

MEDICINE

Potent Anti-Malaria Drug

Hope that malaria, the world's Number One disease, may be completely wiped out seen in development of the most powerful drug yet known, Daraprim.

See Front Cover

► AN ANTI-MALARIA drug more powerful than any yet known was reported by U.S. Public Health Service scientists at the meeting of the American Society of Tropical Medicine and Hygiene in Galveston.

There is hope in some quarters that this drug might completely eradicate malaria, the world's Number One disease problem.

Even the conservative Public Health Service scientists say that a person could, if he took this new drug, go into a region heavily infested with malaria and never come down with malaria while there or after leaving the region.

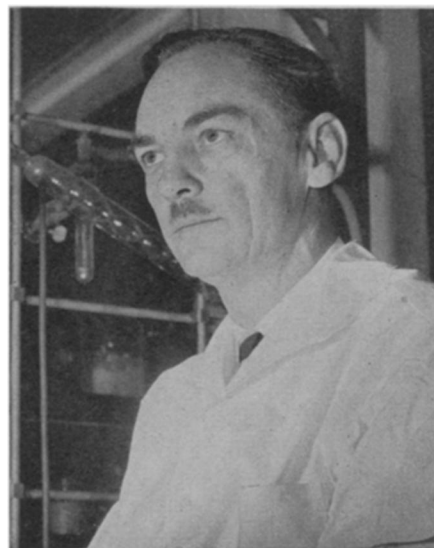
Prisoner volunteers at the U. S. Penitentiary in Atlanta, Ga., who were given this drug after being bitten by malaria-infected mosquitoes showed no signs of getting malaria as long as a year after being infected.

The drug is called Daraprim by its manufacturers, Burroughs Wellcome and Co. Its scientific name is pyrimethamine. It was made by Dr. George H. Hitchings of the Wellcome Research Laboratories at Tuckahoe, N. Y., in the course of a search for antagonists to nucleic acids. First news of it came in a report of mouse tests of Daraprim and related chemicals announced at

an American Chemical Society meeting in April, 1950.

The drug was then "kept under wraps" while undergoing tests in mice and birds by Dr. Ian M. Rollo of the Wellcome Laboratories of Tropical Medicine in London, England, and subsequently by the following U. S. Public Health Service scientists: Drs. G. Robert Coatney, Albert V. Myatt, Thomas Hernandez, Geoffrey M. Jeffery, W. Clark Cooper, Joseph Greenberg and Helen L. Trembley.

Daraprim is 12 or more times as powerful as chloroquine, standard antimalarial drug used as a suppressant to keep our fighting forces from getting malaria while serving in Korea or other malaria regions of the world. In the tests with prisoner volunteers, 25 milligrams weekly was as effective in suppressing malaria as 300 milligrams weekly of chloroquine. Even this small 25-milligram dose is probably more than is needed to suppress malaria. And, unlike chloroquine, Daraprim does a complete suppressing and curing job. Men taking chloroquine alone come down with malaria, if attacked by the relapsing form, after stopping the drug. Primaquine, recently developed, can be given to prevent these relapses. But Daraprim does the



DR. GEORGE H. HITCHINGS—In the course of a search for antagonists to nucleic acids, Dr. Hitchings first made the antimalaria drug, pyrimethamine.

whole job alone. Primaquine cannot do this because primaquine is too toxic to be given over a long period as a suppressant.

