Of the four possibilities we are inclined to believe that the first, with possibly the second, furnish the most logical explanation for this interesting case of myiasis.

Experiments will be made and reported on later as to the effect of the various digestive enzymes on the larvæ and their activity.

PREVENTION OF MALARIA *

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Statistics show that malaria prevails in every state in the union except Wyoming; but because of climatic, meteoric and geologic conditions favorable to the growth of the anopheles mosquitoes, the southern states and the states adjacent to the Mississippi, Missouri and Ohio rivers show the greatest mortality from the disease.

Statistics compiled from the last census¹ show that there died, from malaria, in the United States in the year 1900, 14,909 persons, distributed by states as follows:

Alabama	1,055	Montana	5
Arizona	17	Nebraska	32
Arkansas	1,730	Nevada	10
California	119	New Hampshire	18
Colorado	21	New Jersey	110
Connecticut	110	New Mexico	89
Delaware	19	New York	308
Dist. of Columbia	63	North Carolina	527
Florida	366	North Dakota	4
Georgia	1,011	Ohio	156
Idaho	4	Oklahoma	134
Illinois	497	Oregon	23
Indiana	340	Pennsylvania	140
Iowa	84	Rhode Island	24
Kansas	261	South Carolina	749
Kentucky	344	Tennessee	987
Louisiana	1,030	Texas	1,331
Maine	16	Utah	6
Maryland	131	Vermont	9
Massachusetts	70	Virginia	409
Michigan	168	Washington	13
Minnesota	9	West Virginia	34
Mississippi	983	Wisconsin	5
Missouri	965	Wyoming	0

Of those who died from malaria in 1900, 9,320 were white and 5,589 colored. In the last census the colored population was approximately one-ninth of the whole, while more than one-third of the deaths from malaria were among the negroes. This high death rate from malaria among the negroes, who were formerly supposed to be more or less immune to the disease, may be accounted for by the fact that the negro population, in the states showing a high death rate from malaria, is large, and the negroes, representing the laboring and poorer classes, live in insanitary surroundings and, either from poverty or neglect, do not take treatment for the disease.

I have seen anopheles mosquitoes breeding in Central Park in New York; I have seen the plasmodium of malaria in blood obtained from the child of a millionaire residing on Fifth Avenue, and it is the same variety of mosquitoes, and the same type of protozoon, that I have seen in the swamps of the rural districts of the far south.

The problem of malaria, since it affects all sections of our country and all races and classes of our citizens, is a national one, and I shall discuss it from that point of view, though I admit that the section of country which I represent is vitally interested in this subject. In this connection I submit a few paragraphs from my address² as chairman of the section on medicine of the Southern Medical Association, delivered in Atlanta last November.

Perhaps the most important health problem which affects the prosperity of the south is malaria. One has but to travel in the eastern, northern and western states to find that in those sections the south is regarded as a hotbed for malaria. No doubt thousands of settlers have sought homes in the west and elsewhere in preference to the south, because they feared to take their families to a section which they considered so unhealthful. Many travellers avoid the south, and capitalists have been deterred from making investments in our section because of the fear of malaria. I realize that such impressions are largely due to prejudice and to ignorance of the health conditions of the south, but it is also true that we have more malaria than we should have because, with our present knowledge of the disease, it should soon be stamped out of our towns and cities and made a rare disease in the country.

I have not statistics to show how much malaria has decreased in the south in the past two or three decades, except in the state of Maryland,³ but its prevalence has been wonderfully lessened and it has become a much milder disease, so that to-day the severe types are rarely seen.

The south is enjoying splendid prosperity in all lines, and she should erase from her fair name the blot of malaria, because it is a disease which can be prevented, and which interferes very materially with her industrial development.

Malaria destroys more lives every year than have all the epidemics of yellow fever in the past half-century, and there are several millions of our citizens in the United States to-day whose wage-earning capacity is limited because of the mild and chronic forms of the disease; yet malaria is preventable, and quinin is a specific for the disease.

In my opinion, malaria is a much more serious disease than yellow fever for the reason that one attack does not confer immunity, as in yellow fever, but predisposes to subsequent attacks; and because malaria is considered such a mild disease it is not properly treated and often assumes a chronic form which saps the vitality of the individual, thereby rendering him more susceptible to all other diseases, which are made more serious by the complication of malaria. The effects of yellow fever are soon over, while the victim of malaria may have the disease for years. I believe that the high death rate from nephritis in the southern states may be largely accounted for by chronic malaria.⁴

The existence of a few cases of yellow fever in a city causes a panic which destroys its commerce; there is an exodus of a large portion of its population, and cities, states and the nation will spend thousands of dollars in quarantines and in stamping out the disease; yet in the same city there may be thousands of cases of malaria—nothing is thought of that—and there has never been any organized effort to stamp out malaria because its ravages are “seen so oft” and we are so “familiar with the monster’s face” that we endure it as if conditions could not be remedied.

