

throat is no specific reason why only the staphylococci themselves should be used as overriders. After Ravenel put that theoretic transference into the practical experience of using the staphylococci as overriders to eliminate the diphtheria bacilli, all or practically all the experimenters seemed to be using the same organism. That organism is well known to be a facultative pathogen. Some other organism which cannot damage the human body would perhaps be the more ideal organism to use in overriding.

I have one report which is so brief that no conclusions can be drawn from it; however, it may be of interest. At Rochester we have recently (this year) been using the lactic acid bacillus as an overrider. Four cases of diphtheria appeared in the state insane hospital. The cases had absolutely no direct connection one with another; but it was found that they had an indirect connection with a certain kitchen. Cultures were made from all of the help of that kitchen and one woman, who had never had any symptoms of diphtheria, was found to be the carrier. Her throat was swabbed and sprayed with various antiseptics of different strengths, and repeatedly, for six weeks, gave positive cultures. Then, at the suggestion of Dr. A. H. Sanford, bacteriologist to the Mayo Clinic, the lactic acid bacillus spray was used. The lactic acid bacillus is harmless, undoubtedly, to human beings; it is easily obtained and is a rapid grower. This spray was used for several days and then, two weeks after that, the woman was examined for the first time and gave negative cultures. About three weeks ago our next cases of diphtheria appeared. Four patients were given antitoxin, their throats swabbed out with tincture of iodine, and no effect obtained in neutralizing the diphtheria growth. Three sprayings were given each person within thirty-six hours, and every subsequent culture was negative. One case was especially severe: A young man came from South Dakota with a well-advanced case of diphtheria. His entire pharynx was blocked with membrane, and within thirty-six hours he was given twenty-eight thousand units, with no effect except to check the increase of the membrane. His throat was swabbed with pure tincture of iodine a number of times without effect; but after being sprayed with the lactic acid bacillus three times within thirty-six hours the membrane showed rapid decrease, and within three days it had entirely disappeared. Before the spraying, all the cultures had been positive; after spraying all were negative. These results are simply suggestive, but are offered that the plan may be carried out by others who have greater opportunity for work. There is one practical point in this connection: If a country physician finds a case of diphtheria and if he is without antitoxin or antiseptics, it would do no harm, and might do good, to flush the nasal cavity and the throat thoroughly with ordinary sour milk.

Dr. D. L. RICHARDSON, Providence, R. I.: We have tried all kinds of solutions in the treatment of diphtheria-carriers with about the usual results. We have used silver nitrate solution, staphylococcus spray, iodine, iodine and glycerin, peroxid of hydrogen and bichlorid of mercury as applications to the fauces, to the throat, to the nasopharynx and to the nose, and we have come to the conclusion that cases should be left alone for a certain period of time, no applications being used except some mild solutions when there is a marked nasal discharge. After a certain period, if the cultures continue to be positive, we generally make application of tincture of iodine or of iodine and glycerin. If this, however, proves of no value, we have for eighteen months removed adenoids and tonsils. This latter is, judging from our own experience, a most efficacious method of getting rid of diphtheria bacilli in persistent carriers. Once in a while, we will fail, but I think less frequently than with any other method of treatment. Remember that in getting rid of the foci of infection, the adenoid tissue and tonsils, we have removed the deep infection which local applications could not reach. Then, if overriding with staphylococcus spray is theoretically or practically of any value, by the operation you have infected the throat with the organisms resident in that throat. Whether it is this or the removal of the adenoids and tonsils

that rids the throat of the different organisms, I am not sure. I do know that in England they are removing adenoids and tonsils for this purpose. After operation and until discharge, there is little danger of the throats picking up other organisms, whether diphtheritic or otherwise; but it is our custom to quarantine all such cases so long as the throat shows any active inflammatory result after the operation or until the patient is discharged.

Dr. C. HAMPSON JONES, Baltimore: In Baltimore we have tried to solve this question not only in the use of all kinds of antiseptics, but also in trying to determine whether or not it is necessary to use anything to clear up the throat.

