Address.**THE INFLUENCE WHICH THE ACQUISITION OF TROPICAL TERRITORY BY THE UNITED STATES HAS HAD, AND IS LIKELY TO HAVE, ON AMERICAN MEDICINE.***

BY GEORGE BLUMER, M.D., SAN FRANCISCO.

It is a custom in many universities, both in this country and in Europe, to allow each professor leave of absence during every seventh year of service. This custom is doubtless based on the Sabbatical year of the Pentateuchal codes, an institution which demanded that the fields be allowed to lie fallow every seventh year. It is a question whether the Sabbatical year as an institution could not with benefit be introduced into matters medical, and whether we might not profit by resting every seventh year, and devoting our time not to the strenuous throes of medical existence, but to a calm, dispassionate review of the progress of medicine in the preceding septennate, and the factors which have influenced that progress. With this idea in view I have chosen to speak to-day on an aspect of our medical progress which is now in its Sabbatical year.

It is at present almost exactly seven years since, by the terms of treaty following the Spanish War, the United States came into possession of tropical territory in both the eastern and the western hemispheres. It is unnecessary and inappropriate to discuss here the general significance of this territorial acquisition, its bearing on politics, its effect on commerce, its influence on public affairs in general; it is sufficient if we, as the representatives of the medical profession of this country, take stock of the medical questions involved, discuss their significance, and gauge the effect which they exert on American medicine in general. No doubt many of our hyperopic brethren foresaw, seven years ago, some of the effects which our acquisition of Porto Rico and the Philippines was to have on American medicine. There is just as little doubt that some of the results were entirely unlooked for, and have been complete surprises. It might appear at first sight that, from analogy, we should have been able to foretell the influence which increased commerce with our tropical territory, and the return of our soldiers and sailors with tropical diseases, would have on medicine in the United States. Obviously one would look to the experience of European countries, and notably of England, to form a basis for judgment, for these countries have had tropical possessions for generations. It must not be forgotten that the physical conditions here are different from those in Europe, for, while Europe is almost entirely within the temperate zone, portions of this country are semi-tropic, and a few very small areas are actually within the tropical belt. The United States, therefore, presents a much more favorable

soil for the transplantation of tropical diseases than does Europe. Realizing this, numerous American writers on tropical diseases have sounded in the last seven years notes of warning and alarm. Their apprehensions are based more on theoretical grounds than on observed facts, but for all that are worthy of our most serious consideration. The object of this inquiry is to determine, if possible, how great this danger is. What are the prevailing diseases of our tropical possessions? Which of them, if any, has appeared among us; which, if any, has gained a foothold on our soil; and which may possibly become widely distributed? Aside from endeavoring to answer these questions, we may with profit glance at the effect which the study of tropical diseases has had on the comprehension of cognate diseases in the United States, and also observe that it has led to the recognition in this country of unsuspected diseases of wide distribution and great economic importance.

UNCINARIASIS.

Perhaps one of the most startling results of the increased interest in tropical diseases has been the discovery that large sections of the southern portion of this country are infected with the hookworm, and that large numbers of the inhabitants are suffering from uncinariasis (ankylostomiasis) or hookworm disease. The starting point of this remarkable discovery was, almost certainly, the work of Ashford in Porto Rico in 1900. This observer noted the great frequency of the disease in that island, and pointed out that, to a large extent, the disability and wretched condition of many of the natives was due to it. The credit for drawing attention to the probability that the disease was widespread in our southern states is due to Charles Wardell Stiles, the zoologist of the Bureau of Animal Industry, and to him also is due the credit of amply proving what he at first brought forward merely as a probability. It would be out of place here to go into detail as to the clinical history of this disease, or the minute structure of the parasite which causes it. Mention must be made, however, of Stiles' discovery that the American uncinaria differs from that of Europe. It will be of interest to consider the geographical distribution of uncinariasis in this country, the main facts connected with the method of its spread, and the evidence as to the likelihood that it will become more widely prevalent than it is at present.

