufficient room, the index finger covered with vaseline into the nostril and push the depressed fragments into place.

A broken nose when replaced in the middle line of the face shows very little tendency to resume its former position of deformity and can be held in place by a splint made of sheet metal applied to the outer side of the nose and held there with strips of adhesive plaster so applied as to exert slight traction against the direction of displacement. Depressed fragments of bone when pushed into position from within the nose retain their proper place fairly well. The nasal splint is removed in two days, cleansed and reapplied. It can be dispensed with on the sixth day, as a broken nose usually heals promptly, and for this reason reduction should be accomplished without delay. Internasal splints and tampons can be dispensed with, as they incur the risk of infecting the sinuses by interfering with the ventilation and drainage of the nose.

TREATMENT OF FRACTURED MANDIBLE.

By D. J. ALEXANDER, Assistant Dental Surgeon, Dental Reserve Corps, United States Navy.

Case 1.—Jaw fractured while fighting. Presented himself for treatment three days later. Side of face much swollen, and complicated by a burn, as large as a half dollar, just below and to the left of the mouth, on the left side.

Each posterior tooth was wired to its opponent, as far forward as the cuspid on each side, and then the wires were twisted together, which brought the teeth in occlusion and of necessity brought the fractured ends of the maxilla in opposition.

An X-ray taken next day showed the bones and teeth not quite together. A few twists on each wire on the injured side corrected this. The ends of the wires were then covered with modeling composition to protect cheek, etc.

No originality is claimed for the above method, which is taught at many of the dental schools.

The method of external fixation originated with this case, owing to the burn, and for economy in bandages.

Case 1.—Fractured mandible.

Case 2.—Fractured mandible; marked displacement.

It was thought best to take a strip of adhesive plaster 1½ inches wide, leave the crinoline covering on, and overlap the ends, so that the plaster would not stick to the hair. This was passed around the head, just above the external occipital protuberance behind, and the ciliary ridge in front, and stuck firmly together; then in the same manner two strips were passed from this over the top of the head, one just in front and the other just behind the ear and stuck together. The entire piece could then be lifted off, and be replaced at will (this is called "the convenience headpiece").

A felt splint was padded and held firmly in place by another strip of adhesive plaster passing entirely around the splint and over the top and stuck fast to the anterior strip of the headpiece. This left plenty of room to treat the burn.

The mouth was cleansed daily, and the temporo-mandibular joint massaged with soap liniment frequently.

Patient was fed on liquid diet and maintained his normal weight.

Splint and wires were removed after 21 days. Teeth were in excellent occlusion and the fractured ends firmly united.

Case 2.—Lower jaw fractured on both sides and compounded into the oral cavity on the right side with great displacement, caused by a fall of 25 feet. The patient had a hammer in his hand and struck his jaw with same upon landing on deck. Photograph shows fractures reduced and perfect occlusion.

SUMMARY.

This method seems to the writer ideal for military services:

1. Because of the economy in time and materials used no bandages and but a few inches of Angle's fracture wire and a large strip of adhesive plaster being necessary. The adhesive plaster and headpiece keep clean and remain in place, which is next to impossible with bandages.

2. Because when the fracture is posterior to the last erupted tooth, Angle's bands and screws can not be used.

3. Because at most of the naval and other military stations, the equipment and materials are not available for making interdental splints.

4. This method of external fixation is much better than a Barton or modified Barton bandage.

1. Showing occlusion obtained in case 2.
2. "Convenience headpiece" for attachment of jaw bandages.

PROGRESS IN MEDICAL SCIENCES.

REVIEWERS.

Surgeon G. B. TRIBLE, United States Navy.
Passed Assistant Surgeon D. G. SUTTON, United States Navy.
Passed Assistant Surgeon G. F. CLARK, United States Navy.
Passed Assistant Surgeon W. A. BLOEDORN, United States Navy.

GENERAL MEDICINE.

SCHOONMAKER, H. **Hydrotherapy of heart disease.** Clifton Med. Jour., N. Y. January, 1918.

The author describes the physiological effects of the full immersion bath at various temperatures and shows its therapeutic possibilities in cardiac disease with indications and contraindications for its use.

The temperature at which water is applied to the skin is divided into three zones, namely—

Neutral	93° to 98 F.
Hot	98° to 110 F.
Cold	below 93°.

A tub bath in the neutral zone without modification by chemicals is sedative to nervous, vascular, and muscular systems. If prolonged, it is a cardio vascular depressant. It is therefore negative, and possibly injurious in relation to heart disease, except in palpitation or the tachycardia of Graves's disease. In this condition general sedation is indicated and a 10 to 20 minute full immersion bath in the neutral zone is often good treatment.

A tub bath in the hot zone is actively stimulating to sensory and vasomotor nerves, inducing quick flushing of capillaries, a rise of temperature, increase in heart rate, perspiration, and secondary cardiovascular depression. It is therefore contraindicated in the treatment of a weak heart.

A tub bath in the cold zone produces the following physiological effects: Stimulation of sensory nerve ends, contraction of muscle fibers of skin and capillaries, secondary stimulation of vasomotor nerves with relaxation of muscle fibers of skin and capillaries, flushing of capillaries, contraction of arterioles with elevation of blood pressure. It also excites inspiration and expiration, thus lessening the burden of the right heart and by flushing the capillaries lessens the burden of the left heart. Thus a cold-zone bath produces a mild

discomfort, while pressure applied directly to a nodule was extremely painful and, in the patient's words, "the pain lasted about an hour." He also complained of feeling "bilious" and that his bowels had not moved for two days.

His temperature at the time of admission was 100°. He was put to bed, given a sponge bath, and cathartics. Hot fomentations were applied to the legs. The fever on the day of admission reached 102.6° and then dropped to 100.3° by the following afternoon at 4. Three hours later the temperature had risen to 101°, when a bowel movement occurred, and then it rapidly fell to 99.6°, at which point it remained most of the following day. A light diet, free catharsis, iron, quinine, and strychnine pills, salicylates, and sodium bicarbonate, and continuous hot applications to his legs, brought the fever to normal, and caused the lesions to become less sensitive within a period of five days. In 10 days the patient was discharged to duty, as he was feeling much better and wished to accompany the regiment, which had received orders to break camp. Sixteen days later he was readmitted with a mild exacerbation of the original attack, as he had never fully recovered and had been subject to some severe weather in transit.

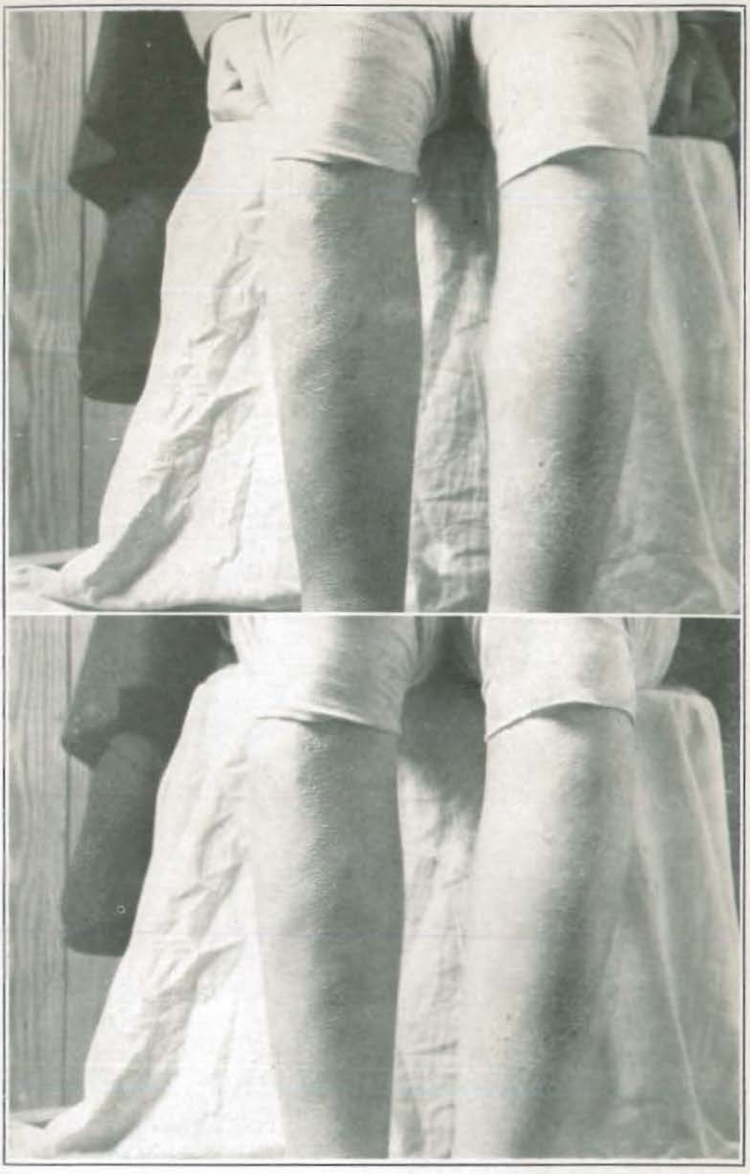
History.—His occupation for the six years previous to his enlistment in the Marine Corps was that of a rural mail carrier, which required him to be out in all kinds of weather.

Family history.—Negative.

Previous illnesses.—Measles, whooping cough, scarlet fever, and typhoid fever. Patient denies venereal disease; has good teeth and has rarely had throat trouble.

Physical examination.—Negative, save for the following cutaneous disorder: The patient has a mild type of ichthyosis simplex, which has been present since he was 1 year old. It gets worse in the cold weather and at times spreads over the entire body, though as a rule localized on the anterior surface of the legs. The accompanying illustrations, taken three days after the patient was first admitted, show the ichthyosis fairly well. The dark patch on the left leg represents the large erythematous area, while the smaller and darker shadows on the right leg represent the nodules of erythema nodosum. This was the best reproduction of the condition that could be obtained.

Etiology.—The fever and joint pains in this case seem to favor the theory that erythema nodosum is an infectious disorder somewhat similar to rheumatism. At the time we were unable to make a differential or leukocyte count. A Wassermann made at a later date was negative. At the onset of the malady we were having very cold weather, and I believe this had a bearing on the etiology. The constipation present favors the theory of its origin being due to an intestinal autointoxication.



Ichthyosis and erythema nodosum.

EARLY CEREBRAL SYPHILIS.

By C. A. AINSLIE, Assistant Surgeon, United States Navy.

Patient, J. M., age 27, private United States Marine Corps, entered the United States Naval Hospital, Canacao, P. I., in December, 1917, with a diagnosis of chancroid. A bubo in the left groin was also present. This bubo became worse and was opened and drained on December 10, and slowly healed until on January 30 it finally closed over. There was a small chancroid on the penis which healed about a week after entrance into the hospital. All venereal diseases seem to be more virulent in the Tropics and take longer to heal than in the more temperate climates, and this probably could account in part for the slow healing of the bubo, however a Wassermann test was done on the patient every week to detect a syphilitic infection if present.

As routine in the venereal ward here, all patients have a blood Wassermann test every Thursday; also every Monday an injection of 1 c. c. of a 10 per cent suspension of mercury salicylate in albolene is given in the buttocks. (The mercurial injections seem to hasten the healing of all venereal cases whether syphilitic or not. Latent lues will often, after one or two injections, give a positive Wassermann, and early cases will give a positive test earlier by this method than if no antisyphilitic treatment is given.)

On January 17 the patient first gave a positive Wassermann test. The next day 0.6 gram of salversan was given intravenously, this being followed a few hours later by a generalized macular rash which gradually died away in the next 12 hours. The patient's diagnosis was changed to syphilis on January 20.

January 25 a second 0.6 gram of salversan was given intravenously.

On January 27 at 4 p. m. the patient was standing near a bed, having just gotten up from reading a newspaper, when he suddenly fell over on the bed, almost immediately began to have clonic convulsions and became very cyanotic. The tongue became slightly injured by the teeth and the froth which appeared on the lips was blood tinged. In a few seconds stertorous breathing began, lasted for about an hour and then gradually subsided and the patient fell into a troubled sleep.

A like convulsion occurred at 8 p. m. and another at 2 a. m. the following morning. No localizing symptoms could be made out; no inequality of the pupils; no loss of or exaggeration of any of the reflexes; no paralysis of any part of the body; no twitching of any member, in fact nothing was found which would indicate a localized process in the brain or spinal cord. The patient needed to be constantly watched as he tossed about so much on the bed that he would have fallen to the floor if not constantly watched. Power of speech was totally lost for several days but the patient would turn his eyes toward the speaker if words were spoken with emphasis. Stupor, inconti-

nence and inability to eat were symptoms which were pronounced for three days.

On January 27 the urine was tested and found negative. Kernig's sign persistently absent.

Lumbar puncture done on January 28 and 30 c. c. of spinal fluid removed. There was no increase in pressure; laboratory tests as follows: Globulin positive—cell count done but was not accurate owing to the fact that the acetic acid used to remove the red cells did not do it. This was later remedied by making up some new solution. At this time there was a discussion as to the advisability of giving Swift Ellis treatment but that was not done and it was decided to push the administration of mercury by inunctions, potassium iodide by mouth and salvarsan intravenously.

January 29: Patient semiconscious and restless; 0.2 gram of salvarsan given intravenously.

Answers to questions put to him on January 30 show a very well marked lapse of memory, practically everything that has happened in the last six months being blotted out.

Q. "What year is this?"—A. "1916."

Q. "How long have you been in this hospital?"—A. "Since July 4, 1916."

Q. "Why is your back sore?" (spinal puncture).—A. "Another man and I were over in France and I was shot in the back."

February 4: 0.3 gram of salvarsan given intravenously. Treatment at this time was as follows: Potassium iodide, grains 10 t. i. d.—mercury inunctions every day except Sunday, rest and bath on that day; salvarsan intravenously at short intervals.

February 7: Blood Wassermann negative.

February 11: 0.6 gram of salvarsan given intravenously. One hour later 20 c. c. of spinal fluid were withdrawn by lumbar puncture and tests made. These showed—cell count 1 per c. m.; globulin negative; Wassermann and Lange tests both negative.

February 14: Patient seems to be slowly recovering his memory. He can now recall everything up to December 20 last, but nothing from that date to January 27. He acts and talks rationally and is trying to recall past events. He has no symptoms except a frontal headache which comes on every two or three days and is not very severe.

The case seemed to be worth reporting because of the following features: No syphilitic or other venereal history before the latter part of November, 1917; a negative blood Wassermann until 10 days before the cerebral symptoms came on with such suddenness; the symptoms of acute cerebral irritation with no localizing symptoms; the rapid recovery from all symptoms except a slight occasional headache when antisyphilitic treatment was intensively given.

REPORT OF A CASE OF DIABETES INSIPIDUS.

By E. E. Moody and C. F. Carter, Assistant Surgeons, United States Naval Reserve Force.

Diabetes insipidus is a relatively rare condition concerning which little is known, and there has been a great deal of discussion as to whether it is really a disease of the kidney (1) or a disease of the central nervous system, or a condition in some way related to the glands of internal secretion. Christie and Stewart (2) have proven in a number of cases that by giving posterior lobe extract of pituitary gland they were able to effect a very considerable concentration of urine and produce thereby a fluid of much higher specific gravity than the patient was able to excrete under ordinary conditions. They construe this to mean that, in certain cases at least, the kidney itself is not the determining etiological factor of the disease. Further proof is that there have been no histological alterations of the actual kidney tissue in diabetes insipidus.

Priestly (3) has measured the blood serum and proved that it shows an actual increase in relative volume upon the drinking of large quantities of water and that as a result the serum becomes more dilute and decreased in salt content. Christie and Stewart, working on this basis, found that the relative volume of serum was diminished simultaneously with the decrease in water excretion when the water intake was restricted or posterior lobe extract administered.

Most of the men who have studied the disease have attempted no definite explanation of it, and practically nothing has ever been contributed which is of value in the treatment of the disease.

It is certainly true that the disease itself is practically never the cause of death.

The following case is reported because of the probability of an hereditary tendency and because of the great rarity of such conditions in military service. The patient, E. V. G., 18 years of age, enlisted June, 1917, nothing abnormal having been found when he was examined for duty. He was admitted to the United States Naval Hospital, New Orleans, La., on November 24, 1917, with the following history:

Clinical case.—Bed wetting.

Family history.—Father and brother are very nervous, and there is a history of abnormal frequency of urination in the father and one paternal uncle. The brother, who is 20 years of age, is in the naval service.

Personal history.—The patient has had mumps, measles, and chicken-pox, all of which were very mild and of short duration. He has had no other diseases.

Present illness.—The present illness dates back to early childhood. He has always been obliged to pass urine quite frequently during the day and has been a bed wetter all of his life. The urine has never been highly colored, nor has it ever had a strong odor. The

condition has always been a source of annoyance and inconvenience, as he has practically not missed a night in the past 12 years. However, he did not consider it of sufficient consequence to necessitate his making a statement as to the condition when he was enlisted. He states that this is because he had become so accustomed to it that it did not impress him as being unusually abnormal. In October, 1917, while on ship duty, he came under observation of the ship surgeon, who tried the ordinary simple method of treating eneuresis, without any success whatsoever. When admitted to the hospital, the condition was neither better nor worse than it had been for several years.

Physical Examination.—Shows a well-nourished youth. Skin clear and of normal turgor. Ears negative. Eyes present no abnormalities. Pupils equal and react to light and accommodation. Under atropine the eye grounds were found to be normal. The nose shows a slight hypertrophic rhinitis. Throat and mouth negative. Teeth all present and in good condition. There was a marked increase of flow from all of the salivary glands, and the saliva had a faintly acid reaction. Neck: slight enlargement of thyroid gland. Chest: the lungs are apparently normal to percussion and auscultation. There is slight enlargement of the heart to the right (verified by X-ray), but the sounds are normal. Abdomen: left kidney apparently palpable but not tender. Genitalia show no abnormalities. Extremities are negative except that all finger nails have been bitten very close. Blood pressure on admission (stethoscopic), 185–158. X-ray of head shows a normal sella turcica. Red blood count 4,300,000, white blood count 11,000. Hemoglobin 70 per cent. Urine, total quantity for 24 hours 9,300 c. c., specific gravity 1.004, reaction acid, negative chemically and microscopically. An attempt was made to allow the patient as little water as possible, and after two days the total quantity for 24 hours was reduced to 5,190 c. c. The administration of 15 grams of sodium chloride every four hours immediately brought the quantity back to 9,000 c. c. For a short period of time he was given 1/200 grain of atropine sulphate every four hours by mouth without appreciable effect on the total excretion.

It was found that the only method by which the bed wetting, for which he was admitted, could be controlled was by waking the patient at one-hour intervals during the night and even then, on one or two occasions the quantity of urine passed during the night was so great that this method was not effective. A board of medical survey has recommended his discharge as being unfit for service.

REFERENCES.

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A CASE OF EMPHYSEMA OF CONJUNCTIVA AND SCLERA.

By J. P. ISRAEL, Assistant Surgeon, United States Naval Reserve Force.

This case is reported because of the rarity of the condition and because of its traumatic origin.

G. D., aged 17 years, a civilian employee of the navy yard, was admitted to the United States Naval Hospital, New Orleans, La., on December 12, 1917, complaining of inability to open the right eye after having been struck in the face by an air stream from a compressed-air hose, used to drill rivet holes. While using the machine the hose became detached from the drill gun and the stream of air was directed into his face from a distance of at least 12 inches.

There was no immediate discomfort, but he was unable to open his eye. He was sent to the hospital, and it was seen that the emphysematous condition of the conjunctiva was responsible for his inability to open the eye.

On exposure there was noted a marked swelling of the conjunctiva of the lower lid and eyeball, involving the sclera over the lower temporal quadrant extending to the sclerocorneal junction. There was no involvement of the cornea and no visual disturbance. Distinct crepitation could be felt over the involved portion.

The patient was given douches of 2 per cent boric acid solution and ice compresses were applied. The following day the edema of the lids had subsided to such an extent that he was able to open his eye, and the emphysema of the conjunctiva and sclera was subsiding rapidly.

Four days after the accident the swelling had completely disappeared and the patient was sent to duty.

Neither Fuchs nor De Schweinitz mentions emphysema due to this kind of trauma.

REPORT OF SEVEN CONSECUTIVE CASES OF MASTOID ABSCESS.

By F. A. HUGHES, Passed Assistant Surgeon, United States Naval Reserve Force.

Case No.	Date of operation.	Date when ear ceased to discharge.	Date when wound ceased to discharge.
	1918.	1918.	1918.
1	Feb. 13	Feb. 18	Feb. 28
2	Feb. 22	Feb. 25	Mar. 12
3	Feb. 28	Mar. 3	Mar. 7
4	...do.....	...do.....	Mar. 11
5	...do.....	Mar. 4	Mar. 13
6	Mar. 2	Mar. 10	Mar. 20
7	...do.....	Mar. 16	Mar. 21

The above cases were operated upon and treated under the same conditions, so permit a fair estimate of what can be expected from the method of aftertreatment used, as two of the cases were as un-

favorable for a rapid healing as would be encountered in the service. Case No. 4 had just recovered from a broncho-pneumonia following measles. Case No. 6 on the third day after operation developed a lobar pneumonia on the right side. His temperature continued high until the tenth day, when he passed his crisis and his temperature dropped to normal. After this the discharge lessened very rapidly and stopped in five days.

The treatment used was as follows: Daily irrigations of the wound and ear canal with Dakin's Solution 1 part and hot water 3 parts. Urotropin grains XV t. i. d. internally.

Conclusions: That the method of aftertreatment in these cases materially shortens the period of healing, the patients are more comfortable, and are able to be out of bed sooner than with other methods of treatment.

The average time required to entirely stop the discharge from the ear, through the canal, was 6 days, though most of them stopped in 3 or 4 days. The average time required for all drainage from the wound to stop was 18 days, though one stopped in 8 days. All dressings were discontinued and the wounds healed in from 2 to 4 days after discharge had stopped. All cases recovered with good hearing. Since the above report three more cases have been operated and are pursuing the same course in healing.

TREATMENT OF CEREBRO-SPINAL FEVER.

A review of 138 cases, with a mortality of 21 per cent.

By W. E. GOLDEN, Assistant Surgeon, United States Navy.

The successful treatment of epidemic cerebro-spinal meningitis depends essentially upon the early diagnosis of the case followed by an early and efficient administration of antimeningococcic serum. The serum should be administered both intraspinously and intravenously in amounts sufficient to overwhelm the infection within the first 24 to 48 hours, the mode of administration and the amount given depending upon the clinical type of the case.

The disease may be divided roughly into three clinical types, the systemic type, an involvement of the blood stream with little or no meningeal signs, the meningeal type with clinical signs of the involvement of the coverings of the brain and cord, and the combined type with both systemic and meningeal involvement.

In the systemic type the manifestations are those of severe toxemia bordering on to the typhoid state, the temperature usually is subnormal at the onset, but may rise to extreme hyperpyrexia. I have observed temperatures of 108.6° and 108.9°, respectively, just before death. The pulse is usually between 120 and 150, extremely weak and thready; the respiration from 25 to 40 and usually shallow.

There may be a muttering delirium, but unconsciousness is rare, while in mild types the mind is usually clear. Lumbar puncture usually shows an increase of clear fluid in proportion to the increase in temperature, with normal cell count negative to globulin, and meningococci. Vomiting is the rule and hematemesis is not uncommon. The rash is always present, and may consist of numerous petechiæ over body and limbs, or in very severe cases of hemorrhagic blotches over the entire skin, conjunctiva, and mucus membranes. The blood culture in early cases is usually positive to meningococci.

The meningeal type is characterized by marked signs of meningeal involvement. Rigid neck and marked Kernig's sign are usually present. The reflexes are increased, and Babinski's sign may usually be demonstrated. The patient may or may not be unconscious, although there is always some mental lethargy. Vomiting is the rule and may be projectile in type. The temperature ranges from 99° to 103°, the respirations from 16 to 24 and are usually deep and laborious; the pulse may vary from 48 to 110, is usually full, and strong and is generally in inverse ratio to the temperature. Lumbar puncture reveals a cloudy fluid, under high pressure containing many pus cells, usually positive to meningococci and reacting to the globulin tests.

The combined type is the most frequent and most fatal if not checked by early treatment. The systemic type if not checked in early stages will usually develop meningeal complications. The symptoms are a combination of the symptoms of the two above-mentioned types.

I consider that cerebro-spinal fever is a blood-borne disease, localizing in the meninges as a point of least resistance or predilection, and should be treated accordingly, both systemically by intravenous administration of serum and locally by intraspinous administration. To be successful in the local treatment of the cerebro-spinal symptoms, the means of transportation of the infection must be blocked, and this is best done by intravenous injection of antimeningoccic serum. As soon as the patient is admitted and the diagnosis is made from a clinical standpoint, a lumbar puncture is done for confirmation. If the rough fluid findings indicate it, an equivalent amount of serum—that is, 10 to 15 c. c. less than the amount of fluid removed—is injected intraspinously at the same sitting. The patient is then turned on his back and from 20 to 40 c. c. of serum is injected into the median vein. Undiluted serum is used and may be injected by gravity or very slowly with a piston syringe. There is usually more or less shock following this intravenous administration, and the physician should make it a point not to leave the bedside of the patient in less than 30 minutes after completing the injection. The heart increases in rate and the pulse may become almost imperceptible; the respira-

tions increase in rate and are very shallow and sometimes may cease entirely. Artificial respiration and administration of oxygen has always carried my cases past this stage. This marked cardiac and respiratory involvement, if it occurs, usually begins within 10 minutes after the injection of serum, and does not last as a rule for more than 5 to 15 minutes, and may be followed by a chill, which in turn is followed by an almost uniform rise in temperature of from 2° to 4°. After a few hours the temperature begins to fall and in the majority of cases has reached normal on the second day. As a rule one intravenous injection is enough to curb the systemic infection, as is manifested by the fading petechiæ, which by the second day are usually brownish pigmented spots and have disappeared entirely by the fourth to fifth day.

To clear the meninges of infection more persistent treatment is required, the initial lumbar puncture and injection of antimeningococcic serum is repeated in 8 hours and as much fluid as possible is withdrawn and serum is injected. This is repeated every 24 hours, or oftener if symptoms of increased pressure indicate it, until the spinal fluid is clear, or persistently negative to meningococci both in smear and culture, as I have found several fluids which continued cloudy under repeated treatment, but if left for two or three days until absorption was complete, returned clear and patient made an uneventful recovery.

The danger of withdrawing a large amount of fluid may be discussed. In dealing with young adults, I think that all the fluid possible should be withdrawn, but the drainage should be slow and gradual, and followed by immediate injection of serum. In this manner the release of pressure is gradual, and the vessels dilate slowly with no danger of rupture, and with no symptoms but a severe headache, which is relieved, together with the danger of diapedesis, through the relaxed vessel walls, by the equalization of pressure on the injection of the serum.

A certain general and symptomatic treatment must be carried out in conjunction with the specific serum treatment. Rest is essential and is best obtained by use of morphine or other opiates. Veronal and chloral have been useful in cases not reacting to opiates. Digalen and atropine have been most successful as cardiac and respiratory stimulants. The throat and nasal passages are cleansed three times daily with an oily antiseptic preparation and the eyes irrigated twice a day with boric-acid solution, as a protective measure.

The diet consists of liquids while the temperature is above 101° or in the acute stage, and is supplemented as soon as advisable by a soft diet.

The complications are treated symptomatically as they arise, the most frequent being a serum arthritis occurring from 7 to 12 days

after the first administration of serum. At first the inflammatory stage is treated by immobilization by splint if possible, and later, when inflammation has subsided, massage aids in removing any exudate. An arthritis sometimes is found at the onset of disease, but usually clears up after intravenous injection of serum. Other complications, as otitis media, paralysis of ocular muscles and panophthalmitis, are treated as they arise.

In conclusion I wish again to emphasize the necessity of rapid and efficient administration of antimeningoccic serum in amounts sufficient to overcome infection. This is accomplished by early injection of serum intravenously in conjunction with intraspinous treatment.

Review of 138 cases, from Oct. 30, 1917, to Mar. 20, 1918.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total.
Number of cases	2	5	22	94	11	4	138
Number of deaths	1	1	7	19	.....	1	29

Per cent deaths, 21.

Showing hemorrhagic rash	[1] 83
Received unconscious	[2] 59
Showing rigid neck and Kernig's sign	129
No meningeal sign, but with hemorrhagic rash	9
No meningeal signs, petechiae present, spinal fluid positive to mening	7
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By E. A. KNORR, Assistant Surgeon, United States Naval Reserve Force.

Fracture of the nasal bones is a fairly frequent occurrence at the navy yard, Norfolk, Va., all the cases reporting for treatment at the yard dispensary being due to direct violence, and the fracturing agent in most cases being a fist. In all the cases treated here both nasal bones were broken. The nasal processes of the superior maxillary bones were involved in prominent noses, but not when the patients were negroes, as in them the nasal processes are less prominent, are rather thick and occupy a more protected position. The line of fracture extends into the bony portion of the nasal septum, and the fracture is compound internally and accompanied by nose bleed. When the fracture is due to the impact of a human fist, it is not likely to be compound externally.

If there is an external wound, apply tincture of iodine and collodion. Place the patient in a chair with a headrest. Steady the

[1] Per cent, 60.1. [2] Per cent, 42.9.

head by securing a good grip with the arm and applying the thenar emminence of the hand of the free arm against the convex side of the patient's nose, exerting steady, increasing pressure laterally until the bone is pressed into place. A distinct crepitus is felt as the fracture is reduced.

If there is marked depression of the fragments, cocainize the depressed side of the nose by the application of 8 per cent cocain solution, allow 5 minutes for anesthetization and shrinking of the turbinate bodies. Introduce the little finger or, if there is sufficient room, the index finger covered with vaseline into the nostril and push the depressed fragments into place.

