YELLOW JACK'S TROLLEY LINE

Part Played by Tropical Insects in Spreading Yellow Fever.

MOSQUITOES ONE HOST OF DEATH

Facts Established by Prolonged Study of Microbes and Insects Which Harbor Them—Evolution of the Microbe.

"The Role of Insects in the Transmission of Disease" is the title of a timely paper contributed by Dr. Millard Langfeld of Omaha to the October number of the Trained Nurse and Hospital Review of New York. Dr. Langfeld is professor of bacteriology in the John A. Creighton Medical college and also bacteriologist of the Omaha Board of Health. His paper follows:

The recent appearance of yellow fever in Louisiana draws attention again to the part that a certain mosquito plays in this disease. It also suggests the inquiry why yellow fever, when it invades the United States, has of late years been confined to the southern and gulf states. A consideration of the role of insects in the transmission of diseases in general furnishes us most excellent reasons for this peculiar localization. The word transmission is used advisedly, namely, in the sense of transferring or passing on of the cause of the disease by insects, in contradistinction to such insects as are themselves the actual cause. For example: The so-called yellow fever mosquito is not the primary cause of yellow fever; it is only when this mosquito harbors the parasite of yellow fever that it can convey the disease. It is an accessory factor only, the accidental host of a death-dealing microbe. On the other hand, the itch mite is the primary cause of the disease we call "itch," the manifestations of which are the direct result of the female burrowing into the skin to lay her eggs.

The investigations which successfully solved the problem of the part that insects play in the transmission of disease incriminated not only the mosquito, but the fly, the bedbug, the ant, the flea, the tick, and probably the body louse—insects which have the greatest opportunity for contact with both food and human beings. The diseases spread by these insects make quite a formidable list, a few of the more common ones being yellow fever, malaria, typhoid fever, cholera, tuberculosis and bubonic plague.

Incidental to, but not less important than these invaluable discoveries, are the many other interesting phenomena brought to light in the course of these studies. Chief among them is the fact that all animals, both aquatic and terrestrial, cold-blooded and warm-blooded, also suffer from diseases conveyed by insects. Of biological interest are the many curious and unexpected data concerning the life history, or cycle of development, of very low forms of animal life.

As a rule diseases communicated through the agency of insects are caused by the lowest forms of animal and vegetable life, the organisms being so small as to be invisible to the unaided eye. To this class of micro-organisms the vegetable kingdom has given the bacteria; the animal kingdom the protozoa, filaria and the like. Some diseases are caused by microbes so minute that an instrument has not yet been devised to make them visible, yet we are aware of their presence through tests evolved from the study of forms which the microscope has revealed.

Insects as Disease Carriers.

A micro-organism, microbe or germ of a disease is carried by an insect either accidentally or as a host. In the former instance some portion of the insect's body becomes soiled by disease germs, which, in turn, are transferred to food or persons during the creature's flight. In this way many diseases may be carried, among them typhoid fever, cholera and tuberculosis. Or the insect may imbibe the germs with its food and then contaminate persons or food with its excrement, the germ passing through it. Still another possibility is the contamination of wounds either during flight or by a person crushing the insect and then scratching the spot where it had set up an irritation through biting. Plague, lock jaw, etc., may be conveyed in this way.