Up to the year 1900 not more than ten authentic cases of uncinariasis were on record in American literature, though there are statements by southern physicians in the writings of the early part of the nineteenth century which leave little doubt that the disease was then prevalent. During 1900 and 1901 only nineteen cases of the disease were reported, but in 1902, following the publication of Stiles' monograph on "The Significance of the Recent American Cases of Hookworm Disease in Man," the number of reported cases rose at a bound to 524. In 1903, 273 cases were

* Oration on State Medicine at the fifty-sixth annual session of the American Medical Association, Portland, Oregon, July 11-14, 1905. Published through the courtesy of the *Journal of the American Medical Association*.

reported; in 1904, 334; the number this year will probably not be so large, as the disease is no longer a rarity to southern physicians, and they will not be so apt to record cases. Prior to 1900, then, possibly ten authentic cases of hookworm disease had been reported; since this date I have been able to collect from the available American literature 1,212 cases, of which 1,095 originated in the United States, and 117 were imported from other countries, mainly from Porto Rico and the Philippines. Of the latter 62 are reported by Gunn, and occurred in San Francisco, mainly among Porto Ricans.

If we separate the domestic from the imported cases we find that this disease is distributed mainly through the southern states along the seaboard from Virginia to Texas. But it is not confined to seaboard states, for Missouri and Tennessee are also infected. The states in which the disease is known to be indigenous, and probably widely distributed, are Virginia, North and South Carolina, Georgia, Alabama, Florida, Louisiana, Texas, Mississippi, Missouri, and Tennessee. This list of states includes only those in which definite evidence of the presence of the disease has been furnished; it does not include, I think, all of the infected states. Taking into account the similarities of soil and climate, any one who will take the trouble to make a map of the known infected area will feel convinced that Arkansas, Indian Territory, Oklahoma, West Virginia, Kentucky, and the southern portions of Illinois, Indiana, and Ohio are also probably infected. The physicians in some states have shown a lamentable lack of enterprise in investigating this disease, while in other states extensive and valuable studies have been made of it. As I have already stated, 1,095 cases of domestic uncinariasis have been reported since 1900, 824 of these have been observed in three states: Georgia, Alabama, and North Carolina. This has been due to the interest and energy of single physicians, in Georgia of Claude A. Smith, Warfield and Harris; in Alabama of E. D. Bondurant, and in North Carolina of Nicholson and Rankin. A knowledge of the distribution of the disease is not merely of academic importance, for the economic aspects of uncinariasis are paramount. There is little doubt that the stigma of laziness and general inefficiency which has attached for generations to the so-called "poor whites" of the South has been earned by them not as a result of qualities due to innate "cussedness," but because a large percentage are suffering from uncinariasis with the resultant physical and mental deterioration. This being the case, a plotting out of the infected areas is one of the first steps which must be taken preparatory to stamping out the disease. This is only one step, however, the others depending on our present conception of its method of spread. At present there are two main theories as to the means by which the parasite gains entrance to the body, the one presupposing that it enters through the alimentary canal, the other that it gains entrance through the skin. The advocates

of the former theory hold that polluted drinking water and food soiled by dirty hands are the means of introduction, the advocates of the latter, that the so-called "ground itch" is the point of entrance of the *Uncinaria rhabdites*. There is a good deal of evidence in support of both views, though the work of Claude A. Smith and of Nicholson and Rankin favors the idea that the cutaneous form of infection is the more important. In view of this the wearing of shoes, especially during the rainy season, becomes the most important prophylactic measure, though the necessity for pure water supplies and the proper disposal of excreta still remain of great importance. In all such matters the enforcement of hygienic laws can never be obtained without education of those who are at fault. As uncinariasis is essentially a country disease (I have not been able to find on record a single American case which originated in a city), the question is one which must be dealt with by the country physician, on whose back falls a heavy load of responsibility. The stamping out of this disease is, of course, of great economic importance to the South, but, further than this, the question arises whether it may not be of importance to other parts of the country. Is there any chance that uncinariasis may become more widely distributed than it is at present? The question is a hard one to answer. While there has not been a lack of physicians who have predicted such a spread, it cannot be said that there is much actual evidence that it has occurred. There are a few instances in American literature in which the evidence plainly points to infection of natives from imported cases. Such, for example, are some of the cases reported by Möhlau in Buffalo, where Polish and Italian laborers contaminated a brickyard. That such sporadic outbreaks can and will occur can not be denied, and physicians all over the country should be on the lookout for them. Whether the disease will ever become widespread outside of its present habitat is quite another story. It must not be overlooked that a variety of circumstances are necessary to its spread; the right kind of soil, sufficient heat, and enough moisture for the parasite, and a lack of certain hygienic precautions on the part of the inhabitants of the area to be infected. The absence of any one of these conditions may be fatal to the dissemination of the disease. Considering the fact that uncinariasis has existed in the South for at least one hundred years, and probably longer, it does not seem very probable that it will ever extend much beyond its present limits. What is needed at present, then, is a more accurate knowledge of its distribution, and the inauguration of an educational and sanitary campaign to effect its extermination.