2. Harris, Seale: Some Problems in Medicine which Affect the Prosperity of the South, Jour. South. Med. Assn., April, 1909.

3. Thayer, W. S., and Hewetson, J.: The Malarial Fevers of Baltimore, Johns Hopkins Press, 1895, Baltimore. The Present Decline of Malaria in Maryland, Maryland Med. Jour., 1905, xlviii, 289.

4. Marchiafava and Bignami: In Twentieth Century Practice of Medicine, New York, 1900, William Wood and Company.

*Read in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.

1. Twelfth Census of the United States, 1900, Vital Statistics, Vols. 1 and 2.

Both malaria and yellow fever are transmitted by mosquitoes, the only difference being that they are carried by different varieties of mosquitoes which breed under different conditions: the anopheles breeding in puddles, undrained ditches, swamps, and in the scum on the surface of stagnant and slowly moving water along the banks of rivers and small streams, while the *Stegomyia calopus* has its habitat in the standing water of old cans, bottles, gutters of houses, badly drained sewers and other water-containers in and around human habitations. The anopheles must be infected by biting a malarial subject just as the stegomyia must get the infection from man. Since the above facts regarding the transmission of yellow fever and malaria are true, it would seem that the same measures should be employed in stamping out malaria as were used so effectively in stamping out yellow fever in Havana and in the Canal Zone. According to Colonel Gorgas,⁵ the mosquito crusade in Havana not only freed that city from yellow fever for the first time in more than a century, but practically eradicated malaria at the same time. The number of deaths per year from malaria, in the city of Havana, before American occupation, averaged 350; after three years of sanitation by Colonel Gorgas and his assistants the deaths were reduced to 40 per annum.

That malaria may affect the welfare and destiny of nations is shown by the fact that students of history believe the decadence and downfall of ancient Greece and Rome was, to a great extent, due to the life-and-energy-sapping disease—malaria.⁶ They believe that malaria is largely responsible for the transformation of the most learned, cultured and physically the strongest race of people in the history of the world into the ignorant and morally and physically degenerate people who to-day live among the ruins of Greece, which is now regarded as a "death hole for malaria."⁷ The writings of nearly all the Roman authors contain many references to severe and destructive epidemics of malaria, and the efforts to drain the deadly Campagna date back before the time of the Cæsars. The prevalence of malaria in Italy no doubt had much to do with breaking the spirit of the ancient lordly Roman, "who was greater than a king," and thus helped to bring about the decline and downfall of the Roman empire.⁸

In the earliest years of this republic, and even in the first few decades of the last century, malaria was prevalent in the southern states to an extent which greatly interfered with their development. At that time quinin was such a rare and expensive drug that it could not be obtained, particularly in the rural districts, and nothing was known as to the nature and cause of the disease, so that thousands died from the malignant types of malaria.

The first capital of Alabama, St. Stephens, which, at one time, in 1810, was a thriving town of several thousand people, was literally wiped off the earth because malaria was so prevalent and of such severe type that its inhabitants either died or abandoned their homes. With our present knowledge of malaria, the inhabitants of old St. Stephens could live in perfect health, without one of them having a symptom of the disease which a century ago destroyed their prosperous little city.

Malaria was the principal obstacle to the completion of the Panama Canal by the French; and I may add that it has been the cause of the failure of many smaller enterprises in our own land.

Now let us consider the question of how malaria affects the prosperity and happiness of our nation to-day. I will first discuss the question of what malaria costs the United States, of how much money is spent each year because of the ravages of this now mild and easily preventable disease.

According to the census for 1900, there died from malaria in the United States 14,909 persons, and, estimating the value of a human life at \$3,000 (the legal estimate is \$5,000), malaria costs our nation from loss of life alone \$54,727,000 each year. The death rate from malaria is very low; probably not one out of 500 people affected dies from the disease, and, adding to the death losses the loss of time and decreased earning capacity of the millions in the United States who are afflicted with the chronic and mild types of the disease, and the money paid out by the people in quinin and other medicines, to say nothing of the doctors' bills, on account of malaria, the cost of malaria to our country is enormous and astounding.

