

GERMS OF DISEASES.

They Are Now Being Harnessed by Medical Investigators.

How Bacilli Are Isolated, Tested and Propagated—Important Part Played by Horses and Guinea Pigs.

[Special New York Letter.]

THIS is essentially the age of antitoxins, extreme cases of the "hair of the dog" curing the bite. New discoveries are constantly being made, both of the specific germs causing certain diseases and methods of utilizing them for their own destruction. It is well known that if a person were shut up in a room for an extended length of time where no fresh air was allowed to enter death would ensue because the air in the room, breathed over and over, would become charged with poisons given out by the body.



TESTING ANTI-TOXIN HORSE.

and there would soon be no fresh air to feed upon. In the case of a disease germ much the same condition prevails. It must have fresh material to feed upon, as the juices it throws off are a certain poison to itself. Hence, if to the blood of a person containing germs of a disease, a sufficient quantity of the effete material furnished by the germ itself be added, the small pest dies because it has no fresh food, free from its own specific poison, upon which to feed. In the case of many of our most common and virulent diseases the bacillus has been isolated and for their treatment an antitoxin has been secured.

Nearly everyone is aware that the antitoxins in general use are obtained from horses, and the methods of securing them are being constantly improved upon. Of course the first thing to be considered is the isolation of the offending microbe from the thousands of different variety which surround it. This presupposes the fact that the wicked one is so well known as to be recognizable; that his portrait hangs in the germ rogues' gallery.

After the bacteria are removed from a sufferer, they are more carefully cultivated than most plants, the usual medium being bouillon prepared from filtered, sterilized water and fresh beef. After standing for a few hours, the bouillon is strained, refiltered and re-sterilized. For several days, a process of reboiling, sterilizing and filtering goes on in white dust-proof closets, by men dressed in most immaculate white. It is kept in sterilized jars, stopped with sterilized cotton. When this bouillon has become absolutely free from all germs,



INOCULATING GUINEA PIG.

It is inoculated by having the bacilli dropped in from the point of a needle of glass and platinum. The germs multiply as rapidly as in a human body, for the bouillon is kept in a warm incubator for about 72 hours, when it may be seen to be covered with a ghastly-looking, greenish crust, a toxin which is a hideous mass of the disease to be treated, consumption, diphtheria or whatever has been cultivated. It is then injected into guinea pigs which die and are opened and examined. If it is found that the toxin was pure, it is injected into an antitoxin horse. Before one of these horses is utilized for this purpose, he is tested to ascertain if he be free from all disease, by receiving an injection of mallein, a fluid which will arouse into activity any disease which may happen to lurk in his

system. If he be healthy, the mallein will not affect him. Being proven healthy, the first injection of toxin, about one-half a thimbleful, or one cubic centimeter, is introduced into his blood from a syringe of glass and silver by a thoroughly sterilized, disinfected, white-clad, clean-shaven physician, in a white enameled stable. For three days, the horse is very ill, eating nothing. His bones are sore. He swells, then slowly recovers. In ten days, he is quite well again, when another injection is given, this time of three cubic centimeters. He becomes ill, but less so than in the first instance. Ten days later, 20 cubic centimeters are administered. The effect of this is hardly perceptible. By the end of two months, more than one pint or 500 cubic centimeters are given without producing any ill-effects. This dose would kill a large number of ordinary horses, but our friend has become immune, that is, his system is able to resist any number of live germs introduced, because it contains so much of their own poison, that they have nothing to feed upon and die from an overdose of themselves.

Now that this antitoxin quality has developed in the animal, each month eight quarts of blood are drawn from him, while every ten days he still receives an injection of 500 centimeters of toxin. Thus his antitoxic power is kept up. He suffers no inconvenience. His health is good, he exercises moderately and eats his sterilized grain with relish. If he goes to pasture for a month or two, his antitoxic power is impaired and he has to begin all over again with his first dose of one cubic centimeter of toxin which renders him ill as at first. After being drawn from the horse, the blood is sealed up and stands for several days, when the serum, or thin portion, is extracted by means of a force pump. This serum is used on guinea pigs and its strength thus ascertained. It is now filtered and purified, sealed in small vials and passes into the hand of physicians in general practice, who introduce it into the circulation of such patients as are suffering from the special disease from whose germ it was prepared. Their systems are thus reinforced by a poison to the germs whose demise rids them of the disease which was preying upon their tissues.