A broken nose when replaced in the middle line of the face shows very little tendency to resume its former position of deformity and can be held in place by a splint made of sheet metal applied to the outer side of the nose and held there with strips of adhesive plaster so applied as to exert slight traction against the direction of displacement. Depressed fragments of bone when pushed into position from within the nose retain their proper place fairly well. The nasal splint is removed in two days, cleansed and reapplied. It can be dispensed with on the sixth day, as a broken nose usually heals promptly, and for this reason reduction should be accomplished without delay. Internasal splints and tampons can be dispensed with, as they incur the risk of infecting the sinuses by interfering with the ventilation and drainage of the nose.

TREATMENT OF FRACTURED MANDIBLE.

By D. J. ALEXANDER, Assistant Dental Surgeon, Dental Reserve Corps, United States Navy.

Case 1.—Jaw fractured while fighting. Presented himself for treatment three days later. Side of face much swollen, and complicated by a burn, as large as a half dollar, just below and to the left of the mouth, on the left side.

Each posterior tooth was wired to its opponent, as far forward as the cuspid on each side, and then the wires were twisted together, which brought the teeth in occlusion and of necessity brought the fractured ends of the maxilla in opposition.

An X-ray taken next day showed the bones and teeth not quite together. A few twists on each wire on the injured side corrected this. The ends of the wires were then covered with modeling composition to protect cheek, etc.

No originality is claimed for the above method, which is taught at many of the dental schools.

The method of external fixation originated with this case, owing to the burn, and for economy in bandages.

Case 1.—Fractured mandible.

Case 2.—Fractured mandible; marked displacement.

It was thought best to take a strip of adhesive plaster 1½ inches wide, leave the crinoline covering on, and overlap the ends, so that the plaster would not stick to the hair. This was passed around the head, just above the external occipital protuberance behind, and the ciliary ridge in front, and stuck firmly together; then in the same manner two strips were passed from this over the top of the head, one just in front and the other just behind the ear and stuck together. The entire piece could then be lifted off, and be replaced at will (this is called "the convenience headpiece").

A felt splint was padded and held firmly in place by another strip of adhesive plaster passing entirely around the splint and over the top and stuck fast to the anterior strip of the headpiece. This left plenty of room to treat the burn.

The mouth was cleansed daily, and the temporo-mandibular joint massaged with soap liniment frequently.

Patient was fed on liquid diet and maintained his normal weight.

Splint and wires were removed after 21 days. Teeth were in excellent occlusion and the fractured ends firmly united.

Case 2.—Lower jaw fractured on both sides and compounded into the oral cavity on the right side with great displacement, caused by a fall of 25 feet. The patient had a hammer in his hand and struck his jaw with same upon landing on deck. Photograph shows fractures reduced and perfect occlusion.

SUMMARY.

This method seems to the writer ideal for military services:

1. Because of the economy in time and materials used no bandages and but a few inches of Angle's fracture wire and a large strip of adhesive plaster being necessary. The adhesive plaster and headpiece keep clean and remain in place, which is next to impossible with bandages.

2. Because when the fracture is posterior to the last erupted tooth, Angle's bands and screws can not be used.

3. Because at most of the naval and other military stations, the equipment and materials are not available for making interdental splints.

4. This method of external fixation is much better than a Barton or modified Barton bandage.

1. Showing occlusion obtained in case 2.
2. "Convenience headpiece" for attachment of jaw bandages.

PROGRESS IN MEDICAL SCIENCES.

REVIEWERS.

Surgeon G. B. TRIBLE, United States Navy.
Passed Assistant Surgeon D. G. SUTTON, United States Navy.
Passed Assistant Surgeon G. F. CLARK, United States Navy.
Passed Assistant Surgeon W. A. BLOEDORN, United States Navy.

GENERAL MEDICINE.

SCHOONMAKER, H. **Hydrotherapy of heart disease.** Clifton Med. Jour., N. Y. January, 1918.

The author describes the physiological effects of the full immersion bath at various temperatures and shows its therapeutic possibilities in cardiac disease with indications and contraindications for its use.

The temperature at which water is applied to the skin is divided into three zones, namely—

Neutral	93° to 98 F.
Hot	98° to 110 F.
Cold	below 93°.

A tub bath in the neutral zone without modification by chemicals is sedative to nervous, vascular, and muscular systems. If prolonged, it is a cardio vascular depressant. It is therefore negative, and possibly injurious in relation to heart disease, except in palpitation or the tachycardia of Graves's disease. In this condition general sedation is indicated and a 10 to 20 minute full immersion bath in the neutral zone is often good treatment.

A tub bath in the hot zone is actively stimulating to sensory and vasomotor nerves, inducing quick flushing of capillaries, a rise of temperature, increase in heart rate, perspiration, and secondary cardiovascular depression. It is therefore contraindicated in the treatment of a weak heart.

A tub bath in the cold zone produces the following physiological effects: Stimulation of sensory nerve ends, contraction of muscle fibers of skin and capillaries, secondary stimulation of vasomotor nerves with relaxation of muscle fibers of skin and capillaries, flushing of capillaries, contraction of arterioles with elevation of blood pressure. It also excites inspiration and expiration, thus lessening the burden of the right heart and by flushing the capillaries lessens the burden of the left heart. Thus a cold-zone bath produces a mild

gymnastic treatment for the heart, with relatively little peripheral resistance.

It is apparent, then, that in the hydrotherapy of heart disease, the object being improvement in cardiovascular tone, baths should be given in the cold zone or in the neutral zone approximating the cold.

If the cardiovascular system responds to the cold bath, the clinical evidence is a slowing of the pulse, an increase in pulse volume, an increase in the volume of the first heart sound, a shortening of the diameters of the heart, and a sense of well-being on the part of the patient.

The author regards the Nauheim system as of great value, as it enables a full immersion bath to be taken comfortably at much lower temperature.

The essentials of the Nauheim system are: A stimulating tub bath in water containing various amounts of salts, chiefly sodium chloride, calcium chloride, and carbon dioxide. The salts act as skin irritants and encourage capillary dilatation. The gas is also a skin irritant and at the same time conserves the body heat by virtue of the layer of globules which forms upon the skin. The gas is a nonconductor. This combination of flushed capillaries and slow heat radiation makes comfortable a cold bath.

It is the rule to give 18 to 20 baths, beginning at 94 F. and 7 minutes' duration and to diminish the temperature 1° and increase time 1 minute every second or third bath until 86° and 16 minutes are reached. At the same time, the saline and gas contents are gradually increased. The patient should be fully relaxed, and care should be taken not to rub the gas from the skin.

The author considers hydrotherapy indicated in myocardial insufficiency providing the skin capillaries react and the reserve force of the heart be not lost.

It is contraindicated in advanced valvular disease, with lost compensation until compensation is being restored.

Hydrotherapy is contraindicated in acute dilatation due to overstrain in advanced infectious myocarditis, advanced fatty heart, and the terminal stage of cardiorenal disease; also in advanced arteriosclerosis and in typical mitral stenosis.

The hydrotherapy of angina pectoris depends on the underlying cause. If this be coronary or general arteriosclerosis, the warm baths are indicated. If due to a dilated heart, in the absence of sclerosis and kidney disease the graduated cold baths are indicated.

The author arrives at the following conclusions in the hydrotherapy of heart disease:

1. Hydrotherapy in heart disease is based on physiological response to stimuli, and is therefore scientific.

2. In hydrotherapy there are more possibilities for good in the treatment of heart disease than in any other single agent except rest.

3. The saline carbonated bath is especially helpful in the treatment of heart disease because it makes possible the giving of cold tub baths without undue shock and provides a wide limitation in temperature, time, and strength of bath.

4. As a therapeutic agent, hydrotherapy is not incompatible with any other.

(W. A. B.)

KURITA, T. **Tuberculosis of penis.** Bull. Nav. Med. Assn. of Japan, March, 1918.

Fleet Surgeon T. Kurita, I. J. N., reports a case of tuberculous ulcer of the penis in a man of 22, of fair physique, well nourished, apparently healthy. In May, 1916, he was admitted as a patient to the Yokosuka Naval Hospital and repeated Wassermanns were made under the conviction that the ulcer was specific, but the tests were invariably negative. Antisyphilitic and antiseptic treatments were persisted in without benefit. The subjective symptoms were slight, the course chronic. The ulcer itself was irregular in shape with undermined sharply cut edges. Secretion was scant, but the vicinity of the ulcer was distinctly infiltrated. The base had a yellowish gray fur on bright red granulations. A histological examination of the ulcerous tissue proved it to be a tubercular nodule.

On inquiry it developed that the patient had frequently and for a considerable period consorted with the same courtesan, who *angusti introitus causa* was in the habit of moistening the labia with her own saliva before each act of sexual congress. Preceding the development of the typical tuberculous ulcer there had repeatedly appeared on the penis many small reddish nodules with a yellow point in the center.

(It is a matter of regret that the English abstract of the original Japanese article does not contain any statement regarding the health of the prostitute apparently impugned as the source of the infection.)

MENTAL AND NERVOUS DISEASES.

COLLIE, J. **Notes on the management of war neuroses and allied disorders in the Army.** Mental Hygiene, vol. 3, No. 2, January, 1918.

During the past few months there have been numerous articles and special reports written by men of unquestionable reputation, on this subject, but for obvious reasons, few if any of these articles have reached the public press.

The material, as treated by the author in this case, is quite valuable to those of us in the service and it is recommended for careful reading, by those who are interested in the subject, or, those who expect to be actively engaged in work of this character. These statistics from Europe of course involve only the Army, but it can be very well

realized that neuroses of the character discussed would arise in the Navy, after an engagement involving ships of the dreadnaught class. The psychogenic make-up of the individual is the basic element involved in each case, of course, but there are certain predisposing causes cited by the author which are well worth taking into consideration. He enumerates fear, fear of being afraid, terrifying experiences, want of sleep, exposure to cold and wet, appalling sights at the front, suppression of emotions, etc. These conditions extending over a period of days produce mental irritability, loss of self-control and subsequently insomnia with the final reaction of intense emotion. The symptoms seen may be very mild or severe, simulating any neurological picture known and in many cases suggesting hysteria to the expert investigator. In fact the element of hysteria, in many of the regiments, especially those of the Canadian Army has been accentuated by the officers in charge as essential in outlining prophylactic means. Handling the condition from this angle the officers have told troops that they did not believe in such a thing as shell shock and the reviewer has been told, by a major of the Princess Pat Canadian Regiment, that even though that regiment had been rebuilt over 15 times, since the beginning of the war there had not been a single case of shell shock develop. This officer explained that the conditions of shell shock in other regiments had made their appearance in the interval immediately after a very severe engagement and before the soldiers had had an opportunity to regain their normal poise. If just at this time non-commissioned officers and regimental officers come in touch with a case that seems to be emotionally, literally shot to pieces, they have a talk with the man, reassure him, tell him that there is no such thing as shell shock, and by that means get him back on his feet. The characteristic symptoms of the condition as given by the author are disordered action of the heart, epileptiform seizures, tremors, functional loss of power of muscles, loss of flesh, impairment of the special senses, mental lassitude, giddiness, nightmares, loss of control, loss of power of concentration, fear of closed spaces, a vague feeling of apprehension, confusion of thought and frequently a functional paralysis of a group of muscles, simulating a foot or wrist drop. In the latter group of cases the diagnosis is, of course, cleared up by the reaction of the involved muscles to electrical stimulation.

It has been suggested that the pathology of the condition is minute hemorrhages into the nerve tissue, usually supported by increased cerebro-spinal pressure, as elicted by a lumbar puncture.

The chief manifestation, of course, is a perversion of mental outlook, requiring psychological treatment, involving kindness, combined with firmness and unswerving faith in an ultimate recovery.

During the first year of the war all or practically all of these cases of neuroses were transferred to the base hospital in the rear and subsequently to special hospitals in England, but within the past six or eight months, or possibly longer, authorities have recognized the value of treating all of these cases in the immediate vicinity of the trenches. The cases that were treated in the base hospitals or far in the rear of the fighting zone, in England, demanded a very long period of active massage, electrical treatments and reeducation, but since the cases have been handled in the immediate vicinity of the trenches the average number of sick days per case has decreased markedly and a large percentage of the men are being returned to active duty. In fact, our records of the cases of severe shell shock, in which the functional paralyses were simulated there has frequently been a record of full recovery in a short period and the man has, in some instances, received a medal for bravery for subsequent fighting in the trenches. The important basic principles involved in the treatment seems to be reassurance, appreciation by the patients that their fears are abnormal, that their mental outlook is perverted and, above all, that there is no question but that they will get entirely well. Associated with this psychological treatment, of course, is rest, massage, both manual and electrical, and finally reeducation along the lines of graded exercise and work.

(D. G. S.)

Rivers, W. H. R. **Repression of war experience.** Proc. Roy. Med. Soc., London, January, 1918.

Reference is made at the outset of this very interesting paper to the use of the word "repression" in two senses. It may mean the "*process* whereby a person endeavors to thrust out of his memory some part of his mental content," and again it may be used "for the *state* which ensues when, either through this process or by some other means, part of the mental content has become inaccessible to manifest consciousness. In this paper the author uses repression to designate an active voluntary process by which it is attempted to remove some part of the mental content out of the field of attention with the aim of making it inaccessible to memory and producing the state of suppression." In this sense *repression* is not a pathological state but a necessary element of education in all social progress. "It is not repression in itself which is harmful, but repression under conditions in which it fails to adapt the individual to his environment."

"It is in times of special stress that these failures of adaptation are especially liable to occur, and it is not difficult to see why disorders due to this lack of adaptation should be so frequent at the present time. There are few, if any, aspects of life in which repression plays so prominent and so necessary a part as in the preparation for war. The training of a soldier is designed to adapt him to act calmly and

methodically in the presence of events naturally calculated to arouse disturbing emotions. His training should be such that the energy arising out of these emotions is partly damped by familiarity, partly diverted into other channels. The most important feature of the present war in its relation to the production of neurosis is that the training in repression normally spread over years has had to be carried out in short spaces of time, while those thus incompletely trained have had to face strains such as have never previously been known in the history of mankind. Small wonder that the failures of adaptation should have been so numerous and so severe.

"The process of repression does not cease when some shock or strain has removed the soldier from the scene of warfare, but it may take an active part in the maintenance of the neurosis. New symptoms often arise in hospital or at home which are not the immediate and necessary consequence of war experience, but are due to repression of painful memories and thoughts, or of unpleasant effective states arising out of reflection concerning this experience."

The author attempts to show, by citing cases successfully treated, that many of the sufferings of war-neurosis patients are due not so much to the strain of battle as to the attempt to banish from the mind distressing memories of warfare of "painful affective states which have come into being as the result of war experiences."

The natural tendency is to try to thrust aside painful memories, just as it is natural to try to avoid horrible actualities. Such a disposition is increased in those whose resistance has been lowered by the prolonged life of the trenches or other burdensome incidents of war. Not only do they do this instinctively, but friends, relatives, and physicians urge such a course upon them. They are even told not to talk with other patients or with visitors about anything relating to the war and to confine themselves to other topics, such as the beautiful scenery and pleasant features of life. This is a wise policy in general. To many patients the constant inquiries about war experiences are extremely annoying, not only through the revival of distressing scenes, but because of the patient's sense of the utter impossibility of conveying to his hearers any adequate conception of war's realities. Then there is a disposition for men associated closely in hospitals to keep harking back to the scenes they have been through and to get more than ever "fed up" with the whole business. But it is one thing for the victims of shock and strain to avoid dwelling continually on what they have seen and felt and quite another to banish it altogether from the mind. The author cites numerous cases of patients who were unable to banish the memories in question and whose symptoms were distinctly aggravated by the constant effort to do so, as advised and directed, which, if partly successful during the daytime, only brought the horrors of war more forcibly before

them by night, robbing them of needed sleep. In these cases the author talked with the patients and frankly admitted the difficulty of banishing disagreeable memories, advising that the effort be renounced and at the same time suggesting a slight modification of the ordinary line of thought, which robbed the scenes and experiences of some of their frightfulness when revived. For example, an officer had been buried by a shell explosion and suffered from a certain degree of cerebral concussion. In spite of severe headache, vomiting and disorder of micturition, he remained on duty for two months. He then collapsed after the trying experience of going out to seek a fellow officer and finding his body blown to pieces, head and limbs scattered about, wholly separated from the trunk. From that time on he was haunted by visions of the mangled dead friend. He had a horror of the night because of the dreams and visions which beset him. The day was terrible, partly from memories and fruitless attempts to banish them and partly from dread of the habitual nocturnal suffering. The constant effort to banish the painful recollections appeared to aggravate his situation. The author's advice was to relax from the persistent effort to forget, and he invited the patient's attention to the fact that the horrible state in which he had found his friend was conclusive evidence that the unfortunate victim had died instantaneously and so had been spared the prolonged agony that accompanies many injuries. This line of thought gave partial instant relief and in time the patient recovered his balance completely. In other cases "the cessation of the repression was followed by the disappearance of the most distressing symptoms and great improvement in general health.

"After one of my patients had for long baffled all attempts to discover the source of his trouble, it finally appeared that he was attempting to banish from his mind feelings of shame due to his having broken down. Great improvement rapidly followed a line of action in which he faced this shame and thereby came to see how little cause there was for this emotion. In another case an officer had carried the repression of grief concerning the general loss of life and happiness through the war to the point of suppression, the suppressed emotion finding vent in attacks of weeping, which came on suddenly with no apparent cause. In this case the treatment was less successful, and I cite it only to illustrate the variety of experience which may become the object of repression.

"Another complicating factor which may have entered into the therapeutic process in some of the cases is reeducation. This certainly came into play in the case of the patient who had the terrifying dreams of his mangled friend. In his case the cessation of repression was accompanied by the direction of the attention of the patient to an aspect of his painful memories which he had hitherto

completely ignored. The process by which his attention was thus directed to a neglected aspect of his experience introduced a factor which must be distinguished from the removal of repression itself. The two processes are intimately associated, for it was largely, if not altogether, the new view of his experience which made it possible for the patient to dwell upon his painful memories. In some of the other cases this factor of reeducation undoubtedly played a part, not merely in making possible the cessation of repression but also in helping the patient to adjust himself to the situation with which he was faced, thus contributing positively to the recovery or improvement which followed the cessation of repression.

"A more difficult and more contentious problem arises when we consider how far the success which attended the cessation of repression may have been, wholly or in part, due to faith and suggestion. Here, as in every branch of therapeutics, whether it be treatment by drugs, diet, baths, electricity, persuasion, reeducation, or psychoanalysis, we come up against the difficulty raised by the pervasive and subtle influence of these agencies working behind the scenes. In the subject before us, as in every other kind of medical treatment, we have to consider whether the changes which occurred may have been due not to the agency which lay on the surface and was the motive of the treatment but at any rate, in part, to the influence, so difficult to exclude, of faith and suggestion. In my later work I have come to believe so thoroughly in the injurious action of repression, and have acquired so lively a faith in the efficacy of my mode of treatment, that this agency can not be excluded as a factor in any success I may have. In my earlier work, however, I certainly had no such faith, and advised the discontinuance of repression with the utmost diffidence. Faith on the part of the patient may, however, be present even when the physician is diffident. It is of more importance that several of the patients had been under my care for some time without improvement until it was discovered that they were repressing painful experience. It was only when the repression ceased that improvement began.

"When I find that a soldier is definitely practicing repression, I am accustomed to ask him what he thinks is likely to happen if one who has sedulously kept his mind from all thoughts of war, or from special memories of warfare, should be confronted with the reality or even with such continual reminders of its existence as must inevitably accompany any form of military service at home. If, as often happens in the case of officers, the patient is keenly anxious to remain in the Army, the question at once brings home to him the futility of the course of action he has been pursuing. The deliberate and systematic repression of all thoughts and memories of war by a soldier can have but one result when he is again faced by the realities of warfare.

"Several of the officers whose cases I have described or mentioned in this paper were enabled to return to some form of military duty with a degree of success very unlikely if they had persisted in the process of repression."

The author concludes with the reminder that, while he deprecates the "ostrichlike policy of attempting to banish them from the mind," he is far from recommending that thought be concentrated on painful memories. "On the contrary, in my opinion, it is just as harmful to dwell persistently upon painful memories or anticipations, and brood upon feelings of regret and shame, as to attempt to banish them wholly from the mind. It is necessary to be explicit on this matter when dealing with patients. In a recent case in which I neglected to do so, the absence of any improvement led me to inquire into the patient's method of following my advice, and I found that, thinking he could not have too much of a good thing, he had substituted for the system of repression he had followed before coming under my care one in which he spent the whole day talking, reading, and thinking of war. He even spent the interval between dinner and going to bed in reading a book dealing with warfare.

"There are also some victims of neurosis, especially the very young, for whom the horrors of warfare seem to have a peculiar fascination, so that when the opportunity presents itself they can not refrain from talking by the hour about war experiences, although they know quite well that it is bad for them to do so. Here, as in so many other aspects of the treatment of neurosis, we have to steer a middle course. Just as we prescribe moderation in exercise, moderation at work and play, moderation in eating, drinking, and smoking, so is moderation necessary in talking, reading, and thinking about war experience."

HYGIENE AND SANITATION.

Lusk, G. **Food in war time.** W. B. Saunders Co., Philadelphia: 1918.

This is largely a reprint of articles which have previously appeared. It is a little work of 45 pages divided into 3 chapters: I, A balanced diet; II, Calories in common life; III, Rules of saving and safety.

Attention is called to the diet of the Italian laborer, consisting of corn meal, bread, cabbage or other green food with garlic and oil. The author considers a diet of corn meal, the cheapest of all cereals, a vegetable oil cheaper by far than animal fat, with the addition of cabbage or beet tops, a balanced diet and "capable of maintaining mankind from generation to generation." The claim is that the green leaves furnish the vitamines present in butter fat but absent in olive oil. Lusk lauds the value of milk as a food, and maintains that when it is taken with other foods, meat may be dispensed with. An

ideal diet is described as consisting of bread, potatoes, fruit, and a pint of milk. Parenthetically it may be remarked that Dr. Graham Lusk is related to Sylvester Vegetable Graham. Dr. Lusk says "Taking meat even in large excess is not harmful, but it represents luxury and waste." It is claimed that neither in England nor in Germany has the meat reduction in the diet produced any untoward results. A British commission has reported to Parliament that it takes three times as much fodder to produce beef as it does to produce milk or pork of the same food value. "Since cows eat chiefly hay and grass and pigs eat grain, the cost of the production of a unit value of milk is much less than the cost of the same value in the form of pork. It takes only 50 per cent more fodder to produce veal than to produce pork. Milk, pork, and veal have long been protein-containing foods of nations on the Continent of Europe. * * * It would save food for milk production if steers were eaten as veal and not fattened up into beef cattle. A suitable tax on all steers over a year old will accomplish this result." The author strongly advocates the increase of the dairy business at the expense of the butcher, claiming that "a well-nourished cow during a single year will give in the form of milk as much protein and two and one-half times the number of calories as are contained in her own body. Dr. Lusk extols the merits of corn sirup or Karo, pronouncing it wholesome and a valuable substitute for sugar. I wish very much that he had expressed an opinion on old New Orleans molasses, which has individuality, whereas corn sirup, or Karo, is peculiarly tasteless and insipid. In Chapter III, Rules of saving and safety, he urges that no family of five persons buy any meat until they have bought three quarts of milk, the cheapest protein food. He urges the consumption of oleomargarin and vegetable oils in preference to butter and cream. With the vegetable oils it is essential that cabbage, lettuce, or beet tops be taken to supply vitamines. Fresh fish, fruit, and vegetables are recommended and we are allowed raisins in our rice pudding because raisins contain sugar.

The utilization after appropriate treatment of condemned meat. (Report of the meeting of the Council of Public Health and Hygiene, Department of the Seine, April 27, 1917.)

It is well known that certain meats which the sanitary inspectors at the slaughterhouse interdict as food can be rendered safe and then sold at low cost in the interest of the consumer of very limited means. The sanitary services of Belgium, Germany, Holland, and Sweden have reported fully on this practice. Between 1898 and 1910, in 14 cities of Belgium, over 2,000,000 kilograms of condemned meat were sold after it had been rendered fit for consumption by sterilization. In Holland a similar practice has been increasingly popular since

1898. In 1912 there were 11 cities which had special shops at the slaughterhouses for the sale of tuberculous meat. At Rotterdam, between 1898 and 1908, two thousand and odd beef carcasses and one thousand two hundred and odd hogs were put on the market after sterilization by heat. In Amsterdam, in a nine-year period, one thousand two hundred and odd beef carcasses and one thousand five hundred and odd hogs were so treated and disposed of.

In Bâle, Zurich, and Berne tuberculous meat is sterilized and put on sale in special shops.

Since 1901 the French town of Roubaix has had installed in its public abattoir a horizontal autoclave of the Godon model, intended to sterilize the flesh of tuberculous cattle. The flesh is subjected for three hours to a temperature of 110 C. It is then cut into pieces weighing from 3 to 4 kilos and sold in large or small quantities when cold at from 12 to 14 cents a kilo.

The meat juices and fats recovered during the process are collected separately, and the juice is sold at 2 cents a liter, the fat at the current price of suet. In this establishment the returns from all sales are made over to the owner after all expenses have been paid. The town receives $2 for each sterilization, plus the income from a tax of 40 cents on each ox handled in the slaughterhouse. In a 10-year period the sum of 14,860 francs was turned over to the owners of the cattle, while the town received 2,100 francs, being an average of 85 francs to the proprietor and of 12 francs to the township for each animal.

After the practice had been in vogue for some years in Troyes the routine recovery of condemned meat was given up because of the persistent protests of the butchers. In the same way the complaints from wholesale establishments have greatly interfered with the sterilization of condemned meat in Paris. In Versailles the practice was abandoned in October, 1916, owing to the prejudice excited by rumors set afloat regarding the safety of the procedure. Nevertheless, large quantities of meat of an inferior quality, or actually condemned after veterinary inspection, was obtained from army purveyors and contractors and turned over to various charitable agencies to be used for the relief of the poor.

Even where the consumption of tuberculous meat is objected to (on the grounds of pecuniary loss and not on the grounds of health), there are other types of condemned meat available for use, but the problem has been complicated by the great increase in the commercial value of fats for industrial and manufacturing purposes. The sanitary veterinary service of the Department of the Seine has been making earnest appeals to butchers and wholesale dealers with a view to resuming and increasing the sterilization of meat capable of being rendered edible and of being put on the market at prices adapted to the means of the needy.

De Filippi, F. **Special problems of the Italian medical war services.** Proc. Roy. Soc. Med., London, February, 1918.

The author begins with a discussion of the Italian ration, quoting from Belli (see U. S. Naval Medical Bulletin, October, 1917) and the statistics of injury and mortality in the Italian campaign, quoting Balestra (see U. S. Naval Medical Bulletin, January, 1918).

One of the early tasks which confronted the Italian sanitary officials was the control of a virulent epidemic of cholera which developed in August, 1915, when the Italians captured and occupied Austrian trenches infected with cholera. The problem had three phases: (1) To localize the outbreak and prevent its distribution to the whole army; (2) to isolate and cure the patients; (3) to prevent the spread of cholera throughout Italy.

These features of the problem were brilliantly solved. The disinfection of the first-line trenches was accomplished under fire by medical officers and specially trained men of the newly created prophylactic section. Infected men were removed. Feces collected from each individual in the inspected area were sent for bacteriological examination to the advanced field laboratories so as to isolate carriers. Isolation of carriers was everywhere always followed by reduction in the number of cases. Earth trenches were treated with lime. Those lined with cement were sprayed with carbolic acid or lime water or with acid sublimate, 3 to 5 parts per 1,000.

"The isolation and cure of the patients, the isolation and bacteriological examination of suspected cases, the quarantine and examination of every man belonging to an army unit in which cases of cholera have occurred, and the establishment of a protective zone to prevent the spread of the epidemic into the country at large are all parts of the prophylactic organization which has been strictly applied to all the troops operating at the eastern and northeastern front, to the workmen and also to the civil population of the districts where these troops are quartered.

"The men sent back from an infected area fall naturally under three categories: Those actually suffering from cholera, those sick from other causes or wounded, and those in a normal condition. The first are sent straight to the advanced isolation hospitals, whence, after being clinically cured and recognized as free of bacteria, they pass into convalescent hospitals. Those suffering from noncontagious diseases have to spend six days in special quarantine hospitals, while their freedom from the germ is ascertained. Finally, the men in normal health returning from the front are obliged to pass through an observation station where they are bacteriologically examined and where their clothes and every object they carry are sterilized, while the men themselves are cleaned and freed from parasites.

"The interior of Italy is protected from contagion by an advanced quarantine zone and a second wider zone stretching along the foot of the Alps as far as Milan, and from Milan skirting the Apennines along the Via Emilia to the Adriatic. No person can pass out of the quarantine zones until two separate examinations have been made, proving him to be germ free.

"The movements of the civil population in the Isonzo districts occupied by our army were subjected to the same restrictions as were applied to the troops. These measures were supplemented by a strict surveillance of the drinking water, food, and hygienic conditions of the houses, barracks, etc. The supply of drinking water has required a special organization. Owing to the scarcity of springs on the tablelands to the north of Vicenza, by the Isonzo, and on the Carso, it became necessary to organize the transport of water by lorries or by pumps and water pipes and by the building of reservoirs, etc. The troops on the Asiago tableland alone required 100,000 gallons of water per day.

"It goes without saying that cholera vaccination is universally practiced side by side with the typhoid and paratyphoid vaccination. The compulsory vaccinations in the army are performed in the following order:

"(1) Smallpox vaccination.

