MEDICINE

"Green Germ" of Ceylonese Malaria is New Species

CEYLON'S "green germ" malaria, which has swept disastrously across that once ideal island, is still a mystery disease to the U. S. Public Health Service. The emphasis on the green color of the causal parasitic cells appears to be the distinguishing characteristic that would set it up as a quite new malarial species.

The three well-recognized species of malaria "germs" already known also have pigments; but two of them are described as dark brown to black, and the third as light brown. The darkest of them, the species causing the quartan or "four-day" type of malarial fever, is described by some observers as "greenish." But, noted Dr. Louis L. Williams, Jr., of the U. S. Public Health Service, "if the British medical men on the island, who are exceedingly competent in the malarial field, describe the present form as 'green', it is not likely that they are confusing it with any of the already known species."

All forms of malaria are caused by one-celled animal parasites, of the genus known to scientists as *Plasmodium*. There are three well-recognized species, and a number of varieties of less certain distinctness. Of the three known species, one causes quartan fever, one tertian fever, and one a most virulent type of tertian or three-day fever which because of its seasonal nature is called aestive-autumnal, or summer-and-fall fever.

The parasites causing all malarias pass through a most complicated life cycle, partly in the body of the human victim, partly in that of the carrier mosquito. In the human blood they attack the corpuscles, breaking them down as they themselves multiply. Because of this peculiarity, the most marked of the many disagreeable effects of malaria are seen in the blood itself and in the organs where blood plays an important role, especially the spleen, the liver and the red marrow in the spongy parts of the bones. In the especially vicious attacks of pernicious malaria that end in death, it is often found that so many of the red blood corpuscles are broken down that the tiny capillaries are choked with their debris. In other cases, death seems to result from simple massive poisoning from a toxin secreted by the parasites.

The present terrific epidemic in Ceylon is not without precedent in that part of the world. In the Punjab, in northern India, Dr. Williams told Science Service, more or less localized epidemics break out at intervals of a few years, seldom occurring twice in the same region. In these epidemics it is not uncommon for 65 per cent. of the population in the affected area to be attacked; and of the sick, sometimes a third or more will die. This is much more severe, though less extensive, than the present Ceylon epidemic where about a sixth of the total population are ill, with deaths of only one in a hundred.

Science News Letter, February 16, 1935

PHYSICS

Quick Photographs Possible With New Ignitron Tube

TO DEMONSTRATE the rapidity with which it is possible to start high current electric arcs, engineers of the Westinghouse Electric and Manufacturing Company have used their new ignitron tube to "stop," photographically, the motion of a rubber ball fired from an experimental gun at a velocity of 240 miles an hour.

Dr. Phillips Thomas, research engineer, is demonstrating the experimental apparatus consisting of the special gun, a rubber ball bullet, a rubber tube enclosing a fine wire and the special ignitron tube control.

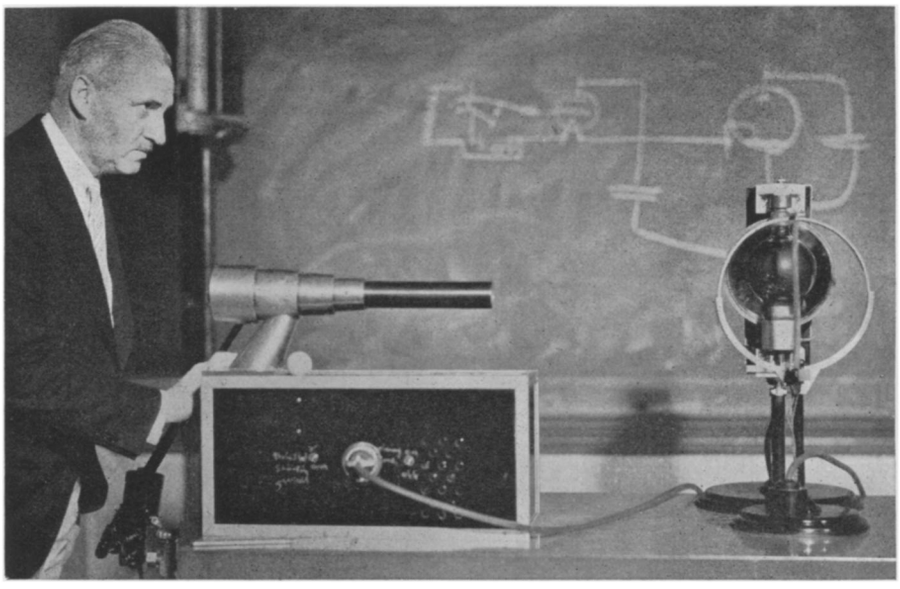
Impact of the rubber ball on the rubber-enclosed wire broke an electrical current which caused a powerful flash in the ignitron tube of 1,000 amperes for one millionth of a second. By the light of this mercury flash the ball was photographed, as shown, in contact with the rubber tube and wire. At the instant of photographing the stretch of the rubber tube was local around the fired ball. The ball, in the picture, is moving from left to right.