Drs. W. L. Moss and Guthrie of the Johns Hopkins Hospital carried out a series of experiments during the past twelve or eighteen months. I know that from fifty positive throats that were followed day after day and week after week there were absolutely no cases of disease produced. . . . Exactly what it means we do not know. Of course, Dr. Moss and Dr. Guthrie and others have worked out the strictly scientific end of it, so far as the bacteriology is concerned, and no doubt their report will be found of great interest.

There is one method of clearing up the throat not mentioned to-day, that might be of service somewhere, that is, the use of iodine. The iodine we use is known as Boulton's solution of the national formulary—a combination of phenol (carbolic acid) and iodine—which clears up the throat wonderfully well; but the preliminary spraying of the throat with cocaine and going over the throat with the finger, pressing out the crypts, not only of the tonsils but also of the pharynx, will make the subsequent application of Boulton's solution much more effective, because it seems then to get into the crypts.

Dr. M. P. RAVENEL, Madison, Wis.: Dr. Jones has brought up an entirely new point of view. Several years ago I recommended that spongy and enlarged tonsils should be massaged. We use the true ivory spatula for this purpose; the finger would do just as well. In cases in which the spray did not act well, massage of the tonsil and use of the spray a second time cleared up the condition in practically every instance, without any trouble. Dr. Jones has brought out another point, namely, the non-contagiousness of the disease in some of these diphtheria-carriers; but what about the condition of the carriers themselves?

Dr. Lawrence and myself have used the staphylococci spray for treatment. It is an excellent method, except in carriers; but we are going to try it next winter early in the case, more exclusively with reference to the treatment of the disease.

Dr. E. F. OTIS, Peñuelas, Porto Rico: We are on the right track when we do not treat these tonsils too vigorously with too strong an antiseptic solution. My practice has been to use a very strong alkaline sodium bicarbonate, combined in a normal saline solution, and thus cut away all mucus; and then I use healing oils that are not too strong. I find that this method does not seem to set up an irritating reaction.

Dr. HENRY ALBERT, Iowa City, Iowa: The number of methods that have been discussed emphasizes one of the conclusions that we made; namely, that no one method has as yet proved satisfactory for the proper treatment of the carrier condition.

DISEASES OF PORTO RICO *

ELMER F. OTIS, M.S., M.D.
PEÑUELAS, PORTO RICO

Porto Rico is an interesting island-gem forming an emerald setting of the crescent of the West Indies. The climatic and social conditions are such that the various diseases have no difficulty in making great headway, when permitted to pursue their natural course. It is about the diseases here encountered that I wish to speak.

* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

Manson has well said, "If by 'tropical diseases' be meant diseases peculiar to the tropics, then half a dozen pages might have sufficed for the description [for, at most, only two or three comparatively unimportant diseases strictly deserve that title]. If, on the other hand [the term] include all diseases occurring in the tropics, then the work would require to cover almost the entire range of medicine."

TUBERCULOSIS, TYPHOID AND MALARIA

Tuberculosis, typhoid and malaria may justly receive first mention; while rickets, bronchopneumonia, angina pectoris, venereal diseases, tumors, meningitis and a variety of chronic rheumatic affections are not unfrequently found. On account of the fact that the warm climate favors germ growth, varied forms of enteritis take their full toll from among the young people that are born and reared amid tropical surroundings. The death-rate for this disease alone last year in Porto Rico was 41 per ten thousand.

Tuberculosis is a community disease of the thickly settled parts, and is proving to be a most difficult problem to handle in tropical lands. The *Liga Antituberculosis* is working along the general lines of its sister society in America; while the insular government remembers the distressing condition of her "white-plague" victims by periodic appropriations. On account of the rapidly increasing population of the island the number of deaths from tuberculosis per year is numerically on the increase. The death-rate had dropped, however, from 20 to 14 per ten thousand during the fiscal year 1911-1912.