When the insect acts as a host for the germ, an entirely different condition is presented; the insect is not only the carrier of the germ, but is an incubator for it, as it were, during one phase of its life history. In the host the microbe finds all the conditions favorable to its growth and multiplication, and, coincidentally, for the increase in virulence of its specific virus. The germ is, in this case, a parasite on the insect. There exist in the world numerous genera of animal and vegetable life that always live upon other genera as parasites; that is to say, they live at the expense of other organisms by sharing their food, or by drawing nourishment directly from their bodies. The organism that supports the parasite is called the host. Among low forms of life parasitism is almost the rule. Many of the parasites require two hosts to successfully carry out their life cycle—one host to support their baby or larval form, another the mature or adult form. In each host development can only proceed to a certain point, and, unless another host is found upon which they can continue their development, their life is ended. Therefore, when an insect carries a microbe for which it is a host (among low forms it is almost a biological law that each parasite has a particular host and no other) it must be regarded with greater fear on account of its greater possibilities for doing harm. In illustration of this, the mosquito serves as an excellent example. The mosquito is the host for the microbes of both malaria and yellow fever; when it bites a person suffering from one of these diseases it sucks up with the blood a few of the parasites of the disease. These parasites can in no other way get out of the afflicted person's body and would perish if a fatal termination of the infection resulted; or they would be destroyed within the person's body should he recover. But the few which find their way into the mosquito's body produce innumerable broods that are from time to time inoculated into one person after another as long as the creature is active. The microbe of yellow fever is not yet to be discovered, unless we accept that one described by working party No. 1 of the public health and marine hospital service. This party, consisting of Drs. Parker, Beyer and Pothier, while working at Vera Cruz, Mexico, in 1902, during an epidemic of yellow fever, discovered in the body of a yellow fever mosquito a microbe that bears a close resemblance to the malarial germ. It was found only after the mosquito had bitten a yellow fever patient. But these doctors were not able to find the same germ or its antecedent in the blood of the sick. Therefore, until this most essential fact in the chain of evidence is supplied, we cannot accept their microbe as the cause of yellow fever. Nevertheless, despite the fact that the yellow fever microbe is not known, we are fortunately in possession of the important facts relating to the spread of the disease.

Known Methods of the Disease.

The conclusion reached by the medical board of the United States army, composed of Doctort Reed, Carvall, Lazear and Agarmonte, submitted in 1900, and those of a later report submitted by Major Reed in 1901, contain practically all the facts essential to be known to prevent the spread of yellow fever. Briefly, the conclusions are as follows:

1. The mosquito, stegomyia fasciata, serves as the intermediate host for the parasite of yellow fever.

2. Yellow fever is transmitted to the non-immune individual by the bite of the mosquito that has previously fed on the blood of those sick with this disease.

3. An interval of about thirteen days or more after contamination appears to be necessary before the mosquito is capable of conveying the infection.

4. The period of incubation in thirteen cases of experimental yellow fever has varied from forty-one hours to five days and seventeen hours. (The "period of incubation" is the time that elapses between the mosquito bite and the onset of the disease).

5. Yellow fever is not conveyed by fomites and hence disinfection of articles of clothing, bedding or merchandise, supposedly contaminated by contact with those sick of this disease, is unnecessary.

6. A house may be said to be infected with yellow fever only when there are present within its walls contaminated mosquitoes capable of conveying the parasite of the disease.

7. The spread of yellow fever can be most effectually controlled by measures directed to the destruction of mosquitoes and the protection of the sick against the bites of these insects.

8. While the mode of propagation of yellow fever has now been definitely determined, the specific cause of this disease remains to be discovered.

The Mosquito Theory.

The discovery that a particular genus of mosquito conveyed yellow fever led to a study of this particular insect's habits. An impetus had already been given to the study of mosquitoes as carriers of disease through the earlier discovery of Ross that another genus the anopheles, was the transmitter of malaria. The study of the habits of the stegomyia disclosed marked differences between it and the anopheles. Whereas the anopheles prefers densely populated centers. While on the one hand the anopheles breeds in naturally still or slowly moving bodies of water, the stegomyia is domestic in its habits, preferring open vessels in and about a household. Therefore, while the anopheles breeds in the open, in swamps and shallow puddles of water, the stegomyia elects water-barrels, cisterns, gutter-spouts and even the shallow vessels placed about table-legs in certain regions to exclude ants.

It was also learned that the stegomyia is not so widely distributed as the anopheles, being found chiefly in tropical and sub-tropical countries. Yet if transported, as it often has been by rail or boat, it may become acclimated in any place which supplies the conditions necessary for its development. And if perchance it harbors the parasite of yellow fever, the disease is soon spread by it and the young it breeds. For example: Working Party No. 1, states that while at one time the stegomyia was supposed to be a coast mosquito, in twenty-eight years it has gradually extended into the interior (Mexico) to great altitudes along the commercial lines of communication, until now it is a constant inhabitant at places with an altitude of from 3,000 to 4,000 feet, and yearly causes epidemics of yellow fever.