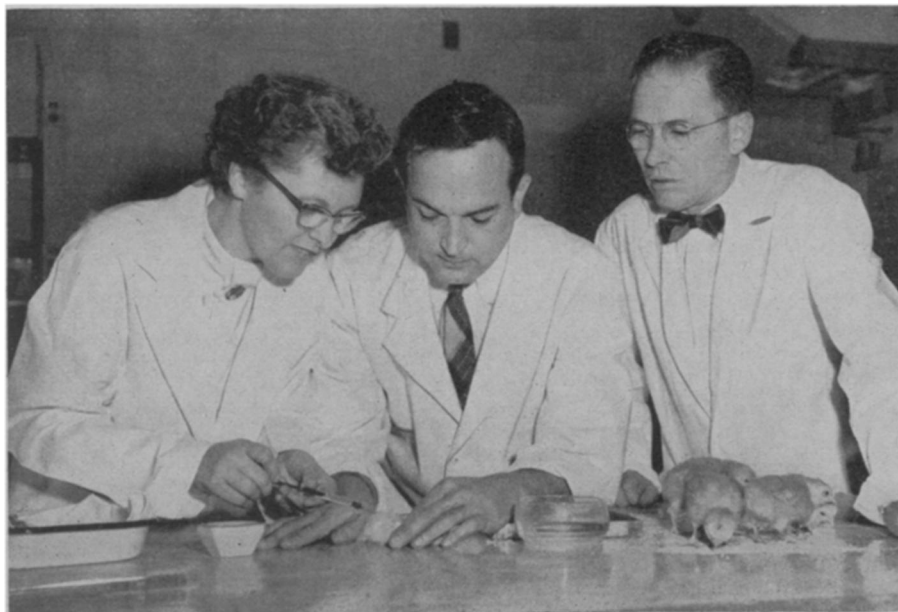
Daraprim is odorless and tasteless. It does not discolor the skin. It comes in a white tablet somewhat smaller than an aspirin or Empirin tablet. It is a cheap drug, both because it is inexpensive to manufacture and because it is so powerful that a little goes a long way. These features promise great advantage for public health programs in India, Africa and other regions where hundreds of millions are continually drained of health and strength by malaria.

The tests reported by Dr. Coatney and associates were made first in bird malaria. In the tests with birds, the mosquito *Aedes aegypti* (L.) is used to give the birds malaria. Shown on the cover of this week's SCIENCE NEWS LETTER is an *Aedes aegypti* (L.) mosquito, just after completing her meal of human blood. Humans get malaria from *Anopholes* mosquitoes.

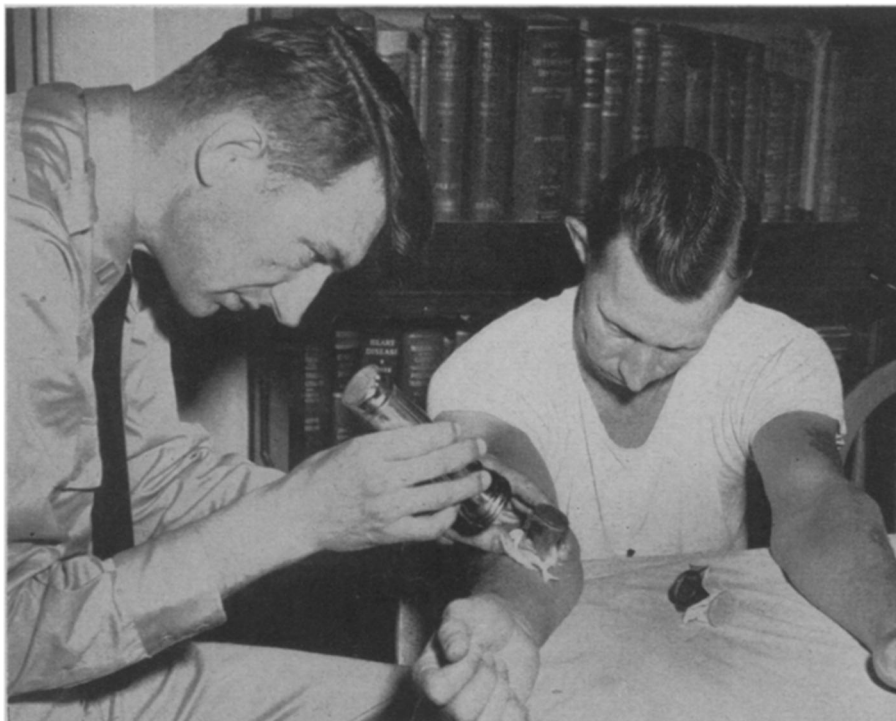
These tests were a repeat of the tests made in London. Satisfied that the new drug did indeed have "unbelievable" potency as an antimalarial, Dr. Coatney and associates launched the tests with prisoner volunteers in Atlanta similar to those made by the same group in the development of primaquine.