DYSENTERY.

One of the first diseases which the American army surgeons in the tropics had to confront was that scourge of camps, dysentery. The study of the acute form of the disease had received a great impetus from the work of Shiga in Japan, and

the investigation of this condition in the American troops in the Philippines, instigated by Flexner, has since been carried on by Strong and Musgrave, J. J. Curry, and Charles H. Craig. It can fairly be said, I think, that our conception of the etiology of dysentery, and particularly of the tropical form, has been completely revised in the last few years, and this revision has depended, in no small measure, on the work of American investigators. So far as tropical dysentery is concerned, the studies of recent years have taught us to recognize two distinct forms, the bacillary and the amebic. The bacillary form, of which the acute dysentery of the tropics represents the most common type, is due to an organism first described by Flexner, and closely allied to the bacillus described by Shiga in the epidemic dysentery of Japan. In the chronic forms the ameba seems to have held its ground as the main causal agent, though the earlier investigators in the Philippines seemed inclined to think that it was usually a secondary invader. Our knowledge of the life cycle of the ameba, of the differentiation of pathogenic from nonpathogenic forms, and of the cultivation of the organism, has been achieved in the past few years, and is associated with the names of Craig, Strong and Musgrave, and Caspar Miller. A more exact knowledge of the complications of dysentery has also resulted from the work of our army surgeons, and it is to be especially noted in this connection that the so-called "tropical" abscess of the liver is nearly always due to the amebic as opposed to the bacillary form.

The most surprising and unlooked-for result of the stimulus given to the study of dysentery has been the discovery that the same group of organisms which are responsible for tropical bacillary dysentery are also concerned in dysentery in this country, and in certain forms of the summer diarrheas of infancy. The first steps in determining these relationships were taken under Flexner's guidance during 1902. In that year Vedder and Duval published the result of their work on the dysentery of the United States, work which was based on both sporadic and epidemic cases, and which showed that certain types of dysentery all over the world were due to the Shiga group of bacteria. In the same year Duval and Bassett published their preliminary announcement of the isolation of bacteria of the same group from cases of infantile summer diarrhea. Subsequent studies, conducted mainly at the large centers in the East, have, in the main, confirmed these observations, and have led to more accurate knowledge of both the clinical and bacteriologic aspects of these two classes of disease. Since 1903 investigation has been mainly focussed on the summer diarrheas of infancy, the scourge of the tenement districts of the large cities. These studies have resulted in the classification of the *Bacillus dysenteriae* into three main types, a differentiation which was suggested in part by Gay and Duval in 1903, and which has since been rendered more exact by the work of Hiss and Russel, and that of W. H. Park and his associates. On the clinical side it has been

shown that all classes of summer diarrhea are not due to organisms of the dysentery group, but that certain types associated with mucus and blood in the stools are nearly always associated with them. It has also been shown that these organisms, like the pus cocci, may give rise to primary infections, or may play the rôle of secondary or terminal invaders. Mild cases without blood in the stools may also be due to this group of organisms, accurate and early diagnosis only being possible in any type of case by means of a bacteriologic examination of the feces. The serum reaction, while of some value, appears late in many cases, and is not available for early recognition of the disease.

