

equal amounts of sterile olive oil, producing similar trauma, do not give rise to reactions.

The agar reaction differs from the luetin reaction chiefly in a tendency to a more torpid course and a slower development.

Papular and pustular reactions may be produced, the latter being somewhat more hemorrhagic than those produced by luetin.

The percentage of positives in known syphilitics, eliminating doubtful reactions, varied in two series aggregating forty cases, from 50 to 70 per cent.

The normal persons and nonsyphilitics in my series did not react. The only positive case in which syphilis seemed to be eliminated was a case of urticaria pigmentosa with factitial urticarial phenomena. Two patients with gonorrhea in a total series of seventy-six reacted positively. Both were receiving vaccines with marked reactions. One patient with sycosis barbae, receiving vaccines with marked reaction, also reacted positively to the agar.

The influence of iodids could be eliminated from the series in which 50 per cent. reacted positively.



Fig. 10.—Iodid reaction to agar. Pustule ruptured on the sixth day. Patient with syphilitic aortitis, receiving salvarsan, intramuscular injections and 20 grains of potassium iodid, three times a day.

The positive reaction to agar as brought about by the internal administration of iodids was observed in typical form in three cases. It is simply a severe form of the luetin and agar reactions. In two cases in which iodids were being administered, the reaction to agar was negative.

The cutaneous reaction to both luetin and agar in syphilis is interpreted as non-specific in character and as a colloidal adsorption phenomenon in a hypersensitive or

labile skin. The theoretical considerations on which this view is based have been published in part, and a review of their possible bearing on the immunologic mechanism of syphilis will be published shortly.

RESULTS OF TESTS

Form of Syphilis	Positive		Negative Number
	Number	Per Cent.	
Primary	2	66	1
Latent	2	40	3
Secondary	3	43	4
Tertiary	6	55	5
Cerebrospinal	8	62	5
Total Early	46.6	..
Total Late	58.3	..

The importance of a further study and standardization of preparations of "luetin" is suggested. The foregoing studies suggest that the fragmented *Spirochaeta pallida* are not indispensable in the production of the reaction clinically known as the luetin test.

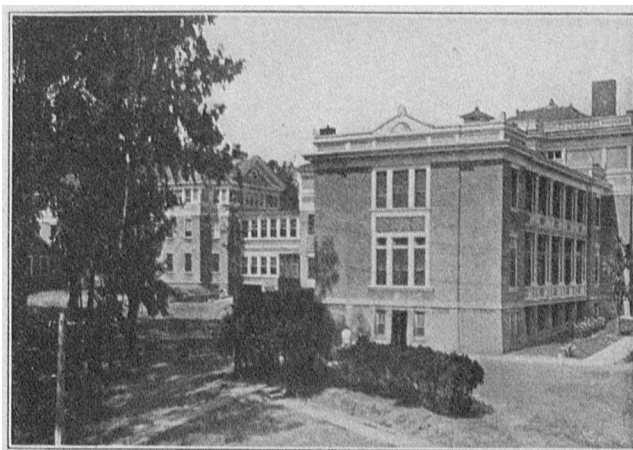
THE NAVY, AND ITS RELATION TO THE MEDICAL PROFESSION IN TIME OF WAR

R. C. HOLCOMB, M.D.

Surgeon, United States Navy

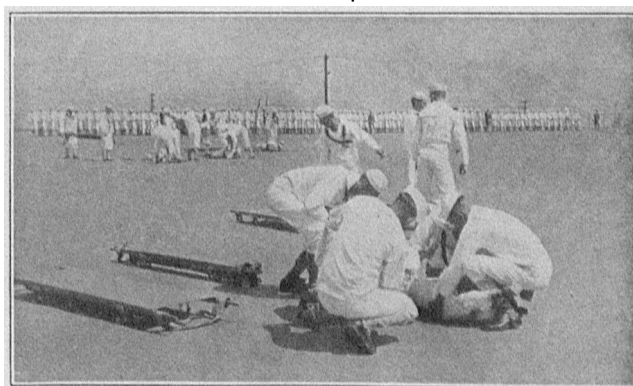
WASHINGTON, D. C.