While some antitoxins have been obtained with comparative ease, experiments with typhoid germs have proven very unsatisfactory. In 1884 Koch discovered the bacilli of typhoid. They are rod-like and thick



FREEZING GERMS IN LIQUID AIR.

with the ends rounded, and sometimes joined in filaments. They possess little hair-like projections called flagella and move very rapidly. They are found in water, milk and meats and gain entrance into the system by various methods. Many experiments have been made to secure an antitoxin from bouillon, but to no great purpose. It has been nearly impossible to obtain the "juice between the cells" of typhoid bacteria without destroying the chemical action of germs themselves. No really satisfactory results had been obtained until, recently, Dr. Allan McFayden, of the Jenner institute of preventive medicine, one of the leading bacteriologists of Europe, after much research, has discovered a method of manufacturing antitoxin for typhoid which, it is generally believed, will soon be universally adopted. The microscopical cells of the typhoid bacilli are so small and pliable or elastic that no mechanical agent could destroy them. Freezing does not injure them.

It occurred to Dr. McFayden to freeze the cells by means of liquid air until very brittle, then to crush thousands of them together in a mortar. This first and most difficult step has proved a great success. The mass now dead, so far as its power of communicating disease is concerned, is allowed to become warm again, and is still chemically alive as to its qualities from which antitoxin may be prepared. Repeated injections into animals have produced a serum, which, it is believed, will prove efficacious. It is too soon after its discovery for a large number of experiments to have demonstrated its successful use, but results so far obtained are very promising.

WILLARD C. APPLETON.

A Rich Catch.
"Leaving college, old man? Going to marry and settle down?"
"No; I'm going to marry and settle up."—Chapparral.

AN HONEST STREAK.

Which Led a Man Charged with Theft to Take Himself to the Calaboose.

Humor makes its appearance in queer places, but one would hardly expect to find it at the door of a house of correction, says the Milwaukee Sentinel. An unfortunate fellow was recently taken before a justice of the peace in Milwaukee, charged with stealing a quantity of wood. There was not much of a defense to offer, but an attorney who knew him volunteered to say a few words to the court in his behalf.

The attorney began his talk, and, warming up to his subject as he proceeded, finally succeeded in making a good plea for leniency. The justice, of course, found the prisoner guilty, but let him off with a sentence of 30 days in the house of correction. When the commitment had been made out it was discovered that there was no constable present, so the lawyer said to the prisoner:

"John, you know where the house of correction is, don't you?"

"Yes, sir."

"Well, here's five cents and this paper. You take a car and go out there and give them this paper and they'll let you in. Will you do it?"

"Sure!"

And the funny part of this story is that John kept his word.

ESTIMATING EACH OTHER.

Showing Opinions as They May Be Formed from Different Points of View.

"My word, Fitznoodle," said a war office clerk, according to the London Express, to a colleague who sat at the next desk, "just look at that workman on the roof of that building over the way!"

"What's the matter with him?" inquired Fitz, glancing through the window at the individual indicated.

"Matter," retorted the other; "why, I've been watching the lazy beggar for the last 25 minutes, and he hasn't done a stroke of work all the time."

At the precise moment at which the above conversation occurred a British workman was addressing his "mate."

"Sy, Bill," he remarked, in a tone of deep disgust, "d'ye see that 'ere loafin' war office clerk in that room darn there? S'elp me, if Hi ain't bin watchin' 'im fur nigh on arf an hower, an' the bloomer's done nothin' but stare hout o' 'is window the 'ole blessed tyme. That's the sort of chap as we pye taxes ter keep!"

A Cure for Dropsy.

Sedgwick, Ark., June 22d.—Mr. W. S. Taylor of this place says:

"My little boy had Dropsy. Two doctors—the best in this part of the country—told me he would never get better, and to have seen him anyone else would have said they were right. His feet and limbs were swollen so that he could not walk nor put on his shoes.

"When the doctors told me he would surely die, I stopped giving him their medicine and began giving him Dodd's Kidney Pills. I gave him three pills a day and at the end of eight days the swelling was all gone, but as I wanted to be sure, I kept on with the pills for some time, gradually reducing the quantity, till finally I stopped altogether.

"Dodd's Kidney Pills certainly saved my child's life. Before using them he was a helpless invalid in his mother's arms from morning till night. Now he is a healthy, happy child, running and dancing and singing. I can never express our gratitude.

"Dodd's Kidney Pills entirely cured our boy after everybody, doctors and all, had given him up to die.

A Wide-Spread Vanity.