In his report on Philippine dysentery Flexner suggested the possibility of serum therapy in these cases, and the discovery of the relation of the *Bacillus dysenteriae* to infantile summer diarrhea led to attempts at the production of a curative serum. During 1904 such a serum was used in a number of outbreaks of dysentery and summer diarrhea. The results, as a whole, have been disappointing, and will probably improve as we gain in experience. As Booker pointed out in 1903, little is to be expected from the serum in cases in which marked anatomic lesions are present. The work done under the Rockefeller Institute and summarized by Holt shows that the serum to be of value must be used early and in repeated doses. Judging from the results of Shiga in Japan more is to be expected for the serum treatment, and, as a matter of fact, it has not yet received a fair trial in this country. At present we need more knowledge regarding the natural history of the dysentery germ, its method of introduction, and the distribution of this form of infection in the United States. As regards the means by which the germ is introduced into the body there is already some evidence, both from the Philippines and this country, that contaminated water is at fault, but the whole matter needs more thorough investigation. The distribution of this form of infection has hardly been studied outside of the large cities of the East, and although the severe forms of infantile diarrhea are almost unknown on the Pacific Coast, there is little doubt that they exist in the South and Middle West.

YELLOW FEVER.

At the time that the Island of Cuba was occupied by American troops, in 1898, yellow fever had been endemic there for 130 years. The disease was not wide-spread, but was mainly confined to the coast towns, and was particularly prevalent in Havana, the continuous stream of non-immune Spanish immigrants serving to keep up the infection. A great deal of study had been devoted to the disease at this time, and in the years immediately preceding the Spanish War renewed interest had been awakened by the work of Sanarelli, who claimed to have found the causal agent in his *Bacillus icteroides*. His claims had met a good deal of opposition, especially from Sternberg, in this country, and many yellow-

fever experts did not accept his results. In view of the prevalence of the disease, and the constant menace which it offered to our southern states, a commission composed of Walter Reed, James Carroll, Jesse W. Lazear, and Aristides Agramonte was detailed to Cuba still further to study it. The commission presumably started out with a disbelief in Sanarelli's work, for certain of the members had published investigations showing that the *Bacillus icteroides* was closely allied to, if not identical with, the hog-cholera bacillus. While Sanarelli's work was repeated as a necessary precaution, and was proved to be erroneous, the commission concentrated its efforts on the investigation of the relation of the mosquito to yellow fever, a relationship which had been insisted on by Carlos Finlay of Havana for nearly twenty years, and which the work of Carter on the time limit between primary and secondary cases rendered probable.

It is not necessary to go into details as to the methods used by the commission in their work, further than to state that they were scientifically above reproach. It will be of interest, however, to consider their results, and the influence which they have had on the practical aspects of yellow-fever quarantine. Briefly stated, these results were as follows: The proof that Finlay's conception that yellow fever is conveyed by a certain variety of mosquito (*Stegomyia fasciata* of Theobald) is correct. The demonstration that a certain time must elapse after the mosquito is infected before it can transmit the disease; that the causal agent is in the blood during the first few days of the disease, that it can be destroyed by heat, and that it can pass through filters which hold back some of the smaller forms of bacteria. The explosion of the old idea that the disease can be conveyed by fomites, unless these are of a character to allow of transmission in them of infected living mosquitoes. These are the main results, and they have led to greater accuracy in our knowledge of the incubation period of yellow fever, increased study of the yellow-fever mosquito, and an entirely new conception of the prevention of the disease. Since the original work of Reed, Carroll, Lazear, and Agramonte several independent observers have confirmed their findings, notably Guiteras in Cuba, Marchoux, Salembini, and Simonds in South America, and the working parties of the U. S. Public Health and Marine-Hospital Service in Vera Cruz, Mexico. The investigations carried on under the Public Health and Marine-Hospital Service have also supplied many details extending our knowledge of mosquito transmission, of the life history of the yellow-fever mosquito, and of quarantine methods against the disease. Few discoveries in medicine have led to more rapid and more brilliant practical results than those above cited. The story of the remarkable change in the yellow-fever history of Havana achieved by the work of Gorgas reads almost like a romance. When we consider that the annual number of deaths from yellow fever in Havana for the ten years preceding the establishment of the mosquito theory