Other factors in regard to the life-history of this insect that are of importance in this connection are: That this mosquito does not bite when the temperature is below 63 degrees F.; that its eggs are not hatched out below 68 degrees; and that an average temperature of 75 degrees F. or higher is required for it to multiply abundantly. In these facts we find the explanation as to why a cool spell decreases the number of new cases, and a frost kills off the disease completely.

Confined to Certain Localities.

From the foregoing, it is evident why yellow fever occurs principally in tropical and sub-tropical countries. Many contributing circumstances are essential in order that the disease may gain a foothold; and these are supplied by a limited number of places. Particularly in the tropics, to a lesser extent in sub-tropical countries, the conditions still prevail in most places which make this pest-carrying mosquito possible. Surface drainage, lack of public water-supply, which means cisterns, rain-barrels, water-buckets to hold the day's supply of drink-water; inefficient or no sewage system; a large indigent population, none too cleanly in its habits; these are all important contributing factors in that they offer convenient breeding places for this pestilential mosquito. Add to these conditions a mean high temperature, and the mosquito, once introduced, multiplies rapidly and becomes a permanency. Then only one imported case of yellow fever is necessary to create what physicians call an endemic focus. Given a town in which there are lacking the public improvements above described, this town may never have had a case of yellow fever within its boundaries, yet, it only remains for a ship or car to bring one female parasite-harboring mosquito, and the trick is turned—the seeds of an epidemic have been sown on fertile soil. To recapitulate:

Yellow fever confines itself to certain localities because the conditions there are favorable to the propagation of the yellow fever mosquito; that yellow fever is conveyed from the sick to the well by a mosquito, the stegomyia fasciata; that the germ of yellow fever circulates in the blood of the sick, and is taken therefrom when the creature bites; in the body of the stegomyia, which is the natural host for the yellow fever germ, the germ passes through changes which occupy about twelve days, and which are essential to a continuation of its pernicious existence. These changes culminate in the production of innumerable young, which are conveyed into the blood of any person that the mosquito may bite. In the person bitten, after a period varying between forty-one hours and five days and seventeen hours, symptoms of yellow fever begin, which are the expression of the microbe's evolution in man.

HOUSES WITH MANY CLOCKS

A Remedy for Insomnia and a Fad Among People Otherwise Sane.

"Forty clocks in one house is not by any means uncommon," said a New York clockmaker. "In some private residences the time pieces exceed even this number. Almost any house of fair size will have from fifteen clocks up to twenty or thirty."

With forty or more clocks in operation it can be imagined that a rare treat may be in store for the restless guest at his friend's country place. As he tosses sleepless on the pillows of his strange bed the hour of 12 approaches.

Suddenly the slow, sweet tones of the chimes of the great clock in the dining-room break forth upon the silence in glorious melody. Scarcely have the chimes died away, followed by the deep measured, deliberate strokes that mark the hour, than another clock bursts forth upon the scene with its message.

This time the hour is announced in rather a saucy, emphatic manner—one stroke banging after the other like shots from a rapid fire gun, the entire twelve consuming little more time than one stroke of the big clock. Then from another room in the opposite side of the house comes the faint and barely distinguishable notes of a bar of music that is still another time piece's way of demonstrating that the midnight hour has arrived.

These notes are closely followed by a grand chorus of rings, bangs and tinkles as the score or more remaining time pieces whirl into action.

Silence more intense by contrast follows this unexpected and somewhat startling outbreak upon the night's quietness, which is again undisturbed save by the occasional striking of the quarter and half hours. The guest's sleeplessness disappears in the perfect silence that follows the charming midnight concert.

"How are so many clocks kept in good running order?" repeated the clockmaker. "Easily enough. No one in the house is supposed to touch or wind a single clock. That duty is left to the clockmaker.

"I spend one day each week winding clocks. In one house alone in this city an hour and a half of my time each week is taken up in winding the clocks. Of course I regulate them, too. And if there is any slight repair to be made, I attend to that, too.

"This constant and careful attention is economical in the long run. When a clockmaker attends to your time pieces you may be sure the work is done thoroughly. For he is regular in his work, and regular winding means better time.