The people of Porto Rico have until recently supposed that when the diagnosis of pulmonary tuberculosis was established, there was absolutely no hope for them. This idea, working in connection with the lack of climatic stimulation and the prevalence of some very unhygienic customs, makes the cure of the patient and the prevention of the spread of tuberculosis even more difficult than in our northern latitudes. The custom of tightly closing all doors and windows, and thereby excluding the night air which is considered so deleterious, brings with it a baneful effect. Very few indeed of the better houses have any provision for ventilation at night time. Those who live in the "shacks" fare somewhat better from the fact that it is impossible to make these air-tight.

Typhoid fever is practically endemic and, on account of the fact that it is many times confused with paratyphoid and coli bacillosis, reliable statistics are not available. My experience has been that custom strongly opposes the idea that any infectious disease should be diagnosed as it actually exists, and that it should be given the benefit of every possible doubt. Preference is given to a diagnosis that carries with it no unpleasant forebodings.

The general manifestations of malaria seem to be about the same the world over. This, however, is a subject for special study for those of us who are situated in tropical zones. Laboratories are being established whereby we may study its more uncommon manifestations. There is a virulence which goes with it in the warmer latitudes that is not even to be seen in the north. Those who especially study it think that they can see a possible connection between it and the kala-azar of the East Indies or even the black-water fever of Africa. Malignant malaria is exceedingly common, and the treatment must be heroic, else the patient goes into profound delirium or even into intense toxemia.

TROPICAL ANEMIA

Tropical anemia (uncinariasis or what was first called "lazy-man's sickness") is the most interesting to us because of its influence on the health, happiness and prosperity of our people. It was on Porto Rican soil that its identity was first worked out by Ashford. It was here, also, that the enormity of its deleterious effect on human life and efficiency was demonstrated, another of the world's great economic problems, and thereby solved. Its discovery came at a time when practically every one in Porto Rico was infected, and the hungry *jibaros* were crying to heaven for relief from their physical disabilities. They were described by Fray Inigo Abad as "having the appearance and color of convalescents." That was in 1788; and there is little doubt but that the like condition had prevailed since 1530. It was the Medical Corps of the American Army, whose men are ever ready to lay down, if necessary, even life itself, which finally came to the rescue of the Porto Ricans.

The accompanying table gives a few of the results obtained from a special examination of the schoolchildren in our municipality and will be of interest. All classes of children are here represented, and Peñuelas is so situated that almost all physical and climatic conditions are found. Its territory stretches from the coastline to the tops of the mountains. The twelve *barrios* represent almost all industries and social conditions and are therefore typical of the island in general. In spite of the large amount of anemia work that had been done in the place, there was still to be found an average of 38 per cent. of the schoolchildren infected with uncinariasis. Eggs of other parasites, such as *Ascaris*, *Trichocephalus* and more rare varieties, were found in 72.4 per cent. of the feces examined for the hookworms. I observed that an evident pallor was to be detected in 53.3 per cent.; while the average hemoglobin was 81.5 per cent.

SUNDRY DISEASES

Asthma is frequently found.

Whooping-cough is endemic.

Nervous affections limit themselves to a few—largely on account of the simple life of the majority of the inhabitants; but most of the native women are afflicted with a peculiar form of hysteria in which they must be restrained lest they do themselves bodily injury. It is called *ataque*, and sometimes assumes almost an epileptoid nature.

Among eye affections cataracts are frequently found—especially in those suffering from an intense degree of hookworm infection. A persistent form of conjunctivitis is endemic; however, my experience has been that it responds readily to medication, when the ordinary hygienic measures are adopted.

Trachoma has never been reported, except in a very few cases in which the infection was caught while sojourning in some other country.

Obstruction of the bowels is commonly encountered. The people in general do not attend to their bowels. Not infrequently the country people report having gone from three to six days without a movement, sometimes twenty days or more have passed. On closer inquiry, however, they usually recollect having had "very slight movements once or twice." These abnormally long periods are accounted for by them from the fact that often the patient has eaten very little or nothing during his entire illness.

