

SCIENCE NEWS

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THE SUPPLY OF PHYSICIANS

A FIRST step toward solving the problem of estimating how many physicians can be taken by the armed forces and still leave enough in a community to satisfy present demands for physicians' services is now available through a study of the Washington, D. C., the Baltimore and the Maryland situation.

The study, by Dr. Antonio Cioeco and Isidore Altman, of the National Institute of Health, U. S. Public Health Service, is reported in the *Journal* of the American Medical Association.

From information furnished by about two thirds of the physicians of the two cities and one state for one week in early fall, 1942, it was possible to determine the present number of patients seen in one week by doctors of various age groups, male and female, Negro and white, and in general practice or specialties. Among many significant facts, the study shows the following:

General practitioners under 45 years of age, the group the armed forces are drawing on, have a patient load 25 to 50 per cent. greater than those between 45 and 64 years and more than twice as large as that of doctors 65 years and older.

This age difference is important because, as the statisticians point out, "in a community containing two physicians, one 35 and the other 65 years of age, one could maintain that the removal of the younger man will mean the loss of not one half but of two thirds of the physicians."

General practitioners who spend eight hours in their office daily see on the average 140 patients weekly. Those who spend nine hours can be assumed to see an average of 158 patients weekly. On the basis of the figures, a weekly average patient load of 140 would require a ratio of one physician to 960 persons in Washington, D. C.; one to 970 persons in Baltimore, and one to 1,135 in Maryland.

A weekly average patient load of 140 for Washington, D. C., means an increase of about 22 per cent. over the present patient load or, considering the ages of the remaining general practitioners, since some younger doctors have already been taken into the armed forces, an increase of about 26 per cent.

If an average weekly patient load of 160 is considered as a maximum, giving a ratio of one physician to 1,060 persons in the nation's capital, the increase over the present patient load, taking into account the ages of the remaining general practitioners, becomes 48 per cent.

It is pointed out that the present average patient load already represents an increase of perhaps 25 per cent. over that of 1940. Increasing the patient load of a group of physicians by 40 per cent. over that of the present actually increases it by about 75 per cent. over that of 1940. Therefore, the pertinent question to be asked is, "before accepting any proposed value of the maximum patient load, is whether or not the remaining physicians are able to sustain the added burden."

TUBERCULOSIS

TUBERCULOSIS will become a plague affecting approximately 10,000,000 persons in Europe after the war, is stated by Dr. Robert E. Plunkett, general superintendent of tuberculosis hospitals for the New York State Department of Health, in a report to the *Bulletin* of the National Tuberculosis Association.

A three-point program by which the United States could help check this anticipated plague was outlined by Dr. Plunkett as follows:

1. Governmental and private agencies dealing with tuberculosis in this country can appraise the problem and develop the control program, for which public or private funds or both could be used.

2. Many American physicians and X-ray technicians who are gaining tuberculosis experience and training with the armed forces during the war could be available for post-war service abroad, since not all of them could find work in the anti-tuberculosis fight here.

3. Some of the vast amount of X-ray equipment acquired by the armed forces for chest X-raying of men entering the services could be assigned or contributed to foreign service since not all of it will be needed here at home after the war.

Dr. William Charles White, chairman of the National Tuberculosis Association's committee on medical research, announced that a new tuberculosis research program has been initiated as a result of the chest X-rays for detection of tuberculosis given the millions of men entering the armed forces. The work is being done under the direction of Dr. Carroll E. Palmer and Dr. Herman E. Hilleboe, of the U. S. Public Health Service, with financial aid from the National Tuberculosis Association.

The object is to discover the constitutional factors that decide whether or not a person will be able to resist the tuberculosis germ invasion. Student nurses have been selected for the study because they are subjected to frequent contact with active cases of tuberculosis and can be examined at short intervals during their three years period of training.

Only when the factors of constitutional resistance are known will it be possible to prescribe the right treatment for each individual case of tuberculosis. At present, the only safe procedure for all cases in the earliest stages is immediate and complete rest in bed.

How to prescribe the right treatment for each man rejected by the armed forces because of very early tuberculosis is, according to Dr. White, the most pressing current tuberculosis problem.

A POSSIBLE SUBSTITUTE FOR
BLOOD PLASMA

A POSSIBLE substitute or supplement for blood plasma in treating shock from hemorrhage in war wounds in case of shortages of plasma is announced by Dr. Robert Elman and Dr. Carl E. Lischer, of Washington University School

of Medicine and Barnes Hospital, St. Louis, in the *Journal* of the American Medical Association.