For more than two and a half years we have been watching the evolution of a gigantic conflict involving



The naval hospital, Mare Island, Calif. This is one of a large system of naval hospitals maintained by the navy at the various naval stations along the east and the west coast of the United States.

the peoples of the greater part of Europe and Asia, our near neighbor Canada, and far off Australia. In these fateful days our sober thoughts search for a lesson from which we may profit. Our nation has been profoundly stirred by the horrors of this war, and it is not surprising that, being thus deeply stirred by the dangers of a general war conflagration, patriotic impulse searches for a method of expressing itself. Individuals and organized groups of individuals are coming forward, offering their skill and their services. But if we are without a clear understanding of the



Members of the hospital corps at drill. There are three large hospital corps training schools located at the various training stations, where the members of the hospital corps are instructed in their duties before going to naval hospitals or to duty aboard the hospital ships.

fundamental needs of the situation, if we are without a sympathetic exchange of purpose, if we are without a definition of requirements, the result will not aid our military and naval services, but will lead only to misunderstanding, confusion and bewilderment.

I have often found in discussing the needs of the Medical Department of the Navy that the subject is confused with the needs of the army. Plattsburg

camps and base hospitals occupy the field of mental vision, and the ocean and ships are somewhere far over the mental horizon. It is my purpose, therefore, as briefly as possible, to outline a concise statement as to where we should look for aid, and what circumstan-

the van. It is not, therefore, assistance in reorganizing the Medical Department of the Navy that we need, but assistance in organizing the civilian facilities outside of our sphere of naval influence to supplement the organization already a part of a great machine, so that when war comes, order and preparedness will take the place of confusion.

RECRUITING OFFICERS

We should first need to recruit our navy and marine corps to full strength. For this purpose, additional recruiting medical officers are lacking. Medical officers for our auxiliaries must be supplied. Auxiliaries are ships which carry supplies for the fleet—a sort of floating base which carries supplies of fuel, food and ammunition, and which contains ships employed as district scouts, ships employed with submarine and aeronautic activities of a district, and, not the least of these, the hospital ships.

To man most of these ships with medical officers we must look to our professional brethren who are now engaged in peaceful pursuits. The duties of the medical officer will take him on the ocean where his professional isolation is complete, and where he must solve from his own resources all the problems that may confront him. He should be a young man ready for any hardships, and possessing a large fund of temperamental compatibility.

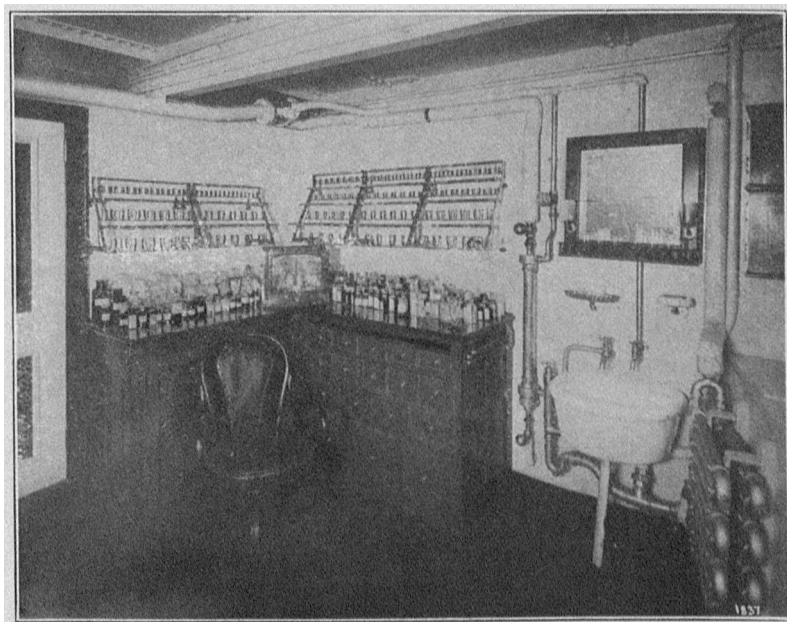
When our ships turn back from the sea bringing their sick and wounded, their destination will not be Chicago or St. Louis, but coast cities where we have our navy yards and stations, such as Boston, New York

Ward aboard the Hospital Ship *Relief*, utilized by the army as a hospital ship during the war with Spain, and later taken over by the navy. She is now unseaworthy, but is still used for hospital purposes at the Naval Station, Olongapo, P. I.

tial, national and other considerations must direct us.