"(2) Anticholera vaccination. This is performed 10 days after the smallpox vaccination, and is given in two doses at five days' distance from each other. The first dose is 1 c. c., and the second 2 c. c. The reaction is generally very slight. The cholera vaccination is repeated twice a year—in the spring and in the autumn. The strength of the vaccine has been gradually increased from 1,000 million to 3,000 million germs per cubic centimeter.

"(3.) Typhoid-paratyphoid vaccination. This is made with mixed vaccine and is given in three doses at intervals of 8 to 10 days, beginning 7 days after the second anticholera vaccination. The first dose is ½ c. c., the second 1 c. c., and the third 1½ c. c. The typhoid-paratyphoid vaccination is practiced once a year, between December and March. The mixed vaccine is prepared on the basis of 800 million of typhoid bacilli and 400 million of paratyphoid bacilli per cubic centimeter.

"The prophylactic organization has never interfered with the military operations, and it has been completely successful. It has even been possible to send the whole of the troops operating in the front line on winter leave for a fortnight, without any danger to the country from contagion. Not one case of cholera has appeared in the interior of Italy.

"In 1915, in a few months' time, we had to deal with over 14,000 cases in the Army. In the following year the cases amounted to only

170, due to small outbreaks in two units, which were at once arrested. This sanitary organization has been so successful that it has gradually been extended from the Isonzo to the other territories of war, giving us complete security against any sudden outbreak of contagious disease.

"Venereal diseases in the Navy have been brought down to less than half of their former number, which was 136 cases per year per 1,000 sailors. In a few ships where the measures were applied more vigorously the infection disappeared altogether for long periods at a time."

PATHOLOGY, BACTERIOLOGY AND ANIMAL PARASITOLOGY.

HENRY, H. **Investigation of cultural reactions of anaërobes found in wounds.** Jour. Path. Bacteriol., July, 1917.

The report comprises: (1) The isolation of anaërobes in pure culture. (2) The morphology and cultural features of the more important anaërobes found in wounds. (3) The differentiation of anaërobes by means of sugar reactions. (4) The changes produced by anaërobes in the tissues. Only portions of the first two sections are considered in this abstract.

The three anaërobic organisms most frequently found in war wounds and heart blood post mortem examinations are *B. Welchii*, 52 per cent; *B. sporogenes*, 32 per cent, often confused with *B. oedematis maligni; B. tertius*, 8 per cent (*B. Fleming*).

The methods of isolating pure cultures of the organisms depend upon their cultural characteristics and spore production. The *B. Welchii* is saccharolytic, producing stormy fermentation on milk. It grows with great rapidity on alkaline meat media. When transferred twice daily for a few days and plated a pure culture can be obtained. *B. sporogenes* is proteolytic, grows very slowly and produces spores. After four or five days' growth on litmus milk it may be separated from *B. Welchii* by heating to 80 C. for 20 minutes. It survives that temperature because of its spores. Subcultures in alkaline meat media cause a foul odor and the production of a black pigment. Direct plating from exudate of wounds on agar will at times permit separation of *B. Welchii* and *B. sporogenes*. *B. tertius* is saccharolytic, but grows more slowly than *B. Welchii*. It forms spores. It may be obtained in pure cultures by growing on milk for five days, heating at 80 C. for 20 minutes, planting on alkaline meat media for two days, and then planting on agar for two days; repeating the planting on alkaline meat media and on agar plates until pure cultures are obtained. If after two days fermentation begins on meat media it points to the presence of *B. tertius*. All the culturing was done anaërobically.

The formula for alkaline meat media is as follows: To 8 ounces of bullock's heart freed from fat and finely minced add the same amount of tap water and cook slowly. Add normal caustic-soda solution until the mixture is alkaline to litmus. Tube out the mixture, cover with paraffin and autoclave.

[G. F. C.]

EYE, EAR, NOSE, AND THROAT.

KEIPER, G. F. Pretended blindness and deafness and their detection. Jour. Indiana Med. Assn., Vol. X, No. 11.

While the following tests are considered from the Army standpoint, they are of sufficient importance to be given in their entirety.

THE EXAMINATION OF THE EYES.

The conscript is seated 20 feet from the Snellen test card. One eye is covered with a card—not the hand. He is asked to read the letters from the top of the card down as far as he can, and the result obtained is recorded on the blank in the form of a fraction. The numerator is always 20, the distance in feet from the test card to the one under examination. The denominator is determined by the size of the last letter read—i, e., 20/30, 20/40, or 20/50, as the case may be. While 90 per cent respond readily, it is interesting to note the hesitancy of the malingerer, and how easy it is to make him see letters in the line below the last one that he says he can read plainly. I use a chart which at the side has the lines numbered with figures of the size of the 50-foot line. He may begin to read 200-foot line and repeat the figure or ask if he shall repeat the figures. That already determines that his vision is 20/50ths. He may stop at the 50-foot line, but urging him on because he saw the other figures so well, we persuade him to read the next line, which, as it were, pushes him into the service unconsciously, or, if he discovers his fatal error, it is too late; or the same result may be obtained by the shifting of weak lenses before the eye. Usually they do not discover the error committed. Then the other eye is similarly tested.

If in spite of these ruses the vision remains reduced below the above standards, we must test each eye at 10 feet first and then at 40 feet. If the conscript has a real defect the fractions obtained will be constant; if a malingerer, the fractions will not be constant, as a rule.

By using the illiterate test type with a mirror so placed that when he is turned around to read the test type in the mirror instead of direct, as he did, the apparent distance is trebled, we have another way of detection of which the examinee is unaware. Moreover, if the vision is below standard, we must examine the conjunctiva for trachoma, the lids for ptosis, blepharitis, ectropion, and entropion;

the lacrimal apparatus for epiphora; the eyeballs for exophthalmos, strabismus, nystagmus, and asthenopia.

Artificially produced conjunctivitis is to be looked for, for abroad we read of ipecac powder put into the conjunctival sac to produce conjunctivitis. In this country similar effects have been produced by silver nitrate, copper sulphate, and pepper. Atropia has been used as mentioned previously. Oblique focal illumination will reveal the condition of the cornea. The ophthalmoscope also must be used to determine if organic lesions exist in the fundi.

Suppose the conscript feigns total blindness in one eye. We have two valuable objective tests—the position of the visual axes and the pupillary reaction. If one eye turns outward and upward, it is pretty good evidence that the eye is amblyopic, and vice versa. The pupillary reaction depends on the fact that in the dark the pupil dilates, while in the bright light it contracts. The reflex arc is the optic nerve for the afferent nerve, and the third nerve for the efferent nerve. The examinee is placed before a well-lighted window and the examiner covers both eyes with his hands, cautioning the examinee to look into the distance, and after a few seconds removes them to observe the pupillary reaction. If the pupils promptly contract there is sight present. Then the alleged blind eye is uncovered while the good eye is covered. If the pupil promptly contracts there is sight, and the more prompt the reaction the better the vision. Of course, there will be no reaction if synechiæ are present. The same is true of paralytic mydriasis.

The consensual reaction is also to be noted—i. e., the behavior of the other pupil when one only is uncovered, the other remaining covered, for with vision in one eye uncovered reacting to the light there should be a similar reaction in the uncovered eye. In every instance avoid touching the patient's face.

The ability of the patient to converge is also to be noted, as well as his power of accommodation. The behavior of the eye under a prism of 6° placed base out is interesting; to secure binocular vision the eye will turn in, and vice versa.

There are a large number of subjective tests used to detect malingering, and it behooves the examiner to be acquainted with all of them in order not to run the same test for all, as shrewd malingerers are liable to trade information and thus enable subsequent ones to malinger successfully, or to make them the harder to detect. In all these tests the examiner must sit directly in front of the examinee or on the side of the alleged blind eye, and keep the gaze on it at all times, for the malingerer may attempt to close the alleged blind eye and thus defeat the test for malingering. On several occasions I detected that trick and used the incident to browbeat the examinee into confession of trickery and to secure eyesight in an eye claimed to be blind.

The principal tests are as follows:

Duane's test: Place on a white piece of paper some letters alternatively in red and black. Place over the good eye a piece of red glass and ask the examinee to read. If he reads all, he sees with the alleged blind eye. For if he were really blind in the other eye, he would read only the black letters.

Snellen's test: In a frame is placed alternately red and green glass of such density that when one piece of it is placed over the other no light is transmitted. On these pieces are blocked off the well-known Snellen letters for distance vision and as on the test card. Before the examinee's eyes is put a pair of specs, in one cell of which is a piece of red glass and in the other a piece of green glass, and he is asked to read the letters from left to right. If he reads all, he is not blind at all. His acuity of vision is also determined. This frame must be exposed only in testing the vision. If he is really blind in one eye, he will see only the letters of one color.

Cuignet's test: Cause the examinee to read aloud some matter as in a newspaper, and while thus engaged place a lead pencil between the paper and the examinee, holding the pencil vertically. If he reads unhesitatingly he is not blind in one eye. If he has a blind eye, he will have trouble reading consecutively. A modification of this test is the Javal-Cuignet shoebox test.

Cuignet's test with a lighted candle: Hold a lighted candle in front of the examinee's good eye and slowly move it across the face in front of the alleged blind eye. If he says he still sees it he lies, for the nose would prevent him seeing it, provided the alleged blind eye were really so.

Graefe-Baudry test: Take precaution that you are concerned with the good eye only, slyly covering the alleged blind eye with your hand. Place over the good eye a prism of 18 prism diopters, base up, in such a position that monocular diplopia is produced, and which the examinee acknowledges. Now slowly slide the base up until it has crossed the pupil, in the meantime uncovering the alleged blind eye. If the examinee says he sees two lights ahead, he lies as to the condition of his alleged blind eye.

Duane's test for close vision: Have the examinee read out aloud fairly rapidly, and when thus engaged slip a prism of four prism diopters base up before the alleged blind eye. If he reads with confusion and hesitates, he sees with the alleged blind eye.

Rendering the examinee artificially myopic: Place before the good eye a six diopter lens. Print can only be read with that eye at 17 centimeters. At this distance hold some test type and ask him to read; while doing so, slowly withdraw the printed matter. If he still reads, he reads with the alleged blind eye. Harlan's test is but a modification of this, for he uses a 20 diopter lens, convex or concave, before the good eye.

Jackson's test: Place before the good eye two strong cylindrical lenses, one convex and the other concave, so that they neutralize each other. Have the examinee read, and while thus engaged turn the cylinders so that they are crossed. If he still reads, he reads with the alleged blind eye.

Todd's test: Place before the good eye a black disk with a pin-hole in the center. The examinee is asked to read aloud the test letters of Snellen across the room. While reading thus, the examiner gradually tilts the head upward until the line of vision is thrown below the hole in the disk, and the letters are no longer visible with that eye. If he still reads the letters, he reads with the alleged blind eye.

Todd's test with the Worth amblyoscope: The amblyoscope is set so that the objects placed in the distal ends of the tubes appear crossed, as the bird and cage. It is then locked in this position and carelessly laid on the table of the examiner. The instrument is placed before the eyes of the examinee and he is asked what he sees. Suppose the right eye is the alleged blind eye, and with the left eye he sees the cage that is in the right tube—he lies and the truth is not in him.

The 6 or 8 diopter cylinder: Make some vertical lines on a piece of paper; place before the good eye a 6-diopter cylinder axis vertical, and hold the lines 3 feet from the examinee's eyes and ask him to count the lines. If he succeeds, he sees with the alleged blind eye.

The double prism: Place before the good eye a double prism, horizontally. If he says that he sees three lights ahead while looking at a candle, he sees with the alleged blind eye. If he says he can not see the two lights, he lies.

Fridenburg's test: The principle of the apparatus is to reflect into a mirror into which the examinee looks, test type of the illiterate, these being placed on each side of the patient's face in the frame's racks. The mirror is placed before one eye, and, being pivoted, can be revolved or tilted so that he can not tell which eye is being tested. The mirror can then be swung before the other eye.

Hartman's diaphragm test: While this instrument was not invented for this purpose, it is valuable, nevertheless, for the detection of malingering. It is the reverse of the bar-reading test. Instead of of the bar, the examinee negotiates a screen in which there is a hole. Through this he looks at the test card naturally, not suspecting the test of vision to which he is being subjected. If he is able to read all the letters, he sees with both eyes.

Priestly Smith and Edward Jackson test: Place before the alleged blind eye a 6° prism, base out, while the examinee is fixing his vision on a light ahead. To secure binocular vision the eye will turn in if it is a seeing eye. It will turn out again when the prism is removed.

Jackson's test: Place before the good eye a prism of six prism diopters, base out. The eye will move in and the blind eye will move in the same direction and to the same extent. If binocular vision exists, the other eye will not move at all.

Berthold's test: Take a prism of 20 prism diopters and hold it before the alleged blind eye while the examinee is reading aloud small printed matter. If good vision exists in the eye, it will be very difficult to do this.

Nettleship's test: Place in the good eye of the examinee a drop of 1 per cent solution of atropia sulphate and bandage the eyes for one hour, after which place in his hands some small printed matter and, removing the bandage, ask him to read. If he succeeds, he reads with the alleged blind eye.

PRETENDED TOTAL BLINDNESS.

Schmidt-Rimpler test: Ask the examinee to put his hand before his face and to look at it. The really blind, knowing its position in space, readily does it and without hesitation. The malingerer will hesitate and look in a different direction for it.

Van Welz's test: In a darkened room place a candle in front of the examinee in such a way that he will naturally look in its direction. Place a prism, base out, before one eye. If vision exists, the eye will turn in, and vice versa.

The examiner may go to one side of the room, interposing a barrier as he goes. Then ask the examinee to approach him. If he avoids the barrier, he sees it. Care must be taken to avoid accidents with the really blind.

In a hospital, under close scrutiny, bandage both eyes. If he sees, he will reveal his true state very soon, as it is very irksome to be blindfolded very long thus.

The reaction of the pupils is to be observed as before noted. It may give us a clue to the quantity of vision present.

The really totally blind have a peculiar gate, the expressionless face, the upturned eyes.

THE EAR TESTS.

It is expected that the ordinary conversational voice will be used in making these tests that determine a recruit's fitness for service. It ought to be heard at a distance of 20 feet. The record is in the form of a fraction. Its denominator is always 20. The numerator is the distance at which the voice is heard. One ear at a time is tested, the other being tightly closed by pressing the tragus into the external auditory canal with the index finger. The examinee stands with the open ear toward the surgeon. He is commanded to close his eyes. The test is begun a short distance from him and he is asked to repeat whatever is said to him. We usually use numbers. He may hear

perfectly up to, say, 12 feet and refuse to hear anything more. Now step quietly back to the full 20 feet and ask in a low voice, "Can you hear me now?" Very many respond: "No, I can not hear you, Doctor." Of course we say to the clerk: "Mark him normal," for he has malingered.

At one place in our State the examiner lined up a number and stepping the full 20 feet asked all who could not hear him to step out of line. Four did so, exposing themselves to the charge of malingering. In an adjoining county the examiner was much perplexed by one attempting to deceive him and happened to remember that he owed the examinee a $5 bill. Stepping back the full 20 feet, said in a voice just above a whisper, "Come around to-night and I will give you that five I have owed you for some time." To his uttermost surprise, he responded: "All right, I'll be there." Such devices while not strictly scientific are otherwise to be commended because they save a lot of valuable time.

The tests usually used are as follows:

The Weber test: If a tuning fork in vibration is placed on the vertex of the examinee it will be heard best in the deaf ear. The malingerer will claim that he hears it best in the good ear. Now stop the good ear with the finger and he will say that he does not hear it at all. Of course he lies, for he should now hear it best in the otherwise good ear.

Kerrison test: In a patient who claimed to be deaf in one ear by injury the drumhead appeared normal. He assumed a degree of deafness which could only have come from injury to the labyrinth. The caloric test was applied to the alleged deaf ear and the result was positive. The response was quick and normal in every respect, and in the confusion ensuing on the vertigo it was very evident that the unilateral deafness was assumed.

The noise apparatus of Bárány: This is one of the best of the recent tests. It is applied as follows: The examinee is asked to read aloud. While thus engaged the noise apparatus is placed in the good ear and the noise started. If the examinee is really deaf, he will raise his voice and sometimes these subjects will fairly shout in order to hear themselves read. If the voice is not raised there is no deafness in the alleged deaf ear.

The confusion test: Take two rubber tubes and on one end of each place a funnel; the free ends are inserted into each ear, one in each; have two persons read aloud one into each funnel, but read dissimilarly, and ask the examinee to repeat what he hears. If hearing exists in both ears this is very difficult.

Chimani's observations: He recommends repeated tests with the acoumeter and metronome. If slight differences exist in the different examinations, the person is probably telling the truth. Wide variations indicate malingering.

Erhard's test: This is based on the fact that the normal ear even when tightly closed will hear the tick of a loud watch. The alleged deaf ear is closed. The loud ticking watch is approached to a distance of 3 meters. The examinee counts the ticks. The normal ear is now closed and the deaf ear is examined at a meter distance. If he says he can not hear the watch he is malingering.

Wagner's test: This is the most recent test, and comes from Chicago. The sound of a tuning fork is received in a funnel from which runs a tube to a bifurcation and from the latter run two tubes on the ends of which are funnels meant to cover the ears of the examinee. The total length of the apparatus is 6 to 7 feet. To conduct the test, both ears are covered with the funnels and the examiner and his assistant stand behind the examinee; each have in their hands tuning forks of the same pitch (C2). Both are sounded at the same time and one is placed on his vertex, while the other is placed in the funnel. Sound is thus transmitted both by air and bone conduction. Repeat two or three times. Then the examiner places his tuning fork, which is now still on the vertex of the examinee, while at the same time the assistant places the sounding tuning fork within the funnel. The tube leading to the good ear is pinched shut and if the examinee says he hears the tuning fork still he is a liar.

With these tests the surgeon will be able to easily detect the malingerer in the very large majority of cases. There are a few who will for a time baffle the surgeon. They will require frequent observations before the truth is arrived at, but it will ultimately come to light.

(G. B. T.)

FRASER, J. S., and FRASER, J. **The morbid anatomy of war injuries of the ear.** Jour. Laryngol., Rhinol., and Otol., Vol. XXXII, No. 11.

Ear injuries in war are classified according to the morbid anatomy as:

(1) Direct injuries, due to bullets or high explosives; (2) indirect injuries, due to blows or falls on the head, and may be either with fracture of the labyrinth capsule, or without; (3) noise deafness, due to prolonged or intense gunfire; (4) "shell" or "explosion" deafness (labyrinth concussion).

1. In direct injuries, fracture of mastoid, involvement of middle and inner ears, and in fatal cases extreme comminution may be present. Radiographs are of use in estimating extent of injury.

2. Indirect injuries, due to fracture of base of the skull, same as in civil life.

3. Noise deafness. It has been shown that air conduction of sound is of paramount importance in the production of noise deafness. Tissue and bone conduction are of little importance. The hair cells of Corti's organ are first affected, later the supporting cells and,

secondarily, the ganglion cells and nerve fibers; the part of Corti's organ affected depends upon the pitch of the sound—high pitch affecting the neuroepithelium at the base of the cochlea; medium pitch, Corti's organ in the middle coil; low pitch, Corti's organ nearer the apex (confirming Helmholtz's theory).

4. In "shell" or "explosion" deafness, there is a blow from the condensation of air, so that in many cases there is an injury of the drum membrane accompanied by hemorrhages.

With rupture of the drum, it is stated, there is less likelihood of damage to the labyrinth.

Hemorrhages may occur in the peri or endo lymphatic spaces of the inner ear, although it would appear that these structures are well protected. There may occur hemorrhages in the internal auditory meatus.

In addition to the above-mentioned lesions, theories have been advanced, first, that the explosion and loud noises may destroy the delicate nerve endings in the cochlea, and cause paralysis.

This may occur somewhat the same way as the "eclipse" blindness. Another theory places the seat of the damage in the brain, multiple small hemorrhages, in the pons, medulla, and cerrebellum; involving the central connections of the auditory and vestibular nerves.

Milligan and Westmacott have suggested that shell deafness is due to a temporary interference with the neuron connections in the higher brain centers, and not to an organic lesion.

Several cases with pathological findings were reported, illustrating salient points.

(G. B. T.)

BRYANT, W. S. **Prevalence of ear injuries and diseases in the French Army.** Jour Laryngol. Rhinol. and Otol., Vol. XXXII, No. 11.

The ear patients in the author's service amounted to about the same number as the eye patients in his service, and in the Zone des Armeés at the front ran 16 per cent of ear patients, while from the evacuation hospitals 4½ per cent of ear cases are evacuated to the rear. In the (Zone des Étapes) ear cases were 6¼ of the total sick, and in the interior region 9 per cent were ear cases, and of these the author estimated 80 per cent will show considerable impairment of function.

Injuries and their complications are classed thus:

1. Rupture of tympanic membrane.
2. Complications of ruptured tympana.

(*a*) Suppuration of middle ears, acute and chronic.

(*b*) Mastoiditis, mastoid abscess and its complications.

3. Commotion of the eighth cranial nerve apparatus (cochlear branches always suffer; the vestibular less frequently).

(*a*) Sudden onset.

(*b*) Gradual onset.

Susceptibility to damage is increased by nasal and tubal obstruction, presence of existing ear disease, or disturbances of nutrition.

Treatment of a ruptured membrani tympana consists in dry, aseptic treatment, removal of moisture by wiping, insufflation of sterile boric acid powder, and plugging of the meatus with sterile absorbent cotton.

The author believes the actual total of ear cases to be twice the statistical figures.

(G. B.

STEINBUGLER, W. C. **Dental infection in eye diseases.** Arch. Ophth., Vol. XLVII, No. 2.

The exciting organism of ocular infections, due to oral sepsis, may be any one of a number of bacteria, but the streptococci, especially the viridans, staphylococci, and pneumococci, are probably most frequently involved. The selective tissues of the mouth organisms have been the joints, endocardium, and the eye. The exact method of eye infection from a dental focus is yet undetermined; it may be through channels in the bone, subperiosteal tissue, or lymphatics. A direct extension through the venous channels from the diseased area to the cavernous sinus is anatomically possible. No definite clinical picture can be described, but the iris, ciliary body, and choroid are most frequently involved.

A very thorough investigation along these lines has been carried out by the dental department of the Herman Knapp Memorial Hospital, where in all 53 cases were examined. The routine examination where the infections were excluded was to have the teeth X-rayed, the streptococcus complement fixation test being performed on the blood. The teeth were treated and, if necessary, extracted. A vaccine was prepared from the culture obtained at the time of extraction.

In summarizing the result of investigation the following conclusions were reached:

(1) Dental infection does nor present a definite clinical entity, although most frequently seen as a low-grade chronic infection of the iris, choroid, and ciliary body.

(2) Dental infection is more frequent than has been believed and must be carefully sought for by means of the X-ray.

(3) The infection is carried to the eye, in all probability, through the lymphatics and osseous channels.

(4) The streptococcus viridans is the organism most frequently found in cultures from the tooth sockets, and it is the chief bacteriological factor. Other organisms to be considered are the staphylococcus, pneumococcus, and bacillus pyocyaneus.

(5) The streptococcus fixation tests have not given satisfactory results, and vaccine treatment has been disappointing. The factors most concerned in the cure and improvement of these cases were the extraction of the offending teeth.

(G. B. T.)

MILITARY, LEGAL AND INDUSTRIAL.

ANDERSON, H. G. **Selection of candidates for the air service.** Lancet, London, Vol. 1, No. 11.

In a very careful and thorough review of the present status of aviation, in the discussion of the special-sense examination the author believes that the aviator should have unaided normal vision in each eye separately, and normal color perception. In his experience, which includes much actual flying, the vision had more to do with determination of position in space than any other sense. Those with defective vision are at a great *disadvantage* in an aerial flight on making landing. The presence of heterophoria, or latent squint, has also been found a cause for making bad landings. Concealed hypermetropia should cause rejection if sufficient to enable a candidate to read 6/9 each eye, with a plus 2 lens. *The importance of perfect color perception is very great.* Its use comes in picking out the color or markings of hostile machines, in recognizing signal lights, and in judging the nature of landing grounds. Night blindness is important in selecting pilots for night bombing. Night blindness is tested by reading ordinary test cards under increased or decreased illumination.

Under the aural examination is included examination of the nose, throat and ear, and also of the teeth and gums, since most aviators fly with the mouth slightly open, and any minor degree of oral sepsis is aggravated by the rush of cold air. Septic tonsils should be enucleated. The nose should be examined to estimate the amount of clear air-way. The Italians lay stress on this examination, and even take tracings of the degree of nasal stenosis. Cases with adenoids, nasal polypi, or infected sinuses are rejected temporarily.

Hearing must be normal, and each ear is tested separately by whisper at a distance of 20 feet. Use is made of the terms employed in aviation, such as "contact" and "switch off." Defective hearing in the pilot or air mechanic may lead to serious injury or even death to the latter in starting the engine. In this the mechanic swings the propeller, and should the aviator through defective hearing fail to catch the words "contact" or "switch off," the propeller may back fire and cause serious injury to the mechanic. Chronic suppurative middle-ear disease is cause for rejection. Cases showing perforation of the drum, or scars, should be rejected. They would probably suffer from pain in the ears, induced by the constant noise and from pressure effects in changing height rapidly.

EQUILIBRIUM AND MUSCLE SENSE.

It has been found in a fog that it is almost impossible to detect any deviations of position during a flight. Aviators have come out of dark clouds or fogs and found themselves flying one wing down, or even upside down, without knowing it. Therefore most of the impressions which control balance in flying come from the eyes. To investigate this the author, his sense of balance and vestibular reactions being found normal, carried out the following experiment: Blindfolded and with ears plugged, he sat in the stern seat of an aeroplane in telephonic communication with the pilot in front. The author attempted to describe the evolutions carried out and his position in space during the flight. At first he was able to do this fairly accurately, but after a time was completely confused and thought the machine was flying up and up continuously, while in reality it was spiraling down to the left. Nevertheless, he advises a thorough investigation into the candidate's equilibrium, muscle sense, and vestibular reaction. In addition to those tests, the psychomotive reactions should be thoroughly gone into, and the aviator should possess a normal reaction time with regard to vision, hearing, and touch.

(G. B. T.)

STONE, ESTHER H. **Plea for early commitment to correctional institutions of delinquent children, etc.** Institution Quarterly, Springfield, Ill., March, 1918.

In a very interesting paper read before the Illinois State Hospitals Medical Association the author reviews the present status of public opinion relative to the punishment of habitual offenders and refers to the mental attitude which furnishes criticism but no practical remedy for the difficulties connected with the proper handling of juvenile delinquents. Reviewing the admissions and readmissions for two years ending March, 1916, at the Illinois State Training School for Girls, Geneva, Ill., the writer paints the relationship between criminal inclination and mental deficiency and shows how inadequate are all repressive or educational measures unless adopted so early in life that the criminal inclination has not become confirmed and ingrained habit. The lack of response to precept or example, the superficiality of character, the incapacity for sustained effort or earnest purpose found in girls of an average age of 16 in this institution is proved by the definite cases cited.

In conclusion, Dr. Stone says:

Social workers and courts become active when it is much too late.

Boards of education and public-school systems must provide, as a part of the regular staff, for a trained psychologist, to operate in every school, and to be in constant touch with the pupils and the teachers from the lowest grade up. Immediately after it is noticed that a child appears to be backward in his work, or evinces any mental peculiarity, or is criminally or immorally inclined, the psychologist should be consulted, and a thorough study made of the case.

It is possible to determine whether or not the child is likely to outgrow its handicap, or whether that handicap will develop into something more serious. If the latter is the case, the child must be at once transferred to a special school for its training. This should not be the result of court action, nor should the consent of the parents be necessary; it should be a very simple process of passing from one grade to another. It should be understood and accepted as the natural course of procedure, without attaching to it any unusual publicity.

The school for the psycopath should be a permanent home or boarding school, under municipal supervision. There, amongst his own kind, and away from others whom he might influence to evil, he should be studied constantly; as much education as it is possible for him to retain should be furnished him, but primarily he should be taught some useful work for which he is best suited, and by which he is likely to become self-supporting. With this class book learning is secondary; ability to financially care for himself is most important.

Provision should be made to retain the person until he is at least 25 years old, at which time it is possible to decide with considerable accuracy whether or not he is a fit subject to mingle, unsupervised, with the rest of society. If he is, he should be permitted to leave the care of the State; if not, he should be sent to a community of his kind, where his special working ability is required. There should be segregation of the sexes in both the school and colony, and by no means should marriage or sexual relations be permitted.

The only solution to the problem is to cull out the defective from the rest of society at a very early age, remove him from the normal child, prohibit procreation by segregation, and give him the special training that he requires. In this way will defectives eventually be eliminated, to a great extent, from the general population.

Hutt, C. W. **The future of the disabled soldier.** William Wood & Co., New York, 1917.

From the beginning of war to December 31, 1916, there were discharged from the army and navy of Great Britain 270,275 men, owing to disability, by which some are permanently and completely incapacitated for work and others able to work without assistance. The naval and military authorities are responsible up to the time the men are discharged as unfit because it is realized that they will be of no more use in the service. It has been suggested that the State should do something for (1) those requiring prolonged aftertreatment in order to become fit to earn a wage; (2) those disabled by tuberculosis; (3) those affected mentally; (4) the totally blind; (5) the deaf; (6) the paralyzed; (7) those who have suffered loss of limbs.