In these days there seem to be as many writers as there are readers. The spread of authorship and its egotistic pride is hit off in this dialogue from the Fliegende Blaetter:

A guest at a hotel table, reading the bill of fare, says: "Your bill of fare is great!"

"I am glad to hear it," replies the head waiter.

"I am its author."

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Pitfalls in Vanity Fair.—Edgar—"Arthur won't accept an invitation unless he knows who is to be there." Edmund—"Maybe he's afraid he will meet some of his creditors."—Brooklyn Life.

It Cures While You Walk.

Allen's Foot-Ease is a certain cure for hot, sweating, callus, and swollen, aching feet. Sold by all Druggists. Price 25c. Don't accept any substitute. Trial package FREE. Address Allen S. Olmsted, Le Roy, N. Y.

Arrrogance is always the sign of a little and unbenevolent temper, having no more greatness in it than the swelling of the dropsy.—Collier.

To Cure a Cold in One Day.

Take Laxative Bromo Quinine Tablets. All druggists refund money if it fails to cure. 25c.

He (gloomily)—"Do you know how much the luncheon you have ordered will cost?" She—"No, don't take away my appetite!"—Town Topics.

I am sure Piso's Cure for Consumption saved my life three years ago.—Mrs. Thos. Robbins, Norwich, N. Y., Feb. 17, 1900.

A laugh is worth a hundred groans in any market.—Chicago Journal.

Cab drivers' lives are filled with whoa.—Chicago Daily News.

SAWYER'S EXCELSIOR BRAND Pommel Slickers

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It is not a get at the man who wears Sawyer's Oiled Clothing. Slickers to suit all occasions. Get the genuine. If your dealer doesn't keep them, write for catalogue.

H. E. Sawyer, Sole Mfr., East Cambridge, Mass.



Mrs. Hughson, of Chicago, whose letter follows, is another woman in high position who owes her health to the use of Lydia E. Pinkham's Vegetable Compound.

"DEAR MRS. PINKHAM:—I suffered for several years with general weakness and bearing-down pains, caused by womb trouble. My appetite was fitful, and I would lie awake for hours, and could not sleep, until I seemed more weary in the morning than when I retired. After reading one of your advertisements I decided to try the merits of Lydia E. Pinkham's Vegetable Compound, and I am so glad I did. No one can describe the good it did me. I took three bottles faithfully, and besides building up my general health, it drove all disease and poison out of my body, and made me feel as spry and active as a young girl. Mrs. Pinkham's medicines are certainly all they are claimed to be."—Mrs. M. E. HUGHSON, 347 East Ohio St., Chicago, Ill.

Mrs. Pinkham Tells How Ordinary Tasks Produce Displacements.

Apparently trifling incidents in woman's daily life frequently produce displacements of the womb. A slip on the stairs, lifting during menstruation, standing at a counter, running a sewing machine, or attending to the most ordinary tasks may result in displacement, and a train of serious evils is started.

The first indication of such trouble should be the signal for quick action. Don't let the condition become chronic through neglect or a mistaken idea that you can overcome it by exercise or leaving it alone.

More than a million women have regained health by the use of Lydia E. Pinkham's Vegetable Compound.

If the slightest trouble appears which you do not understand write to Mrs. Pinkham, at Lynn, Mass., for her advice, and a few timely words from her will show you the right thing to do. This advice costs you nothing, but it may mean life or happiness or both.

Mrs. Lelah Stowell, 177 Wellington St., Kingston, Ont., writes:

"DEAR MRS. PINKHAM:—You are indeed a godsend to women, and if they all knew what you could do for them, there would be no need of their dragging out miserable lives in agony.

"I suffered for years with bearing-down pains, womb trouble, nervousness, and excruciating headache, but a few bottles of Lydia E. Pinkham's Vegetable Compound made life look new and promising to me. I am light and happy, and I do not know what sickness is, and I now enjoy the best of health."

Lydia E. Pinkham's Vegetable Compound can always be relied upon to restore health to women who thus suffer. It is a sovereign cure for the worst forms of female complaints,—that bearing-down feeling, weak back, falling and displacement of the womb, inflammation of the ovaries, and all troubles of the uterus or womb. It dissolves and expels tumors from the uterus in the early stage of development, and checks any tendency to cancerous humors. It subdues excitability, nervous prostration, and tones up the entire female system. Its record of cures is the greatest in the world, and should be relied upon with confidence.

\$5000 FORFEIT if we cannot forthwith produce the original letters and signatures of above testimonials, which will prove their absolute genuineness.

Lydia E. Pinkham Medicine Co., Lynn, Mass.

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