To begin with, the fighting ships of the navy must be built before war descends on us. The protection that stands between our coasts and an enemy from over the sea is vested in the navy. Of all our frontiers, our ocean frontier is the greatest. Against an over-sea enemy the navy is the first line of defense. Our strength or our weakness at the beginning of hostilities will decide whether or not the invader can secure a foothold on our shores. What I wish to emphasize is that unlike an army, which can expand and expand as long as there is land to hold it and men to constitute it, the navy has limitations as to personnel and its requirements, limitations which can be quite accurately determined by the number of its fighting units before the outbreak of hostilities. It is not the number of men that constitutes a navy, it is the number of ships with trained men to man them. Battleships cannot be built in a day. The need for power on the sea, so far as our country is concerned, would be immediate. The navy must always be ready for war, not tomorrow, but today. For the navy that is unprepared there may be no tomorrow; for the personnel of such a navy tomorrow may be too late.

Our naval medical officers are a highly efficient body of specialists, always seeking the solution of the problems which are peculiarly theirs, and which belong to the man who must separate himself from normal or usual considerations. In the march of sanitary progress the naval medical officers have sought a place in



Dispensary aboard a battleship.

and Philadelphia, where the navy maintains navy yards and naval hospitals. As some of these hospitals may not be large enough to meet the requirements, we must look to the civilian hospital facilities at these places to help us out. Hence our interest is keen in the hospitals of these particular coast cities, and therefore

we have carefully compiled information of all the large municipal and private hospitals in these cities, tabulated, filed and kept up to date.

As not all of our bases promise such facilities as places like New York, Boston or Philadelphia, we have

probably should come back as victors or not at all. Some authorities have placed the possible casualties in a naval battle of large fleets, including the rescued enemy, at 3,000 wounded, 5,000 being the outside number of those who would have to be cared for. Cer-

tainly no naval fight up to the present time has left the fleets with such a large number of wounded as this. But there would also be the usual morbidity which is experienced in time of peace, the result of exposure, and the hazard of life on the sea. No one can say when, how or where an enemy will strike, and it therefore behooves us to be ready to handle the results of morbidity and battle anywhere along our thousands of miles of coast, where the activities of the navy may take us.

New problems of warfare are confronting armies. This may be illustrated by referring to Germany's western front. No longer do visible armies meet each other for a quick and decisive victory, but foes invisible to each other, encamped in dug-outs and fighting from trenches, are carrying on a sort of subterranean warfare, terrible and ruthless. Not that the older type has passed away, for the eastern front of Germany and Austria has been characterized by sharp and decisive campaigns of rapidly advancing troops; but this new type of warfare has been added to the older. The value of cavalry and light

artillery has not been destroyed.

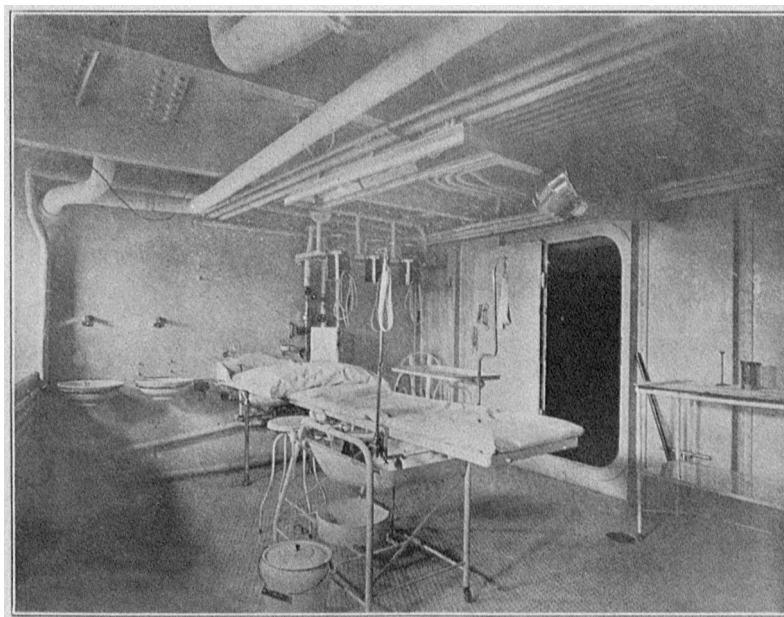
And so, too, navies are confronting a new type of warfare. But this newer method of warfare has been added without destroying the power and usefulness

asked the Red Cross to organize five hospital units. We have requested that three of these units be organized on the east coast, preferably at Boston, New York and Philadelphia, and that two be organized on the west coast, preferably at San Francisco and Los Angeles.