History.—Hans Knudsen in 1872 founded an institution in Copenhagen to care for and train cripples. In a period of 25 years 255 children and 175 adults were trained there, and 5,800 were cared for and given surgical appliances. In Petrograd in 1897 a workshop was organized for the orthopedic department of the Maximilian Hospital, partly to provide artificial limbs more cheaply, and partly to give a trade to cripples. During a course of 12 years 703 cripples were taught in the shop and 174 were taught to earn as good wages as the regular makers of artificial limbs. In France in 1899 the departmental shops of the Seine were founded by Mr. Marsoulan to deal

with crippled or invalid workmen. Many of these men are past the capacity for work and can not earn an independent livelihood. Their pay is in excess of their real earning capacity. The institution of the Frères de St. Jean de Dieu of Paris discharges each year 40 young men of 20 years of age perfectly able to earn their own living at bookbinding, tailoring, and bootmaking. However, their training covers years. They are taken in for rather trifling defects (less than the loss of a limb), to which, of course, they have been accommodating themselves since infancy. In 1908 at Charleroi a school shop was founded in connection with the large provincial technical school to train and employ cripples, more particularly men injured by accidents in factories. Classes were provided for clerical work, including typewriting, shorthand and designing, tailoring, harness work and saddlery, bootmaking and bookbinding. A pupil of this institution who had lost both hands was trained to make brushes almost as well as a workman with both hands. "The stump of his right forearm was fitted with a laced leather bucket, stiffened with a metal framework; to the stump was fixed the head of a hammer, the forearm acting as the handle. With a magnet, the man picked up a nail, held it in the proper position and them knocked it in with the hammer; all this was done quickly, easily, and in a natural manner."

Similar establishments were subsequently opened at Tournai and Brussels. Hence the Belgian Government had experimental knowledge of the problem of handling disabled men, and made suitable provision for them within a few months of the beginning of the war in a large school at Rouen. In December, 1914, a home for discharged soldiers was instituted at Havre. This has gradually become a school for vocational reeducation. Later, in December, an Anglo-Belgian hospital was opened for 50 convalescents in two military barracks, which has grown to 250 beds, with dependent establishments accommodating 700 more men. The above provision having become inadequate, the Belgian Military Institute of Professional Reeducation was founded near Vernon in August, 1915. This institution is not only self-supporting but has long since paid back to the Belgian Government the entire capital cost of installation. "The land provided was part of a forest; a sawmill was erected, the trees scientifically thinned out, the timber not used for building the huts was sold. The smaller wood was made into pickets and stakes for the use of the Belgian Army. The cost of the buildings 450,000 francs (£18,000) was repaid out of the profits on the lumber; the cost of the equipment and plant for workshops (£12,000) has been repaid out of the profits of the different workshops, which have sold their output at a cheap rate to the Belgian War Office thus affecting a double economy to the Government. A large farm forms part of the

establishment; on it horses wounded in the war are cared for and made useful again.

"There is at present accommodation for 800 patients; in addition, attached to the institute is a staff of 350 quasi-civilians unfit for military duty on account of age or on medical grounds; they serve as teachers, overseers, manual instructors, or as workmen.

"The fact that the entire population of Belgium is mobilized for military duty enables Capt. Haccour, the director of the technical work, to requisition the services of the very best craftsmen in the different trades for the teaching staff, who receive the ordinary pay of a soldier.

"The cost per day to the Belgian Government for each man is just over 2 francs; the feeding and clothing cost 1 franc, 54 centimes; the daily pay is 43 centimes; the cost of lighting and heating is 8 centimes per man per day.

"Forty-three different trades are taught, including almost every imaginable occupation. The workshops provide for instruction in bookkeeping, shorthand, typewriting, telegraphy, molding in clay, wood carving, drawing and designing of all descriptions, wall paper designing and painting, the manufacture of motor vehicles, and electrical machinery of all descriptions, tinsmithing and plumbing, tailoring, bootmaking, basketmaking, poultry farming, and rabbit farming, to which fur curing, dyeing, and trimming are added.

"The institute makes all the tools used by the workmen, besides a large number for the Army. All the printing and photographic work required is done on the premises, in addition to much work for the Government. The men are paid, in addition to their Army pay, from 5 to 20 centimes an hour, according to the work they do; the surplus profits are now being funded for the benefit of the men.

"The underlying principle of the whole establishment is constant work; no man is permitted to be idle. In part of the buildings is a small hospital for men who become ill or are temporarily suffering from their old wounds. Unless these men are absolutely helpless they are required to do some sort of work in bed, the hospital orderlies being efficient instructors of such work as net making or light basket-work.

"Men are only sent from the hospital at Rouen to Vernon when they are considered to have completed their actual hospital treatment. On arrival at Vernon the man is received by the officer in command and goes before a medical board, who determine the need for any further medical treatment.

"Port Villez affords opportunities for treatment similar to those of L'Hôpital Anglo-Belge, at Rouen. They make a certain number of orthopedic appliances, especially surgical boots. The men who have not yet finished their functional reeducation go through a course

of medical gymnastics; these are followed by school gymnastics, including athletics, throwing the disk and javelin, jeu de balle, jeu de paume, fencing, sword exercises, boxing, running and jumping, the underlying motive of the athletics being to reeducate the sound limbs and make them as effective as possible. The men are put through a graduated course in the use of their artificial legs. Successful efforts have been made to reeducate the hands and fingers of men who have been trephined. The injured limb can only be exercised by medical treatment for a very small part of the day, an hour at most; the manual work of the workshops fortunately provides an excellent means of continuing the movement of the disabled parts for several hours during the day.

"After the medical board, the head teacher sees the man to make arrangements for his general and theoretical instruction. To help him form an idea of the sort of work he would like to take up, he is taken round the workshops to see the different kinds of work and is given an opportunity of talking to the men and the instructors.

"Finally the man appears before a board presided over by the medical director, and comprising the head teacher, the technical director, and the doctor in charge of the *laboratoire de recherche sur le travail professionnel* to determine the occupation most suitable for him.

"The choice of an occupation is too difficult to leave entirely to the disabled man; he requires help to make a suitable choice. It is a momentous decision not to be lightly come to; on it depends in a considerable degree the man's happiness for the rest of his life. The medical examination card is carefully studied, the man is questioned, the extent of his general education ascertained, the degree of his intelligence gauged, special account is taken of his previous trade and social status. When advising the man the following are used as guiding principles:

"(1) He is advised to keep to his former trade if he earned a good enough wage and was satisfied with the work.

"(2) If the man must change his work, he is advised to take up work akin to his former work, unless prevented by his injury. A plumber, for instance, would be advised to take up tinsmithing.

"(3) If a man's output in a trade would be very considerably diminished by his injury, if he is sufficiently intelligent, he is selected for training in official, commercial, or teaching work, and is sent to the institution at Mortain *pour les blessés intellectuels*."

In 1914 the school at Charleroi was reproduced at Lyons. Later a professional school for the wounded was opened at Tourvielle. Here all the ordinary trades are taught, and, in addition, gardening, fruit growing, the raising of poultry, etc. Men for these institutions are selected from those having severe or incurable wounds inflicted during

action or on "any commanded duty," or suffering from severe and incurable infirmity due to military service. Rigid medical examinations are required for entrance, as the authorities do not desire the period of training to be interrupted by necessity for hospital treatment. A rigid investigation is made of the men's histories and characters and they are rejected unless they give promise of repaying the training. The majority of the men here—145 out of 200 pupils—had suffered the amputation of a limb. Money earned by the sale of articles is divided among the men who have reached the productive stage. Two-thirds of the proceeds go to the men who have been longest in the school, and only one-third to the newcomers, who are naturally less skillful. This system tends to reduce loafing in the shops, because the larger the output the greater the returns thus to be divided among all hands.

In April, 1915, a commission was formed, representing the ministries of war, marine, public instruction, commerce, agriculture, and the interior, which founded two schools for the reeducation of disabled soldiers—one at Paris, the other at Bordeaux, the former established in the Vacassy Institute under Dr. Bourrillon. From May, 1915, to December, 1916, 756 men were admitted for training at Vacassy. Of these, 591 completed their training, 315 secured places of employment, 36 returned to their relations, 32 left and can not be traced, and 208 were still undergoing training. Of the 165 who failed to complete their training, 12 were transferred to other centers, 16 returned to hospital, 99 left of their own accord within a month of admission, and 36 were dismissed for breaches of discipline.

Schools were founded at Montpellier and Bourges, subsidized by the territorial department. The former is one of the largest in France. It started in July, 1915, with 7 pupils, and by November, 1916, had received more than 450 disabled men, of whom 100 have left, after a complete course of reeducation, and are now earning a living by the exercise of a different trade from that which they pursued before the war. One of the features of this school is the perfecting of artificial limbs and appliances that will enable men who have lost limbs by amputation to undertake manual labor and thus prevent the congestion of occupations of the clerical type. Fifteen or sixteen different trades are taught here, and all the pupils receive a course of general instruction. Work begins at 7.30 a. m. and lasts till 5 p. m., with a break of two hours at noon. There are night classes in drawing for carpenters, mechanics, etc., and classes in anatomy and drawing for men making artificial appliances, etc. Reeducation of the left hand is a feature of this school. For three years this has been taught by Mr. Tamenne, a Belgian refugee who, having lost his right forearm when 16 years old, has taught himself to shave, to peel fruit, roll a cigarette, button a collar, tie a neck-

tie with his left hand, get on a bicycle, as well as a man with two hands can do. In addition, he has learned and is able to teach shorthand and typewriting with the left hand only.

One of the most important tasks of the authorities at the professional schools is to select the trades to be taught. Every effort is made to teach things that are really worth while, as, for example, the production of articles which bring a higher price when handmade. The competition of women after the war must be taken into account, and so the work must be as heavy as is compatible with the man's physical condition. While light sedentary work of clerical type can be taught to a large number of men in a short time, one teacher sufficing for many pupils, and there is no difficulty in finding candidates for the course, there is serious objection to encouraging this line of reeducation, as there will undoubtedly be great competition in this field by women widowed by the war or otherwise compelled to earn their own living. It is interesting to note with what foresight men from a locality having some special work have been incited to take this up. Thus in the Department of Ain, the making of combs and fancy articles in wood is a specialty, while in the vicinity of Lyons and in the vicinity of Bordeaux a special type of shoe or clog is worn, and so there is a demand for the production of these articles, while, naturally, in the vicinity of Thiers men having ability in the manufacture of cutlery will be able to find work.

Bootmaking, tailoring and tinsmithing have special value because they can be practiced successfully away from the large cities, and thus lessen the tendency of the rural population to flock thither Every effort is being made to encourage men to return to the land. The French Government is considering a plan by which soldiers may commute a part of their pension to agricultural holdings, but on account of reduction of winter work these men should all have some alternative indoor work.

The most difficult task is the training of men who have lost an upper extremity. They should be in workshops together for mutual encouragement and example and to permit an exact estimate and classification of their output.

From experience in training 700 men, Dr. Bourrillon estimates that the following length of courses is adequate:

	Months.
For clerical work	3
For draughtsmen (architectural and mechanical)	10–12
For leather worker	8
For bootmaker (for repair work)	6
For mechanic (to drive and repair agricultural motor tractors)	6
For tailor	8
For tinsmith:	
For an ordinary workshop	4
To work without supervision on his own account	8

Most professional schools give longer courses of training. At Montpellier, for instance, the courses are:

	Months.
Bootmakers	12–15
Tailors	12–15
Carpenters	15–18
Wood turners	8–12
Mechanics	15–18
Harness work and saddlery	11–15
Orthopedic work	15–11
Draughtsmen	8–12
Clerical work	8

At agricultural schools three months is deemed sufficient to learn basket making, fish rearing and milk testing, while six months are required for harness work, beekeeping, cow keeping. Twelve months are needed to train the agricultural machinist, the vine grower, horticulturist and cheese maker.

The best instructors are persons with physical defects similar to those of their pupils, but they require special instruction in the best methods of teaching. This point is emphasized at the school at Bordeaux.

The average daily cost of instruction, board, and lodging per man at a French provincial school is 5 francs. Funds are obtained from private sources, but in the main from a State grant of 3.50 francs per day per man.

The professional schools are far superior to ordinary workshops because there is less tendency to discouragement and less chagrin over initial failures; because there is a superior form of instruction, regular habits are inculcated, and a valuable rivalry springs up between the pupils. On the other hand, it must be admitted that with the present general lack of skilled labor and the demand even for unskilled men in the shops, that work in the latter almost insures the pupil's finding permanent employment there when he acquires a reasonable proficiency. On this account the local society at Orleans has arranged for all instruction to take place in the shops of private firms. At Agen a center for reeducation founded with the support of the local manufacturers all available resources are drawn upon. Thus at the Practical School of Agen there are available 80 places for those desiring to learn bookkeeping and clerical work, private workshops afford room for 400 apprentices, and, finally, there are a hundred places in workshops for men disabled but not requiring reeducation.

The ministry of artillery and munitions provides work for disabled men in the metal works controlled by it at Lyons, Toulouse, Marseille, and Bordeaux. To obtain work of this type a man must have a certificate from the officer in command of the military hospital as

to his general condition and fitness. He works for but half a day and is paid by the piece. The military governor of Paris has approved a similar scheme for men under hospital care.

"The general experience is that the men do not avail themselves to the extent that they should of the opportunities placed at their disposal for learning skilled trades. Of 2,000 men interviewed by Dr. Bourrillon only 350 were willing to be trained, 500 out 3,000 men interviewed by the authorities of the Federation Nationale."

Naturally enough some of the men apprehend that they will not be strong enough to go through with training and earn a living at a trade. This lack of confidence is often increased by the unwise sympathy of nurses and visitors and the public generally. Many consider that, having been wounded, they have a right to demand permanent assistance from the State, and hence do not need to learn a trade, or else they look forward to some soft Government job. In some cases the men are incorrigible and lazy. For all these reasons it is essential that training be begun early and while a man is still using only a temporary appliance. Occasional work in military orthopedic hospitals, such as wielding a broom, duster or a mop, is far superior to any technical exercise, because the man's mind "is set on the dirt he has got to remove, not on the fact that his maimed hand is repeatedly taking hold of and letting go the duster."

An atmosphere of work in a hospital is essential, because it will benefit the mental outlook of the patients. Spirit and initiative tend to depart when a man lies in bed week after week recovering from a septic wound. If there is nothing definite for him to do but play cards, smoke, and listen to concert or cinematograph, he acquires the habit of getting through a day doing nothing. The man must forget himself, forget he is maimed, and begin to think of himself as having a future, and the men who begin to work are the ones to have the privileges.

The men in hospitals who decline reeducation should not be discharged prematurely, as this might be an incentive to decline. They should be segregated, for even well-disciplined men would refuse training if they could thus get discharged and draw a pension the sooner. Many students and observers agree that reeducation should be compulsory. In general, work is found for the reeducated by local societies. In the early days of the war some 50 such societies were formed in Paris alone. An employment bureau under the Ministry of War has now been in operation for over a year and has 21 branches in as many military districts of France. Special effort is being made to prevent the influx to Paris of disabled men seeking work. The Association for Aiding the Mutilated Poor has arranged a system of loans with security to help men start work.

In June, 1917, there were 41 departments in France possessing professional schools.

All work of this character in England is far behind the organized French effort, and it has been found that there the number of men spoiled for future work and worthy activities by the entertainment and many kindnesses lavished on them during their stay in hospital is very large. In England, too, many men after training show a lack of willingness to fall in with factory rules and regulations where they are employed.

The driving of motor vehicles should not be considered a suitable occupation for men who have lost any portion of a limb or an eye, but they may be useful as attendants in garages. Incidentally it may be noted that these occupations are being invaded by women.

Electric shops and the cinematograph industry offer a field for this class of labor. Special looms have been devised to be operated by cripples. Cripples and one-armed men are employed as ticket collectors and buss conductors. The following occupations are suitable for the totally blind:

MEN.	WOMEN.
Basket making.	Book folding.
Mat making.	Ironing factory.
Knitting.	Typewriting.
Sewing.	Artificial flower making.
Chair caning.	Knitting.
Pianoforte tuning.	Sewing.
Boot and shoe making and repairing.	
Massage.	
Typewriting.	
French polishing.	
Gardening.	

The attempt to find occupation for the disabled is less difficult in the case of unmarried men, who are not restricted to a particular locality by the needs of their families.

A national registry of disabled men should be maintained, and there should be one central agency for employment, to which every ex-sailor, ex-soldier could turn at will.

The British war office has established special hospitals to give inpatient and outpatient treatment to soldiers.

Definite places have been established for treating (1) the blind; (2) amputation cases (*a*) when nearly ready, (*b*) when fully ready to be fitted with artificial limb; (3) orthopedic cases; (4) neurological cases; (5) rheumatism and kindred complaints; (6) injuries of face and jaw and cases requiring artificial eyes; (7) heart cases.

Reprints from the "Daily Review of the Foreign Press." Issued by the General Staff, War College, January to April, 1918.

VINCENT'S ANGINA.

Formerly regarded as rather infrequent and of special interest, as a condition associated with the presence of two micro-organisms—a fusiform bacillus and a spirochaete—this form of infection, described in 1896 by Vincent, has become extremely common, and even known as "trench mouth." The tonsils are most often attacked, and diphtheria may be diagnosed; the mouth, gums, bronchial tubes, and in rare instances the prepuce may also be infected. Locally iodine, salvarsan, or liquor arsenicalis swabbed on three or four times daily, are effective. Nolf, Colard, and Spehl record two cases of Vincent's angina with a rash, an erythema in one, a generalized maculo-vesicular eruption in the other. In both cases the intravenous injection of neosalvarsan was followed by the rapid disappearance of the faucial and cutaneous changes.

SKIN DISEASES.

Horse mange.—In peace horse mange was not common in the Central Empires, but during the war it has been imported from Poland and Serbia and has spread to man and even from man to man; Pick, who examined a number of cases in unfavorable circumstances, thus contracted it. He has never seen *dermatokoptes* or *dermatophagus* mange but always the *sarcoptes* form. The incubation period is short—two to three days—and then groups of small pale nodules the size of a pin's head appear on the back, trunk, flexor surfaces of the upper extremities, groins, and thighs, the distribution being ascribed by Reif to hair and scales falling down inside the collar. The wrists hands, penis, face, and scalp escape. As in scabies, itching when the patient gets warm in bed is troublesome; but, unlike scabies, there is no associated impetigo or eczema. Burrows are not seen, probably because the parasite is more superficially placed than the *Acarus scabiei* in the skin. Spontaneous cure occurs in from one to three weeks. Prophylaxis consists in washing with carbolic soap, rubbing on perugen or petroleum after working in the stables. As a cure, Weidner speaks highly of petroleum (℥i) rubbed on the skin until it is dry once daily; mild cases are cured by a single application, severe ones after two to four. The clothes and bedding should be disinfected.

ŒDEMA OF PRISON CAMPS.

Œdema among soldiers on active service is generally due to so-called war nephritis, whereas the œdema in prison camps is of a different nature. Hülse, who observed 185 cases in the war prisoners' camp at Neuhammer, regards this œdema as a manifestation of

inanition due to many causes; a small percentage (22 per cent) showed a definite infection, namely malaria (24 cases), tuberculosis (7 cases), recurrent fever (1 case); but most of the cases were due to the bad conditions of life in a prisoners' camp, namely, bad feeding, overwork, cold and damp rooms. Rapid improvement followed better dietetic and hygienic conditions without any drug treatment. As a diet abundant in quantity but poor in vitamines was followed by the same improvement as that due to a diet containing the same number of calories and rich in vitamines, it is concluded that the caloric value and not the vitamine content is the important factor in the disease. This is an important point, as the œdema might naturally have been ascribed to a deficiency in the antiscorbutic vitamine and to be a manifestation of avitaminosis.

The œdema of war or of prisoners' camps occurred during the Napoleonic campaigns, the siege of Paris, and in the concentration camps during the Boer war, when it was known as epidemic œdema (Maliwa). Falta, of Vienna, in a review of the subject mentions that the disease was well known in Russia during famines before the war, and that the expression "swollen from hunger" was current in the affected districts. During the war the first record of the disease was in 1915 by Strauss, who described "the hunger disease" in Russian Poland and Galicia, where the poor were much exposed to war epidemics and had an insufficient and monotonous dietary. It has also been called "potato disease" and "salt hunger." About the same time Budzynski and Chelchowski recorded 224 cases in Galicia; roughly, half these cases were in children between 2 and 10 years of age, and the remainder in elderly subjects, the condition being often associated with anæmia, debility, and intestinal disorders. In Germany the disease first made its appearance in prisoners' camps in July, 1915; and as 66 per cent of his cases had the *Spirochaeta recurrentis* in the blood, Rumpel at first considered relapsing fever responsible, but in 1916, when many cases with dysenteric symptoms occurred in prisoners' camp free from relapsing fever, Rumpel and Knack regarded dysentery as a disposing cause. At this time cases were reported among Russian soldiers at the front where direct contact with infectious disease was thought to be excluded. Early in 1917 there were numerous cases in the civil population and labor battalions in Germany, and in the spring cases first appeared in Austria among civilians, especially workmen, but rarely among the troops. The affection has also been often reported in Asia Minor.

The disease may occur at any age, but children, elderly people, and men engaged in hard physical work are especially likely to suffer. Its features are remarkably uniform; the œdema resembles that of renal disease and in mild cases may be confined to the lower

limbs, but in severe cases is universal and may cause considerable limitation of movement; it is soft and elastic, and the skin anp puncture fluids pale; it may come on gradually or, especially after physical exertion, rapidly. With rest in bed and good feeding the œdema, which is most persistent in the face, usually disappears in a few days, and then reveals extensive emaciation with loss of weight up to 50 per cent. After the disappearance of the dropsy relapses are prone to occur, especially if there is an early return to hard work or unsuitable food. The urinary symptoms are polyuria and frequency of micturition; the urine being clear, of low specific gravity, free from albumin, urobilin, and from formed elements except a few hyaline casts. Franke and Gottesmann are the only observers who described functional disturbance of the kidneys in war œdema, but Schiff believes that they were really dealing with cases of chronic nephritis. Franke and Gottesmann in their study of the functional efficiency of the kidney in 17 cases of war œdema found delay in the excretion of urea and sodium chloride in 10 patients, and of potassium iodide and milk-sugar in 7; and they therefore call war œdema a nephritis without albuminuria. It is, of course, well recognized that cases of acute nephritis with œdema may occur without albumin or casts in the urine. This was known to R. Bright, and recently His has described cases of war nephritis without albuminuria with impaired excretion of water and salts just as in cases of undoubted renal disease with albuminuria and dropsy. Falta states that the slow pulse characteristic of war œdema—sometimes 35–40 per minute—is best marked in males. There is hydraemic anæmia, and slight leucopenia with relative increase of the lymphocytes has been observed. Subacidity and diarrhea with mucus and blood may occur. Prostration, apathy, and weakness are almost constant; pains in the calves, a feeling of heaviness in the legs, and diminished reflexes may be noticed, but typical polyneuritic symptoms do not occur. In severe cases night blindness, corneal ulcer, or xerosis of the conjunctivæ may be troublesome. The prognosis is good if the patients are kept in bed on a proper diet, but severe cases may prove fatal. The diet should be ample, especially as regards proteins, and during convalescence the patient should be in the open air. Post-mortem examination shows chronic marasmus with atrophy of the viscera, especially the heart and spleen, fatty degeneration of the liver and kidneys, and in some instances dysenteric ulcers. Falta states that war œdema has no connection with scurvy, except that in very rare instances the two diseases occur in the same person. The wet stage of beriberi is the only other deficiency disease in any way resembling war œdema in which, as already mentioned, there is no polyneuritis. All the patients have been improperly fed for a

long time, especially as regards proteins, and the liability to œdema always present in malnutrition is aggravated by the large quantity of sodium chloride in the food. Maliwa, from investigation of four cases, correlates the stage of colyuria with an excess of sodium chloride in the blood, and finds that after the polyuria has passed off the blood is then deficient in the sodium chloride content; the change in the osmotic relations of the tissues is the essential factor in the disease, the polyuria and œdema, though prominent clinical features, being secondary in importance.

MALARIA.

As in France, the return to the Central Empires of numerous men infected with malaria, though many are unconscious of it, as they have not had an attack, is arousing some anxiety on the ground that the disease may thus be introduced into the Fatherland. Külz, in discussing the question whether or not a recent uncomplicated case of malaria should be sent home, takes this possibility, in addition to other reasons, into account, and decides against the return of the patient. As men with latent malaria may after their return home have a first attack as a result of chill, operations, powerful drugs, physical or mental strain, or the depressing effects of illness, Keller naturally advises that obscure fever in a soldier who has come from a malarial country should always demand a blood examination in order to determine if malarial infection alone or combined is present.

The interrelations of war wounds and malaria are discussed by Moreau, who points out that most of the wounded from the East have malarial attacks in France, and that, though their nature may be quite obvious, they are sometimes regarded as due to wound infection. The first attack of malaria may follow a wound in a man with latent malaria, or a relapse may thus be induced. The gravity of the wound has some relation to the severity of the malarial attack; a severe fracture with shock and hemorrhage may be followed by pernicious malaria, a simple fracture by benign tertian. The opening of an abscess due to quinine injections may determine a relapse, and an antityphoid inoculation may have the same effect. The interval between the wound and the first malarial attack is between two and four weeks, but in patients previously the subjects of frank malaria it is considerably less. Conversely, the existence of malarial infection delays the healing of wounds and the union of fractures, and hence wounded from malarial countries should be given quinine, especially those who have already had febrile attacks. It has been stated that malarial patients when wounded are especially prone to secondary hemorrhage, but Moreau's experience does not support this view. Malaria, however, so modifies the resistance of the liver that delayed chloroform poisoning is facilitated.

LATENT TETANUS.

A case is reported of a soldier who received a gunshot wound of left thigh on September 20, 1916. By suitable treatment the wound had mostly closed up by the middle of December, although a sinus still remained. On January 15, 1917, the scar was opened up and part of the callus removed, this being followed by the extrusion of several sequestra. A second operation, undertaken on April 28, was followed by the appearance of other sequestra. On May 6 he was seized with pains in the muscles of the jaw and developed typical generalized tetanus, which was quelled, however, by antitoxin, magnesium sulphate, and general analgesics, recovery ensuing within a month. So far as could be ascertained no prophylactic dose of antitoxin had been injected in this case. The tetanus developed eight and one-half months after the injury. Discussing various possibilities, the author considers that the tetanus infection took place at the time of the injury, the bacilli remaining latent in the cicatrix until set free as a result of the subsequent operations.

HYPNOTISM AS AN AID IN THE DIFFERENTIAL DIAGNOSIS BETWEEN HYSTERIA AND EPILEPSY.

In the case of soldiers who are so frequently brought to hospital with a history of attacks supposed to be epileptic, but who have been seen in the attacks by laymen only, Neutra has found hypnotism a valuable method for determining the character of the attack. The hysterical patient at the word of command reproduces the complete attack in all its details, whereas the epileptic, though he may carry out all the commands, shows no reaction.

SANITARY CONDITIONS ON THE ITALIAN (ISONZO) FRONT AMONGST THE AUSTRIAN TROOPS.

Preventive vaccination is carried out systematically, viz, every three months against cholera, every seven months against typhoid, against smallpox only if there is any danger, and after dysentery only occasionally. All wounded are given tetanus serum. All vaccines and sera are in the hands of every medical officer with the forces.

GERMAN VITAL STATISTICS.

In Prussia during 1914, 766,828 persons died, viz, 449,645 males, including soldiers, and 317,183 females. In 1913 the total was 620,455 persons, of which 321,980 were males and 298,475 females. The excess of deaths in 1914 over 1913 was therefore 146,373.

From infectious diseases there were 151,542 deaths (19.75 per cent), and among these 58,577 (7.64 per cent) from tuberculosis. In 1913 the deaths from tuberculosis were 56,861. Reckoned per 10,000 living, the mortality from tuberculosis in 1913 was 13.65 and in 1914, 13.87.

Table 3.

	Deaths in German towns of 200,000 inhabitants and over.		Total deaths in civilian population.		
	1917	1916	1913	1917	1916
January	18,907	13,601	13,326	13,539	12,339
February	20,922	14,913	12,135	16,347	13,105
March	19,996	16,517	13,795	15,926	13,812
April	18,946	16,406	13,014	15,177	12,161
May	18,376	16,282	12,660	14,171	11,418
June	17,159	14,807	11,447	12,212	10,233
July	18,577	15,275	11,654	13,190	9,813
August	18,582	15,659	11,411	12,980	9,609
September	17,685	15,817	11,176	11,804	9,736
October	17,586	16,922	12,139	11,823	9,648
November	15,958	17,340	11,758	11,564	10,647
Total (11 months)	202,694	173,539	134,515	148,733	122,521
December	.....	19,049	12,693	.....	13,720
Total (12 months)	.....	192,588	147,208	.....	136,241

Table 4.

	1917	1916	1913
Total deaths in civil population	148,733	122,521	134,515
Deaths under one year	18,087	18,462	31,991
Deaths over one year	130,646	104,059	102,524

Table 8a.

	Deaths from tubercular diseases.					
	1917		1916		1913	
	Total deaths.	Rate per 1,000.	Total deaths.	Rate per 1,000.	Total deaths.	Rate per 1,000.
January	2,060	2.2	1,704	1.7	1,598	1.7
February	2,258	2.6	1,870	2.0	1,490	1.8
March	2,829	2.9	2,111	2.1	1,772	1.9
April	2,890	3.1	2,034	2.1	1,758	1.9
May	2,983	3.1	2,026	2.0	1,702	1.8
June	2,727	2.9	1,792	1.9	1,474	1.6
July	2,337	2.4	1,599	1.6	1,394	1.5
August	2,129	2.2	1,468	1.5	1,351	1.4
September	2,053	2.2	1,449	1.5	1,221	1.3
October	2,128	2.2	1,390	1.5	1,391	1.5
November	1,911	2.0	1,526	1.6	1,369	1.5
Total (11 months)	26,305	2.3	18,969	1.6	16,520	1.5
December	.....	.....	1,809	1.9	1,471	1.6
Total (12 months)	.....	.....	20,778	1.8	17,991	1.6

Table 8b.