Dr. Albert Woldert, of Tyler, Texas, in a paper⁹ read before the Texas State Medical Association, gives statistics from the hospitals of the United States Army posts in Texas in the year 1901, showing that one person in seven residing in those posts had malaria at some time during the year; and, according to his statistics from the railway hospitals, located in all sections of Texas, one railroad employé out of every four had malaria. Dr. Woldert states that about 3,000 people die annually from malaria in Texas, and he estimates that the financial loss from malaria to the people of the State of Texas during the year 1901 amounted to the enormous sum of \$5,333,320. If it cost Texas that sum, the loss to the United States is at least \$50,000,000 to \$100,000,000 per annum. These figures give what malaria costs in cold cash, and do not take into account the sorrow and suffering of the millions who are afflicted with this preventable disease.

Is it worth while to combat, and to hope to exterminate, a disease so widely prevalent in the United States?

In answer to this, I would point to what has been accomplished by the Italians in the last five years. Though Italy has suffered more from malaria than any other nation, it should be said to the credit of her physicians that they have studied the disease most carefully and have contributed more than those of any other nation to our present scientific and practical knowledge of malaria. The Italian Society for the Study of Malaria has made most valuable contributions to the science and literature of the disease. The Italians have also made practical use of their knowledge of malaria by aiding the physicians in their campaign against the disease, and even though in financial difficulties Italy has spent millions of dollars to prevent the disease. She not only enacted and enforced laws to stamp out malaria, but went into the manufacture of quinin, selling it to her citizens at the cost of production and giving it free to her poor. That this expenditure of money and the campaign against malaria as made by the Italian government and its physicians was wise is shown by the result. The mortality rate from malaria in Italy for the

5. Gorgas, W. C.: Malaria in the Tropics, THE JOURNAL A. M. A., 1906, xlv, 1416.

6. Jones, Ross and Ellett: Malaria: A Neglected Factor in the History of Greece and Rome, 1907, Cambridge.

7. Ross, R.: Malaria in Greece, Jour. Trop. Med., 1906, ix, 341, 351.

8. Jones, W. H. S.: Malaria and History. Ann. Trop. Med. and Parasit., 1907, 1, 529-546.

9. Woldert, A.: Malarial Fever, Its Expense to the People of Texas, Transactions of the Medical Association of Texas, 1904, pp. 37-61.

past five years has been reduced two-thirds (Thayer). Think of the saving of lives and suffering to the people of our country if our mortality and morbidity rates from malaria can be reduced even two-thirds!

The results in the mosquito crusades in Havana and in the Canal Zone should encourage us. As I have said, malaria was practically exterminated in Havana, and the following extract from Gorgas' last report¹⁰ shows how malaria is being conquered in the Canal Zone under the most favorable circumstances:

In 1906 we had from malaria 233 deaths; in 1907, 154 deaths; and in 1908, 73 deaths. That is, with a force more than one-third larger in 1908 we had from malaria less than one-third the deaths that we had in 1906. I consider malaria the best measure of the sanitary work done. In 1906, out of every 1,000 employes we admitted to our hospital, from malaria, 821; in 1907, 424; and in 1908, 282. That is, we now have only about one-third the amount of malaria among our employes as we had three years ago.

President Taft, in a recent address, said: "The sanitation of the Canal Zone has made possible the completion of the Panama Canal, the greatest enterprise in the history of the world."

Colonel Gorgas, in an address before the Academy of Medicine in New York, said: "With the removal of yellow fever, malaria and other tropical diseases, the tropics will become the centers of civilization of the world." If it is possible to eradicate those diseases from the tropics—and medical science has practically eliminated yellow fever from the diseases to be considered—how much simpler and easier will the problem be in the United States! It seems almost as feasible to stamp out malaria as yellow fever, and I believe that, with our present knowledge of the disease, it will soon become one of our rare diseases and that it will not be many years before our public health authorities will quarantine against malaria as we do now against yellow fever.

In discussing methods for the prevention of malaria, it may be well first to state the precautions to be used with an infected individual, which are largely the same as with a case of yellow fever, i. e., he should be (a) isolated (placed under a mosquito-net or in a screened room) to prevent his infecting anopheles mosquitoes; (b) the mosquitoes in the house should be destroyed by burning sulphur or pyrethrum; (c) the persons in the house or others exposed to the bites of infected mosquitoes should have preventive doses of quinin (3 grains, morning and night); (d) after the patient has been relieved of all symptoms he should take six grains of quinin a day for a period of at least three months, to be certain that he can not infect the anopheles mosquitoes in his community (Thayer).

Malaria should be classed as a reportable disease. Physicians should be required to report to the city and county health officers the name and location of each patient suffering from malaria, just as is now done with yellow fever and typhoid; and, as in those diseases, the source of infection should be searched for and removed if possible.