averaged about 500, and that under Dr. Gorgas' administration they were cut down in two years to nothing, we can enthusiastically echo the sentiments expressed in a resolution of the conference of State and Provincial Boards of Health in which they say: "We regard (it) as one of the most brilliant achievements of the application of sanitary science to public-health work ever accomplished." Judging from recent reports, it seems likely that Gorgas will repeat his Havana success in the Isthmian Canal zone. We have still to discover the cause of yellow fever and we have still to ward off its advances in our southern states. So long as our Central and South American neighbors pursue their present lax sanitary methods we are liable to have sporadic outbreaks of the disease in those regions in which the *Stegomyia fasciata* can multiply. As Carter and Howard have shown, this mosquito is widely distributed in the subtropic portions of our country, and it behooves us to continue with the work of mosquito extermination, to increase its range as rapidly as possible, and to keep up with its old-time strictness the quarantine of vessels, especially sailing vessels, from infected ports. The protection of our land boundaries to the south will, of necessity, be much more difficult, and, judging from the recent experience in Texas, it is by this route that infection is now most likely to reach us.

MALARIA.

The soldiers returned from Cuba and Porto Rico, and, later, those from the Philippines, offered an opportunity for the study on a wholesale scale of certain aspects of malaria, an opportunity which was grasped by both military and civilian physicians. During and immediately following the Spanish War the accomplishment of greatest importance resulting from this study was the overthrow of the refuge of the careless diagnostician, typho-malarial fever. Those physicians who had studied malaria and typhoid fever carefully before the war, and who had controlled their diagnoses by blood examinations, had always been skeptical about the existence of combinations of the two diseases, and had published from time to time protests against the indiscriminate use of the term typho-malarial fever. It needed the studies of the camp fevers, however, to prove to the satisfaction of most physicians that the combination was exceedingly uncommon, and that when it occurred the malarial fever preceded, or more commonly followed, the typhoid fever. In his remarks on the subject, based on the examination of the blood of 159 typhoid cases at Camp Wikoff, Ewing says: "In no case of undoubted and established typhoid fever were malarial parasites found in the blood in connection with any of these sudden rises of temperature (in typhoid), but only at the onset of the disease or during convalescence"; and later in his article: "In short, in spite of painstaking effort, the attempt to find a case of typhoid fever and active malaria progressing simultaneously was unsuccessful." Aside from this,

the clinical study of the disease has received but few important additions since 1898, though mention must be made of the valuable studies of Craig on latent and masked malaria, studies which showed how great the danger to a community might be from soldiers returned from the tropics. In his article published in 1904 Craig states that 25 per cent. of the soldiers returning from the Philippines show latent or masked infections, and in a large percentage of these cases the parasite is the estivo-autumnal crescent, a stage of the organism capable of development in the mosquito. The same observer cites one company of sixty men in which forty-one had parasites in their blood, and yet but fourteen complained of illness.

As far as the parasitology of malaria is concerned, the past seven years have been marked by great simplification in staining methods, but discoveries of paramount importance have not been numerous. The studies of Craig on estivo-autumnal fever have tended to confirm the views of the Italian school as to the quality of its parasite, and the work of Ewing on the tertian parasite has thrown light on its early sexual history in the circulating blood. Working Party No 2 of the Yellow Fever Institute has been able to show that at the time of the malarial chill there is present in the blood a toxin, and have been able to produce a chill by the intravenous inoculation of filtered blood extracted during the paroxysm.

The study of the distribution of the malarial mosquito has been carried on in a few places, in Boston by Theobald Smith, in the Valley of the Androscooggin by Jordan, and in Baltimore by Hirschberg and Dohme, but the amount of work which has been accomplished in this direction and the time and money which have been expended in the attempt to exterminate the malarial mosquito are almost infinitesimal when we consider the territory affected by the disease, and the losses resulting from it. Woldert estimates the annual financial loss in Texas alone at over \$5,000,000, and if all the infected zones in the United States are considered the loss must be appalling. Like yellow fever, malaria is a perfectly preventable disease, but to stamp it out requires either destruction of malarial mosquitoes, or protection and sterilization of infected individuals. In this country mosquito extermination has always been the favored plan, but before it can be accomplished a much more complete knowledge of the distribution of the anopheles is necessary, and much more thorough education of the public as to the necessity of the work. The danger that the disease may be introduced into uninfected areas by soldiers returning from the tropics is a real one, though, as Theobald Smith has shown, it is unlikely that the estivo-autumnal parasite will be introduced into the northern states. Still, we have plenty of southern territory not yet infected, and the extermination of mosquitoes would prevent the possibility of such contamination. The question is one which has not yet been seriously considered in large sections of the country, but is, nevertheless, of the greatest importance.

