

is to give you that added push necessary to meet the crisis brought about by the stress.

However, these hormones attack and kill the white blood cells or lymphocytes. Yet Drs. Thomas F. Dougherty and Jules A. Frank of the University of Utah discovered that this destruction of normal white blood cells is not always apparent. They seem to be replaced, sometimes almost as fast as, and sometimes faster than, the hormones kill the cells.

"Stress Cells" Found

Looking further into the matter, they found that the replacement cells were not exactly like the normal cells. They appeared to be somewhat similar to the leukemia cells although they were not deadly. Dr. Dougherty named them "stress cells."

What caused the production of these stress cells? The two scientists have now identified a mysterious substance "X" which seems to be produced when mental or physical stress takes hold of an animal or a human. This substance "X", which they have not as yet identified completely but which they have seen, causes the lymphatic tissues to produce these "blood brothers" to the white blood cells, the stress cells.

This has an influence on the course of a great many diseases, such as arthritis and tuberculosis. It has a bearing on the disease of leukemia. Is there something similar to substance "X" which is responsible for the production of leukemic cells? Is a leukemic cell an abnormal stress cell?

Tiny electric currents course through the brain and change magnitude as we think or dream or experience emotions. These can be measured, and are measured by

neurologists to find out something about the activity of various parts of the brain. Only recently some scientists have been sending small electric currents into the brain to find out whether they can affect the brain activity and many of the body functions which depend on the brain.

At Tulane in New Orleans, Dr. Robert G. Heath, a psychoanalyst, implanted electrodes three inches into the skull of a woman with incurable cancer of the cervix. She was in constant pain. Two hours before Dr. Heath gave her the first small jolt of electricity, she had been given a large amount of morphine which had little effect on her horrible pain. Her face was drawn with suffering. She was down to 75 pounds in weight.

Two milliamperes of electricity—instantly, she lost her pain. What is more, the effect lasted for about a week and could be repeated. Two months after the first jolt,

she was up and walking around the hospital, and she had made plans to go out to a movie.

Accompanying the loss of the pain there was a rise in the production of certain hormones called 17-keto-steroids. Dr. Heath saw both a psychological and a chemical change.

This patient's cancer was widespread. It had invaded many adjacent parts of the body. When Dr. Heath was asked whether his treatment for pain had had any effect on the cancer, he answered: "Who knows?"

That, in two words, is the answer to any question today about the interrelationships between cancer and the emotions. But five years ago, the answer would have been a decided "No." Now the scientists have learned enough and guessed enough so that this question has become an important part of the general picture of cancer research.

Science News Letter, June 13, 1953

Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N. Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ADVANCED STYLE IN LETTERING—Jean Loisy, Ed.—*Sterling*, 110 p., illus., \$5.00. Contains new letter designs which have been created and evolved in Europe, and describes ways in which they have been utilized.

THE ART AND SCIENCE OF STAGE MANAGEMENT—Peter Goffin—*Philosophical Library*, 120 p., \$3.75. A critical study of the aesthetic and technical aspects.

ATOMS, MEN AND GOD—Paul E. Sabine—*Philosophical Library*, 226 p., \$3.75. Attempts a synthesis of the fundamental concepts of modern science and psychology with the intellectual content of Protestant religious faith.

THE CAPTIVE MIND—Czeslaw Milosz, translated by Jane Zielonko—*Knopf*, 251 p., \$3.50. By the Polish poet who broke with the communist government in Poland, with tells of the moral and psychological effects of the official philosophy of dialectical materialism on the people behind the Iron Curtain.

CHICHICASTENANGO: A Guatemalan Village—Ruth Bunzel—*Augustin*, American Ethnological Society Pub. XXII, 438 p., \$7.00. A study of the life and culture of a town in the Guatemalan Highlands.

COLOMBIA: A General Survey—W. O. Galbraith—*Royal Inst. of Int. Affairs*, 140 p., illus., \$2.50. An introduction to the country's history and geography, its present and potential economic development, its health problems, etc.

FRUIT OF AN IMPULSE: Forty-five Years of the Carnegie Foundation, 1905-1950—Howard J. Savage—*Harcourt, Brace*, 407 p., \$6.00. A history of this noted philanthropy, its operations, the development of its policies and their effects upon American education.

HAPPY JOURNEY: Preparing Your Child For School—Beatrice M. Gudridge—*National Education Association*, 32 p., illus., paper, 40 cents. Ways in which parents can aid future first graders and about-to-be kindergartners to adjust happily and easily to school living.

A HERD OF MULE DEER: A Record of Observations Made on the Hastings Natural History Reservation—Jean M. Linsdale and P. Quentin Tomich—*Univ. of California Press*, 567 p., illus., \$8.50. Demonstrates the deers' many responses to a wide range of environmental situations in one locality.