"A lady in Tarrytown has more than forty clocks in her summer home. I make a trip one day each week up there through the summer season to keep her clocks in good shape. She is a great lover of time pieces, and has many rare and beautiful specimens, and never tires of adding a new clock to her collection.

"Many people buy clocks just the same as they do bric-a-brac, and the number they already have never seems in any way to affect their purchase of new ones that may strike their fancy. There is an old saying that there's always room for another clock, and I guess that's about right.

"No room seems to be complete without one, and as some residences have nearly a hundred rooms, it is easy to understand how one house may contain forty or more clocks and yet not have the appearance of a clockmaker's store, as one might at first think.

"We now have clocks that suit the laziest and most forgetful person down to the ground. These are imported, and run for 400 days with one winding. Anybody ought to be able to remember to wind a clock in that time, and this style of time piece seems to be meeting with great favor, for we have recently sold a great many of them."—New York Sun.

PRATTLE OF THE YOUNGSTERS.

"How old are you, Mabel?" asked the inquisitive caller.

"I'm 7 and five-twelfths years," answered Mabel, who has a great liking for fractions.

Dorothy was accustomed to having her eggs broken into the cup before they came to the table. One morning she said: "Mamma, why can't I have my eggs cooked with the hulls on, same as you do?"

"Why, Johnny, what's the matter with your face?" queried the anxious mother of a small boy, whose countenance looked like a railway map.

"Oh," answered Johnny, "Sammy Higgins said he didn't like my face, so he fixed it to suit himself."

"Ma, may I go out and play with Willie Grafter?"

"That's the son of the politician, isn't it?"

"I dunno whose son he is, ma, but he's the only boy on the street who says I can lick him an' don't make me prove it."

Horatio G. Herick of Lawrence, Mass., took a lively interest in the schools of his home town. Shortly after Garfield's death Mr. Herick visited one of the schools and made an address upon the life of the statesman. He asked: "Now, can any of you tell me what a statesman is?" A little hand went up and a little girl replied: "A statesman is a man who can make speeches." "Hardly that," answered Mr. Herick, who loved to tell this story. "For instance, I sometimes make speeches, and yet I am not a statesman." The little hand again went up and the answer came triumphantly: "I know; a statesman is a man who makes good speeches."

Pointed Paragraphs.

True love says nothing and swaps kisses.

A swelled head indicates a contracted heart.

It is easier for most people to be poor than honest.

A knot will not come untied if it would rather knot than not.

Give a woman a chance to show off and she will make good.

Some men make friends and some others make them tired.

Pride holds a few people up and throws a good many down.

No, Alonzo, a man of grit doesn't necessarily have a sandy complexion.

Speaking of unnatural mothers, what's the matter with the incubator?

Many a woman leads a dog's life—by holding the other end of the string.

A man who insists on having everything his way will have trouble thrust upon him.

Enjoy life today. The joys of yesterday are past and those due tomorrow may fail to arrive.

It doesn't take the average man long to tell all he really knows, but he never gets through telling what he thinks he knows.—Chicago News.

VAST COST OF EDUCATION

Why America Leads the World in Intellectual Development.

MILLIONS SPENT IN TRAINING MILLIONS

Instructive Review of Educational Progress in All Parts of the Country and the Money Invested Annually.

Money madness is the besetting sin in the United States, according to all the rest of the world. And it may be true that here and there an American does like to make a dollar now and then—every day, possibly.

But the grand passion of people of the United States is for education, not money. With them the education microbe has done its perfect work. In their efforts for mental training Americans lead the world. The latest official and trustworthy figures, the only ones, in fact, are furnished by the United States bureau of education. Its last report deals with the school year of 1902-1903. When the report was closed the total, to be exact, was 18,187,918.

But even this vast total does not take in all the Americans who are striving eagerly to improve their mental condition, some of them with every ounce of energy they have left after doing their day's work each twenty-four hours.

For, entirely outside the 18,000,000, entirely unnoticed by the statisticians, come the students enrolled for instruction by the famous Chautauqua university, the 30,000 who are regularly taking the Young Men's Christian association courses, and the students of the correspondence schools, whose subscribers number thousands.