I do not wish to convey the impression that all the interest of the navy in civilian hospital facilities is limited to hospitals adjacent to existing navy yards and stations, for this is not true. The navy defends the whole coast, so that every hospital on the east or west coast or adjacent to these coasts commands our special interest. For purposes of defense the coast of the United States is divided into districts. Each of these districts has its scouts, submarines and ships of defense, its coast guard, and other district naval activities. Therefore a survey has been made and information compiled concerning all the important civilian hospitals in each naval district, so that these district ships and naval activities may know their district hospital facilities. In these hospitals we have the same keen interest that we have in the hospitals of those cities in which are located the large navy yards and stations—the home bases of our fleet in time of peace or war.

NAVAL CASUALTIES

There are never the overwhelming numbers of wounded after a sea battle that there are after a battle on land, for a modern sea fight is not a fight among individuals, but a fight of ship against ship, a fight between monsters, a fight for annihilation, and we



An operating room aboard a battleship. This room is completely equipped with sterilizing equipment, consisting of dressing, utensil and instrument sterilizers.

of battleships. This added menace, like the new problems confronting armies, is invisible in its essentials. It is submarine in character. In place of the trench and dugout we have the submersible boat. Medical personnel must adjust its ideas to the newer type of warfare as well as to the older. Brilliant triumphs in

surgery have little place here. Physical, chemical, bacteriologic and physiologic problems in their relation to the atmosphere and the human mechanism will demand careful consideration to insure the physical fit-

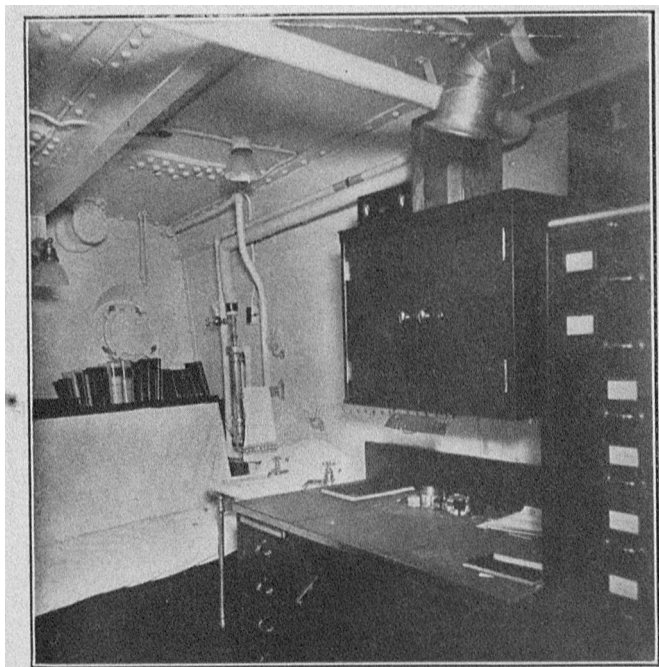
ness (corresponds with lieutenant-colonel in the army).

QUALIFICATIONS

A candidate for appointment in this corps must be between the ages of 21 and 32 years, must be a citizen of the United States, and must submit satisfactory evidence of preliminary and medical education. Original appointment in the medical corps is made only in the grade of assistant surgeon. For each advance in rank and grade the candidate is required to undergo a physical and professional examination. The examination for appointment is in two stages. The first examination qualifies the applicant for appointment in the Reserve Force. If successful the candidate then, on full pay, attends a course of instruction at the Naval Medical School, at the end of which course he appears for final examination for appointment in the Medical Corps. The pay of the various grades of the Medical Corps is given in the accompanying table.