To protect the inhabitants of a community, whether in the city or in the country, efforts should be made to destroy all anopheles mosquitoes. Every accumulation of stagnant water, whether large or small, which can become a breeding-place for mosquitoes, should be drained or filled in, or oiled, when those measures are not practicable. The debris, green moss, and decaying vegetable matter on the surface of the water along the

banks of slowly running streams should be removed because that is a favorite place for the breeding of anopheles mosquitoes.

When it is not possible to destroy all mosquitoes in any community, every person should sleep in screened rooms, or under mosquito-nets, from early spring until the mosquitoes are destroyed by the frosts of winter.

In badly infected communities (malarial localities) every person should take prophylactic doses of quinin during the summer and autumn months.

A physician in performing his daily duties can do great good by treating each malarial patient as if he had any other infectious or contagious disease, and by instructing his patrons as to the mosquito origin of malaria. He should inform his patients that malaria is infectious and of the methods to be employed in preventing its spread.

There should also be carried on a systematic campaign of education among all classes of people, by means of lectures and by widely distributed tracts, written in popular style, regarding the mosquito transmission of malaria and of how the disease may be prevented, because without the cooperation of the public a crusade against any disease can accomplish but little.

There should be organized a national association for the study and prevention of malaria, just as was done in Italy, with auxiliary state and county societies in the sections most infected.

The medical societies and boards of health in each town, city, county and state affected should take up the work of stamping out malaria. The American Medical Association, and particularly the Section on Preventive Medicine and Public Health, should aid in this great work, at least, by lending its influence toward a practical solution of this problem.

The United States Public Health and Marine-Hospital Service should also be called on to assist in stamping out a disease which causes so many deaths and so much suffering. Malaria is of more importance to the welfare of our country than yellow fever, and the scope of the United States Public Health and Marine-Hospital Service should be enlarged and its force increased so that a trained body of sanitarians can be employed in the fight against malaria just as has been done in epidemics of yellow fever. Malaria may be at times an interstate disease and already the health officer of Mobile is protesting against the introduction into that city of severe cases of malaria from the tropics.

Congress should be urged to create a special commission for the study and prevention of malaria, and to provide an appropriation sufficient to carry on the work. It seems to me that, at this time, a separate commission could accomplish more than by placing the work in the hands of any of the departments of the government now existing, because such a commission could be composed of physicians of wide influence in the localities most affected, men who would be especially interested in getting results and men who could enlist the active cooperation of the various county and state boards of health. The physicians composing such a commission should have hospital facilities for the study of the disease, because there are many problems connected with malaria which have not been worked out.

Congress has appropriated money for the study and prevention of yellow fever. Malaria is a similar disease, and, in my opinion, is of greater importance, certainly, at this time, to the welfare of the entire nation, than yellow fever ever will be again. Congress appropriated \$50,000 for the study and prevention of the boll weevil

10. Gorgas, W. C.: Annual Report of the Department of Sanitation of the Isthmian Canal Commission for the Year 1908. Government Printing Office, Washington.

and also considerable money for destroying parasites in wheat and corn; it has given large sums for stamping out diseases in cattle; why should it not be called on to aid in stamping out a distinctly preventable disease, which destroys thousands of human lives and decreases the earning capacity of many hundreds of thousands of American citizens?

The problem of the prevention of malaria means much to the southern states and, therefore, much to the nation. If our section can be freed from malaria, the poor whites and negroes will be stronger physically and, therefore, better laborers; our naturally fertile lands will become more productive; the cotton mills will come to our cotton fields because of our cheap and efficient labor; our iron and other mineral resources will be developed to an extent hitherto not dreamed of, and our Gulf and Atlantic cities will become shipping and manufacturing centers of great importance. If we can prove to the world that malaria, like yellow fever, can be forever stamped out of the south, our prosperity will amaze the world.