	Deaths from respiratory diseases.					
	1917		1916		1913	
	Total deaths.	Rate per 1,000.	Total deaths.	Rate per 1,000.	Total deaths.	Rate per 1,000.
January	2,567	2.7	1,903	1.9	2,038	2.2
February	3,796	4.4	2,456	2.6	1,880	2.2
March	3,222	3.4	2,776	2.8	2,229	2.4
April	3,032	3.2	2,091	2.2	1,865	2.1
May	2,461	2.6	1,775	1.8	1,669	1.8
June	1,672	1.8	1,441	1.5	1,153	1.3
July	1,365	1.4	1,118	1.1	1,144	1.2
August	1,093	1.1	920	1.0	998	1.1
September	1,145	1.2	1,000	1.0	941	1.0
October	1,149	1.5	1,263	1.3	1,254	1.3
November	1,731	1.8	1,551	1.6	1,432	1.6
Total (11 months)	23,533	2.1	18,303	1.6	16,603	1.5
December	.....	.....	2,652	2.7	1,800	1.9
Total (12 months)	.....	.....	20,955	1.8	18,403	1.7

INFANTILE MORTALITY IN GERMAN TOWNS.

In the 26 large cities the number of infants born alive was reduced by 48,623 as against the previous year, in which there was already a drop of 49,470 from the number registered in 1914, so that the total fall in births up to the end of 1916 amounted to 98,093, or 38.3 per cent of the number of infants born alive in 1914. Whereas in 1915 there was a rapid fall in May, in 1916, the decline was more evenly distributed throughout the 12 months, there being, however, a distinct increase in the figures for August and September as against July. This was noticeable not only in the large cities but also in the other localities, and should be connected with the period of Christmas leave extensively granted to the soldiers in 1915. The previous curve had shown its apex during the winter months and its lowest limit in autumn. In localities with 15,000 or more inhabitants the figures for 1915 had shown a decline of 131,068 as compared with 1914, and the year 1916 shows a further fall of 114,557, so that the total diminution since 1914 until the end of 1916 amounted to 245,625, or 39.5 per cent of the live births in 1914. Thus the figures for the two groups of localities run closely parallel. This extraordinary decline of births is not compensated for by a simultaneous fall in infant mortality, though the latter fall has progressed more rapidly than the former. In the large cities the deaths among infants were 13 per 100 live births as compared with 15.3 in 1914, and in the other localities the figure is 13.3 as against 15.5. Thus the infantile

mortality has fallen below the previous minimum of 14.1 reached in 1912. In the last quarter of 1916 there was, however, a distinct increase in the infantile death rate. There is no reason to incriminate climatic conditions, since those were the same both years—under normal summer heat—and should have made rather for a reduction in mortality. It does not seem clear whether the increase may be connected with the upward curve of live births, for the figures of mortality in the first month of life, which alone could answer this question, are not supplied by the imperial health office. Factors other than the biological must have been responsible for the increase, and it is only a local inquiry conducted in some of the big industrial centers which could elucidate the problem adequately.

THE EDUCATION OF THE BLIND IN GERMANY.

Of 40,000 blind people in Germany before the war, only 0.2 per cent belonged to the class with university education. But since the war the number of blind people with academic ambitions has increased so much that facilities had to be created in order to satisfy a real want. A society was formed called "University Library, College, and Advisory Board for Blind Students." Committees were established for the task of elaborating the best type of blind script for scientific works and of deciding on standard textbooks in the various faculties. In many towns associations were formed for the training of voluntary workers, mostly female, for the production of library books in blind script. The advisory board gives information and help to blind students and blind professional men all over Germany. In Marburg, a prettily situated small university town, a college for the blind has now been opened with resident as well as nonresident students. It was frequented by 17 students during the first term. The teaching staff includes three blind tutors—a theologian, a philologist, and a jurist. The building is situated near the university, surrounded by a garden, and contains workrooms for a bookbinder, a printer, and 21 living rooms, of which 7 are allotted to resident students.

SCURVY.

Extensive outbreaks of scurvy have occurred on land during wars since the Middle Ages; thus, 55 out of 143 endemics analyzed by Hirsch were during hostilities. Three previous endemics in prisoners' camps have been recorded: (1) 159 cases among 10,000 French prisoners in the Ingoldstadt camp in 1871, (2) among prisoners at Port Blair in the Andaman Islands, and (3) among the Hereros in the Southwest African War, the last two being the more serious. In recent wars hygienic measures have prevented scurvy, and only in Russia or countries where the disease is endemic or sanitary

methods are in grave default are large endemics probable. The outbreak among the Austro-German prisoners in Turkestan was much more extensive than in former wars; Disqué saw 504 cases in one military hospital, and in a camp of 4,000 prisoners there were 754 cases, or 19 per cent. The largest number of cases occurred in March (222) and April (158), when night blindness also increased. The incidence of this large number of cases in the spring was attributed to bad hygienic conditions and the absence of green vegetables during the winter. In the initial stages the permeability of the vessel walls was shown by papules and slight discoloration around the hair follicles on the lower limbs, the skin feeling rough like a grater; changes in the gums occurred in three-fourths of the cases.

Among the complications were four cases of hemorrhagic pleurisy, three of hemorrhage into the capsule of the knee joint, and one of well-marked subconjunctival hemorrhage. The only case of hemorrhage from internal mucous membranes was from the stomach. The blood examination showed a secondary anemia, but no other change was noted. Among 504 cases there were 4 deaths only, those with hemorrhagic pleurisy. In addition to suitable diet and hygiene calcium lactate was given, and appears to have been most successful, as under its influence the largest cutaneous and muscular hematomas disappeared in two to three weeks, whereas without it the process occupied months.

Giugni observed an outbreak of what appears to have been scurvy among the Italian troops, especially the infantry, at a high elevation in the Dolomite Alps (1,500–2,000 meters), beginning in June, 1916, increasing during July, reaching its acme in August, declining in October and November, and disappearing in the winter. The disease spread in an epidemic fashion to neighboring areas, but not to the same extent as in the original focus, and some sporadic cases were seen at the base. The duration of symptoms ranged from two weeks to two or three months; there were no fatal cases. Blood cultures gave negative results. The etiological factors in the order of their importance are given as the high altitude with rarefaction of the atmosphere, mountain climate, reflection from the snow, the influence of the special emotional state of the troops on active service on the peripheral circulation and blood pressure, and the restricted diet. The administration of vegetables did not exert any curative effect, but some improvement followed the use of salicylates and adrenalin.

During a mild epidemic of scurvy among soldiers, Tüchler found that at least 60 per cent of the patients, including those already ill for three or four weeks, were in an excellent state of nutrition. So far from there being any relation between the severity of the attack and the general state of nutrition, many soldiers in good

condition showed the most extensive hemorrhages in the skin and gums. The occurrence of an initial rigor, the continued fever, and the microscopic data led Tüchler to support the view that scurvy is an infective disease, but he does not agree with Much and Baumbach (*vide* MEDICAL SUPPLEMENT, Mar. 1, 1918, p. 67) that the infection is conveyed by lice, as all his cases appeared after satisfactory measures for combating this pest had been established. That a restricted diet is only a predisposing cause was suggested by the observation that patients treated with fresh vegetables and lemon juice did not improve more rapidly than did those on the diet of the troops at the front. The influence of dark and damp quarters in producing the disease was shown by the cessation of fresh cases when stationary warfare was succeeded by active campaigning in the field, and by Weinberger's experience that a regiment provided with a good diet was regularly attacked by scurvy when sent into dark quarters.

GLUECK, B. **A study of 608 admissions to Sing Sing prison.** Mental Hygiene. Vol. 2, No. 1. January, 1918.

From a sociological standpoint, the author has made a very exhaustive study into conditions at Sing Sing prison, New York, and the results of this investigation are very interesting. The article is rather an exhaustive one, and for that reason a brief review would be of little value to the interested party, but it is recommended for careful study to the members of the medical corps of the service who are interested in prison reform work and possibly also those that are on recruiting duty. The phase of the subject relative to the unnaturalized element in admission to Sing Sing would be of particular importance to the latter. Just at this time, when there is so much reform work going on throughout the country relative to prison conditions, the causative factors in the individual prisoner's offense to the Government, and so forth, the article will appeal to medical officers in the service on duty at the various naval training stations, where an effort is being made to exclude the mentally unfit. The author, as far as can be seen, has brought out no new facts, in reality he has recapitulated certain statements which he has made in other journals, but the way in which the matter is handled makes it particularly valuable and the information from the statistical standpoint is invaluable.

Of the 608 cases studied, 66.8 per cent showed abnormal behavior of some kind during their life previous to admission; 59 per cent deviated from the average normal mental health; 28.1 per cent were found to be defective by the usual psychological tests, and the average age of the prisoner under this group was found to be 12 years. He classes 18.9 per cent under constitutional psychopaths, who evidence a lack of ability to adjust to the environment in which they have been

placed. Attention is called to the fact that of the 18.9 per cent of psychopaths at present in the prison, 82.4 per cent are to be discharged in the near future to return to civilian life. Of the latter group 86.7 per cent have averaged 3.9 former admissions to prisons. Of the cases examined, 12 per cent were found to be suffering from definite mental illness.

In the past years, those who have attempted to make certain prison reforms have pointed out the fact that the method of dealing with the offenders is entirely erroneous, in view of well-recognized psychological laws and in practically every part of the country the offense, and not the individual, is dealt with. As a result when mental defectives, or constitutional psychopaths, commit an offense against the law they are merely placed in prison for a term of years and no attempt is made to correct the basic condition. Of course, the place to begin reeducation is in the schools of the country, where an effort should be made not only to educate the individual along technical lines, but to instruct him along certain lines that he may be able to live without coming into conflict with his environment.

The author classifies the various cases examined under four headings: Intellectually defective group, mentally diseased group, psychopathic group, and the unclassified group. With the prisoners so classified recommendation is made that certain well-defined efforts be made to reeducate the individual along the lines that are indicated by the classification. An interesting thing brought out in the investigation is the fact that 35.3 per cent of the prisoners examined were foreign born. Of these, 58.2 per cent were below par mentally and for that reason, of course, could have been excluded from the country on the emigration law. Of the original 35 per cent, many were of the constitutionally inferior make-up, and only 10.3 per cent had become naturalized citizens. (D. G. S.)

REPORTS.

SURGICAL NOTES FROM THE FRONT.[1]

By R. G. Le Conte, Surgeon, United States Naval Reserve Force.

The number of wounded and injuries sustained.—Modern trench warfare has repeatedly given similar statistics as to the number of wounded and the location of wounds in offensive and defensive measures. A French division is at present composed of from 11,000 to 12,000 men. At the time of attack each division will have 400 wounded the first day; if the attack persists, there will be 400 wounded on the second day; on the third day the number falls to half, or 200, while on the fourth day the casualties will be small, for exhaustion has rendered that division useless for fighting.

In the same way the situation of the wound is known beforehand with almost mathematical precision. The following table of figures has been verified many times by the French and may be considered accurate:

	Per cent.		Per cent.
Head and neck	16	Chest	10
Arm	14	Abdomen	4
Forearm	8	Spine	2.6
Hand	12	Thigh	15
		Leg	12
Total	50	Foot	6
		Total	49.6

Head and upper extremities furnish 50 per cent, trunk and lower extremities 50 per cent, and of multiple wounds there will be 20 per cent. Knowing the number of divisions that will participate in the attack, the plans of transporting and treating the wounded are arranged beforehand.

Treatment of wounds.—The first step in the mechanical cleansing of wounds is taken at the battle dressing station, where the wound is covered or packed with sterile gauze. This dressing acts as a wick and removes germs from the wound as it absorbs the wound secretions. Upon arrival at the first advanced hospital a bacteriological examination of this first dressing will disclose the flora of the wound.

Excision of the wound, the debridement of the French, consists in largely opening the wounded area and removing all contused and damaged tissue and foreign bodies that may harbor infective germs.

[1] Extract from report to Bur. M. & S., March, 1918.

This exposing incision must be so placed that it will not cause any further destruction of anatomic tissues of value. In the extremities, incisions should be in the long axis of limb and transverse only in the depth of wound, where the muscle masses are so large that complete access to the damaged tissue can not be had otherwise. Transverse incisions should be confined to muscle and aponeurotic structures and the nerves and vessels spared. All damaged muscle must be excised, and the differentiation from healthy muscle is made by its change of color and loss of contractility. The zone of contamination is not limited to the track of the projectile and may extend half an inch to an inch beyond it. As the debridement proceeds, the foreign body will be removed from the depth of the wound, together with the contaminated tissues. The object of this excision is twofold—to remove infection and to place the wound in the most favorable possible condition for closure by suture. Rigid hemostasis is called for, with dryness of the wound, and drainage is seldom indicated and then only for a short time. When possible the whole wound is excised in the same manner as a tumor, the knife cuts being confined to sound tissue; but where the wound is deep, tortuous, or extensive, such an ideal method is impossible. After the sutures are placed, they may be tied immediately if the bacteriological examination of the wound or dressing prior to the excision shows no organisms of special virulence. The streptococci must always be considered virulent, as their bacterial differentiation is too time consuming to be attempted. The sutures may be tied in an hour if the bacteriological examination of the wound after debridement proves favorable. They may be tied in five or six days after disinfection of the wound by chemical means. The terms "immediate primary suture" and "delayed primary suture" are used to define the time when the sutures are tied and the wound definitely closed. Secondary suture is employed where the disinfection of the wound requires more than a week of time. As the wound then is covered with granulations, the edges must be freshened, which requires a second operation of small importance. Secondary suture never gives as good a restitution of function as primary suture; it retards convalescence, but it has the advantage of giving a complete assurance of recovery. Collaboration between the surgeon and a skilled bacteriologist, I need scarcely add, is essential for a large percentage of success.

Gunshot fractures.—On entering a fracture hospital or fracture ward, one is at once struck by the similarity of its appearance in all armies. This is due to the almost universal adoption of suspension and the principles of the Thomas splint. This splint has been modified in a score of different ways, but its principles have never been interfered with. Here the similarity ends, for there is a wide difference of opinion on all else concerning the gunshot fractures.

Broadly speaking, there are two schools. In one the treatment is directed chiefly to complete reduction and proper alignment of the bone, while the wound is regarded as of secondary importance and its care is reduced to the use of vaccines and to protective or absorbent sterile dressings. The other school considers the earliest possible closure of the wound of paramount importance, believing that the proper alignment of the bone can be left to a later period. This latter school is in the majority, and to them is due the increasing number of fractures that are treated by debridement and primary suture. This is done with great success in the smaller bones, with less in the humerus and tibia, and only occasionally is it warranted in the thigh. For the mechanical cleansing of the wound, excision of all damaged structures is required. Theoretically every bit of the shattered and loose fragments of bone should be removed, the marrow curetted, and the damaged periosteum excised together with the damaged soft parts. With so thorough a mechanical sterilization, primary union may be expected, but the removal of so large an amount of tissue will cripple the limb, and may even render it so useless that amputation is later resorted to. Also in closing primarily a fracture of the thigh, the dangers from sepsis and gas gangrene are much increased.

A safer method of treatment is therefore a partial debridement of the soft tissue, with removal only of such fragments of bone as are loose and unattached to periosteum. In other words, remove tissue that is evidently dead and all else that has a spark of life is left for chemical disinfection or later removed in the event of the formation of sequestra. In so grave an injury, and in the presence of shock, the short quick operation of *partial* debridement has evident advantages.

Gas.—Two types of gas are used now by the enemy. One is a vesicating irritant to the skin and mucous membrane, the so-called mustard gas, while the others produce death from inhalation. The vesicating gas is commonly dichlorethyl sulphide (does not contain mustard), and its irritating effect is not immediately noticeable. It pervades and penetrates the clothing, and the longer this is worn the more intense will be the burning. The handling of shell fragments, of the clothes, and any other article that has come in contact with this gas will burn the hands unless they are protected by leather or rubber gloves. When treatment is started early its effects are evanescent even on the conjunctivæ, and the patient will return to duty in a few days. Where treatment is delayed, the resultant burns may incapacitate for some weeks. The scrotum, inner surface of the thigh, and armpits are the portions of the body most severely burned. When possible treatment is started at the first dressing station by making a change of clothing. At the advanced hospital patients are at once stripped and washed with lime water, the eyes

bathed with it, and the mouth, nose, and pharynx treated with the same solution. Lime water is specific and neutralizes the gas immediately. The clothing is speedily removed from the hut through a chute, and it is handled with gloves. The advanced hospital will treat in this way 100 cases an hour.

For the lethal gases which produce dyspnea and edema of the lungs, the treatment is very limited. Oxygen gives some relief from the distressing symptoms, and chambers are prepared in the advanced hospital in which oxygen is liberated from cylinders, and the patients are placed in this atmosphere for 10 minutes. Usually there are two rooms of different size and known dimensions, and one or both are used according to the number of patients. For the rest venesection completes the immediate treatment.

SURGICAL NOTES TAKEN AT VARIOUS BASE HOSPITALS IN FRANCE, JANUARY, 1918.

By D. F. Luby, Passed Assistant Surgeon, United States Naval Reserve Force.

Many young surgeons are now entering the Medical Corps of the Army and Navy, leaving their active civil practice to take up for the first time military surgery. Some of these surgeons are already familiar with the treatment of war wounds, either through experience gained abroad or through the writings and instructions given us by such men as Dakin, Carrel, Joseph Blake, Hutchinson, Keller, Crile, and others. But to those officers who do not come in this class, especially surgeons doing transport duty, I write my findings covering my recent visit to the Hôpital Complémentaire at Ris Orange, to the Base Hospital at the Pasteur Institute, and to the Hôpital St. Nicholas, Versailles.

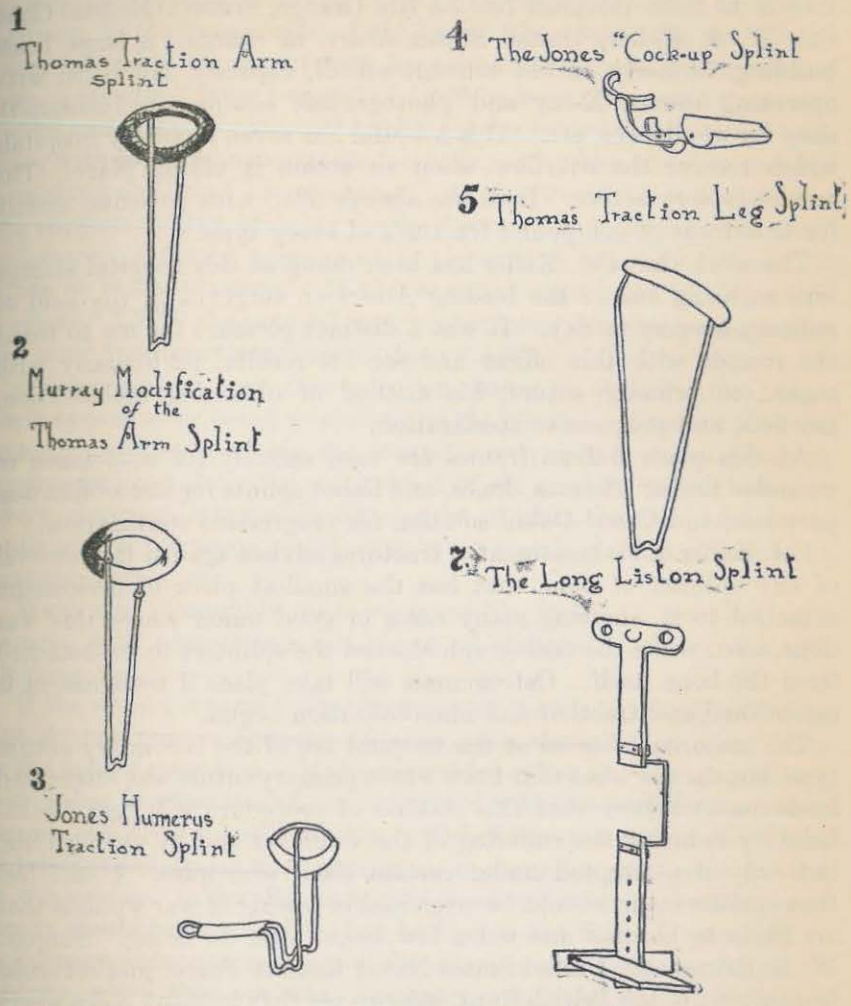
Should any of the transport surgeons find opportunity to go to the above places, it will be to their distinct advantage, for at these places they can see every kind of war wound undergoing the latest procedures, whether in progressive sterilization, primary suture, immobilization by the latest splints, or treatment of burns, keloids, trench feet, etc.

For some time to come the surgical service of the transports will in all probability be of a light nature—the medical department being far more active combating pneumonia, communicable diseases, etc. But the time is not far off when these surgeons may be called upon to care for the many wounded men who may be transported to bases in America.

If this proves true and we are to take wounded soldiers to America, then teamwork between the Army surgical units and Navy transport surgeons must be developed in caring for the wounded in order that there be no break in the continuity of treatment other than in

the event of an untoward complication; and therefore individuality in the latter service must be limited to that of carrying out the treatment already prescribed at the Army bases.

The French have developed surgical teamwork to a high degree of effectiveness in their base hospital service. The teams operating from the advanced dressing stations through to the third-line base



hospitals in the army formations achieve remarkable results—due not only to their advanced methods of procedure but also to the enthusiastic support which the teams at the third line of base hospitals give to those cases coming through from the second and first line base hospitals, each base vieing with the other in carrying out perfectly the lines of the original treatment.

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I understand that this same system of teamwork will be inaugurated in the American Army surgical bases, following a report made by eminent surgeons, who have spent a long time investigating the French system. Therefore it becomes an important question with transport surgeons to know what principles the Army Medical Corps will inaugurate in the handling of its wounded. With this in mind, I went to Base Hospital No. 76, Ris Orange, France, (Medical Chief Col. W. A. Keller, United States Army, in charge), a large brick building, formerly an old convent school, capacity 210 beds, with operating rooms, X-ray and photographic equipment, blacksmith shop for appliances, etc. This hospital has seven auxiliary hospitals which receive the overflow when an action is taking place. The service is very active. Beds are always filled with patients, mostly for treatment of compound fractures of every type.

The work that Col. Keller has been doing at this hospital stamps him as being one of the leading American surgeons in the field of military surgery to-day. It was a distinct pleasure for me to make the rounds with this officer and see his results, particularly with regard to primary suture, his method of obtaining mobilization, traction, and progressive sterilization.

At this place Balkan frames are used entirely for suspension of wounded limbs; Thomas, Jones, and Cabot splints for immobilization purposes, and Carrel-Dakin solution for progressive sterilization.

Col. Keller in his treatment of fractures advises against the removal of any splinter of bone that has the smallest piece of periosteum attached to it, showing many cases of good union where this was done, even when the radiograph showed the splinters to be detached from the bone itself. Osteogenesis will take place if realignment is established and traction and immobilization begun.

The majority of cases at the hospital are of the secondary suture type, but the few cases that I saw where primary suture was attempted leads me to believe that this method of procedure will prove beneficial by reducing the suffering of the wounded and by saving time, but only if attempted under certain fixed principles. I still feel that conservatism should be exercised in sewing of war wounds that are likely to become infected a few hours after so doing. Surgeon W. B. Brinsmade, United States Naval Reserve Force, just returned from a visit to the British front, informs me that in many cases where primary suture was attempted at the clearing station all this suturing had to be removed and progressive sterilization begun when they arrived at the base hospital. Bryan at his station on the British front seldom closes a wound, finding after a large experience that the wounds do better if left open.

However when one sees and studies the experience of the French surgeons with primary sutures, a few principles stand out, which if

employed make this method of procedure worthy of consideration. The following are the essential features: At the nearest dressing station the wound is given first-aid treatment only, the limb immobilized with splint and traction applied, dry dressings are placed over the wound, and the wounded man is rapidly transported back to the base hospital, generally 20 to 25 kilometers from the firing line, arriving at the base inside of six hours (the earlier the arrival the more favorable the opportunity for primary suture.) The operating base is usually a large hospital of 1,000 beds or more, with operating rooms and X-ray equipment, appliances for immobilization and traction, with rapid transportation facilities, and under the command of a medical chief and his assistants. At the hospital it is possible for the surgeon to stay with his charge for the entire period of his convalescence, a factor paramount in importance when an attempt is made at primary suture. If the wounded man must be evacuated to Base "XYZ" the surgical unit in this latter hospital continues on the same treatment practiced at Base "ABC."

Primary suture once decided upon, based as stated above, upon early arrival after being wounded and the clinical judgement that the outcome will be favorable, the wound is converted into a surgical one by free incision along the entire tract of the missile, cutting away in every direction large ellipsoid chunks of skin, muscle, and fascia until contractile tissue is met, care being exercised not to injure large arteries, nerves, etc.

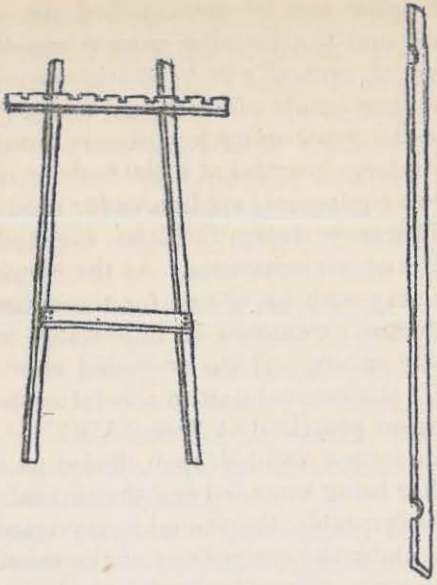
Wash out thoroughly with ether, or Tr. iodine, 5 per cent, and remove with utmost care all pieces of shrapnel, bullets, dirt and clothing.

If the wound is complicated by fracture the same principles apply, but do not remove splinters of bone, even though they seem loose in the field of operation. If these particles of bone be in juxtaposition with other fragments and are connected with the periosteum, osteogenesis will subsequently develop. (Col. Keller is a staunch advocate of this method, based upon experience in many hundred cases treated in this manner.) Small splinters of bone *not* connected with periosteum *should* be removed if they be free in the field of operation.

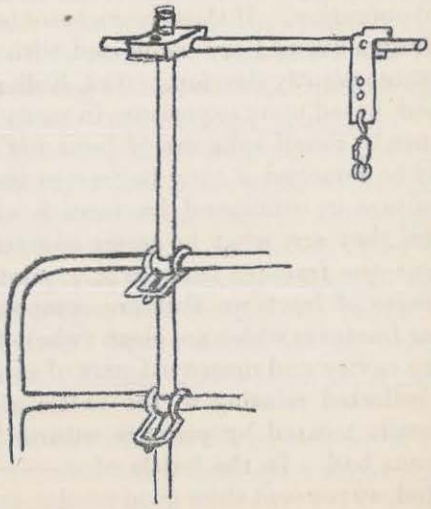
Primary suture in compound fractures is attempted by Capt. C. Leriche, when they are what he terms contact fractures (the bullet resting against the fracture zone) where joint surfaces are not destroyed, in cases of fractures that are compounded but sterile, and in penetrating fractures which are clean (where the missile has entered the medullary cavity and destroyed part of same at site of fracture).

Statistics collected relating to the battle of ——— show 80 per cent good results treated by primary suture, 10 per cent doubtful, and 10 per cent bad. In the battle of ———, with 50 per cent of cases so treated, 40 per cent show good results, and 10 per cent failures.

18 Wooden Overhead Bed frame



19 Maddox Unit Clamps, Iron Pipe and Bed Frame Clamp.



Targante treating seven cases as above had splendid results with four cases, while three failed because they were operated upon 22 to 42 hours after being wounded.

Thubat, in 1917, treated 44 cases of fracture with primary suture, getting good results in 40, and 4 cases being partially successful.

Capt. Charles Leriche, of the French Army, has had experience covering hundreds of cases of joints not treated by this method. Infection sooner or later developed which not only destroyed the joint but resulted in subsequent amputation. At his hospital primary suture is attempted in every possible case.

From observing many cases where secondary suture followed progressive sterilization and immobilization I am of the opinion that when there is a reasonable doubt in the surgeon's mind that the wound will become septic, rather than take the chance of primary suture this tendency toward infection should always be considered primarily and conservatism exercised for a period of three to four days while progressive sterilization is going on under the Carrel-Dakin technique, or with the Eusol method of British origin. If at the end of this short waiting period no infection develops primary suture can be attempted with impunity.

It follows, therefore, from my observations to date, that primary suture should be attempted only:

1. By surgeons of unquestionable ability.

2. At base hospitals with facilities to follow the case through to the end of convalescence.

3. When the operation can be done within four hours, because in the soil in which the men are now fighting tetanus and the B. Perfringens groups (Aërogenes capsulatus) abound. Gas gangrene develops in many cases inside three to four hours after being wounded; this because of four years of putrefaction and close association between animal bodies and the earth along the battle line; therefore biological reports upon soil character would prove beneficial in determining early primary suture.

4 In all wounds involving the pleural cavity closing the cavity only.

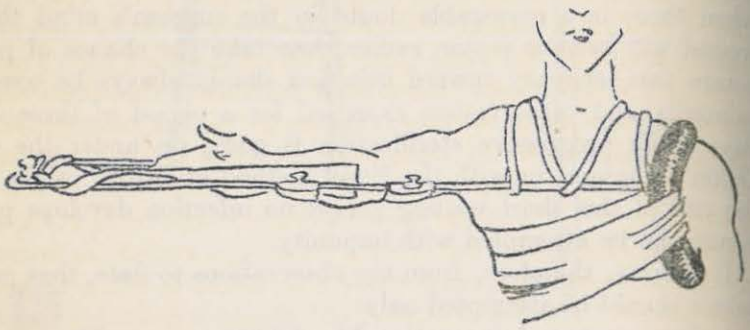
5. In joint conditions after removal of the splinter of steel where the articulating surfaces are not destroyed.