FILARIASIS.

The work of Ashford in Porto Rico, and of Calvert in the Philippines has shown that filariasis exists in both places. In Porto Rico it is probably widely distributed, as Ashford found it in thirty out of 250 soldiers in the Porto Rican regiment. Cases of Gunn and of Brown have shown that infected individuals from this source have already reached this country. In the Philippines the extent of the disease is doubtful. Calvert found the filaria in only two out of 426 Filipinos, but it is to be noted that both of these individuals came from the same district, and it is likely that the disease is much more prevalent in some places than in others. In this country several domestic and imported cases have been reported since 1898. It seems extremely likely that the disease is much more common in the South than the literature would indicate, and that it is often overlooked. The fact that one man, De Sassure, of Charleston, was able to report twenty-two cases, most of them originating in the United States, is pretty strong evidence that the disease is much more prevalent than is generally supposed. It is certain that there are present in this country varieties of mosquito capable of transmitting the filaria. As these generally belong to the *Culex* family, which is widely distributed throughout the United States, it seems possible that there is real danger of new districts becoming infected by returning soldiers or Porto Rican laborers. Before the matter can be definitely settled we need more information as to the exact varieties of mosquito which can transmit filariasis, and their distribution in this country. At present it is quite generally assumed that a number of varieties of *Culex* and at least one of *Anopheles* can transmit the disease. We believe it was Myers who brought forward evidence to the contrary and the matter is one which needs further investigation.

MALTA FEVER.

The fact that Malta fever was present in Porto Rico was first demonstrated by Musser and Sailer, and later by Cox and Curry. In 1900 Strong and Musgrave called attention to its occurrence in the Philippines, and still later cases occurring in returned soldiers were described by Curry and Craig. The number of cases which has been described is small, and practically all of them are in soldiers and sailors. In the seven years which have elapsed since the first case was reported in this country, no case originating here has been described, and it seems that there is little likelihood of the disease becoming disseminated in the United States. It is within the bounds of possibility, as Curry pointed out, that it already exists in the southern states. In its acute form it is easily confounded with malaria, and in its chronic stages it is generally diagnosed at first as chronic rheumatism. The serum reaction of the disease is so reliable, and the test is so easy of performance, that all cases with doubtful fevers in the southern states should be subjected

to it. It seems highly probable that if this is done systematically the disease will be found to be present.

TRYPANOSOMIASIS.

The relation of trypanosomes to animal diseases was observed in the middle of the last century, and renewed interest has been awakened in these parasites in recent years by the discovery of new forms of animal trypanosomiasis, and by the observations on human trypanosomiasis initiated by the work of Dutton. The presence of the trypanosome infection known as surra among horses and buffalo in the Philippines was noted soon after the American occupation, and the results of American researches on this disease may be found in the valuable monograph of Musgrave and Clegg. Up to 1903 attempts to isolate trypanosomes in pure culture had been ineffectual, but in that year McNeal and Novy published the results of their work on the rat trypanosome. They were able to obtain the first successful pure culture of a pathogenic animal parasite with the absolute demonstration of its causal relation to the disease. Up to this time many observers believed that the different forms of animal trypanosomiasis were due to the same organism, but during 1903 and 1904 Novy, McNeal, and Ward were able to cultivate the trypanosome of nagana or tsetse disease, and also that of Philippine surra, and could demonstrate that the parasites from these different diseases showed variations in structure and mode of growth. Later Lewis and Williams succeeded in cultivating the frog trypanosome, showing that this also differs from the other forms. Some forms of animal trypanosomiasis have appeared in the United States, dourine having been observed in Nebraska. Whether there is any possibility of the introduction into America of human trypanosomiasis will be difficult to determine until we know more of certain forms parasitic in man, and the method of their spread. The form of the disease which is most likely to appear in this country is the affection known, likely to be found in the Philippines, and hence most in India, as kala-azar or dum-dum fever. The parasite of this disease, usually spoken of as the Leishman-Donovan body, has recently been shown by Rogers and Chatterjee to belong to a sub-family of the trypanosomes. The method of transmission of this form of the disease to man is not definitely known so far as we can determine; it is probably transmitted like nagana, by an insect, most likely a mosquito. The possibility of its introduction into this country will probably depend on the presence or absence of some insect host.