The physical examination is thorough and the candidate is required to certify that he is free from all mental, physical and constitutional defects.

Acuteness of vision $\frac{12}{20}$ for each eye, unaided by glasses, but capable of correction by aid of lenses to $\frac{20}{20}$, is obligatory. Color perception must be normal and the teeth good.



Surgeon's examining room aboard a battleship.

ness and safety of the men who go down into the sea in these boats.

THE SICK OF THE NAVY

The sick of the Navy and Marine Corps are cared for solely by the medical officers of the service. There are two classes of medical officers; those who enter the regular service and adopt it as a calling for life and those who enter in a reserve capacity for four years at a time, obligating themselves to go on active duty at the call of the president.

PRELIMINARIES FOR APPOINTMENT

The preliminaries for appointment differ principally in the character and scope of the professional examination, which is more searching in the case of those coming in permanently, and due to go to the Naval Medical School for instruction and after this course to be examined, graded and commissioned in the regular service.

The regular medical corps of the navy today has nearly 400 officers. There are now nearly 300 vacancies, as the numerical strength of the corps has recently been fixed by law at 0.65 per cent. of the total strength (officers and men) of the Navy and Marine Corps, including midshipmen. Automatically, each increase in the total authorized strength brings with it proportionate increase in number of medical officers.

The lower grades of the Medical Corps advance in rank from time to time along with the officer of the line with whom they take precedence up to the grade of lieutenant commander (corresponding to major in the army). The new law authorizes that 0.5 per cent. of the Medical Corps shall be medical directors with the rank of rear admiral, 4 per cent. shall be medical directors with the rank of captain (corresponds to colonel in the army), 8 per cent. shall be medical inspectors with the rank of com-



SURGEON-GENERAL WILLIAM C. BRAISTED, UNITED STATES NAVY.
[Copyright by Harris & Ewing.]

If the candidate is found to be physically disqualified, his examination is concluded, but in the case of a candidate otherwise desirable the medical examiners may recommend that minor disqualifications or departures from standard be waived and proceed with the professional examination, subject to final approval by

the department; if found to be physically qualified, his professional examination is continued as follows:

1. Letter to the medical examiners, giving a brief statement of the candidate's general and professional education.

2. Written examination (a) anatomy, (b) physiology, (c) materia medica and therapeutics, (d) general medicine, (e) general surgery, and (f) obstetrics. Two or more questions are asked in each subject.

3. An oral examination is conducted in each of the above enumerated subjects.

4. The medical examiners will give careful consideration to composition and spelling as shown in the written papers submitted by the candidate.

5. As a general average, 75 per cent. is required.

With the consent of the medical examiners a candidate may withdraw at any time from further examination and may at a future time present himself for reexamination provided such examination is not delayed until after the date his permit would expire.

No allowance will be made for the expenses of candidates appearing for examination.

After approval of the record of examination and the recommendation of the medical examiners in the case of a qualified candidate the Bureau of Medicine and Surgery will recommend to the Bureau of Navigation the provisional enrolment of the candidate in the United States Naval Reserve Force.

The final physical examination is thorough in character. No person will receive an appointment whose physical condition may indicate the possibility of early retirement for disability.

The school examination will be on the subjects embraced in the course of instruction, such as naval and general hygiene, naval and operative surgery, tropical medicine and pathology, medical zoology, practical chemistry, bacteriology and serology, ophthalmology, Naval Regulations, Hospital Corps drills, and duties of the medical officer afloat and ashore.

Members of each school class, on graduating from the Naval Medical School, will be commissioned in the order of merit as determined on their examination, but not in excess of the number of vacancies in the Medical Corps.

Since no officer can be commissioned in the Medical Corps who is over 32 years of age, permits to attend the course at the Naval Medical School will not be issued to applicants who cannot complete the prescribed course and obtain their appointment while within the age limit.

NAVAL RESERVE CORPS

The act of Aug. 26, 1916, provided for a naval reserve force. A candidate for enrolment as a medi-

cal officer is first examined for enrolment in the provisional grade of assistant surgeon, rank of lieutenant (junior grade), United States Naval Reserve Force. After his enrolment, should he so desire, he makes request for active duty for confirmation in grade, and after the completion of a minimum period of three months' active service (at sea) he is again examined and, if found qualified, is recommended for a commission as an assistant surgeon, United States Naval Reserve Force.