ABSTRACT OF DISCUSSION

DR. MARSHALL LANGTON PRICE, Baltimore: There is one subject on which I think I ought to dwell, especially because of its importance; that is, the actual value of the statistics of malarial fever. I doubt very much, under present conditions, that 80 per cent. of the deaths which are actually recorded from malaria in the United States are due to any infection from the malarial parasite: I believe this, from my experience in Maryland, in which state there are probably recorded annually from 8 to 10 deaths from malaria. This makes an impressive showing in figures; but when the original certificates are examined one finds about as follows: returned as the primary cause of deaths, malaria, 2 weeks; intestinal perforation and peritonitis, 10 days. Analyze the death statistics of any state and similar conditions will be found. Outside of the extreme southern states there are not more than 100 deaths from malaria during the year, in the states north of Tennessee. Of over 400 deaths reported in Illinois, I doubt very much if 20 were due to malaria. During the Spanish-American War some observer made a tour of the military camps. He found from 50 to 100 men in each camp laid up with malaria and being dosed with quinin. He was told: "They have malaria." He reached some regimental surgeon, who, I am sorry to say, for the sake of Americans, had a very strong German accent. The observer asked: "How many cases of malaria have you?" He said: "Not one, sir!" His patients were not being dosed with quinin; they were being treated on rational grounds for typhoid fever. In Maryland one of the best studies of typhoid fever was that made by Thayer and Hewittson in 1893. At that time malaria was endemic around the suburban portions of Baltimore. Those cases were not founded on conjecture, but the actual parasite was found in the blood. Since then malaria has almost disappeared from Maryland and in every 1,500 to 2,000 cases of supposed malaria the malarial parasite is found in about 5, as determined by the examination of fresh blood or smears. I have no doubt that in the South, as Dr. Harris states, malaria is a very common disease; but I do not think we ought to accept the usual diagnosis by the physician as an actual basis for malarial figures. I think we ought to reject all such cases and base statistics entirely on those cases in which the parasite is demonstrated in the blood either by staining or by an examination of the fresh specimens.

DR. HENRY B. HEMENWAY, Evanston, Ill.: Illinois is exceedingly defective in vital statistics, the state administration having paid very little attention thereto. It is estimated by the Illinois State Board of Health that 80 per cent. of the deaths that occur in Illinois are reported. Of course, that would increase the 400 deaths from malaria quite materially—put it up to 500; but it has been my observation, as Dr. Price has said, that a large majority of the diagnoses that

we get as malarial fever would, with the blood test, prove to be typhoid. So far as I know, in Cook county there have not been more than five cases that have shown the peculiar organism of malaria, within perhaps a couple of years. Some were found along the Desplaines River some time ago. Most of the cases that are recorded as malaria—as fatal cases of malaria, particularly—are really typhoid; and that is one reason why the study of malaria can hardly be separated from the study of typhoid, and the study and prevention of yellow fever. I am glad that attention has been called to the necessity of including among the reportable diseases malaria as much as smallpox or scarlet fever.

DR. W. FORREST DUTTON, Walker's Mills, Pa.: Dr. Price brought up a point that I would like to hear explained, not at any length, but satisfactorily enough for those present, namely: mixed infection. I would ask Dr. Harris to give us, if he can, the frequency of typhomalarial infection, the percentage of cases in which it occurs. I do not think there is any reason why we should be at loss to differentiate typhoid from malaria except when there is a mixed infection. I think that by means of microscopic examination of the blood smears we ought to be able to make our diagnosis very readily.

DR. JUAN GUITERAS, Havana, Cuba: I do not think that in the tropics a mistake in diagnosis is frequently made between typhoid and malaria. I understand the mistake may be made with filaria, hookworm and tuberculosis, but not with typhoid fever. The cases reported as malaria in the tropics—in Cuba at least—would seldom be found to be cases of typhoid fever. Of course, the mistake is possible, but it is exceptional. The unfortunate term of typhomalaria that was invented some time ago was in vogue at that time, because we had no definite means of diagnosing typhoid fever. Malaria in Cuba has fallen from the third and fourth place on the mortuary records to the tenth place. Malaria was originally placed by us on the list of reportable diseases because of the yellow fever campaign. Another important factor in bringing about this reduction of the malarial fevers in Cuba is the isolation of the sick at the port of entry. We are detaining a very large proportion of the patients with malaria who formerly went into the country and, of course, became propagators of the disease. The majority of patients with malarial infection coming from Central America, Mexico, the Mississippi delta, etc., are found with fever on the inspection made by the quarantine officer and are sent to Las Animas Hospital; once there, they are not discharged until they are cured.

DR. J. N. HURRY, Indianapolis: I believe thoroughly in education as the best, perhaps the only way to get these subjects before the people. Sometimes, however, I become discouraged. I went before the county board of health of a certain county in Indiana where malaria was reported as existing to a considerable degree, and from which county several deaths had been reported, and presented the reason of malaria. This county board of health was composed of the county board of commissioners. So I presented the whole matter as carried by mosquitoes and I thought I had made a very excellent impression on the board—that it would take action, print circulars, and perhaps go to draining, and encouraging drainage in the county there and get rid of stagnant water; and I was very confident that I had educated these "practical business men," as they called themselves. One of them turned around and with his hand combed a couple of handfuls of manure out of his beard, saying: "Young fellow, you don't believe all of that stuff, do you?" So sometimes education does not educate, and especially with the man who considers himself highly practical, and—worse yet—with the man who has made a semifinancial success. I think that those men are so consumed with conceit that one cannot get at them. We had a legislator who had cunning enough to amass a hundred thousand dollars. He has decided to be a practical man in his neighborhood; and so practical and so eminent was he in the state that the governor appointed him on a very important examination committee; and when he heard one of our lecturers say that consumption was rarely, if ever, hereditary, he said he did not care if "a thousand doctors and thousand doctor books said that it was not hereditary" he knew that it

was. Now, you see, we have a certain class of people (I suppose they exist in other states), who cannot be educated.