In engineering practice the ignitron tube is used to start powerful electric arcs in lines carry enormous currents.

The interior of the tube contains mercury vapor which has high current carrying capacity when in use. A tiny current in the tube flashes on the arc within the tube, which in turn carries the large currents.

The demonstration was performed to show how promptly such tubes could build up this flashing current-carrying arc.

Science News Letter, February 16, 1935



EXPERIMENTAL GUN WITH RUBBER BALL BULLETS

Dr. Phillips Thomas, research engineer of Westinghouse Elec. Co. demonstrates the experimental gun from which was fired the rubber ball at a muzzle velocity of 240 miles an hour. By breaking an electrical contact the swift motion was "stopped" and the ball photographed in flight. The test was made to prove the rapidity of the company's new ignitron tube for starting high-current electric arcs.

"STOPPING" 240 MILES AN HOUR

Ignitron arc-controlling tube of Westinghouse Elec. Co. flashes on for a millionth of a second to "stop" the motion of a rubber ball fired from an experimental gun at velocity of 240 miles an hour. The rubber bullet has struck a rubber sheet on whose surface is a wire. The breaking of the wire by the ball flashes on the new tube and makes possible the photography by its mercury vapor light.

MEDICINE

Smoking Mother Transmits Tobacco Products to Child

WHEN a mother smokes heavily before the birth of her child, some of the substance in tobacco smoke which makes the heart beat faster is transmitted to the blood of her unborn child and also makes its heart beat faster, Drs. Lester W. Sontag and Robert F. Wallace found in experiments conducted at Antioch College.

In their report (*American Journal of Obstetrics and Gynecology,* January) these physicians make no statement concerning harmful effects of maternal smoking upon the unborn child. But taking into consideration the work of other scientists on the effects of nicotine in the milk of smoking mothers, they consider it "not improbable" that maternal smoking before the birth of the child may have permanently harmful effects on the offspring.

A careful study of the newborn children of mothers who smoke heavily before their children are born is, they believe, the next step to be taken in order to reach a scientific conclusion as to whether mothers should or should not smoke while bearing and nursing children.

CHEMISTRY

Photographic Plates May Test Magneto-Optic Method

Prof. Allison Hopes New Technique Will Make Possible Objective Confirmation of His Results

NEW support for the famous, but controversial, method of chemical analysis used by Prof. Fred Allison and many of his pupils at Alabama Polytechnic Institute will shortly be presented.

The much-debated method uses the magneto-optic apparatus for making the analysis. So sensitive is the apparatus, Prof. Allison claims, that he has been able to detect the presence of the still missing chemical elements 85 and 87 in sea water. And he predicted the existence of the new "heavy water" in the more ordinary variety before Prof. Harold C. Urey of Columbia University started his researches on this strange liquid which recently won for him the Nobel Prize award.

Newest phase of the long-extended controversy will be the report from Prof. Allison's laboratory that it is possible to take observations with photographic plates and thus remove the chance of human error incidental to the system in the past when observers had to be used. This will shortly be submitted to scientific journals.

Without going into the complex nature of the apparatus, it may be said that the identification of chemical elements is made by watching changes of intensity of light coming from a spark, which passes through solutions of materials to be studied. The observer sits in darkness and watches for maxima and minima in light intensity.

By manipulating moving contacts on long wires, known as a trolley, the observer correlates these minima with positions on the track, which finally are translated into chemical analysis of great sensitivity.

How well the apparatus works, and what it means if it does work, is the cause of much argument among scientists. Prof. Allison, his former pupils and colleagues appear to obtain uniformly successful results with the equipment. On the contrary, nearly as many other investigators cannot duplicate their results and believe the apparatus "fools" the observer into predicting things which are not so.

No one doubts the sincerity of the observations but the critical school of investigators believe that one may be "fooled" by the peculiarities of the apparatus and because of psychological tricks which are encountered in observing the weak light source.

Latest of the critical reports on the magneto-optic method appears in the *Physical Review* (Jan. 1, 1935) from H. W. Farwell and J. B. Hawkes of Columbia University. They could obtain no correlation of minima when the precaution was taken of keeping the observer from all knowledge of what his guiding wheel for the trolley meant in terms of the position of the trolley.

It was suspected that unconsciously the observer, by muscular memory or some other subconscious psychological happening, could reproduce positions on the trolley track by turning the driving wheel.

Unwitting Errors

Report Farwell and Hawkes, "Observations of a single low intensity optical field produced by a spark are unreliable not only on account of physiological and psychological effects, but also because of variations in the spark discharge itself."

Prof. Allison when informed of this conclusion told Science Service:

"In recent months Dr. Hughes and Mr. Goslin of this laboratory have developed a photographic technique which is yielding results in confirmation of our claims for the magneto-optic method of analysis; namely that the minima are objective, reproducible and characteristic of compounds present in the solution. This is the first confirmation of the method that has been obtained by photographic means. They expect shortly to submit for publication a preliminary report of this work. This will constitute our reply to those who are reporting negative results."