Because of the large percentage of good results in the French Army service, as shown by the records and reports of their greatest surgeons, this procedure should be favorably considered.

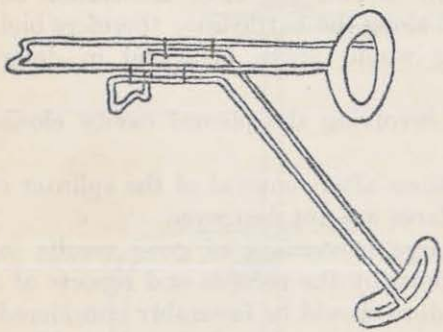
The majority of war wounds which I viewed on this trip were those associated with fracture and would eventually be closed secondarily, having undergone: (1) Progressive sterilization and biological observation; (2) fixation and immobilization by traction; (3) frequent radiographic observation.

Progressive sterilization.—The Carrel-Dakin technique was used at all three hospitals. At the Pasteur Institute Dr. Chutro is said to "out-Carrel Carrel" in this procedure. I went to his clinics on three

20 Thomas Traction Leg Splint
applied over uninjured shoulder
for shoulder and arm injuries



21 Adaptation of 2 Thomas Traction
Arm Splints



occasions, and when I came away it was fully impressed upon me that to know how a wound should be dressed by this method was one thing, but to actually do so correctly was another. For during the past three years I have been using this method of sterilization in indus-

trial surgical work, covering many hundreds of cases, with splendid results, but due, I feel now, to good fortune rather than to my method of procedure along this line of treatment, if I may judge by the manner in which Chutro works. He does all his own dressing. With the aid of five nurses he will pass quickly and quietly from one bed to another and spend usually three to four minutes to a case. Here are many cases of every description—fractured femurs, joints infected and lacerated arms—all with large gaping wounds of every size, showing the characteristic cherry red granulations, foaming with pus varying from a thick creamy type to the coryza mucous kind. This latter type of discharge marks the beginning of sterility.

Chutro technique follows: Garbed in sterile gown, wearing sterile gloves, holding a long artery clamp (Ochsner type) in each hand, he quietly stands by while one nurse opens up the thick pad (2 inches by 3 inches), which incases the injured member. The nurse removing the loose gauze about the tubes exposes the wound, next removing the tubes and disconnecting same from the glass holder. Chutro takes sterile gauze from a container, with artery clamp cleanses the wound of excessive pus. A sterile nurse has some sterile tubes at hand. He takes one with clamp and inserts same into wound, as many as he deems necessary; this same nurse now connects tubes to branched glass holder. The flow is started and wound is flushed. Gauze fluffs are now dropped upon the wound about the tubes by means of the artery clamps, the soft thick pad replaced about the limb, and its edges brought together and held in position by the artery clamps which are now discarded.

Dr. Chutro steps to bedside of the next case, receiving two new sterile artery clamps, and the same procedure takes place as above described.

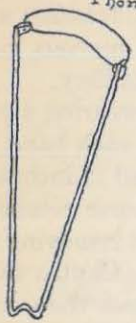
The salient features of his dressings are:

1. No bandages are used, thus saving needless handling of the wounded member especially when fracture complicates the wound.
2. No human hand has touched the wound, thus lessening the chance of reinfection by contact.
3. The teamwork of his assistants and the silence that permeates the wards.
4. The large thick pad, 2 inches by 3 feet by 2 feet, quilted type, taking place of bandages; it forms a warm coat over the wound and catches the excessive overflow of the Dakin-fluid as it flows over the edge of the wound. It is not changed for one week at a time.
5. In all his fracture cases he does not use mechanical appliances for immobilization—depending upon an air mattress to accomplish this fact—the weight of the limb making a furrow of sufficient depth to act as a splint; traction in the usual manner.

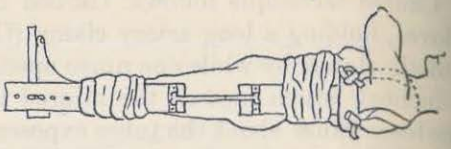
6. Sterile white vaseline in large amount is smeared about the skin in the immediate vicinity of the wound before the dressings are applied in order to prevent burning of skin.

The English are using flavine[1] and eusol in most of their sterilization of wounds. Flavine has strong germicidal properties. Eusol

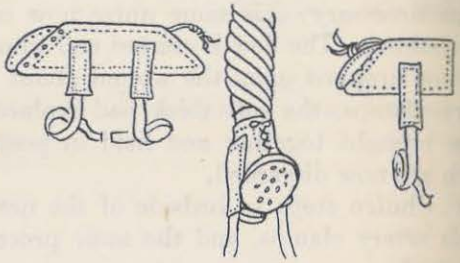
6 The Hinged Half-Ring Modification of the Thomas Traction Leg Splint



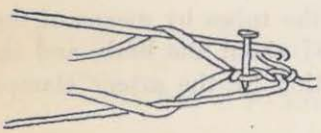
7a Application of the Long Liston Splint



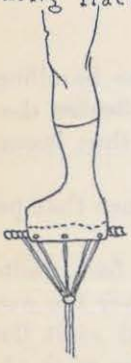
10 Canvass Anklet & Traction Bands



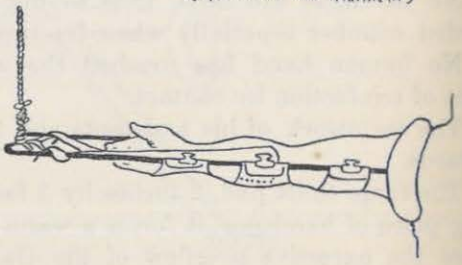
8 Nail Twister or Spanish Windlass



9 Stocking Traction



11 Thomas Traction Arm Splint (Applied for bed treatment)



solution acts like the Carrel-Dakin solution, having as its active agent liquor calcis chlorinatae.

Formula: To 135 c. c. of the liquor calcis chlorinatæ [British Pharmacopœia] add water, 1 liter; add boric acid, 10 grams. Shake

[1] Flavine is a di-amino-acetyl chloride.

well to dissolve. The solution remains clear and ready for use. If the chlorinated liquor calcis is not diluted with water (1 liter) and boric acid is added, a precipitate will develop, which spoils the mixture.

Use in the manner of Dakin technique.

Powdered chlorazene, 1 bottle to 1 gallon distilled sterile water, gives 1 per cent solution of chlorazene, which I find very useful and advantageous in sterilizing the wounds which we have come in contact with to date. It is not so caustic as the Dakin solution and can be used freely, without vaseline prophylaxis, for wound irrigations.

In the hospital on board the U. S. S. *President Lincoln* we are using the Carrel-Dakin fluid as put up in tubes by Johnson & Johnson. This manner of making the fluid is very simple and efficacious.

The caustic properties of the Dakin fluid must not be lightly considered as many bad burns have resulted from overlooking the vaseline prophylaxis. Still I have seen cases where vaseline was used in large amounts and burning take place, due to the susceptibility of the skin to the fluid. In this type of case I advise using: (1) Chlorazene solution; (2) chlorazene paste. Formula: 2 ounces sodium stearate; 1 liter chlorazene solution, ½ per cent.

Very slowly mix the sodium stearate in the chlorazene, stirring it with a ladle for an hour.

The paste has germicidal properties as well as stimulating granulation on large open surfaces, and it does not burn the skin.

3. Dichloramine-T powder and chlorazene oil (5 per cent strength) used as wet dressings for minor surgical wounds, more efficacious than Carrel-Dakin treatment, the latter being reserved for major, deep wounds.

Biological observation.—The temperature and the biological chart are the two factors paramount in closing wounds by secondary suture. Daily observation on the latter show the progress of sterilization, but opinion seems to differ as to when a wound should be closed with reference to the presence of bacteria. Chutro closes when two bacteria are found on an average and the bones are not involved. In the Compiègne battle the same procedure was carried out. Carrel desires his fields absolutely free from bacteria, having counted 20 fields in 3 successive days.

Method of making biological observations:

1. Deep swipe into the tissues of the wound between the fragments of bone if fracture is present.

2. Make smear on glass slide and fix with heat; stain with Loeffler's methylene blue (watery stain) one minute.

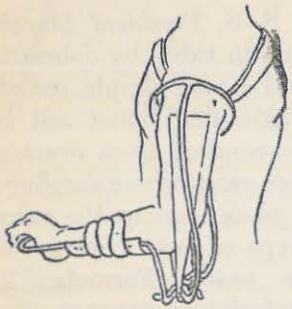
3. Use oil immersion and look for bacteria rods, only.

4. Count 20 fields and strike an average.

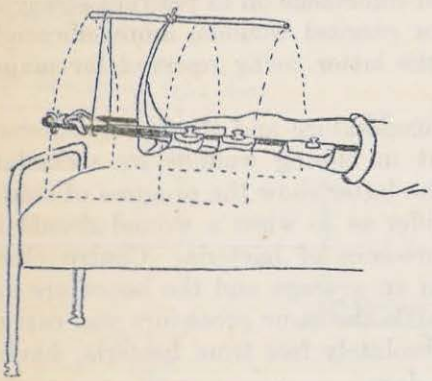
Begin biological examination on third day after admittance to wards; as a rule on the first day the pus is so plentiful that no bacteria can be found.

The average amount of rods found on third day is taken as a starting point. Each daily observation is compared to this number, and charted till the average falls from 2 to 0 per 20 fields—at which point the wound is considered sterile.

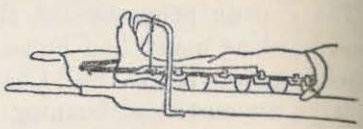
12 Application of the Jones Humerus Traction Splint



13 Application of the Thomas Traction Leg Splint



14 Hinged Half-Ring Modification of the Thomas Traction Leg Splint.



Immobilization by fixation and traction.—In most fractures it seems that the earlier the permanency of immobilization takes place the more favorable the outlook for good results. This can be accomplished by simply constructed splints and traction material, which may be applied at the first-aid station and not touched till patient arrives at the base for his permanent treatment.

The splints used at Ris Orange were of the following type: (1) Thomas traction arm splint; (2) Jones humerus traction arm splint;

(3) Jones wrist crab splint; (4) Thomas traction leg splint; (5) Keller's modification of Thomas leg splint; (6) Cabot posterior wire splint.

These splints are supplied to the American forces by the Red Cross, and consist of rust-proof iron wire one-fourth to three-eighths inch in diameter, having two lateral rods 6 to 8 inches longer and 1 to 2 inches wider than the limb to which they are to be applied. At distant extremity these rods are continuous and bent in toward the sole of the foot or extremity of hand, forming a curved notch, 6 inches from the most distant point. At the proximate end the lateral rods are united by either a complete or half ring of padded wire, fitting the circumference of the thigh or arm, whichever the case may be.

At Ris Orange and the Pasteur Hospital, if wound was in soft tissue and 1 to 2 bacteria (average) were found to 20 fields, suture could be attempted. If wound was in bony structure, however, the sterilization was continued till freed of bacteria before suture was attempted.

The splints are applied to the injured limb and suspended by pulleys from: (1) Balkan frame; (2) overhead supporting bar, consisting of three-fourths inch pipe or 2-inch wood.

Because of the limited space in the sick bay of the U. S. S. *President Lincoln* we have been able to erect only one quadrilateral frame, made of wood. This seemed so cumbersome that a way was sought to provide overhead suspension of a more simple kind which would yet be applicable to every bunk in the sick bay.

The following plan was adopted, which amply meets the requirements: A single bar of wood holds pulleys leading from the head of the bed to the foot. At the head the bar has a pivot arrangement, which enables the patient to move his leg to any comfortable angle. Traction is instituted in the usual manner. The splint is suspended from pulleys by a stout cord. (See cut, page 545.)

By means of the splints and overhead suspensions one will quickly (1) put the injured parts at physiological rest, (2) insure comfort to the patient, (3) facilitate and hasten the process of repair, (4) prevent unnecessary handling of fracture, (5) keep the fragments in alignment and by means of added traction prevent displacement of the sharp ends of the fractured bones.

Traction material used consisted of (1) adhesive plaster ZO, (2) diachylon plaster, (3) glue, (4) canvas anklets (football type).

The plaster was applied in the usual manner along the lateral and medial aspect of the limb up to point of fracture. This leaves end of plaster fastened to a square piece of wood (buckle), and from this a piece of cord was hung over a pulley at foot of frame, holding a bag of shot.

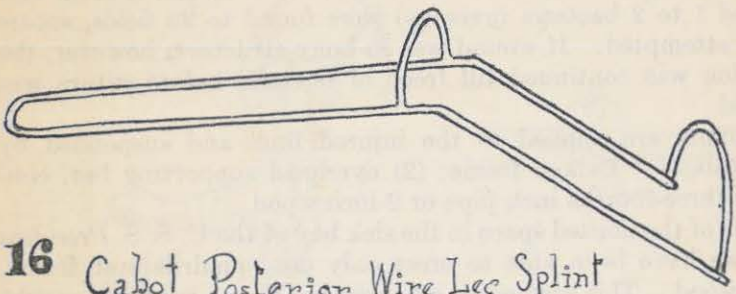
I was much impressed with the glue method of traction, which seemed so simple in the application and yet gave ample means of traction.

Types: Sinclair's glue; Huesner's glue (resin and turpentine).

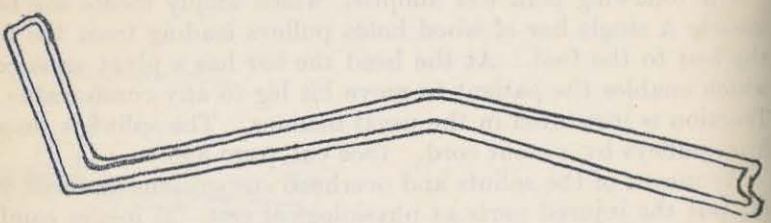
The former must be heated before using. The latter can be used without going through this step.

Resin and turpentine glue: Resin, 50 parts; benzine, pure, 10 parts; alcohol, 90 per cent, 50 parts; Venice turpentine, 1 part.

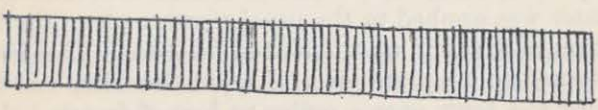
15 Anterior Thigh and Leg Splint. "Hodgen Type"



16 Cabot Posterior Wire Leg Splint

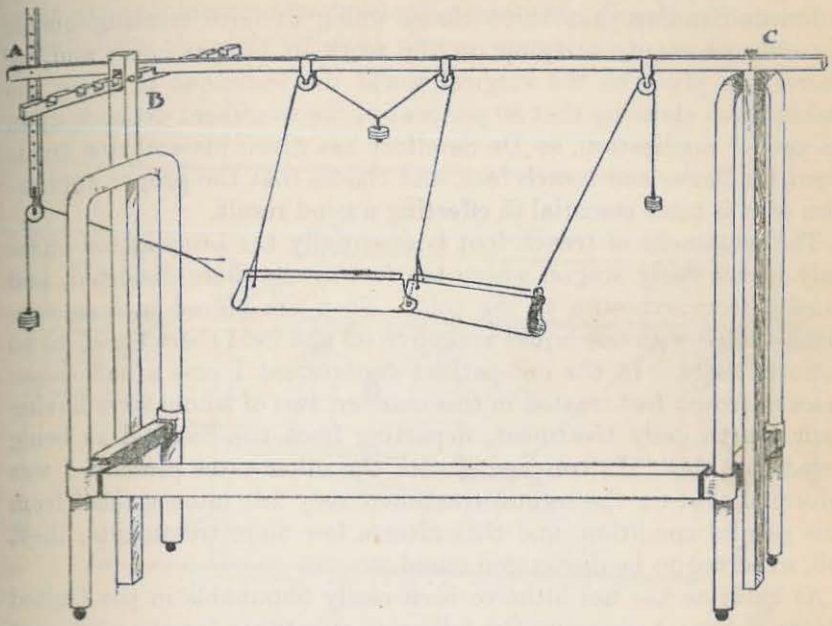


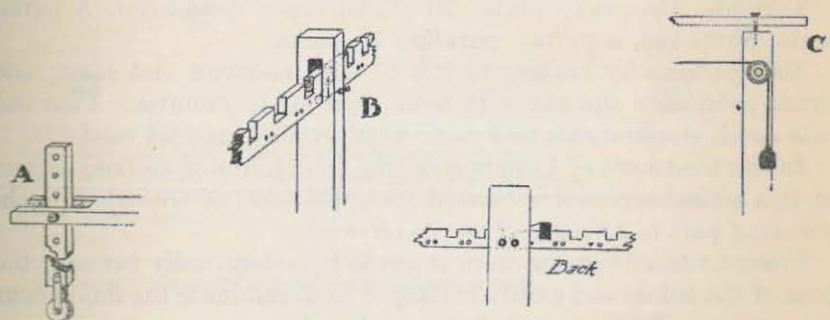
17 Ladder Splint Material



Powder the resin; add one-half alcohol; add Venice turpentine and benzine; wash mixture into a bottle with remaining alcohol and keep well corked. Apply with brush to the leg, painting in opposite direction to hair. Apply flannel or muslin lateral strips to leg (as

you would plaster strips) over the glued surfaces. Press to side of leg and bandage to fix the tractors. Ten minutes after application the weights may be applied to the end of the flannel tractors which are attached to a small piece of wood. From the latter is suspended the cord, holding weight.





At the Hôpital St. Nicholas—10 minutes' walk out of the Gare de Versailles—Dr. Barthe de Sandfort holds his ambrine clinic. While I was there I saw many severe burn cases, second and third degree types, extensive in character; also many cases of trench feet, all undergoing this treatment.

For the past two years I have been using ambrine with varying success. Dr. George Chaffer, of Syracuse, N. Y., attending surgeon

to the Senet Solvay works, employing thousands of workingmen, became interested in this line of treatment, and, together, we worked by this method. Dr. Chaffer agrees with me that it offers the best means of combatting extensive burns, based on an experience of some 200 very bad cases—not to mention hundreds of minor cases so treated.

Dr. de Sandfort has three clinics going at once treating burns, his able assistants carrying on the work in his presence, and, as Carrel has given to the surgical world the technique of using the Dakin fluid, claiming that 80 per cent of the treatment depends upon its proper application, so De Sandfort has given his ambrine treatment for burns and trench feet, and claims that the proper application of it is most essential in effecting a good result.

The treatment of trench foot is essentially the same as for burns only in the early stages, where the feet are swollen, distorted, and painful from exposure to the cold. They are placed in long containers filled with hot liquid and olive oil and held there for 30 to 40 minutes daily. In the out-patient department I saw a half dozen cases of frozen feet treated in this manner, two of whom were having their fourth daily treatment, departing from the hospital as being cured that day. In conversing with the other cases present, I was informed that on the second treatment they felt intense relief from this painful condition, and that after a few more treatments, they, too, expected to be discharged cured.

As ambrine has not hitherto been easily obtainable in the United States, I have been using the following substitute for the past year with good results:

Formula: Beeswax, white, 20 parts; crude petroleum, 5 parts; resin, powdered, 5 parts; paraffin, 70 parts.

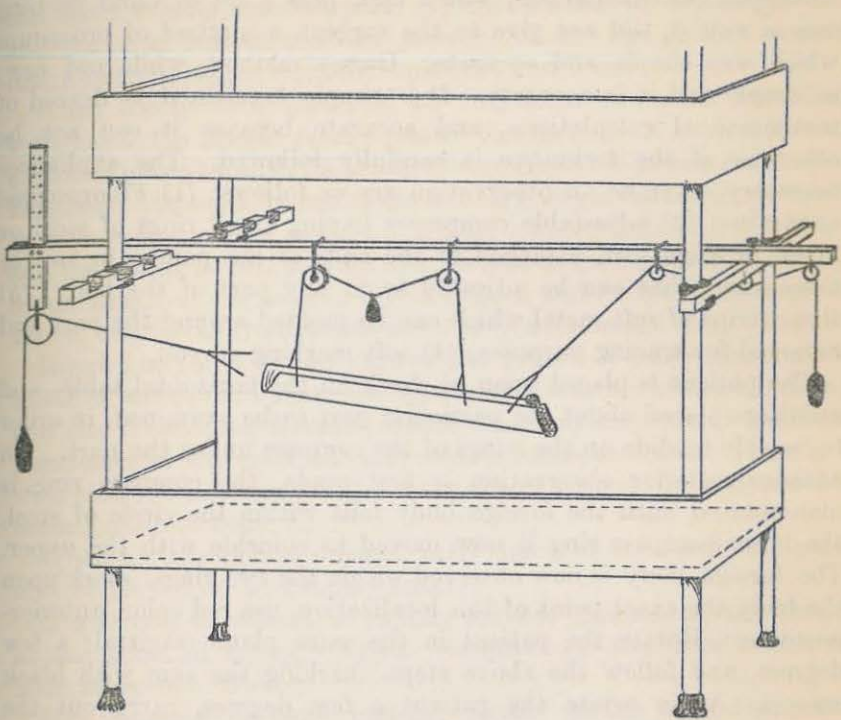
Melt paraffin by heating to 220 F.; add beeswax and resin; add crude petroleum and stir with ladle; boil for 10 minutes. Pour out into small sterile molds and cover with sterile gauze till used.

In the treatment of keloids resulting from burns of marked degree, at this same hospital I witnessed the application of creosote (Beechwood), 1 part in 15 parts of sterile olive oil.

From 10 to 20 minims were injected hypodermically beneath the base of the keloid and gently massaged to disseminate the fluid about the tissues. This is repeated every other day.

Radiographic observation.—It is a well-understood fact that frequent X-ray and fluoroscopic observations are absolutely essential in war surgery, not only in diagnosing fractures and observing the progress of repair, but in localizing foreign bodies, such as shrapnel, bullets, and steel splinters. This procedure involves the use of many plates, and new methods had to be developed in order to meet the conditions as they arise. Mr. Harold Gage has charge of the

X-ray department at Ris Orange. His recent publication on "Simplified X-ray Methods" stamps him as being one of the foremost radiographers developed in the progress of the war. Through his courtesy I viewed many radiograms, plates, and fluoroscopic tracings, showing every manner of fracture in every stage of repair, sequestra, foreign bodies, etc. In order to save plates and the great expense incurred in developing same, Mr. Gage has developed a technique of using celluloid sheets, spread over the fluoroscope



1 piece hard pine 6 feet by 1 inch by ¾ inch (with window at end for bracket bar).
1 piece hard pine 3 feet by 1 inch by ¾ inch (opening for pivot).
1 piece hard pine 3 feet by 1½ inches by ¾ inch (notched every 3 inches).
1 piece hard pine 2 feet by 1 inch by ½ inch (to be inserted in window of support bar).
6 small pulleys—rope.
4 small sand bags.
4 set screws clamp to hold crossbars to bedposts. If not available, ordinary bandages will do.
1 pivot screw for connection with support bar and head crossbar.

screen, and the outline of the fractured bone, sequestra, and foreign body is marked with crayon. Later a tracing from the celluloid sheet is made on tissue paper. This latter tracing is attached to the other charts that follow the wounded man throughout the course of his treatments. It is obvious that this will save considerable expense and time and give ample opportunity to make frequent observations and at the same time be constantly in touch with the progress of repair (osteogenesis). Bromine paper is used to a great extent as a

substitute for plates. In using this type of paper it is advised to use an intensification screen and shorten the spark gap of the tube, more than in ordinary direct radiography. The great value of bromine paper lies in the fact that it produces a good picture, can be stored better, transported a long distance, without danger of breaking and destroying same.

Localization of foreign bodies (Gage).—Heretofore the best methods of localization of foreign bodies depended for the most part upon mathematical calculations, which fact, plus a lot of blind probing into a wound, did not give to the surgeon a method of procedure which was simple and accurate. Gage's method, while not new, is simple and it is accurate. It is simple because it is devoid of mathematical calculations, and accurate because it can not be otherwise if the technique is carefully followed. The appliances necessary to make an observation are as follows: (1) Fluoroscopic apparatus; (2) adjustable compasses having small rings of steel or metal of some sort, attached to the ends of the points, in two or three sizes, that can be adjusted to fit any part of the body; (3) three strips of soft metal which can be molded around the part and removed for tracing purposes; (4) soft marking crayon.

The patient is placed upon his back on the horizontal table, and sandbags placed about the particular part to be examined, in order to be able to slide on the wings of the compass under the part. An anterior-posterior observation is first made, the compass ring is manipulated until the foreign body falls within the circle of steel, the lower compass ring is now moved to coincide with the upper. The foreign body is now observed within the two rings; mark upon the body the exact point of this localization, use red color, anterior-posterior. Rotate the patient in the same plane (sagittal) a few degrees, and follow the above steps, marking the skin with black crayon. Again rotate the patient a few degrees, carry out the observation, and mark with yellow. We have now three observations all marked (anterior-posterior) by means of the soft crayons, red, black, yellow. Using one of the soft, malleable strips, mold same about the plane of observation, and transfer the crayon marks to the metal strip; remove the strip, and re-form upon paper a replica of the contour of the part examined. With a ruler connect the marks, red with red, black to black, etc. Where these lines intersect, the foreign body is located.

Advice given by Capt. C. Leriche, at ———, base hospital, France, in regard to the treatment of fractures and concerning the treatment of injuries to joint surfaces by fragments from shell fire. In many cases of elbow and knee injury, primary subperiosteal resection of a joint is necessary, because, in many hundreds of cases not treated in the above manner infection sooner or later resulted, which not only destroyed the joint and rendered it useless but necessitated

amputation of the affected member. Loss of the joint cartilages also made the above procedure imperative.

Where joint surfaces were not damaged, attempt should always be made at a primary suture of the joint.

Battle fractures are caused by shell splinters for the most part, and not by bullets, as one would expect (always infected, as clothes and dirt are present). Two types of fractures are met with always: (*a*) Fracture due to bullet, resulting in a clean punctured drilling through the bone and soft part; (*b*) fracture due to shell fragments and tumbling bullets, plus the presence of dirt and clothes carried into a ragged, jagged wound of soft part and bone.

When tissues thus traversed by fragments of bullets are filled with blood, the missile causes greater destruction, as it produces an explosive effect beneath the skin and in amongst the muscle and fascia. Example: The vasti, or quadriceps muscle group of the thigh, are much more lacerated by the passage of a steel splinter than skin and bone, and the law of liquids prevails, for the hole in the skin may be merely a puncture, but the muscles above named, and for the reasons given above, will be badly shattered for a very wide area.

Injuries to the bone itself are of two types. There is the contact fracture, where the bullet rests against the bone without penetrating and the penetrating fracture, where the medullary cavity has been punctured by the projectile and soon becomes infected. There is a wide laceration of muscles about the site of injury; also considerable comminution of bone.

When no infection is present, early union of bone and soft parts may be looked for by primary suture.

If infection is present, it rapidly spreads through all the tissues at the point of injury. Agent: Streptococci and bacillus capsulatus aërogenes (Welch).

Gas gangrene develops rapidly, usually killing periosteum and endosteum in the medullary canal, and soon this develops into an open wound in the long bone itself, which eventually becomes the seat of chronic infection, thus preventing union and taking years to effect a cure.

Treatment of contact fractures: (*a*) Prophylaxis of infection; (*b*) change at once (within six hours, if possible) accidental wounds to surgical wounds, by free excision of skin fascia and muscles; (*c*) look carefully along the path where bullet passed, removing every manner of débris; (*d*) do not touch bone unless to cleanse ends, which may have dirt or débris attached to them; (*e*) strive for primary suture after the wound has been thoroughly cleansed by use of tincture of iodine (5 per cent strength); 80 to 90 per cent of such fractures should heal by primary suture if only 6 or 8 hours separate receipt of wound and surgical intervention.

Penetrating fractures are complex in that the bone is now infected. Make no attempt to reset bone. Never remove fragments of bone forcibly. Remove only those fragments which are loose, in order to clean the infected area. Do not touch periosteum. Thoroughly clean skin and muscles with 5 per cent iodine solution. Open site of injury freely. Use Carrel-Dakin solution, striving for secondary closure.

Penetrating fractures demand thorough cleansing for the medullary cavity and ends of the bone; also surrounding parts before attempting secondary closure.

Carrel-Dakin solution, as per technique, is the best method to secure secondary suture.

Dr. Leriche has had large success in elbow, knee, and tarsal joint cases, where good results followed secondary suture of joints.

Summary: Fractures are best treated with splints, modified after the Jones or Thomas type, with elevation in Bradford or Balkan frames.

Early immobilization begins a few minutes after the injury has been received in the front-line trenches, dugouts, or underground hospital.

Early traction also established at the above points and maintained in the transportation of the wounded to the base hospital.

Dr. Leriche lays great emphasis upon early surgical intervention, as the shorter the interval from the time when the patient is injured to the time when he arrives at the base, the more favorable will be the chances of primary suture.

Infection controlled at once by above-quoted method and primary suture resorted to in all cases when the patient arrives within the allotted time (within eight hours).

Base hospitals are equipped especially for this work, having X-ray machine shop, splint equipment machine shop, the Carrel-Dakin apparatus, so that, if necessary, patient can go through his entire convalescence at the first base hospital without being further transported to the rear.

The French have worked for three years on the following system: Chief of staff at base hospital No. 1; assistant chief of staff at base hospital No. 2; other assistants, generally specialists, at base hospital No. 3.

Team play from the trenches to the hospitals, esprit de corps, all along the line, and enthusiasm prevail among the component units of the system.