Legislation establishing the United States Naval Reserve Force contains in substance matter referable to commissioned grades in the Medical Corps as follows:

A member must be a citizen of the United States.

He obligates himself to serve in the navy throughout a war or during the existence of a national emergency declared by the president, should either arise during his term of enrolment.

Enrolment is for a term of four years.

In time of peace, and when no national emergency exists, a member may be discharged on his own request, on reimbursing the government for any clothing gratuity that may have been furnished during his current enrolment.

A provisional grade (assistant surgeon) is given to him on first enrolment, in accordance with his qualifications determined by examination.

On his own request, he may, after enrolling, be assigned to active duty in the navy for such periods of instruction and training as may enable him to qualify for and be confirmed in grade.

For confirmation in grade a member must serve the minimum amount of active service required (three months in one period, or in periods of not less than three weeks each year), and must qualify by examination under regulations prescribed by the secretary of the navy.

No one can be appointed or commissioned an officer in any rank in any class of the United States Naval Reserve Force, or promoted to a higher rank therein, unless he has been examined and recommended for such appointment, commission or promotion by a board of three naval officers, or until he shall have been found physically qualified by a board of medical officers to perform the duties required in time of war, except that former officers and midshipmen of the navy who shall have left the service under honorable conditions and who shall have enrolled in the United States Naval Reserve Force may be appointed in the grade and rank last held by them without examination other than the physical examinations herein prescribed.

A member receives retainer pay of \$12 per annum while enrolled in the provisional grade, provided he

PAY AND ALLOWANCE TABLE

Grade, Rank, and Length of Service	Pay per Annum on Shore	Allowances per Annum for Quarters*	Total Pay per Annum on Shore	Pay per Annum at Sea
Asst. surg., passed asst. surg., and surg.:				
Rank of lieutenant (junior grade)....	\$2,000	\$432	\$2,432	\$2,200
Rank of lieutenant.....	2,400	576	2,976	2,640
After 5 years' service.....	2,640	576	3,216	2,904
After 10 years' service.....	2,880	576	3,456	3,168
After 15 years' service.....	3,120	576	3,696	3,432
Rank of lieutenant commander.....	3,600	720	4,320	3,960
After 5 years' service.....	3,300	720	4,020	3,630
After 10 years' service.....	3,600	720	4,320	3,960
After 15 years' service.....	3,900	720	4,620	4,200
After 20 years' service.....	4,000	720	4,720	4,400
Medical inspectors, rank of commander:				
After 15 years' service.....	4,500	804	5,304	4,950
Medical directors, rank of captain:				
After 15 years' service.....	5,000	1,008	6,008	5,500
Medical directors, rank of rear admiral:				
Lower half.....	6,000	1,152	7,152	6,600
Upper half.....	8,000	1,206	9,206	8,800
Surgeon general, rank and pay of rear admiral				

* Both within and (on shore duty) beyond the continental limits of the United States, but only when quarters are not furnished by the government.

Note.—There are also liberal allowances for fuel and light on shore at home and beyond the continental limits of the United States, the amount varying according to rank, season, and the latitude of the station at which the officer is serving.

makes such reports concerning his movements and occupation as may be required by the secretary of the navy. After confirmation in grade, his annual retainer pay is two months' base pay of the corresponding rank in the navy. Retainer pay is in addition to any pay to which a member may be entitled by reason of active service. Members of the Volunteer Naval Reserve do not receive any retainer pay.

A member who reenrolls for a term of four years, within four months of expiration of last complete enrolment, and who has performed the minimum amount of active service required during the preceding term of enrolment, for each reenrolment receives an increase of 25 per cent. of his base retainer pay. A member who completes twenty years of service, and who has performed the minimum amount of active service during each term of enrolment, on his own application will be retired with rank held, with a cash gratuity equal to the total amount of his retainer pay during his last term of enrolment.

Employment may be accepted in any branch of the public service, except as an officer or enlisted man in any branch of the military service of the United States or any state thereof.

A member is subject to the laws, regulations and orders for the government of the regular navy only during such time as he may by law be required to serve in the navy in accordance with his obligation, and when on active service at his own request, and when employed in authorized travel to and from such active service in the navy.