These tests gave the new drug a rigorous trial, since they were made against the Chesson strain of malaria. This is a southwest Pacific strain known as a particularly "tough" one. White men infected by this strain are very sick, with fever of 105 degrees Fahrenheit and vomiting for hours.

The Public Health Service scientists also made tests to see whether the malaria parasites might develop resistance to Daraprim. This was possible under hospital and laboratory conditions, the tests showed, and



TEST DRUG ON CHICKS—Drs. Helen L. Trembley and Joseph Greenberg here inject the malaria-infected mosquitoes into baby chicks, part of tests to check on efficacy of the new drug, Daraprim. Dr. G. Robert Coatney (right) is watching.



PROTECTED BY DRUG—Dr. Thomas Hernandez of the U. S. Public Health Service uses a flashlight to drive a malaria-laden mosquito to the skin on the arm of a prisoner volunteer who is protected by Daraprim.

the resistance could be transmitted by mosquitoes. But the curative dose was so close to that at which resistance could be induced that it was considered unlikely that the build-up of resistance would be a deterrent to use of the drug.

As treatment for an acute attack of malaria, Daraprim was effective but took longer to act than chloroquine.

While these tests were going on in the United States, English researchers were testing the drug in Africa. These give hope that by treating the population through one or two rainy seasons, the disease can be eliminated. In one of these studies, in an isolated village, every person was treated at the time when most of them would be infected with malaria. The human population was cured in about two months and

the mosquitoes, which would have picked up the infection, were also kept malaria-free. In a bag of 100 mosquitoes at a time when all should have been carrying malaria germs from the people they had bitten, not one mosquito was found with the parasites in its body.

The new drug is on the market in London but not, as yet, in the United States.

While malaria is no longer a problem in this country, the new drug may nevertheless prove life-saving for American babies afflicted by a relatively new and generally fatal disease called toxoplasmosis. In tests with mice, Dr. Don E. Eyles of the Public Health Service found Daraprim combined with sulfadiazine produced more cures than any drug regimen tested to date.

Science News Letter, November 22, 1952

GENERAL SCIENCE

New View of World

► MAN'S AWARENESS of what he intends to do was given a place beside the predictions from physical observations in a new view of the world formulated by Dr. Arthur H. Compton, chancellor of Washington University, St. Louis, and Nobelist in physics. It provides a role for human responsibility.

Presented to the National Academy of Sciences meeting in St. Louis, Dr. Compton's hypothesis is that there exists an objective world regarding which observations,

such as scientists make, reveal one aspect and man's awareness reveals another.

The nature of the physical world is different as viewed by the theories of Bohr and Schroedinger, world-famous physicists. Niels Bohr of Denmark considers that the physical world includes only that which can in principle be verified by observations using material instruments. The wave mechanics of Erwin Schroedinger, now of Dublin, visualizes a physical continuum whose changes follow a strictly causal de-

terminism, but he holds that observations can give only partial information of this kind of world.

Dr. Compton's new view of the world is not the same as Schroedinger's continuum, but it does reconcile physical indeterminateness of man's actions with a high degree of determinateness from man's inner feelings, ideas, and intentions of which a person is aware. Dr. Compton feels that his formulation is an answer to Schroedinger's contention that an undetermined world violates the sense of moral responsibility.

Science News Letter, November 22, 1952

SCIENCE NEWS LETTER

VOL. 62 NOVEMBER 22, 1952 No. 21

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., NORTH 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566, and 360 N. Michigan Ave., Chicago, State 2-4822.

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