The substitute would be a solution of hydrolyzed proteins, enzymatically digested, from either beef blood plasma or casein, the chief protein of milk. In laboratory experiments such solutions showed themselves as good as blood plasma for treatment of animals in shock from repeated hemorrhage. The animals that got the protein solutions survived for a 50 per cent. longer time and could withstand 25 per cent. greater blood loss than untreated animals, and their blood pressures also stayed at higher levels. Solutions made from pure crystals of all the essential amino acids also were definitely beneficial but not as markedly as the solutions of hydrolyzed proteins.

Caution is needed before the encouraging results of these experiments can be applied to treatment of human patients suffering surgical shock from hemorrhage, but it is believed that further study is justified because of the practical advantages such solutions offer.

It is pointed out that while plasma and whole blood are of vast importance in the treatment of shock, it is probable that in wartime the number requiring such treatment might well exceed the available supplies of plasma and that in the armed forces many situations might arise in which blood donors were not available.

The injection of one quart of plasma requires bleeding four donors and considerable processing, not to mention the transport and storage space problems. Solutions of amino acids and hydrolyzed proteins, on the other hand, are as convenient to give as sugar and salt solutions.

"SHIPYARD EYE"

THE latest developments in the "shipyard eye" situation are:

1. The cause of the disease, which has been striking in epidemic form at industrial as well as shipyard workers on the East and West Coasts, has been fairly clearly identified as a virus through studies by two groups of medical researchers.

2. Sulfathiazole has been reported as an "almost specific" remedy.

3. Doctors, nurses and first aiders in Detroit, and probably other industrial areas, have been warned to be on guard, taking extra precautions against getting the disease themselves or spreading it to others when treating patients having or suspected of having the disease. In Detroit the Board of Health is requiring that all cases be reported to it.

Dr. Michael J. Hogan and Dr. Joseph W. Crawford report that in 125 cases studied at the University of California Medical School in San Francisco, undernourishment, occupation and disease germs of the bacteria, that is, the non-virus type, were ruled out as possible causes.

A filterable virus has actually been isolated from patients having the disease by Dr. Murray Sanders and Dr. R. C. Alexander, of Columbia University, in New York. Their studies were carried on in "informal collaboration with the Commission on Neurotropic Virus Diseases, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the United States Army."

The virus they isolated caused "shipyard eye" when rubbed in the eye of a healthy young man who volunteered for the test. Blood from convalescent patients in New York and California neutralized this virus. The virus was shown to be different from other disease viruses by further neutralization tests and by difference in size as measured by the bore of the filter through which it could pass. The results are printed in the *Journal of Experimental Medicine*.

Successful use of a 4 per cent. or 5 per cent. solution of sodium sulfathiazole sesquihydrate in treating cases of "shipyard eye" at the County Hospital in San Diego, Calif., was reported by Dr. F. J. Walter to the *Journal* of the American Medical Association. If further trial shows that this is, as Dr. Walter calls it, "almost specific" as a remedy for the condition, it will be one of the few instances in which a sulfa drug has succeeded as a remedy for a virus-caused condition.

"Shipyard eye," known medically as kerato-conjunctivitis, is highly contagious, according to a report from the Wayne County, Mich., Medical Society. About five out of every 100 persons develop the disease. In spite of its popular name and its outbreaks among industrial workers, the highest infection rate in a recent epidemic was among the doctors and nurses in the affected industry. Housewives, druggists, dentists, bankers and business men have also caught the disease.

The disease might at first be mistaken for "pink eye," and sometimes the patient thinks his trouble comes from something getting in his eye, which is one reason why doctors, nurses and even first aiders are warned to be suspicious and take special precautions against the danger of unknowingly spreading the infection. Inflammation of the mucous membrane, swollen eyelids, watering of the eyes, sometimes with bloody tears, sticking of the lids in the morning and inflammation of the cornea are among the symptoms. Eyesight may be impaired in as many as half the cases, but Dr. Hogan and Dr. Crawford state that permanent impairment of vision is not likely. The condition develops from five to eight days after exposure, lasts, on the average, 10 days to three weeks.

"Shipyard eye" first became headline news in this country when epidemics broke out in West Coast shipyards in the fall of 1941, but it occurred in Bombay and Madras, India, as early as 1920. London had a few cases in 1933 and there were wide-spread epidemics in central Europe from 1932 through 1940. There was a severe epidemic in Hawaii in 1941.—JANE STAFFORD.

TANTALUM

USE of the rare metal, tantalum, for plates and disks to replace pieces of skull lost in war wounds or to cover skull defects from such wounds, is proposed by Lieutenant Robert H. Pudenz, Medical Corps, U. S. Naval Reserve, in a report to the *Journal* of the American Medical Association. He reports success with this use of tantalum in laboratory experiments and referred to as yet unpublished reports from other surgeons who have used it successfully on human patients.

Tantalum is a bluish white metal resembling steel in its physical properties and glass in its chemical characteris-

ties. An important advantage of the metal for surgical use is the fact that it can be drawn into wire or rolled into sheet while cold. Because it is easily malleable, the surgeon can cut and mold a piece of tantalum to the desired shape at the operating table.