A distinctive badge or button will be issued to be worn only by members of the United States Naval Reserve Force. A penalty is assigned for unauthorized persons to wear or use this emblem.

A man actively employed receives the same pay and allowances, gratuities and other emoluments as an officer of the naval service on active duty of corresponding rank and of the same length of service (see pay table quoted above). When not actively employed, he is not entitled to pay, bounty, gratuity or pension, except as expressly provided by the provisions of the act.

When first reporting for active service for training during each period of enrolment, each officer is credited with a clothing allowance of \$50, excepting in the Volunteer Naval Reserve. In time of war or national emergency he is credited with \$150, less the amount previously credited, if any, during the current enrolment. The various grades not above lieutenant commander in rank, corresponding to those in the navy, are allowed. Officers in the United States Naval Reserve Force rank with, but after, officers of corresponding rank in the navy, and are commissioned by the president.

Medical officers enrolled in the United States Naval Reserve Force shall be appointed in time of peace not to exceed 500 in number. To provide for promotion, those who reenroll within four months after the termination of each enrolment, and who have performed the minimum amount of active service required (at sea) in each enrolment, may receive promotion to the rank of lieutenant on third enrolment, and to the rank of lieutenant commander on the fifth, on performing the minimum amount of active service required (at sea) in the new enrolment, provided they are found on examination qualified physically and professionally.

While the greater number of naval medical reserve officers will probably be needed at sea, some might be

detailed to duty on shore—for a time at least—in connection with recruiting and the various medical activities at one of the large navy yards or stations. A naval medical correspondence course has been established at the Naval Medical School, Washington, D. C., to prepare these reserve officers for their duties. For duty at sea they may be assigned as junior medical officers of battleships or on board scouts or cruisers, or aboard any of the various types of auxiliaries which are employed in connection with fleet or district activities.

The life in the fleet calls for the best young manhood of the medical profession. The duty is stimulating, and one lives among men who have high traditions to preserve, although there is often isolation from a professional standpoint, and the best qualities of professional courage and ingenuity are sometimes needed. Not infrequently there is opportunity for rare adventure. The medical officer living among messmates whose life is devoted to the work at hand grows to realize that he is a constituent part of a mighty machine, consecrated to the defense of the nation.

Bureau of Medicine and Surgery, Navy Department.

Therapeutics

HEXAMETHYLENAMIN IN THE PYELITIS OF INFANTS*

Probably few drugs have come into such vogue as has hexamethylenamin for the treatment of infections of the urinary tract. Properly administered, it undoubtedly yields satisfactory results in these conditions. There appears to be danger, however, that this widespread use of the drug encourages its administration without complete regard for the indications and contraindications. According to Useful Drugs:¹

It is of great value as a prophylactic in operations on the urinary organs. It is valuable in cystitis, pyelitis, etc. It is employed as a prophylactic in the bacilluria of typhoid fever. Some advocate its routine use to prevent the occurrence of this complication. It has been recommended to prevent the onset of nephritis in scarlet fever. As it has produced albuminuria and hematuria in some cases, it should be used with caution in cases in which inflammation of the kidney is present or anticipated.

It is evident, then, that there is something contradictory in the recommendation of the use of this drug to prevent the onset of nephritis and the statement that it has produced an albuminuria and hematuria in some cases. Confirmatory evidence is offered by Dr. I. A. Abt,² who says in a discussion on pyelitis in infancy:

Of the various drugs that have been recommended, hexamethylenetetramin (urotropin) has probably been most generally used. I would, however, recommend a word of caution concerning its use. It should be under continuous observation and its use should not be continued for an extended period. The urine should be frequently examined for blood. I have more than once seen severe and fatal nephritis which in my opinion was due to the overuse of urotropin. If urotropin is given to infants under 1 year of age it should be administered in 1-grain doses followed by water. This may be repeated four or five times daily.

* Owing to lack of space, the article on "Disturbances of the Kidneys" is omitted from this issue of THE JOURNAL. It will appear next week.

1. Useful Drugs, Chicago, American Medical Association, 1916, page 77.

2. Abt, I. A.: Pyelitis, Medical Clinics of Chicago, 1917, 2, 904.