DR. SENECA EGBERT, Philadelphia: I remember distinctly that somewhat more than fifteen years ago the secretary of one of the southern states, speaking of the importance of artesian water as replacing that from shallow wells, declared in one of the bulletins that because of the improvement in the well-water supply in certain parts of his state the reduction in malaria had been over 50 per cent. We all know now that the malaria of which he wrote was not malaria, but must have been something else. My experience was that a great many of the people in a locality where I was working used water from very shallow wells; and I remember in one case water that was undoubtedly contaminated, in this village, was taken from wells located a very short distance from a stream, and everybody believed that the wells filled from the stream. On the higher ground above the wells there were twenty-three privy vaults and pig-sties draining directly toward these wells en route to the stream. These people were persistently ill every season, with so-called typhomalarial fever. I doubt very much if any one in the neighborhood had a true case of typhoid fever, but I am convinced that they were suffering from filth infection, and that their general health was depressed by that absorption of human and pig filth. So it seems to me that possibly we may explain much of the reported typhoid fever or malaria if we dubbed it simply filth infection, and occasionally, paratyphoid.

LIEUT.-COL. JEFFERSON R. KEAN, U. S. Army: With reference to the statement of Dr. Guiteras that there were about 40 deaths from malaria in the City of Havana during the past year, I think that the showing is even better than that, my recollection being that it was only 8. Although the difference between 40 and a lower figure is not great for a city of 300,000 inhabitants in the tropics, I wish to call attention to it as an evidence of the thoroughness of the work being done in Cuba. It means the practical extermination of the pathogenic varieties of mosquitoes in and about Havana. The last year that I was in charge of sanitary affairs in Cuba we had to send away from Havana to get anopheles larvæ to show to our inspectors as a part of their course of instruction. I regard Havana at present as not capable of infection with yellow fever and if any one visits the city, unless he stays much longer than most American visitors, he will probably not see a single stegomyia mosquito. In so excellent a paper it seems ungracious to criticize small points, but there is one which I would like to see corrected. I do not want to detract at all from the excellent public work for the extinction of malaria that is being done by the Italians and which we would do well to imitate; and this notwithstanding the fact (as Dr. Price will probably bear me out) that many of the local epidemics which appear in the northern states are initiated by Italian laborers who bring in the infection. While giving the Italians all due credit for their work I do not like to hear them credited with that of men of other nationalities. Laveran, who discovered the malarial organism, was a French army surgeon, and it was a British army surgeon, Ronald Ross, who first demonstrated the agency of the anopheles mosquito in conveying malaria.

DR. LISTON H. MONTGOMERY, Chicago: I do not think very much of the term typhomalarial fever. Has the Italian government succeeded in reducing the number of deaths by two-thirds?

DR. SEALE HARRIS, Mobile, Ala.: Yes.

DR. MONTGOMERY: It shows that in Italy governmental control is paramount; furthermore, Cuba has succeeded in stamping out yellow fever, and practically malaria also. Cuba has a national department of health; and those two examples would, it seems to me, go to show that our government should have a national department of health, with its physician in the cabinet, as has been done in Cuba. Not only this, but such government commission should have supervision over other contagious diseases, such as tuberculosis and bubonic plague, the latter of which is liable to come from South America, particularly Venezuela, and get into New Orleans almost any day.

DR. J. H. WHITE, New Orleans: The national government is standing guard at this present moment.

DR. MARSHALL LANGTON PRICE, Baltimore: Those of us who have been in New Orleans are familiar with the magnitude of Dr. White's work in the last yellow fever epidemic. I think the problems that he tackled were among the most difficult undertaken in this country; and the brilliant results all of you know.