Idiopathic tetanus is quite often reported.

Eruptive fevers, except possibly scarlet fever, are found in Porto Rico, but are usually of a mild character.

Filariasis (elephantiasis), like malaria, seems to confine itself mostly to certain sections of Porto Rico. No satisfactory explanation for this is offered.

The lepers are segregated in a colony on Goat Island within the San Juan harbor. They usually number about forty.

Sprue is more common than was previously supposed, and is being studied by a special committee of the insular medical society. Dr. Bailey K. Ashford's report will appear in due time.

I have not yet encountered in Porto Rico a case of pelagra or dengue. The vital records show none. The former probably exists there.

Beriberi and yaws have been reported, but I have not as yet heard of the diagnosis being confirmed.

EPIDEMICS

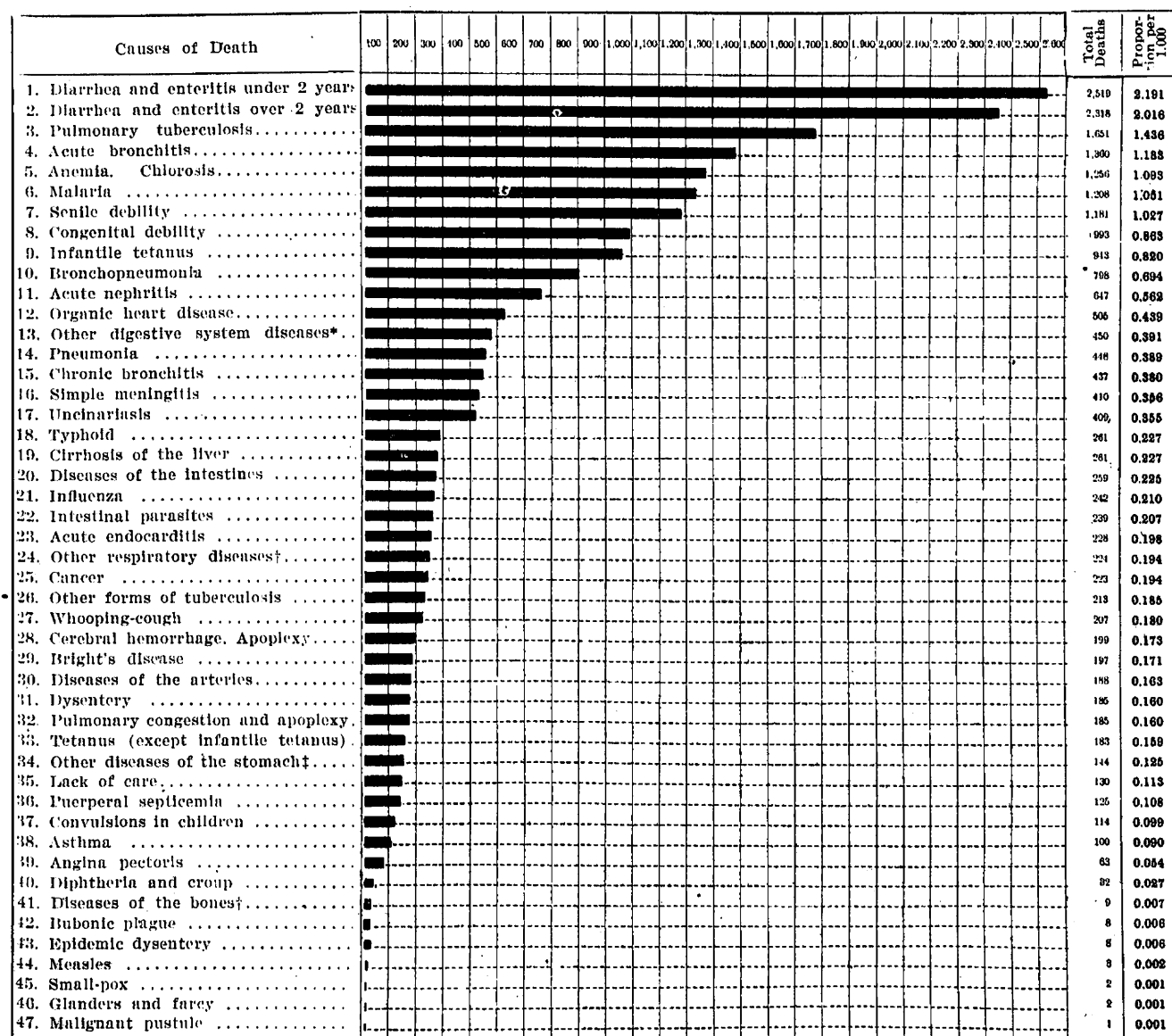
Porto Rico has shared in periodic epidemics with her sister islands for centuries.