Uncle Sam's Educational Problem.

This country alone, of all the countries in the world, has manfully attacked, and for its own preservation must accomplish the herculean task of operating constantly educational mills of such magnitude that they can accommodate 18,000,000 pupils and students from almost every race on earth.

The pupils of the "common" primary schools, including the city evening schools, make up 15,750,000 of the grand total of between 18,000,000 and 19,000,000 composing the American school army, as shown in the latest educational reports. This 15,750,000 are put through our educational mills without the cost of a penny to themselves for tuition, and in many states for books, even; each community paying the cost of its own schools in the main, the federal government educating only about 29,000 Indians, in round numbers, and 2,500 primary pupils in Alaska.

Now, what about the other millions in the educational army? Well, rather more than 1,000,000 are swallowed up by those primary schools that are supported by private means.

A Million for Higher Education.

Broadly speaking, considerably more than 1,000,000 of all the students who go to school in the United States are intent on some degree of the higher education. This is one in every eighty of the whole population (allowing that the 76,000,000 of 1900 have grown to 80,000,000 in 1905), by all odds a larger proportion than can be shown in the high schools, preparatory schools, colleges, universities and professional schools of any other nation now or ever in history dwelling on the crust of the earth.

Not to imitate the pages of a gazetteer too closely, here are the exact figures showing how this army of higher educational students, in America itself larger than the army of Japan in Manchuria, was divided up when the latest official figures were made:

High schools, acadamies and preparatory departments (608,412 being public high school students)	776,635
Universities and colleges proper	126,834
Professional schools (law, medicine, divinity, etc)	61,871
Normal schools	64,114
Total	1,028,454

That part of life covering the eleven years beginning with the age of 15 and ending with 25 may properly be considered the "college age," and, roughly speaking, the number of persons included in these ages in the United States when the last census was taken was 15,000,000. Extending the college age limit for those who may linger over professional and post-graduate studies to 27, the total would be about 18,000,000. Besides the million and more students in these high schools, colleges and professional schools, there are about 150,000 young men and women (137,979 in 1903) attending business schools, and more than 50,000 studying art, music and other subjects in miscellaneous schools—a total, say, of 200,000 in round numbers who are training themselves solely to earn a living and without the slightest pretensions to any alm at scholarship.

An Army of Teachers.

More than 500,000 men and women from college presidents down to plain schoolma'ams and schoolmasters are kept busy as teachers throughout the school year. The public school teachers alone numbered 449,287 in 1903.

Everything in America, say the critics of America, must ultimately be figured down to the basis of the dollar. It is in order, then, to say that the total cost of carrying on the public schools in the country is more than $260,000,000 a year (almost exactly that in 1903), and that the yearly expense of running the colleges and universities is rather more than one-tenth as much—rising above $27,000,000 in 1903. The yearly expense of carrying on all the other schools in the country has not been computed.

But there is no doubt that the total is a good deal more than $300,000,000, a sum so big that the wealth of a Rockefeller even would quickly melt if it were put to the test of meeting it as a yearly payment.

Including the students in the professional schools, and the faculties as well as the students in the colleges and universities, the division of the population which may here be lumped as college students numbered about 187,000 when the last educational report was got out. At the opening of the college semester this fall it must number more than 300,000, or, to make a military comparison, only a few thousands less than the entire military force of Great Britain and Ireland in time of peace.

The United States leads in number of colleges and universities as well as students, there being more than 600 in this country, as against less than 100 all told in Great Britain, Germany and France.

Presidents and Their Work.

But, on the other hand, the best of our universities, our old established seats of learning in the east, like Yale and Harvard, Princeton and Columbia; our newer fabulously endowed western universities, like Chicago and Leland Stanford; our great co-educational and state universities, like Michigan at Ann Arbor, Wisconsin at Madison and Pennsylvania at Philadelphia; our Johns Hopkins and our Clark; our smaller colleges and universities dating back to the early days, vital with tradition and scholarship, though never rich or boasting students by the thousand, such as Bowdoin, Virginia and Williams, and scores and scores of others, these—each in its own way—may hold up their heads with the best of the old world institutions.