DR. J. H. WHITE, New Orleans, La.: When I undertook the work of sanitation against yellow fever in 1905 we were confronted with 196 square miles of territory in the City of New Orleans, whereof 44 square miles are built up rather closely; 660 cases of yellow fever; control more or less lost; and nothing but the indomitable pluck of that magnificent people could have enabled success. It was a question of extermination of all mosquitoes in the City of New Orleans or failure. We put 3,000,000 pounds of salt in the gutters in order to make sure that there were no mosquitoes breeding there. Six weeks afterward the water in the bayous through which the gutters reach the lake showed 5 per cent. saline. We cleaned the whole town from end to end; we oiled 68,000 cisterns, and every rain barrel that we could get our hands on; we left nothing to breed on in that 44 square miles of territory; and in the latter end of September, 1905, a new-born baby could have been placed in the streets of New Orleans to sleep. The extinction of yellow fever was not the only result. A result as truly gratifying was that estivoautumnal malaria which had been common in New Orleans, was distinctly cut down. Having a hospital under my supervision, it is only in the past six months that we have begun again to get estivoautumnal malaria by the river front, by reimportation both of the mosquito and infection from the tropics, proof of this being as follows: At certain points on the river we have lying in close contact steamers from Tampico, Coatzacoalcos, and London and other British ports. These Englishmen occasionally develop estivoautumnalis when they have not been in the tropics for a year or two, and after lying for two weeks in the port alongside the wharf close to the Tampico or Coatzacoalcos ship, and to the collection of water caused by the railroads digging out dirt to fill up their embankments: thus proving the reinfesting of our mosquitoes which have come back only in the last two or three years to that point.

Now, as to governmental control, New Orleans has done her duty very well indeed, in the matter of malarial fever. As I recollect it, the annual death rate in New Orleans back as far as the '70's from fever supposed to be malarial, and probably malarial (because typhoid infection was very uncommon), was close to 335 as the average; and to-day, I think it will not go to 25; and that is municipal work: it has nothing to do with the nation. As a national representative, I say that I think this a pretty good showing in New Orleans, which, if you paralleled with Havana, Dr. Guiteras and Dr. Kean will admit, is a far harder proposition; New Orleans is extended on a mud-flat, below the level of the Mississippi half the year round, the water so sluggish in its flow that it has to be pumped out mechanically, and there is every possible inducement to the mosquito to make its habitat in and around New Orleans. Gradually, slowly but surely, they are eliminating the mosquito. A little more persistence, a little more care, possibly another scare, will be needed to bring them up to it; but I feel sure—as sure as a man can of anything that he has not seen done before him—that New Orleans will, in the next few years, be immune to yellow fever.

DR. SEALE HARRIS: What is the difference in death rate?

DR. J. H. WHITE: As I remember it, the general, as compared with the previous death rate, has been reduced about 2: among the white population, say from 19 to 17; among the negro population, a slight reduction, not so much.

DR. G. FARRAR PATTON, New Orleans: Dr. White, with characteristic modesty, has not mentioned what was really the greatest victory that he won there; that is, overcoming the prejudice of the people. I think it is safe to say that at the outset ninety-nine out of every hundred people in New Orleans believed that the mosquito doctrine was all nonsense, and before the campaign was half over the people of the city, down to the street arabs, were convinced of its absolute truth. That was accomplished mainly by a "hammer and tongs" campaign of education, attended with positive proof in the

way of results. As Dr. White jokingly says, he preached in every church in New Orleans, and it is true: he preached a gospel that saved the lives of the people more effectively, perhaps, than the preachers who ordinarily occupied those pulpits save the souls of their people and I consider that this victory—the moral and intellectual victory—transcended in magnitude the wonderful success achieved in banishing the disease proper before the coming of frost.

DR. R. A. NEALE, Chicago: About thirty years ago I was physician to the poor of Washington, D. C.; I had assigned to my territory a section of the city that was nearly surrounded by water, and it was called "Foggy Bottom;" the three thousand odd people living there for ten or twelve years had been suffering intensely from ague; the little huts that they built were nearly all covered with shrubbery and vines. Foggy Bottom was a piece of land that was marshy; in a number of years it became filled in and houses were built there. My predecessor showed me an average every summer of over 600 cases of typical malaria in that Foggy Bottom. I did not know anything about Italy's great progress in preventing malaria, but I was fearfully annoyed every night by the numerous mosquitoes flying about my head, and I decided that I must get rid of them. I made all of those people get rid of all vines and shrubbery, cut down every tree, and put screens in all the windows and burn sulphur in their rooms. I had them make hundreds of bonfires at night, hundreds of them; because the breezes would come at night and blow the mosquitoes away down the river; in the morning it would come the other way and blow them back again. The next year of my term, instead of having 600 cases of malaria I had only 50; the third year there were only 25, and nearly all of the patients had recently come to reside in Foggy Bottom.