DENGUE.

A disease which does not seem to have received the study which it merits, considering its frequency, is dengue, or break-bone fever. The Reports of the Surgeon General of the Army for 1902 and 1903 show that in the Philippines it caused, in the former year, 31.67 cases of sickness

per 1,000 of strength, and in the latter year 171.39 cases per 1,000 of strength. Presumably it has not been carefully studied in the Philippines, or in the South, where it also occurs, on account of its short duration, and the almost absolute lack of fatalities. In the Isthmian Canal Zone it has been studied in the last two years by Sutton and Carpenter. They have shown that it is probably not of the malarial class of diseases, but that it may, as Graham claimed, be transmitted by the mosquito. Their studies of the blood show that it is one of the diseases accompanied by leucopenia and relative lymphocytosis, and their bacteriologic studies suggest that a bacillus similar to the influenza bacillus may be the cause. The disease is one which, judging by its past history, is unlikely to spread beyond the southern parts of this country. It is worthy of more extended study by modern methods than has yet been devoted to it, and American physicians in the Philippines and the Isthmian Canal Zone will probably have excellent opportunities to clear up many moot points in connection with this disease.

ASIATIC CHOLERA.

During 1902 Asiatic cholera appeared in Manila, spread to the neighboring islands, and caused over 90,000 deaths before it was stamped out. The incidence of the disease among the whites was comparatively small, but among the natives it ran rife, owing to their lack of hygienic precautions and the favorable temperature conditions. In many instances the disease was not carried, as usual, by contaminated water, in fact, in the large cities indirect contact through food was a much more frequent method of spread. On account of the violent local reaction produced by Haffkine's cholera prophylactic the natives objected to its use, and as the scattered distribution of the population made it almost impossible to control them, this method was given up. The objections to Haffkine's prophylactic led R. P. Strong to attempt the production of a protective serum lacking in the irritating properties of those hitherto used. By a process of bacterial autolysis followed by filtration of the culture he was able to produce a practically non-irritating protective. From the experimental standpoint Strong was able to show that animals and men treated by his method showed but little local reaction, yet developed in their blood substances strongly bactericidal to the cholera spirillum. As the cholera had practically disappeared from the Philippines at the time that Strong's work was completed there has yet been no opportunity to put his method to a practical test. From what we know of the disease there is little likelihood that it will ever get a foothold in this country under our present quarantine regulations.

PLAGUE.

The appearance of plague in several parts of the civilized world in 1900, and especially its appearance in San Francisco and Philippines, called the attention of American medical men to this disease. Luckily, but few of them had an

opportunity to study it, and most of the American work on this disease has been done in the Philippines, where, according to Munson, 970 cases with 812 deaths occurred between January, 1900, and September, 1903. It cannot be said that anything startlingly new was discovered during this period, but a good deal of valuable confirmatory work was turned out. In this connection must be mentioned the work of Barker, Flexner, and Novy on various aspects of the subject, the work of Calvert and Ewing on the occurrence of plague bacilli in the circulating blood, and the work of Herzog and Hare on latent and ambulatory plague. The outbreaks of the disease in Australia, in Honolulu, in Glasgow, and in San Francisco have served to warn us of the necessity of being constantly on guard against its insidious approach. The recent outbreak in Leith, in which, as in the San Francisco outbreak, the origin of the disease was in doubt, shows us that at all our seaports constant vigilance must be maintained, and this must be the case so long as endemic foci are present in Asia. In the preventive work in this country, in this as in other infectious diseases, too much praise cannot be given to the officials of the U. S. Public Health and Marine-Hospital Service, who, besides having to bear the burden of their appointed work, have often also to suffer the slings and arrows of outrageous politicians, and the contumelious taunts of misguided citizens.