Our college presidents as a class, considering their number, probably are as influential with their fellow citizens as any other class whatsoever. The names of the most virile among them are names that the world will not soon forget. Indeed, not to mention those whose work has been finished, those now in the harness make up a group of men who stand upon an extraordinarily high level.

Unlike the colleges and universities of the old world, more than half of those in the new are privately endowed, there being about twice as many students in the private as in the public universities in this country.

The College Girl.

The most truly distinctive feature of American college life is the American college girl.

She is nearly 45,000 strong, exclusive of the normal students. She flocks by herself in colleges established and conducted especially for her use and behoof by the thousand, and in coeducational colleges along with her brother, her cousin, her sweetheart and other young men by the tens of thousands. It would be hard to say whether the "co-ed" or the distinctively woman's college girl is the more desirable product.

In some quarters it is thought that the problem of college education for women has been solved best at Columbia and Harvard, where they may take the same courses of study, wholly or in part, under the guidance of the same faculty as the men. Somewhat similar schemes are in force at Brown, the Western Reserve and Tulane universities.

Nevertheless, the strictly woman's colleges like Vassar, now forty years old; Wellesley and Smith, ten years younger, and Bryn Mawr, founded only twenty years ago, but likely to last a century, are flourishing like veritable bay trees, and so are the big 'co-ed'' colleges.

The woman's college presidents make up a small class, but their influence is out of proportion to their numbers. Two of them are men, curiously enough, but the others are women. Miss Thomas of Bryn Mawr, Miss Hazard of Wellesley, Miss Woolley of Mount Holyoke and the rest of them are surely impressing a strong personal influence of the young women students under their direction, and so, indirectly, upon the world at large.

Not only a very large percentage of students are earning their way through, as self-reliant and as independent as any one on earth, but the average of devotion to study is as high today in the colleges of the United States as it ever was in all the history of college education, either in America or elsewhere.

Western Colleges Forging Ahead.

The shifting of the college attendance within the last few years has been remarkable. Of the fifty-four colleges and universities, each of which has an attendance of 1,000 or more, thirty-five are located in "the west," a surprising statement to many, no doubt, but perfectly true, if the old eastern boundary of "the west," the Alleghenies, be accepted. Moreover, the attendance at some of these new western colleges and universities is much larger, in comparison with the older eastern universities, than most folk suppose.

Harvard, with 5,393 students, still leads, and Columbia comes next, with 4,883; but it is a western university—Chicago, with 4,580—that comes third. Then comes the Northwestern, with 4,007; Ann Arbor, with 4,000; the University of Minnesota, with 3,900; the University of Illinois, with 3,594; Cornell (eastern), with 3,423; the University of California, with 3,400, and the University of Wisconsin, with 3,151.

Pennsylvania has only 2,692, only a little more than 400 in excess of the 2,286 in attendance at Washington university, St. Louis. Yale also falls below the 3,000 mark, the number being 2,995, while the University of Georgia (southern), with 2,491, has nearly twice as many as famous Princeton, with its 1,373, and the University of Nebraska, with 2,513, lacks less than 100 of doubling the Princeton figures.

The University of Texas, of which many easterners have never heard, almost equals Princeton in attendance, with 1,348, and Leland Stanford, with 1,485, has about 100 more than Princeton. Other figures just as surprising might be given, but they are as nothing to the figures that will be needed to represent the future growth of the universities of the west.—Chicago Inter Ocean.

Ocean Liner Named Washington.

The North German Lloyd has departed from its custom of calling a new ship after a European monarch or his family and will christen its latest leviathan after the "Father of His Country." Announcement of the decision to call a 17,000-ton vessel to be built the Washington was made recently. The construction of the Washington has been just begun at the Tecklenburg shipyards, Bremerhaven, and it will be completed late in 1907. It is the first instance in which a big line has used the name Washington. What was known as the Bremen line, of which the Ruger Brothers were owners, had a Washington forty or more years ago.

The janitor service in The Bee Building is as near perfect as it can be, remembering that janitors are human. Offices from $10 to $45 per month—several desirable ones from which to choose.