Yellow fever is supposed to have originated in the West Indies. No date is given, but it was first reported

from Guadaloupe in 1635. Soon afterward it occurred in Barbados, Cuba, Jamaica, Santo Domingo, Martinique and in St. Thomas—forty miles off of our east coast—in 1793. I can find no record of its having become epidemic in Porto Rico, although it is known that occasional cases have been seen there. It is mentioned as having been present in 1783; however it is difficult to obtain accurate data from the Spanish colonial records. Yellow fever is now believed to be a thing of the past in Porto Rico. It has never appeared on the island since the American occupation. During the past year a special campaign has been waged against all kinds of mosquitoes.

Cholera once visited Porto Rico, in 1845, and the experiences are still vivid in the memories of a few of the survivors. The invasion lasted over four months; slaves were decimated by the scourge; it also entered the homes of both rich and poor; the people died "almost in their tracks" and were carted off toward the trenches on the lonely hillsides—sometimes before they were quite dead. One dying woman in a comatose state, who was supposed to have died just as the last rounds for the

CHART OF MORTALITY



* Except cancer and tuberculosis.

† Except tuberculosis.

‡ Except cancer.

night were being made, was being transported by a policeman and peon. The fresh air seems to have revived her till she came to herself and desired an explanation as to what was happening. Thereupon, her superstitious "pall-bearers" dropped their charge and fled. She managed to crawl on her hands and knees to a nearby brook and proceeded to alleviate her burning thirst. She shortly recovered.

Another, a boy living in the rear of his father's provision store, was left to his fate while the family were occupied with the "watch" over his dead brothers. He reasoned thus: Although it is considered very dangerous for a cholera patient to take either food or drink, yet it is better to die in comfort with a full stomach than in the miseries of a forced starvation. He improved the opportunity to steal into the store and consume an incredible amount of both bread and water. He had only sufficient strength to crawl from his cot to the store-room, but he was soon up and about and began to insist that his fellow sufferers should also try these measures. Almost all who tried this method survived. The lad is now an old man and takes great pleasure in relating these and many similar experiences which he had when the druggists were the doctors, and customs ruled supreme.

The treatment in vogue at that time was starvation, and deprivation of water and air. A poultice made from a native cactus was applied hot to the abdomen. For this was sometimes substituted the *balleta*, made by sewing together many thicknesses of blanketing and applied as a protection to the trunk.

Small-pox and typhoid have made their periodic visitations—have been at times almost endemic. Thanks to vaccination and the recent introduction of antityphoid injections, these diseases are now found in inverse proportion to the preventive efforts put forth. In the case of typhoid, the campaign against flies and the use of calcium hypochlorite in the drinking-waters has greatly assisted in the results. There are still to be found among the adults many who are poek-marked—an object lesson as to existing conditions in former days. The radical treatment of threatened typhoid epidemics of the last year by the free vaccination of the people gave brilliant results; and I have yet to find a single case in which a person developed the fever after having had the three injections.