In addition, tantalum does not corrode, is not poisonous, does not cause any adverse reaction with the body tissues and is non-absorbable. It is heavy, with an atomic weight about three times that of iron, but because it can be used in a thin sheet its weight is apparently not a disadvantage. None of the patients who have had skull defects repaired with it has, so far as is known, felt any sensation of heaviness or pressure.

Tantalum has previously been used for bone plates and screws and wires in both animal and human tissue. Bone, cartilage, celluloid and the metal, vitallium, have all been used to repair skull defects. Vitallium has recently found most favor with brain surgeons, but tantalum has the advantage of being easily malleable.

ANTI-FREEZE SOLUTIONS

AVOID the danger to your car that may come from the use of calcium chloride or other salt in an anti-freeze solution for its cooling system, is the advice of automotive engineers of the National Bureau of Standards.

These engineers, who made a special study of this matter, call attention to the danger due to hidden corrosion. The use of salt solutions is prohibited in all government-owned motor vehicles.

Salt solutions have been tried ever since automobiles were first driven in freezing temperatures. Damage always resulted if the solutions were in the cooling system for more than very short periods. Salts cause corrosion. Water pumps and cylinder heads, particularly where the latter were of aluminum alloys, developed leaks which showed up only after the damage had been done.

With the present shortage of the more commonly used anti-freeze solutions, salt solutions are now being offered. Some contain inhibitors which it is claimed will protect against corrosion. The Bureau of Standards engineers do not know of any inhibitor effective under ordinary winter driving conditions.

There are a few simple tests that may be made to determine if an anti-freeze solution probably is based on calcium chloride or any other salt. The first is by weight. If a gallon of the solution weighs over 10.5 pounds, it is probably a salt solution.

A half-cupful may be boiled slowly in an iron skillet until dried. If a substantial deposit is left in the skillet it is probably salt. Two spoonfuls of the solution may be put in a glass and a drop or two of silver nitrate added. A whitish deposit or cloud will indicate calcium chloride or other salt.

The advice of the Bureau of Standards with regard to any radiator preparation of unknown composition is to analyze it or to avoid it.

ITEMS

THE great-grand-uncle of all frogs, a giant amphibian with a skull more than two feet long and a foot and a

half wide, that lived in Texas some 250 million years ago, more or less, is described and given scientific christening in the current issue of the *Journal of Geology*, by Professor Alfred S. Romer and Robert V. Witter, of Harvard University. Although the creature is definitely identified as an amphibian, it had a well-developed array of teeth in both jaws, and at least part of its skin was beset with bony scales. Since modern frogs and toads have neither teeth nor scales, the kinship of this ancient giant of their tribe must be regarded as avuncular rather than directly ancestral; though Professor Romer does state that the frogs are probably related to the extinct group of which this big amphibian is a member. The fragmentary remains of several of these animals were found in the lower levels of strata known to geologists as the Texas red beds, which gives them a geologic age about where Carboniferous and Permian meet. The genus has been given the scientific name *Edops cragei*.

SUGAR, potatoes and other sweet and starchy foods belonging to the carbohydrate class may not be necessary as such in the diet, is reported in the *Bulletin* of the Johns Hopkins Hospital by Dr. Richard H. Follis, Jr., and Dr. William M. Straight, of the Johns Hopkins School of Medicine. They found that laboratory rats could live and grow on a purified diet completely lacking in carbohydrate, though containing all essential vitamins, minerals, protein and fat. The rats not only thrived but seemed active and normal in every respect. Microscopical examinations of the tissues of the animals after death showed no significant differences from animals that were fed carbohydrate. Carbohydrate is needed by the body to furnish energy and for the utilization of fat, but rats apparently can manufacture all they need of this from protein and probably also from fat. The findings may not, however, apply to man or other species of animals, since a case has been reported abroad of an attempt to raise a human baby from birth on a "practically carbohydrate-free" diet. At ten months the child developed ketosis, a condition signifying disturbance of liver function, and the experiment was stopped.

WIRED-RADIO programs are now given in several Army camps by the U.S.O. for the entertainment of the soldiers. The equipment is operated by the Army, which uses it for other purposes as well. Civilian defense units are using the wired-radio in their work in a number of key cities. So it may be said to be playing its part in the nation's war effort. Wired-radio programs are distributed over power lines instead of being radiated through space by means of transmitting antennae. They are picked up with the ordinary broadcast receiver. They are particularly of interest to communities not in the primary service area of any long-wave broadcasting station. Forty stations could operate at the same time on the broadcast band in any locality without interaction with nearby similar systems, according to *Electronics*. It is being used by several colleges and might be used by fire and police departments.