Four French armies are working under this system:

Base hospital No. 1, at ———, *France.*—Four hundred-bed hospital for treatment of fractures. Dr. Thevonot, chief of staff. Fifteen kilometers from line. Building protected from attack. Several operating rooms, X-ray rooms, laboratories and blacksmith shop.

Patients received within six hours remain until primary union has taken place, then sent to hospital No. 2 at ——— if a big drive is under way at this particular sector of the line, otherwise he can remain until his full convalescence.

Here primary suture of wounds was done in 40 per cent of all cases. Of these 80 per cent were successful. All fractures of the arm and lower leg sutured primarily.

In fracture of the thigh, Dr. Thevonot is not convinced of the advisability of primary suture because of the intense lacerations of muscle tissue. Thigh fractures cleaned up surgically under the Daken-Carrel method were sutured secondarily.

Base hospital No. 2, at ———, Dr. Patel in charge.—Two hundred beds for active cases, 200 beds for convalescents. Same equipment.

It is here that frequent radiographic observations are made on fracture cases. The general run of cases is as follows: (*a*) Old ununited fractures; (*b*) osteomyelitis cases; (*c*) vicious unions; (*d*) comminution fractures.

In the last type of fracture, Dr. Patel wires the comminution with ordinary fisherman's wire.

FORMULA OF SURGICAL DRESSINGS USED IN FRENCH BASE HOSPITALS AND TO BE USED IN THE AMERICAN BASE HOSPITAL.

1. Hypotonic solution for dressing infections of gas bacillus: NACL, .10 parts; distilled water, 1,000 parts.

2. Quinine solution for B. pyocyaneus infections: Quinine hydrocloride, 1 part; NACL, 8.75 parts; distilled water, 1,000 parts.

3. Acetic acid solution for dressings: Acetic acid (glacial), 10 parts; NACL, 8.75 parts; distilled water, 1,000 parts.

(NOTE.—Dilute to one-tenth of 1 per cent of salt if used for continuous irrigation.)

4. Bicarbonate of soda solution for dressings: Sodium bicarbonate, 10 parts; NACL, 8.75 parts; distilled water, 1,000 parts.

5. Physiological salt solution for dressings: NACL, 8.75 parts; distilled water, 1,000 parts.

Hypertonic salt solution for dressings: NACL, 25 parts; distilled water, 1,000 parts.

EUSOL DRESSING (FORMULA).

Take 135 c. c. of the liquor, calcis chlorinatae (B. P.) and dilute with water to 1 liter; add 10 grams of boric acid and shake well till dissolved. The solution should remain clear and ready for use.

If eusol is made in this manner, the 135 c. c. of liquor calcis chlorinatae should be diluted to 750 c. c., and the 250 c. c. of boric solution added. This will prevent the formation of a precipitate which occurs if boric acid is added to the undiluted liquor calcis chlorinatae. By this method of using two stock solutions, eusol can readily be made.

This solution is used chiefly by the British surgeons in progressive sterilization of wounds. In strength of 1–200,000 it has some antiseptic power. It is frequently used for irrigations and wet dressings in 1–1000 to 1–5000 strength.

A ROUTINE MILITARY HOSPITAL TREATMENT FOR SYPHILIS IN FRANCE.

Drugs used: Novarsenobenzol (Billon), cyanide of mercury 1 per cent solution in ampoules of 1 c. c. (dose, 0.01); grey oil, 40 per cent. Local applications to chancre, etc.

First course.

Days.		Gram.	Grams.	Gram.
1	Novarsenobenzol, intravascular	.....	0.30	.....
2	Cyanide of mercury, hypodermic injection	.....	.....	0.01
3	Cyanide of mercury, hypodermic injection	.....	.....	0.01
4	Cyanide of mercury, hypodermic injection	.....	.....	0.01
5	Novarsenobenzol, intravascular	.....	0.45	.....
6	Cyanide of mercury	.....	.....	0.01
7	Cyanide of mercury	.....	.....	0.01
8	Cyanide of mercury	.....	.....	0.01
9	Novarsenobenzol, intravascular	.....	0.60	.....
10	Cyanide of mercury	.....	.....	0.01
11	Cyanide of mercury	.....	.....	0.01
12	Cyanide of mercury	.....	.....	0.01
13	Cyanide of mercury	.....	.....	0.01
14	Novarsenobenzol, intravascular	.....	0.75	.....
15	Cyanide of mercury	.....	.....	0.01
16	Cyanide of mercury	.....	.....	0.01
17	Cyanide of mercury	.....	.....	0.01
18	Cyanide of mercury	.....	.....	0.01
19	Cyanide of mercury	.....	.....	0.01
20	Novarsenobenzol, intravascular	.....	0.90	.....
20	Grey oil	0.10	.....	.....
27	Novarsenobenzol, intravascular	.....	0.90	.....
27	Grey oil	0.10	.....	.....
34	Novarsenobenzol, intravascular	.....	0.90	.....
35	Grey oil	0.10	.....	.....
41	Novarsenobenzol, intravascular	.....	0.90	.....
42	Grey oil	0.10	.....	.....
		0.40	5.70	0.15

Allow 30 days' rest.

Begin second course.

Second course.

Days.		Gram.	Grams.
1	Novarsenobenzol, intravascular	.....	0.45
	Grey oil, intramuscular	0.10	.....
8	Novarsenobenzol, intravascular	.....	0.60
	Grey oil, intramuscular	0.10	.....
15	Novarsenobenzol, intravascular	.....	0.75
	Grey oil, intramuscular	0.10	.....
22	Novarsenobenzol, intravascular	.....	0.90
	Grey oil, intramuscular	0.10	.....
29	Novarsenobenzol, intravascular	.....	0.90
	Grey oil, intramuscular	0.10	.....
		0.50	3.60

After second course, allow two and one-half months' rest. At the end of six months make a Wassermann examination of blood and spinal fluid.

Third course.

Seventh month. Same as course No. 2, regardless of Wassermann.
Three months' rest. Wassermann (end of eleventh month).

Fourth course.

Same as course No. 2 (end of eleventh month).
Four months' rest. Wassermann—if negative, no treatment. If positive, begin treatment with course No. 2.
Four months later. Wassermann—if negative, no treatment. If positive, begin treatment with course No. 2.
Five months later (end of second year). Wassermann—if negative, no treatment. If positive, begin again with course No. 2.

THE RAPID ISOLATION AND TYPING OF MENINGOCOCCUS STRAINS FROM CARRIERS.[1]

By J. E. HOUGHTON and L. L. BULL, Assistant Surgeons, United States Navy.

A modification of the slide agglutination method introduced by Krumweide [2] for the identification of the meningococcus both simplifies and shortens the procedure. The present technique of fishing colonies, inoculating slants of suitable media, growing the organism 12 hours or longer, preparing a standard bacterial suspension, then further incubating the organisms in varying dilutions of monovalent and polyvalent sera for 18 hours at 55 C., has seemed an unduly long and tedious process. It must be mentioned that the agglutinating sera for this method are all used in low dilutions and as some workers have contended that these sera show a "proagglutinoid" reagin or some factor interfering with the reaction, such has not been the case in this work. In connection with agglutination reactions it may be here mentioned that in determination of pneumococcus types the antisera are all used in a comparatively lower dilution than those used in this work. However, checking the slide agglutination method with the macroscopic at 55 C. on a considerable number of strains isolated from both spinal fluids and carriers has proved satisfactory in 100 per cent of tests. (See table.)

The monovalent sera used were prepared by inoculating rabbits with cultures of normal or regular (strain 1) and para (strain 60) obtained from the Rockefeller Institute through the kindness of Dr. P. K. Olitsky. Polyvalent sera furnished by Dr. Simon Flexner and a commercial product were used.

The technique of the test is practically the same as that recommended by Krumweide. Colonies having the lenslike appearance and butyrous consistency and staining characteristics of the meningococcus are emulsified in a drop of 1:10 normal horse serum on a glass slide (1 drop from a 1 mm. capillary pipette). Organisms read-

[1] Reported from the laboratories of the U. S. Naval Medical School, Washington, D. C., and of the Naval Training Station, St. Helena, Norfolk, Va.
[2] Krumweide, C.: Jour. Am. Med. Assn., Aug. 4, 1917, p. 358.

ily emulsifying in the horse serum and showing no agglutination are considered M. catarrhalis or Meningococcus. Those showing agglutination are immediately ruled out as being the M. flavus group, pharyngeus siccus, or one of a number of the pigmented cocci. A 3 mm. loopful of normal-type serum is rubbed into the milky slide-emulsion and should agglutination take place is considered a normal or regular type coccus. Should no clumping appear a loopful of para-type serum is added. Finally the addition of a loopful of polyvalent serum immediately demonstrates white flocculi. Now, if no reaction has been noted with the monovalent sera and definite agglutination occurs with the polyvalent, the organism is considered as being the irregular type. Slight reaction in either one of the two types of sera and complete in the polyvalent are termed "irregular normal" or "irregular para" strains. Clumping is readily seen without the aid of a lens and takes place readily at room temperature, being observed as a curdy coagulation or much like snow-flakes. When stained the Gram negative cocci are shown in large clumps, many completely filling the microscopic field. Influenza-like bacilli, so often found along with the meningococcus in confluent plate growths, do not interfere with the reaction and are oft-times shown scattered between the clumped cocci. The dilutions of antiserum by this method are about 1:10.

Media for cultivation of meningococcus.—Ordinary nutrient agar (beef extract 5, peptone 10, sodium chloride 5, water 1,000, agar 25) having a reaction of plus 0.3 to 0.5 to phenolphthalein or neutral to litmus, to which is added 3 to 5 per cent of defibrinated, laked, or citrated blood (goat, sheep, or human), offers a satisfactory medium for cultivation. Whole-blood media are preferable in that hemolytic organisms are immediately eliminated. Growth is rapid and luxuriant after 16 to 18 hours' incubation at 37 C., the colonies appearing from 0.5 to 2 or more millimeters in size. The preparation of more complex and difficultly prepared media, as veal infusion, the so-called harmone agar, and the addition of dextrose seems not only an unnecessary procedure, but inadvisable from an economical standpoint at least. The first consideration is the time and expense involved in preparing meat infusion; secondly, the addition of dextrose to the media offers a substance which rapidly undergoes acid formation and tends to cause rapid destruction of this fragile microorganism.

Rapid death of the culture has long been recognized as being due to acid production.[1] It is of course admitted that dextrose does to a slight degree enhance the early growth, but the point to be brought to notice is the prevalence of acid-forming bacteria in the mouth and nasopharynx, which exert an inhibitory reaction on meningococcus on sugar media due to the acid produced. It must be con-

[1] Hiss and Zinsser: Textbook of Bacteriology, 1915.

sidered the acid formation of the salivary organisms, rather than the action of saliva, which is said to exert an inhibitory action.[1] Swabs from a number of carriers planted on dextrose-free blood agar plates yielded numerous colonies of meningococcus in large zones of hemolysis due to a hemolytic streptococcus and pneumococcus, the growth being seemingly unimpaired. Inoculation from the same carriers of swabs taken in the same manner on blood agar media containing from 0.5 per cent to 2 per cent dextrose demonstrated only a few scattered colonies, isolated from the hemolytic areas. For stock transplants and cultures the starch medium of Vedder is very satisfactory.

The cumbersome West swab[2] was discarded as being impractical for field use, difficult to properly prepare, and easily broken. The most convenient form of swab is an 8-inch length of galvanized-iron wire tipped with cotton,[3] with the last inch and a quarter bent through an angle of 30 to 40 degrees. These are put up in bundles of 24 each, wrapped in muslin and sterilized. With a little practice they are easily passed under the arch of the palate at either side of the uvula, during phonation, the patient saying "Ah!" The swab having been taken it is sown without delay on a spot near the edge of the blood-agar plate and distributed with a bent glass rod, which is easily sterilized by placing in alcohol and passing through flame, or with platinum or Nichrome wire loop.

From an examination of several thousand cultures and a trial of the various methods and media, the foregoing has been adopted as the most simple and expeditious procedure in the isolation and identification of the meningococcus.

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[1] Gordon, Flack, and others: Report of Research Committee on Meningitis, Great Britain, 1917.
[2] Foster and Gaskell: Cerebro-spinal Fever, 1916, p. 134.
[3] Stitt: Practical Bacteriology, Parasitology, and Blood Work 1916.

Comparison of macroscopic (55 C.) and slide agglutination.

Coccus.	Macroscopic 55 C.—18 hours.															Slide method.				
	Normal horse.	Normal type serum 1.					Para-type serum 60.					Polyvalent sera R. I. M. S.				Normal horse.	Normal (1).	Para (60).	Polyvalent.	Remarks.
	1–50.	50.	100.	200.	400.	800.	50.	100.	200.	400.	800.	100.	200.	400.	800.	1–10.				
1...	−	+	+	+	+	±	±	−	−	−	−	+	+	+	+	−	+	−	+	
2...	+	−	−	−	−	−	−	−	−	−	−	+	+	±	−	+	−	−	+	M. flavus.
3...	−	+	+	+	−	−	−	−	−	−	−	+	+	+	±	−	+	−	+	
4...	−	+	+	+	+	−	+	+	−	−	−	+	+	+	+	−	+	−	+	
5...	−	+	+	+	+	−	±	−	−	−	−	+	+	+	−	−	+	−	+	
6...	−	+	+	+	±	−	−	−	−	−	−	+	+	+	±	−	+	−	+	
7...	−	+	+	±	−	−	+	+	+	±	−	+	+	+	+	−	+	+	+	
8...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	M. catarrhalis.
9...	−	+	−	−	−	−	+	+	+	+	±	+	+	+	+	−	−	+	+	
10...	+	−	−	−	−	−	−	−	−	−	−	+	+	±	−	+	−	−	+	M. flavus.
11...	−	+	+	+	+	−	+	−	−	−	−	+	+	+	−	−	+	−	+	
12...	−	+	+	+	+	±	+	±	−	−	−	+	+	+	±	−	+	−	+	
13...	−	−	−	−	−	−	+	+	+	−	−	+	+	+	−	−	−	+	+	
14...	−	+	−	−	−	−	+	+	±	−	−	+	+	+	+	−	−	±	+	
15...	−	+	−	−	−	−	+	+	+	±	−	+	+	+	±	−	−	+	+	
16...	−	+	+	+	+	−	+	−	−	−	−	+	+	+	+	−	+	−	+	
17...	−	+	+	+	−	−	+	±	−	−	−	+	+	±	−	−	+	−	+	
18...	−	+	+	+	+	+	±	−	−	−	−	+	+	+	+	−	+	−	+	
19...	−	±	−	−	−	−	+	+	+	+	±	+	+	±	−	−	−	+	+	
20...	−	+	+	+	±	−	+	−	−	−	−	+	+	+	+	−	+	−	+	
21...	−	+	+	+	+	±	±	−	−	−	−	+	+	+	−	−	+	−	+	
22...	−	+	−	−	−	−	+	+	+	±	−	+	+	+	−	−	−	+	+	
23...	−	+	+	+	±	−	±	−	−	−	−	+	+	+	±	−	+	−	+	
24...	+	−	−	−	−	−	−	−	−	−	−	+	±	±	−	+	−	−	+	Do.
25...	−	+	+	+	−	−	+	+	+	+	±	+	+	+	−	−	±	+	+	
26...	−	+	+	+	+	−	±	−	−	−	−	+	+	+	−	−	+	−	+	
27...	−	+	+	+	−	−	−	−	−	−	−	+	+	+	+	−	+	−	+	
28...	−	±	−	−	−	−	+	+	+	−	−	+	+	+	±	−	−	+	+	
29...	−	+	+	±	−	−	−	−	−	−	−	+	+	−	−	−	+	−	+	
30...	−	+	+	+	±	−	±	−	−	−	−	+	+	+	+	−	+	−	+	

ABSTRACT OF MEDICAL AND SURGICAL CONFERENCE.

At one of the recent bimonthly meetings for medical officers of the hospital and navy yard, Mare Island, Cal., Passed Assistant Surgeon C. F. Charlton, United States Naval Reserve Force, reviewed the statistics of venereal disease in the Navy and quoted statistics for New York City. He concluded his paper by emphasizing the medical officer's duty at this juncture, not only to keep men fit for duty, but, as far as possible, to keep them on duty while receiving treatment. "Generally speaking, our business is not 'as usual,' for we are now trying to maintain the greatest number effective instead of trying to cure them, and in venereal disease there is not complete coincidence of these two objectives."

Assistant Surgeon R. E. Kriz, United States Navy, read a paper entitled:

ULTRA-VIOLET AND SOLAR RAY THERAPY.

After references to Rollier and the marvelous results he has obtained in the treatment of tuberculosis by solar rays, he says:

"The local effect of the ultraviolet rays are quite analagous to the natural sun rays. They produce a dermatitis or sunburn of a greater or lesser severity governed by the length of the exposure, which does not tend to produce scarring. They may be said to be germicidal, soothing and antipruritic, stimulative and constructive, or caustic and destructive, depending on the length of the exposure, the distance from the light, and the amount of ray generated. We may also speak of them as superficial or deep, depending on the pressure produced on the parts exposed.

"Therefore, in the treatment of disease, especially those of the skin, the above properties and those which I will speak of later must be kept in mind.

"What the exact function of the pigment is and what relation it has to skin diseases, I am free to confess I do not know. However, it is a well-recognized fact that the dark-skinned people in the native state have few skin infections. Rollier found that blonds who would not tan under the actinic ray treatment would not improve. This, therefore, shows a relationship between pigmentation, the ultraviolet ray, and diseases of the skin which is yet to be explained physiologically.

"General conditions which must be kept in mind in the treatment of different cases are as follows:

1. Dark people stand more light than individuals of lighter complexion; brunettes more than blonds.
2. Persons who tan easily when exposed stand more than those who blister readily.
3. A congested skin has more toleration than normal skin. Hence the precaution of protecting the normal skin in treatment.

4. A thick skin, especially one which rests upon a large amount of fat, stands more light than a thin, dry skin.

5. A tough skin stands more than a sensitive skin.

6. A pigmented skin requires more than one free from pigment.

7. Certain parts of the body—for example, the palms and the dorsum of the hands and corresponding parts of the feet and face—require more light than those parts covered by clothing.

8. The head and other parts covered by hair stand more than parts not covered by hair.

9. The genitalia stand the ray in moderate doses.

10. Mucous membranes stand the light in fair doses.

11. In acute conditions the treatment should be conducted once every second or third day. Treatment should never be more than eight days apart. A chronic condition is best treated daily.

INDICATIONS IN SURGERY: ADJUVANT.

1. Surgical tuberculosis.
2. Fistulae of all kinds.
3. Badly healing sores.
4. Ulcers of all types (cutaneous).
5. Festering wounds.
6. Furunculosis.
7. Nevi.

INDICATIONS IN INTERNAL MEDICINE.

1. Disturbances in metabolism, such as chlorosis, anemia and high blood pressure.
2. Tuberculosis of the lungs.

INDICATIONS IN GYNECOLOGY.

1. Bleeding uterine myomata.
2. Gonorrhea.
3. Metrorrhagia.

"Its most efficient place is, however, in dermatology, and here it is the most efficient and far-reaching therapeutic agent in the armamentarium of dermatology, and surely its application is more pleasing to the patient than salves and lotions, etc.

"It is to be remembered that the technic of radiation must be in line with the desired result in view. It is practically impossible to formulate a universal rule for its applications. The technic in general which we use is as follows: The normal skin around the lesions is protected as far as possible. The first exposure being given at a distance of 40 inches. In acute cases from one to two minutes, in chronic conditions from three to six minutes. In the succeeding sittings increase the time three minutes until the time reaches 15 minutes, then decrease the distance 3 inches at each sitting until a distance of 18 inches is reached at which sitting you keep until the case is dismissed. We have never had a condition which needed this amount of raying.

"The conditions in which the ultra-violet ray is considered a specific are as follows:

1. Lupus vulgaris.
2. Lupus erythematosus.
3. Sycosis vulgaris.
4. Tenia sycosis.
5. Seborrhea dermatitis.
6. Alopecia areata.
7. Pityriasis rosea.
8. Pityriasis versicolor.
9. Trichophytosis.

"It is adjuvant and clears up the following:

1. Chronic eczema.
2. Pruritis.
3. Acne and acne vulgaris.
4. Furunculosis.
5. Decalvans.
6. Psoriasis.
7. Acne rosacea.
8. Obstinate syphilitic swellings (with specific treatment).
9. Vitiligo (temporarily).
10. Premature baldness.
11. Chancroidal ulcers.
12. Dermatitis venenata.

CASES TREATED.

"We wish to apologize for not giving a very elaborate history, however, we believe that the history would be of little value and only take up unnecessary space.

"Three cases of tenia sycosis, one case of which refused to improve under the ordinary treatment, all of which were cured after six radiations each.

"Five cases of tenia vulgaris, 1 case cured in 14 days, 3 in 18 days, and 1 in 21 days.

"Five cases of pityriasis rosea were cured after three radiations each.

"Four cases of pityriasis versicolor were cured after two radiations each.

"Nine cases of leg ulcers due to different types of infection which failed to heal under the regular treatment, all of which were cured in from 5 to 21 days.

"One case of scabies which would not completely clear up with the sulphur treatment, cleared up on the second exposure.

"Five cases of psoriasis, two of which were of the acute type, cleared up with four treatments each. Two cases of two years' standing cleared up with six treatments each, and one case of five years' standing which was practically general cleared up with 10 exposures.

"Four cases of seborrhea of the bearded area who have had three treatments each were much improved.

"Seven cases of seborrhea dermatitis were cured in one treatment each.

"One case of suppurating tubercular glands of the neck stopped suppurating after the fourth treatment.

"Four cases of chronic eczema, two of four years' standing and two of two years' standing cleared up after five treatments.

"Two cases of dhobie itch (ringworm fungus) cured after three treatments each.

"One case of intertrigo with secondary eczema which was treated for five months by ordinary methods and continually getting worse, was cured in 10 days.

"One case of chancroidal ulcer of the thigh which was treated by the ordinary procedure for eight weeks without improvement. This ulcer was circular with a diameter of 3 inches. This was completely cured in 14 days.

"Three cases of dermatitis venenata (poison oak) were cured in three treatments each. So far as we know we are the first to report cured in this condition. Here we have applied a special technic which we will report later after working up a larger series of cases, if we find that they respond as well as the above."

Medical Inspector J. S. Woodward, United States Navy, read a paper entitled—

PURPURA HEMORRHAGICA,

from which the following is extracted.

"It is supposed that purpura is dependent upon some substance—toxin, bacteria, drugs, etc.—which destroys the platelets and leaves the red cells less resistent. To this may be added another factor, an aplasia of the blood platelet forming elements of the marrow. Among the chief diseases and conditions which appear to influence its origin are scurvy, acute infectious diseases (measles is given prominently among this type), septicemia, certain malignancies, nerve affections, certain drugs, iodides, belladona, mercury, turpentine, and snake venom.

"The case which gives us a reason for this paper is one that presents many features of purpura due to infection. I am of the opinion that the infection was solely responsible and that the type simulated closely a purpura abdominalis. The patient was originally admitted with measles. After a short period in the measles ward, he started to bleed from both nostrils and had profuse hemorrhage. Packs were resorted to with fair success, but a marked anemia was the result.

Later he was transferred to a ward, with a complicating otitis and hemorrhage from the left ear. There were purpuric areas in front of the left ear, behind the left ear and on the lips, and several spots on the face, all of which oozed or bled with little or no provocation. Due to the fact that a streptococci infection was found in the ear and that a focus of absorption was deemed responsible for the tendency to hemorrhage, a mastoid was performed disclosing a hemorrhagic condition of the deeper tissues, the cells of both the tip and the zigomatic base. The sinus itself was not thrombosed. Bleeding was continuous throughout the operation. The blood was then pale in color, but with no appreciable increase of clot time. A firm pale clot was rapidly formed. Prior to operation, patient had had two administrations of antidiphtheritic serum. After operation, he was placed upon 15-grain doses of calcium chloride and salicylates were continued. The areas under this treatment rapidly cleared. There was no further bleeding from the bowel, kidneys, or from the former bleeding surfaces. I might add here that he had two one-half dram doses of ergot, which apparently had some controlling affect. Death five days after operation.

"At the autopsy, two large hemorrhages into the mesentery were found in the abdomen. There were petechial hemorrhages into the heart muscle itself. The lateral sinus was found thrombosed and a septic pneumonia. I do not believe that we benefited his condition by an operation. The symptoms of continued bleeding from the bowel, the hemorrhages found post-mortem, and the cutaneous hemorrhage would lead me to accept this as a type of purpura abdominalis, and together with the above points in common, there was an involvement of the left wrist for several days prior to death.

"I believe that the otitis had no more than an intensifying influence on the termination. Measles was the prime factor.

"In septicemia, or the so-called septicopyemia, gastrointestinal symptoms are principally gastroenteritis, with vomiting, frequent serous discharge, and a diarrhea of mild intensity—septic diarrhea. The hemorrhages are punctiform in character into the skin itself, with occasional and more extensive ecchymosis, scarlatinal eruptions also present, but these are less characteristic. As far as I am able to ascertain in the literature, there is no direct hemorrhage from the skin or mucous membranes due solely to a septic infection. Renal symptoms are those of septic nephritis; albumen, tube casts, red and white corpuscles, but no distinct hemorrhage. Virulent attacks terminate within 48 hours. The mildest type may terminate favorably, but this is rare. The effects are not dependent upon the dose of infection but upon the virulence of the organisms."

Medical Inspector J. S. WOODWARD, United States Navy, read the following paper:

A CÆCAL VENT FOR RELIEF OF PARALYTIC ILEUS AND POST-OPERATIVE GASSING.[1]

In the post-operative treatment of intestinal lesions, varying from obstruction to acute peritonitis, resections, and anastomosis, we have found that the simple procedure of a colostomy and insertion of a small catheter has practically eliminated the distressing gassing so constant in these cases.

The technique used here has been entirely satisfactory and there seems to be no contra indication. After whatever surgical procedure required has been performed, with a No. 0 chromic gut suture a purse-string suture is implanted in the cæcum 1 or 2 inches from the caput coli; a perforation in the center of this admits a No. 10 or 12 soft rubber catheter, implanted about 2 inches into the lumen of the bowel; tighten the purse string about the catheter and invaginate; another purse string reinforces the first; secure the catheter by a single stitch through the lateral wall—a small stab of the abdominal wall gives egress to the catheter. Here it is secured by a single suture, silk-worm gut or horsehair; the gut is held closely to the peritoneum by the catheter and outside fixation, or in case of other drainage is led out through the original incision, no especial attempt being made to approximate the gut and peritoneum.

Retention is obtained as long as desired by increasing the strength of the suture material. In our cases the catheter is removed from the fifth to seventh day, with the skin suture; there has been no complication. Closure of both bowel and skin wound is rapid.

Post-operative convalescence is easy and comfortable. Morphine, one-eighth to one-sixth grain, the day of operation is all that has been required. Except for the usual ether vomiting, which is lessened, nausea has not been present. Gastric lavage for dilation and hiccough have been unnecessary. The drainage of gas and fluid fecal content does away with gas enemata and other medication. A dressing about the tube or leading into a bedside receptacle cares for the drainage. In addition to these advantages, fluid in the form of drips or nutrient enemata are administered and the flushing of the entire large bowel as often as desirable through the catheter eliminates a large amount of toxic material. The size of the catheter can be increased or lessened and has a distinct advantage in our opinion over the large tubes and open end drainage of numerous other methods.

In a recent series of 10 cases this method has given entire satisfaction, with so much comfort to the patient and so little worry to the

[1] Since this paper was read six more cases treated with satisfactory results have been recorded.

attendants one is almost inclined to use it as a routine in abdominal work. Appended is a summary of 10 cases in which venting has been used in this hospital:

J. R. W. Corporal, Marine Corps. Chronic dysentery, amebic; appendicostomy for irrigation; tube placed in appendix. Convalescence uneventful. Dysentery cured.

E. N. B. Printer, United States Navy. Age, 31. White; male. Ventral hernia, post-operative. Patient had previously been operated for gall-bladder drainage, with resulting hernia in scar. During manipulation and freeing of adhesions a loop of ileum was practically severed. A lateral anastomosis was performed, the hernial condition repaired, cæcum vented, and wound closed without drainage. Recovery uneventful.

G. Ensign, United States Navy. Age, 27 Carcinoma at splenic flexure; a short circuiting (ileum to descending colon). Sypmtoms peritonitis on fifth day; marked distention, vomiting, temperature 102°, shock. Drainage of both iliac fossæ and cæcostomy. Easy convalescence, no gassing or distention. Continuous drip through catheter in cæcum.

J. H. M. Machinist's mate, second class, United States Navy. Age, 29. Chronic constipation. Ileo-colostomy. Cæcum vented. No complications. Convalescence uneventful.

R. E. H. Fireman, second class, United States Navy. Age, 22. Diagnosis undetermined. Operated on admission. Belly tension. Upper right quadrant tender. Vomiting; bile-stained fluid; no fecal odor. Marked distention. Preoperative diagnosis; perforated duodenal ulcer. Entrance through right rectus high. Mass of omentum containing pus in center; resected exposing an abscess beneath right lobe of liver, in the pus of which a formed fecal concretion was found, which had escaped from the perforated tip of a long retro-cæcal appendix. Appendectomy, tube drainage, and cæcum vented. Mild shock; no gassing or distention. Uneventful convalescence. Cæcostomy tube disappeared on fifth day and was followed through the large bowel by X-ray; passed on third day.

G. H. Hospital apprentice, first class, United States Navy. Age, 20. Acute appendicitis. Appendical abscess. Appendectomy, drainage; cæcum vented. Uneventful convalescence.