Plague was discovered in the Port of San Juan, June 18, 1912, and was immediately recognized. The management and control of the situation by the sanitary department, seconded by the United States War Department, is another brilliant object lesson to the world as to what may be accomplished by concerted effort. There was a total of fifty-five cases with thirty-six deaths. The situation was controlled mainly by the vigorous campaign against rats; and also the use of the antiseptic injections. The last case developed on September 8.

It was demonstrated that the public control of an epidemic need not seriously influence commerce, but serves rather as a safeguard to business by instilling confidence into the minds of the citizens.

Dangers of Short-Circuiting in the Feeding of Infants.—In my private practice I meet wasting infants, who immediately after birth have been submitted to the tender mercies of a wet-nurse in full lactation. If a healthy infant cannot be expected to short-circuit the colostrum period, how much more improbable is it that a delicate and degenerate infant, on whose life, perhaps, much depends, will be able to dispense with simple lessons in digestion, and learn to run before it can walk.—Eric Pritchard, in (London) *Clinical Journal*.

THE EFFECTS OF COLLOIDAL COPPER WITH AN ANALYSIS OF THE THERAPEUTIC CRITERIA IN HUMAN CANCER *

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NEW YORK

During the past six months, the activities of the research staff of the General Memorial Hospital, devoted under the auspices of the Cornell Medical College to the investigation of malignant disease in human beings, have been in part directed to an analysis of the effects of metals in colloidal solution. In the present communication, the results obtained from a study of colloidal copper will be briefly described. This part of the work is now at an end, and it seems advisable, in view of the very considerable interest in the effects of copper in cases of malignant disease, to contribute to the general discussion of the subject the clinical records which have been collected, and such additional data in this connection as seem to be fairly well established. These records and data have been contributed in part by the clinical service of the hospital, in part by the laboratory departments both of the university and of the hospital, which have severally cooperated in the investigation of this subject. The clinical observations have been made by Drs. Brown, Michailovsky and myself; the chemical data have been contributed by Drs. Benedict and Lewis; the pathologic examinations were made by Dr. Ewing; the photographic and roentgenographic services have been under the direction of Drs. Cole and Holding.

Interest in the therapeutic effects of colloidal solutions of the metals has been very active for about fifteen years. This interest has been largely confined to the effects of these substances in the infectious diseases, owing to the fact that collargol, in particular, has been highly recommended and widely employed in gonorrheal ophthalmia and in general sepsis. During the course of the past year (1912), however, attention was drawn in Germany and France to the fact that the experimental tumors of animals are very strikingly influenced, and in some cases cured, by the intravenous injections of colloidal solutions of the heavy metals and of their compounds. In December, 1912, Leo Loeb¹ and his co-workers published a preliminary article on the effects of colloidal copper in human cancer, containing a detailed report on eight cases. In summarizing their results they state that they "are now able to cause the gradual retrogression of human cancer which until now has withstood various modes of treatment; and, furthermore, that the treatment does not seem to be limited to one kind of cancer, but applicable in the effective treatment of various kinds of cancer." In detail, they observed relief from pain, improvement in the function of diseased areas, general constitutional improvement and gain in weight. The tumors decreased in size, induration lessened or disappeared, granulations sprang up and cicatrization or epidermization played their normal rôle in obliterating or covering the defects produced by the disease. The authors point out, however, that "patients, in whom the growth of metastases is very rapid and extensive, and in whom the cachexia is already very pronounced, cannot yet be benefited by this mode of treatment." In two subsequent papers, of which the latest appeared in May,

* From the Cancer Research Service of the Cornell University Medical School in the General Memorial Hospital, and the Huntington Fund for Cancer Research.

1. Loeb, Leo; McClurg, C. B., and Sweek, W. O.: The Treatment of Human Cancer with Intravenous Injections of Colloidal Copper, *Interstate Med. Jour.*, 1912, xix, 1015.