CONCLUSION.

We have now considered the more important of the tropical diseases which occur in Porto Rico, the Philippines, and the newly acquired Isthmian Canal Zone, the effects which their study has had on American medicine, and the chances of their becoming domiciled in this country. It has been possible to touch on many important subjects but lightly, and I ask your indulgence for the sketchy manner in which the subject has been treated. Of necessity a number of tropical diseases have not been mentioned, tropical ulcer, frambesia, bilharziasis, and black-water fever, for example. These diseases are all present in our tropical possessions, but are of relatively minor importance, and as yet have received but little attention from American observers. Two general conclusions are forced on us as a result of this study, one being that many of the so-called "tropical" diseases are widely scattered through the subtropical portions of this country, the other that the acquisition of tropical possessions by the United States has had a markedly stimulating effect on American medicine, and has led to valuable work, some of it of the very first rank, all of it showing evidences of earnest and painstaking effort.

ACCORDING to the *Medical Record* a woman recently died in Mountain Top, Pa., who had given birth to twenty-five children, and in this number twins occurring only twice. Of the children all but seven are living.

Original Articles.

A CASE ILLUSTRATING THE LOCAL CONDITIONS AFTER A SUPRAPUBIC ENUCLEATION OF THE PROSTATE.

BY ARTHUR L. CHUTE, M.D., BOSTON, MASS.

THERE have been relatively few opportunities to study the local anatomical conditions following the method of suprapubic prostatectomy that has been re-vivified and popularised by Freyer. The following case is of interest as showing the conditions of the bladder and surrounding structures in a patient dying twenty-three days after a suprapubic enucleation of the prostate; beside this, it presents some other points of rather more than usual interest. As the chief interest in this case has to do with the removed prostate and the post-mortem findings, the clinical history is not given in full.

The patient, a man of seventy-two, was first seen with Dr. H. L. Houghton in February, 1904. The history of his prostatic trouble extended back ten years. For two years he had been absolutely dependent on a catheter, passing it every hour or two during the day and ten times at night. He suffered constant bladder pain. His prostate was smooth and elastic, not fixed in the pelvis, not much increased in size. Though there was a small gland under the rectal mucous membrane on the left, there were no chains of lymphatics to be felt by rectum, nor were there any deep inguinal or abdominal glands or other conditions suggestive of malignancy. A catheter had to be inserted nine inches before urine appeared. A stone searcher showed several calculi. The urine was very foul, but showed no renal elements.

On Feb. 26, 1904, a suprapubic cystotomy showed six phosphatic stones in a markedly thickened and trabeculated bladder. There was a valve-like projection from the left lobe of the prostate that arose distinctly at the side of the internal meatus. This mass was the size and shape of a small dried fig, and was so hinged that it closed over the internal meatus. This valve-like projection and a small posterior lip were removed — satisfactory convalescence.

At first the patient passed urine voluntarily. During the summer he gained twenty pounds in weight. The retention slowly recurred, but was unattended with pain until seven months after operation. In September, 1904, there was a recurrence of his former symptoms, though he could still pass a little urine when at stool.

An examination in November, 1904, showed that the patient's general condition was better than at the time of his first operation. The prostate presented no appreciable change. The cystoscope showed another calculus. The urine was as before, with the exception that it now contained a little microscopic blood. The upper part of the suprapubic scar was very thin and bulged on straining.

Dec. 5, 1904, I operated again with the intention of doing a suprapubic enucleation of the prostate. The fold of peritoneum covering the bladder, which had been pushed back at the previous operation, had re-established itself between the bladder and the abdominal wall, and was densely adherent just above the symphysis. In peeling back this fold it was torn through. Under these circumstances, the septic condition of the urine made it seem inadvisable to open the bladder at this time. The hernia was re-