W. B. K. Musician, first class, United States Navy. Age, 33. Intestinal obstruction. Post-operative. Belly generally tender; distended. Vomiting, bile-stained fluid; fecal odor. Marked pain at operation; an adhesion of ileum to left abdominal wall, across which there was a complete twist of the bowel above the adhesion on its mesentery; adhesion freed; bowel and mesentery returned to normal position. Cæcum vented. Convalescence uneventful, except for an ether pneumonia, which terminated favorably by resolution.

J. E. F. Pharmacist's mate, United States Navy. Age, 24. Acute appendicitis. Abscess from perforation. Appendectomy; drainage. Cæcum vented. Convalescence uneventful.

T. E. C. Hospital apprentice, first class, United States Navy. Appendicitis, acute. Perforated appendix. Peritonitis. Appendectomy; tube drainage; Cæcum vented. Convalescence uncomplicated.

J. N. F. Chief water tender, United States Navy. Age, 59. Gall stones. Impacted stone in ampulla of Vater. Removed through transduodenal incision. Gall-bladder drainage. Cæcum vented. Convalescence uneventful.

THE PHYSICAL EXAMINATION OF MORE THAN 8,000 APPLICANTS FOR THE UNITED STATES NAVY.

By J. A. B. Sinclair, Acting Assistant Surgeon, United States Navy, and G. B. Story, Passed Assistant Surgeon, United States Naval Reserve Force.

During the period from October 1, 1916, to December 31, 1917, over 8,500 applicants for service in the United States Navy were examined by the medical officers on duty at the Portland, Oreg., recruiting station, with the following results:

Total applicants	8,500
Total enlisted	5,385
Examined by medical officer	8,500
Rejected by medical officer	3,115
Per cent of rejections	36.6

PRINCIPAL CAUSES OF REJECTIONS.

Deformities:		Hernia inguinal, not operated	140
Marked spinal curvature	152	Hernia umbilical, not operated	3
Deformity of chest	7	Hernia femoral	3
Deformity of fingers	8	Hernia incisional	5
Deformity of elbow	12	Intermittent pulse	11
Genu valgum	8	Aneurism (aortic arch)	1
Genu varum	5	Mental diseases	21
Hallux valgus	16	Deflected nasal septum	7
Hammer toes	23	Nasal spurs	5
Pes cavus	3	Hypertrophy of turbinated bones	24
Deformity of arm	2	Skin diseases	24
Deformity of forearm	4	Defective teeth	94
Deformity of legs	6	Pyorrhea	47
Deformity of thigh	3	Tuberculosis and tubercular suspects	51
Deformity of jaw	5	Tuberculosis of bone	6
Ingrowing toenails	13	Varicocele (medium and large) symptoms	91
Harelip	3	Varicose veins	26
Ear:		Blenorrhea	37
Defective hearing	84	Syphilis	12
Other auditory diseases	16	Hypospadias	9
Eye:		Phimosis	14
Color blindness	170	Loss both testicles	3
Defective refraction	386	Testicles partially descended in canal	9
Corneal opacity following ulcer	4	Atrophy, both testicles	1
Corneal ulcer	2	Hydrocele	12
Ptosis	5	Chronic appendicitis	7
Conjunctivitis	5	Goiter with symptoms	12
Strabismus	7	Malingering	4
Iritis	2	Enlarged tonsils	13
Ectropion	1	Defective speech	5
Congenital cataract	1	Rheumatism	6
Flat feet	82	Colitis	2
Weak feet, not flat	21	Facial paralysis	2
Heart affections (organic)	354		
Tachycardia	6		
Bradycardia	2		

Chicken-pox	1	Disfiguring birthmarks	6
Measles	1	Enlarged cervical gland	18
Asthma	4	Stricture urethra	3
Gastric ulcer	2	No evidence citizenship	16
Intestinal adhesions	4	Undesirable	40
Fistula in ano	14	Under age	49
Hemorrhoids	26	Under height	42
Nephritis	8	Under weight	210
Chronic pleurisy	4	Poor physique	72
Thoracotomy	7	Obscene tattooing	6
Muscular atrophy	3		

During the period considered the per cent of rejections was materially decreased by the following factors:

First.—In April and May, 1917, a large number of young men, students in the various high schools, colleges, and universities of the Northwest, many of whom were athletes in training, presented themselves for examination. These applicants were physically and mentally far superior to the average recruit. In one group of over 30 men from one of our colleges there was not a single rejection.

Second.—Elimination of the grossly unfit by enlisted men in charge of substations and traveling parties. In our opinion, however, good men are lost by such an arrangement, and many recruits were saved by instructions to substations to keep in touch with each and every case which was in any way doubtful, until the station was visited by the medical officer.

Third.—Patriotic services rendered by local dentists. A number of applicants with insufficient number of sound and also with defective teeth complicated by pyorrhea and gingivitis were cared for without cost to the applicants and thus reclaimed for service.

Fourth.—Like services were rendered by local specialists for the correction of eye, ear, nose, and throat conditions which were causes for rejection. Specialists also rendered opinions on skin affections. X-ray examinations were made for us to eliminate possible tuberculosis in light-weight applicants.

Fifth.—Surgical operations were performed upon applicants, temporarily rejected for hernia (inguinal, umbilical, femoral, and incisional), hydrocele, varicocele, varicose veins, phimosis, undescended testicles, amputations of ankylosed fingers, hammer toes, fistulæ, and hemorrhoids. These operations were performed in a large part by the examining surgeons, and also by certain patriotic local surgeons without charge to the applicants. The greater part of the hospital expenses involved were sustained by patriotic citizens of Portland, Oreg., and Spokane, Wash. The Sacred Heart Hospital made arrangements by which the men could easily send back money for their hospital expenses after going into the service.

Sixth. Cases were also saved to the service by giving a list of instructions to applicants who were under weight and in need of routine hygiene, a large number of such cases returning to be accepted after having attained the standard requirements by following the instructions given.

Seventh. Cooperation with the physical directors of the local athletic organizations made it possible for a number of young applicants presenting themselves with moderate spinal curvatures to be accepted, after having taken an appropriate course of physical exercise.

As the result of these services over 400 men who were temporarily rejected were made fit for service.

Among the conditions encountered which were at first confusing we noted:

Defective hearing.—Most of these cases gave a history of otitis media, scarlet fever, or tonsillitis, while a few gave a history of trauma. Two cases having undergone mastoid operations had practically normal hearing. A number of applicants whose hearing was defective on first test, showed normal hearing after cerumen was removed. The whisper test alone was used in all cases.

During the examination of hearts, on inspection, our attention was repeatedly attracted to a line of dilated skin venules, from half inch to 1 inch in breadth, extending along the right costal border, across the ensiform cartilage, and thence along the left costal border. This condition was so frequently associated with an apex beat displaced to the left and below the normal position and with organic cardiac murmurs, that we believe that it is a point which may prove to be of some clinical significance in suspecting abnormal cardiac conditions. We have been unable to explain this condition, and suggest that possibly it may be due to mechanical causes, such as abnormal cardiac impulse against the chest wall and local interference with venous circulation.

Practically all of the cases of organic heart lesions gave a history of either rheumatism, tonsillitis, pyorrhea, diphtheria, pneumonia, scarlet fever, or typhoid fever, and roughly in about the order here given. These cases invariably showed more or less cardiac enlargement, and yet in not a single case was there any evidence of failing compensation, though the majority of applicants discovered with this condition were under weight. Blood pressure findings in these cases were frequently normal.

A diagnosis of "athlete's heart" was made in a number of cases, this condition occurring most frequently in men employed in indoor occupations such as bank clerks, who had engaged spasmodically in competitive athletics like handball, squash, football, rowing, etc.,

many of the heart lesions in these men being associated with more or less anemia.

The influence of sudden change of altitude was often noted. Men who came from elevations as high as 4,000 feet to practically sea level in a few hours, which was quite frequent, showed such marked temporary disturbance of circulation that it was necessary to continue our observations for a few days in order to allow adjustment to new conditions to take place.

Remarkably few cases of syncope occurred during the physical examination. Undoubtedly the majority occurred from psychic influences, as they occurred in groups, two or three fainting at the same time.

One case of aneurism of the arch of the aorta was discovered, the findings being confirmed by X-ray.

Functional murmurs.—This condition offered the most difficult problem in the examination of recruits. Several years ago the Bureau of Medicine and Surgery issued instructions that great care should be exercised in the differential diagnosis between functional and organic murmurs, and further that true functional murmurs should not be rejected. We are in possession of abundant evidence that this advice was timely and wise. Functional murmurs are most commonly audible over the pulmonic valve area, next at mitral, next aortic valve areas. In other words, they are nearly always at the base, always systolic in time, faint and blowing in quality, and not transmitted beyond the præcordia. They are not constant and frequently disappear in a few days, while an organic murmur is constant. Of course, there is no characteristic change of pulse with functional murmurs, as there is at times with organic ones. Nevertheless, the two varieties are hard to differentiate and a conclusion can sometimes be reached only after repeated examinations, which have resulted in quite different decisions. We repeat that to us the proper placing of functional murmurs has been quite the hardest thing for us in the physical examination of recruits, excepting possibly, the detection of beginning tuberculosis. The X-ray has been made use of to some extent to eliminate tuberculous lesions, but we do not feel that our experience in this matter has been sufficient to report upon.

Bunions.—A number of cases of bunions have been operated upon, the Fowler operation being selected and our results have been most satisfactory. All cases operated upon by the examining surgeons have been accepted.

In arriving at conclusions regarding flat, weak, painful and deformed feet no single test was relied upon. Prints, measurements, running, and jumping tests were all employed and we believe that

by giving due consideration to all these methods of diagnosis men have been proven to have strong serviceable feet, who at first inspection showed apparently weak and flat feet.

Cases showing slight enlargement of the thyroid without symptoms in men especially fit for service, and free from other defects, were accepted, proper note being made in their health record. In only one case of thyroid enlargement was exopthalmos present.

Patience in determining the presence or absence of defective color sense proved valuable, and our relatively low percentage of rejections for color blindness is probably attributable to this. The error of too quickly dismissing a man who has placed skeins wrongly soon became evident to us, and instruction circulars sent by us to postmasters and physicians in the smaller towns advised against the employment of the test by them.

It is suggested that all examiners adopt a *system* of examination, a regularly repeated routine, one which takes cognizance of the whole applicant in serial order of his parts.

This prevents unnecessary repetition and the unintentional overlooking of any part of the examination. This routine should start in the reception room and end in the recruiting officer's room with the swearing in of the man.

We believe the hearing test would be simplified by the employment of the whispered voice only, the man looking directly away from the examiner and an assistant stopping the ear not under examination. The ticks of different watches vary much in loudness, and the close proximity of the examiner helps the man to guess where the watch is.

In the "Hints for the Inexperienced in Naval and Marine Corps Recruiting" the print test is mentioned, though not praised. In our opinion it should be discarded. It has not been used in this office for several years; but before putting it aside we noted that feet which by actual measurement of the distance between the tubercle of the scaphoid and the line from lower border of the internal malleolus to the lower tubercle on head of the first metatarsal showed one-half inch or less were sometimes flat when judged by the print test, and conversely some feet which failed to make flat prints showed three-fourths inch and more between the aforesaid point and line, while still others were encountered which were actually *weak* as shown by the running and jumping test, with a distinct limp and admission of painful (Morton's) third toe and heel pain, but which were not flat by either print or measurement. Too many good men have been lost from "flat foot."

Most of the Siwash Indians and most Negroes and Filipinos are flat-footed, but no one who has undertaken to follow a Siwash up mountain trails would accuse him of the possession of weak feet. They, like many white men who went barefoot when boys and whose

fathers and grandfathers did likewise, have bulky plantar muscles and fatty pads underneath them.

The number of men who have been surveyed for "pes planus" has been greatly enhanced by their desire to get out. (Do not let the examined hear you say much about flat feet.)

A recruiting officer (Medical Corps or Line) feels no particular qualms of regret when an applicant is found upon examination to have multiple causes for rejection, but on the other hand a most disappointing feature of recruiting duty is the necessity for rejecting otherwise good men for single causes.

The question then arises; Can this disappointment be modified or eliminated? It can be modified, and many men can be saved to the service. It is essential that the medical officer have a heart in his work. If a would-be recruit is summarily dismissed without v uchsafing him an explanation of his rejection, he usually leaves sans cheer and sans any particular tendency to overcome his defect and return for another examination. In our experience lads who at 17 to 20 years of age were underweight or undeveloped or had spinal curvatures have come back in from six months to three years and been accepted. We know how readily a boy's physique is improved at the naval training stations, and we have a number of times been able to accept men who six months before were rejected for above-mentioned causes and who carried out the advice offered them upon ;e ection. This advice has been particularly in reference to symmetrical exercises, to be faithfully and regularly carried out. Some have accomplished the end by joining the Y. M. C. A. classes and others have worked in other gymnasia, while one lad told us that he did his work in his back yard. He had been rejected for a spinal curvature which in about six months was sufficiently straightened to justify accepting him. It is suggested that distinction between slight gradual lateral spinal curvatures and the angular variety be made clear to new examiners. Of course the straightening process will continue at naval training s ations. As with flat feet and functional murmurs, too many men have been rejected for this condition.

Men have been saved at our substations by keeping a list of rejections with addresses. With the exception of such mani estly bad cases that the petty officer in charge knows there can be no chance with the medical officer, these men are told upon rejection that they might have a better chance with the latter, and that they will be notified in due time of the next visit of the recruiting party. Upon a recent visit to our substation at Spokane, Wash., 12 such men reappeared for examination and 7 were accepted.

Men on substations should have prior experience in recruiting. Every man (except the yeoman) on duty in the Portland office is required to either watch or actually assist in the physical examina-

tions. Since the institution of this rule at this station, the number of men accepted at substations and later rejected at the Portland office has been far smaller.

Instead of summarily rejecting a man for defective teeth, he should be told that if he can arrange to have a dentist do the necessary work, usually the filling of several cavities, he will be accepted. He should be cautioned not to get temporary fillings, and to steer clear of the advertising "painless" dentist. In one instance we found the man had obtained two nicely polished silver surfaces on large gutta-percha fillings. The tops gave way under the pressure of a probe.

It is believed men are unnecessarily lost by rejection for piles, when the real condition is one of distention of the perianal veins. While these veins are frequently distended in connection with hemorrhoids, many cases are unassociated with actual piles. Hemorrhoids are of the hemorrhoidal veins, and from this standpoint there is no such thing as an external pile. If a true hemorrhoid is outside the sphincter, it is there by reason of protrusion from within and can be replaced. One might conclude, then, that hemorrhoids can be diagnosed only by palpation within the rectum or by speculum. By the latter, yes; but not by palpation. They can be diagnosed only by inspection. It is suggested that a suitable speculum be furnished recruiting offices to be used at least where piles are suspected. In our experience they have been frequently associated with varicose veins and varicoceles.

PIN-POINT METHOD OF SKIN GRAFTING WITH A NEW TECHNIQUE AND AFTER TREATMENT.

By J. Duff, Assistant Surgeon, United States Navy.

The wounds treated in the present war are, in a great number of cases, caused by shell fragments, and therefore more or less extensive. Infection has been successfully combated by the Carrel-Dakin and other methods, but frequently as much time is lost waiting for the skin to grow as in fighting infection and stimulating granulation.

Various methods of skin grafting are well known, but the Rividin, or pin-point method, has proved, at least to the writer, to be the most efficient. The Thiersch graft, if successful, is most excellent, but unfortunately success is not common. Skin scrapings may or may not take. Usually they do not. At best it is only a haphazard method.

The Rividin method presents obvious advantages. Many small bits of skin are used and if a few die they do not preclude the success of the operation, for the remaining grafts will grow just as well. On the other hand, if the large Thiersch grafts fail the whole operation must be repeated. The technique and after treatment herewith

presented is not in the experimental stage, because of the fact that it was absolutely successful in all but two of the 50 or more cases in which it was used.

The grafts may be autogenous or homonomous, the end results from both being practically the same. For convenience the autogenous graft is usually the most desirable. The grafts may be taken from any part of the body, but the area selected should be that which is subjected to the least possible strain, pressure, and tension postoperatively in order that the maximum of comfort may be assured the patient.

TECHNIQUE.

Anesthetic.—Any of the local or general anesthetics may be used. However, if the area to be grafted is of considerable size, a general anesthetic should be employed. Local anesthesia with one-half per cent cocaine or 2 per cent novocain is frequently very satisfactory, but care should be taken not to infiltrate the tissues, for grafts taken from skin in this condition rarely take. Sensation should merely be blocked by the intracutaneous injection of the solution.

PREPARATION OF THE SKIN FROM WHICH THE GRAFTS ARE TO BE TAKEN.

First day.—The skin should be thoroughly washed with soap and water for 10 minutes with sterile sponges. Next a soap poultice, made by saturating sterile gauze with sapo mollis, should be applied and allowed to remain for at least 10 minutes. This is a most important part of the preparation, for it softens the skin, making cutting easy. When the poultice is removed wash the skin with normal salt solution, follow with alcohol, which should be given time to evaporate, and apply a dry sterile dressing.

Second day (just before operation).—Scrub the skin with sterile sponges and soap and water for five minutes, wash with normal salt solution, and dry with a sterile towel. Surround the prepared area with sterile towels or sheets and cover with a sterile pad.

Preparation of the area to be grafted.—In the first place, the granulations should be as clean as possible; that is, they should be comparatively free from pus. This may be accomplished by frequent wet dressings for a few days before grafting. At the time of operation, if the granulations extend above the surrounding skin they should be rubbed down with dry sterile gauze until they are on a level with the skin. The process of rubbing down the granulations should not be hurried. Firm, long strokes are preferable to short, sharp ones. The most distressing complication occurring from rubbing down the granulations is hemorrhage, but this is easily controlled by the application of sterile gauze wet with hot normal salt solution and pressure applied for 7 to 10 minutes. When the gauze is removed, the denuded

surface will be found to be covered with a moist, glistening film of blood clot which, when exposed to the air for a few moments, dries and proves a most admirable resting place for the grafts. If there is any bleeding when the gauze is removed, pressure should be again applied or operations suspended for a few moments until the blood is clotted, for the grafts stick and grow very much better on a surface that is primarily dry. The skin about the denuded area should now be thoroughly cleaned, dried and coated with 7 per cent iodine. Care should be taken that none of the iodine reaches the new grown epithelium, extending inward from the margin of the wound, because it will invariably kill the growth. Exuberant granulations about the margin of the wound may be hindered and often prevented by painting them, preoperatively, when they show the slightest indication of becoming troublesome, with tincture of benzoin compound once or twice a day. The avoidance of injury to this marginal epithelium is of great importance, because if it is destroyed the process of repair is thereby materially lengthened. When the denuded area is dry and the surrounding skin has been painted with iodine, the part should be draped with sterile towels or sheets. Asepsis is imperative throughout the whole operation.

Technique of cutting the grafts.—Contrary to the general belief, large pin-point grafts—we have frequently taken them three-eighths of an inch in diameter—prove quite as effective as the minute ones. In fact, the larger ones are preferable, as they grow more rapidly and there is less chance of their being removed with the dressing. A cambric needle, about size 5/10, held in a heavy hæmostat, at any convenient angle, is probably the best instrument for elevating the skin preparatory to cutting. The snap provides a firm hold and enables the operator to avoid all unnecessary movements, thereby saving time, which is always a factor, and facilitates the application of the grafts at the desired points. A cambric needle should be used because it does not cut through the skin when tension is applied. The needle should be thrust into the skin only so far as to assure a firm hold, for, besides proving inconvenient when coming in contact with the knife blade, it may perforate the deep layers of the skin and traumatize unnecessarily the malphigian layer, from which growth occurs. All unnecessary trauma to this layer should be avoided, particularly the practice of drying the drop of blood or serum that frequently appears on the cut surface of the graft, because this substance proves, as it dries, a most admirable cement.

A knife with a thin blade, about 6 inches long and a quarter of an inch wide—we use an old worn amputating knife—will be found best for the following method of excision: When a conical elevation of the skin has been made with the needle, the incision is made, starting close to the heel of the knife, one stroke severing the graft, cutting so that the surface to be applied is concave rather than convex.

This method of excision, gives the cut graft an umbrella shape, which makes application more easy and sticking qualities far better. A graft with a convex surface and cut with a short knife which, because of the necessary short strokes, produces a very rough surface is, even from a mechanical standpoint, undesirable.

The distance that the grafts should be from one another is of very little importance. The most important point to be remembered is that they should be first of all planted about the margin of the area so that they will unite as soon as possible with the marginal epithelium. When the grafts have all been applied they should be exposed and dried for about 10 minutes. In cutting the grafts, particularly on a curved surface, if the first are taken at the lowest possible point and each row successively higher, the inconvenience of having the skin from which the grafts are being taken covered with blood will be avoided.

Immediate postoperative dressing.—Compress cloth, or any other nonabsorbable material, with very small diamond-shaped perforations about three-eighths of an inch apart, is a satisfactory protection when applied firmly immediately over the grafts. The firm and stationary application of this dressing is of the greatest importance, because it is the main protection for the grafts and the new epithelium. The critical period is the three days following the operation, and during this time pressure must be constantly applied to the grafts. By the liberal use of collodion and a loose sandbag this may be accomplished. For instance, if an area on the anterior aspect of the thigh has been grafted, one side of the compress cloth should be first stuck to the skin with collodion an inch to an inch and a half from the margin of the wound. When this has thoroughly dried, the two opposite corners should be grasped firmly between the thumbs and forefingers and stretched tightly. While it is still under tension it should be carried over the grafts and stuck on the opposite side with collodion. In this way, because of the natural elasticity of the skin, a constant pressure on the grafts is obtainable. Collodion should likewise be applied to the two remaining sides. The compress having been made fast, sterile gauze, moistened with warm normal salt solution should be firmly packed over it. A firm bandage over oiled silk and sheet wadding is now in order, and over this dressing, if the pressure is in any way doubtful, the loose sandbag should be applied.

The post-operative care of the graft.—We have found that for 12 hours after operation it is best not to disturb the first dressing. For the next 24 hours, new gauze, moistened, but not wet, with normal salt solution, should be applied every four hours. Almost invariably a considerable amount of pus is formed and this is very much better absorbed by moist rather than wet dressings. Such frequent dressings do not injure the graft because of the immovable compress dressing. For the second 24 hours similar dressings should be

applied every six hours and three times on the third day. For the next two days, depending on the amount of pus, one or two dressings should be done. By the sixth day, if ever, the grafts will have taken. The next problem is to remove the compress with the least possible injury to the new epithelium. Usually, in spite of all precautions, the serum has caused the cloth to stick to the grafts and if it is carelessly removed they are very likely to accompany it. This undesirable possibility may be prevented by soaking the part or the dressings for 5 to 7 minutes in a solution of chlorinate of soda (U. S. P.), 2 drams to the pint of hot water. Strong solutions of and long immersions in the chlorinate will kill the grafts. When the crusts have been softened, the compress should be cut with scissors just above the collodion and carefully removed. The remnants of the cloth may be removed at the same time or later. Some pus even now is usually present, so it is wise to apply a warm 2 per cent boric dressing for a day or so. An occasional application of a weak chlorinated solution for a short while often helps. Stimulating ointments should not be used until the pus has entirely disappeared. Very frequently, because of the stimulating effect of the ointments, the granulations surmount the grafts. This should be prevented by the judicious use of silver nitrate because the new epithelium will not grow over these obstacles.

When the grafts have started to grow well, all that is needed is a stimulating dressing once every day or two until the area is covered, and even when it is all covered a protective dressing of some sort should be worn for a reasonable period of time, because the new epithelium is very tender and sensitive to trauma.

USE OF CRÊPE PAPER BANDAGES FOR SURGICAL DRESSINGS.

By H. F. Strine, Medical Inspector, United States Navy.

With the increasing scarcity of cotton the necessity of finding some substitute for it is constantly growing.

During the past month bandages of crêpe paper, manufactured by the Dennison Manufacturing Co., have been used in the surgical wards of the United States Naval Hospital, Washington, D. C., with very satisfactory results, especially in cases where the simple retention of dressings is all that is desired. These bandages are remarkably strong, possess a considerable degree of elasticity, can be very neatly applied and are very much cheaper than gauze. It is believed that their more general use throughout the service will result in a distinct saving of gauze. In cases where there is much discharge from wounds or where moist dressings are used, the paper bandages can not be employed.

BOOK NOTICES.

A TREATISE ON CLINICAL MEDICINE, by *W. H. Thomson, M. D., LL. D.* Second Edition. W. B. Saunders Co., Philadelphia, Pa., 1918.

The book is charmingly and convincingly written. One can not read it without fervently longing for a better memory with which to retain the innumerable suggestions of value on diagnosis and treatment based on a personal experience which have made the author the master clinician. The sections on catching cold, vomiting, emaciation are interesting and illuminating. The author believes in the power of drugs and speaks with assurance and conviction of remedies that will cure. This is unusual but gratifying. There is a very general tendency in America to-day to speak disparagingly of drugs, due to the fact that men who are good in the laboratory, good surgeons, good diagnosticians, *do not know* the physiological action of drugs because they have long neglected this subject and so are unable to get results from their remedies. This is the age of vaccines and serums and some of our ultrascientific practitioners find themselves equipped with nothing better than a placebo when called to treat maladies for which vaccines and serums are not available. What is surprising in this truly attractive and valuable volume is the meagerness with which certain topics are handled, c. f., pellagra, beriberi.

LOCAL AND REGIONAL ANESTHESIA, by *C. W. Allen, M. D.*, Assistant professor of clinical surgery at the Tulane University of Louisiana. Second Edition. W. B. Saunders Co., Philadelphia, Pa., 1918.

To those familiar with the first edition of this work no word of commendation upon it need be addressed. To others the issue of this work will come as an agreeable surprise because of its fullness, completeness, and clearness. In the 23 chapters spread over six hundred and odd pages the history of local anesthesia is touched upon, pain, pressure anesthesia, all local anesthetics, the surgical uses of adrenalin, general principles of technique, the use of morphin and scopolamin, shock, the application of local anesthesia in the various parts of the body, such as the upper and lower extremities, the neck, the thorax, the abdomen, in hernia operations, the use of local anesthetics in genito-urinary diseases, spinal analgesia, the organs of speech, sense, and dental anesthesia are exhaustively treated. The book is amply illustrated. It should prove a valuable addition to the hospital library.

ANALYTIC CYCLOPEDIA OF PRACTICAL MEDICINE. Edited by *Charles E. de M. Sajous, M. D., LL. D., Sc. D.* Seventh revised and enlarged edition, F. A. Davis Co., Philadelphia, Pa., 1918.

This work in nine volumes reflects the greatest credit on the editor and his hundred active associates, among whom are numbered the foremost medical men of the day in Europe and America. By means of the Index-Supplement it has been possible to bring the book up to date in a literal sense so as to include the Carrel-Dakin methods, the paraffin treatment of burns and other recent developments largely confined hitherto to current periodical literature, brochures, and monographs.

MODERN UROLOGY. Compiled by *Hugh Cabot, M. D., F. A. C. S.* Lea & Febiger, Philadelphia, Pa., 1918.

Profusely illustrated work of 1,300 pages, in two large volumes. An interesting departure from precedent is the presentation in the first chapter of a brief history of American contributions to urology.

MODERN OPERATIVE BONE SURGERY, by *Charles George Geiger, M. D.* F. A. Davis Co., Philadelphia, Pa., 1918.

This is frankly a treatise on plastic bone surgery which considers only the autogenous bone transplant "for it is THE safe and sound procedure," according to Charles Geiger, presumably the same person as the Charles George Geiger, of the title page. From a rapid perusal of the book it is evident that the bone surgery described is that of Geiger and of Geiger only and done by his methods and with his instruments. In other words, it is a monograph without references or bibliography. Nothing could be more admirable than this form of presentation and nothing more satisfactory to the surgeon of experience who wishes to study the author's views and methods. The young surgeon just entering the field will not be satisfied with such ex parte judgements but will prefer to get a variety of views, especially on the treatment of a broken elbow or knee cap.

THE FITTING OUT AND ADMINISTRATION OF A NAVAL HOSPITAL SHIP, by *E. Sutton*, Fleet Surgeon, Royal Navy; Senior Medical Officer, R. N. Hospital Ship "Plassy"; Late S. M. O., R. N. Hospital Ship "Drina"; Late Surgeon, R. N. Hospital Ship "Malacca." John Wright & Sons, Ltd., Bristol, 1918.

The author, after more than three years' experience with hospital ships, is in a position to speak with authority. He treats his subject under four heads: 1. Evolution of the hospital ship. Geneva Convention. Uses and abuses of hospital ships in war time. 2. Conversion of passenger steamers to hospital use. 3. Ordinary organization (embarkation and disembarkation, book routine, departmental organization). 4. Emergency. So far as structure is concerned the author deals solely with the adaptation of ships from the passenger and freight service to hospital purposes, and makes no reference to

the designing and outfitting of a ship for this special use. The book is not intended to make entertaining reading but will repay careful study on the part of anyone facing the problem of organization and management of a hospital ship.

SYPHILIS AND PUBLIC HEALTH, by *Edward B. Vedder, A. M., M. D.*, Lieutenant Colonel, Medical Corps, United States Army. Lea & Febiger, Philadelphia, Pa., 1918.

The author offers the collected statistics with praiseworthy reserve as to their real significance. He considers *syphilis d'emblée* an established fact, cites illustrative cases of the transmission of syphilis by *conception*, and gives some interesting historical data regarding prophylaxis against venereal disease.

Of peculiarly vital significance to-day are the remarks under the heading: Ethics of Venereal Prophylaxis. Vedder establishes the postulate that "venereal diseases are not a punishment for immorality" and disproves the assertion that "the fear of venereal diseases deters many from vice." The conclusion regarding the propriety of prophylaxis is obvious, but the difficulty of employing it in civil life is pointed out. Prostitution as a sociological problem is ably discussed.

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.*