DR. SEALE HARRIS, Mobile, Ala.: I expected my statistics to be questioned, but those obtained from the United States Census Reports are the only ones available. I am willing to admit that many deaths reported as malaria are due to typhoid fever, tuberculosis, sepsis, hookworm and other diseases, but it is a remarkable fact that along the Mississippi Valley, along the valleys adjacent to the Missouri and Ohio rivers, and in the South, where conditions are favorable to the development of anopheles mosquitoes, there are so many "ignorant" physicians who report these cases of malaria. The United States Army surgeons, I believe, represent as good a class of physicians as we have, and the statistics from the United States Army posts, which are located in all sections of Texas, show that one person out of every seven residing in those posts had malaria in 1901. Not only that, other statistics compiled by Dr. Waldren show that in the railroad hospitals in Texas, which are located in cities in different parts of the state, where it is certainly probable that there are competent physicians in charge, one patient out of every four has malaria. I admit that my statistics may not be correct, but from my own observations in the South I believe that there a large proportion of the population has malaria at some time during the year. The death rate from malaria is low, and is growing less, and it is a very mild disease, yet it does affect the vitality of the individual; it makes him more susceptible to other diseases, and I believe it materially affects the general mortality rate. I am sure that malaria is growing less prevalent in the cities where there is proper sewerage. I believe that will account for much of the decrease of malaria in Maryland. In Havana and the Canal Zone where the sanitation was worked out largely against mosquitoes the general mortality rate was reduced about 50 per cent., and as Dr. White has pointed out, the general death rate has been reduced in New Orleans since the crusade against mosquitoes.

Regarding the amount of typhomalaria in the South, I do not know of any cases in which typhoid and malaria have been found at the same time in the same individual, but it is certainly true that in the convalescence of typhoid fever malaria does occur. In the tropics during the Spanish-American War, when a large number of United States soldiers had yellow fever, they suffered a great deal more from the malaria that followed. I realize the difficulties of educating the public, but the lessened prevalence of malaria in the South is due

to the fact that the educated, "well-to-do" people have their homes screened with the idea of preventing malaria by keeping out mosquitoes, and with such people malaria is less prevalent than formerly. Another reason why malaria is less prevalent in the South is the widespread use of quinin. Dr. H. F. Harris, of Atlanta, studied a large number of cases of continued fever and the greater majority of them responded to the Widal test for typhoid.

I desire to thank Dr. White for calling attention to my mistake as to Laveran being an Italian, but the italians have done a great deal in studying malaria, and the literature published by the Italian Society for the Study of Malaria is greater in volume than that contributed by any other country.

My object in bringing this paper before this Section is this: While malaria is not perhaps so severe an infection as yellow fever, typhoid fever, tuberculosis and many other diseases, it is one of the more prevalent diseases in the United States. There is a great opportunity for sanitarians in the South to make records by decreasing the death rate from malaria, and in doing that it would be one of the greatest things for our country, particularly for the South, because we have the reputation of being unhealthful. Eliminate malaria and you will certainly decrease the general death rate.

SOME MINOR GYNECOLOGIC MATTERS OFTEN OVERLOOKED *

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In routine practice we may fail to appreciate certain rare or obscure diseases which are very annoying to our patients, although not dangerous to life. We find a number of cervical erosions, classified as infectious, which are due to other causes. There are numerous infections of glands of the genital tract which are not understood, and which are not successfully treated because the seat of the infection is not exposed and thoroughly sterilized. Many patients have numerous deep vulvar glands, especially about the vestibule, which may become veritable nests for gonococci or other microbes and will perpetuate an infectious discharge indefinitely unless opened widely and sterilized by iodine or some equally good application. Skene's glands in the urethra are known to harbor infectious organisms and to cause a persistent urethritis. This disease requires surgical treatment if a cure is obtained. The glands must be opened up, thoroughly exposed and treated. My purpose at present is to direct attention to certain nerve changes about the genital tract.

NEURITIS AND HYPERESTHESIA OF THE VULVA AND VAGINA

This is a frequent and often unsuspected cause of annoying symptoms. One of the commonest mistakes made by physicians who treat gynecologic patients is to call every sensitive surface an inflammation. Careful discrimination will enable one to detect certain nerve alterations and to see the difference between them and vaginitis or vulvitis, due to infection or persistent irritation of any kind.

These nerve changes are often seen in a consulting practice. The patient has had fairly good, and perhaps rather active, treatment for infectious disease and has not obtained relief. In fact, nearly every patient coming under observation has been subjected to much local treatment, all of which has probably done harm unless such treatment finally results in a diagnosis.

* Read in the Section on Obstetrics and Diseases of Women of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.