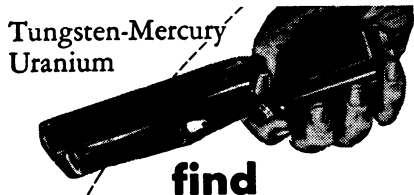
AN INTRODUCTION TO ANTHROPOLOGY—Ralph L. Beals and Harry Hoiyer—*Macmillan*, 658 p., illus., \$6.00. An elementary college text, this has interesting sections on racial types, race problems and on the new applied anthropology. Includes a discussion of the problem of removing the native people from the atomic proving ground at Bikini.

IONIC PROCESSES IN SOLUTION—Ronald W. Gurney—*McGraw-Hill*, 275 p., illus., \$6.50. For graduate students and research workers in the field of electrochemistry, this deals with the chemistry of ions in solution.

A LABORATORY MANUAL OF COMPARATIVE EMBRYOLOGY—Alfred F. Huettnner—*Macmillan*, 116 p., paper, \$1.75. Aids in facilitating the laboratory work of a course in embryology.

LET'S WORK TOGETHER IN COMMUNITY SERVICE—Eloise Walton—*Public Affairs Committee*, 28 p., illus., paper, 25 cents. Points out the need for welfare agencies to co-ordinate their efforts in aiding "problem" families.

LOGIC AND LANGUAGE: Second Series—A. G. N. Flew—*Philosophical Library*, 242 p., \$4.75. An



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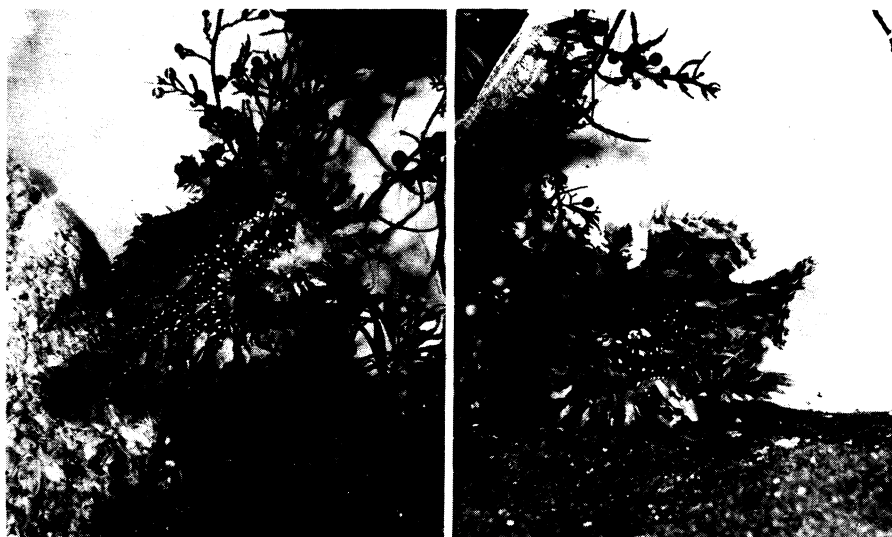
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HARD TO SPOT—If you have trouble seeing the sargassum fish, *Histrio histrio*, hidden among the tropic and semi-tropic sargassum sea weed in the photo on the left, so do his natural enemies who would like to make a meal of him. But move him out of his natural environment as in the photo on the right, and the sargassum fish stands out like a barber pole. His orange, brown and white coloration, along with the flapping membranes about his body, afford him ideal camouflage in his sea weed home.

introduction to the recent linguistic developments in philosophy.

MEASUREMENT OF AIR POLLUTION—W. C. L. Hemeon, J. D. Sensenbaugh and G. F. Haines, Jr.—*Mellon Institute*, 5 p., illus., paper, free upon request direct to publisher, 4400 Fifth Avenue, Pittsburgh 13, Pa.

THE NATURE OF VIRUS MULTIPLICATION: Second Symposium of the Society for General Microbiology Held at Oxford University, April 1952—Paul Fildes and W. E. Van Heyningen, Eds.—*Cambridge Univ. Press*, 320 p., illus., \$6.50. Papers and discussions by experts representing the various schools of thought as to the nature of virus multiplication.

NEW WORLD WRITING: 3rd Mentor Selection—*New American Library*, 360 p., paper 50 cents. A cross section of current world literature

including an article, Sex and Censorship in Contemporary Society, by Margaret Mead.

NOTES ON FLYCATCHERS OF GENUS BATIS—Austin L. Rand—*Chicago Natural History Museum*, 15 p., paper, 35 cents. A review of the species minor, molitor, perkeo and soror.

NOTES ON PHILIPPINE MOSQUITOES, XIII: Four New Species of Zeugomyia and Topomyia—Francisco E. Baisas and Pablo Feliciano—*Chicago Natural History Museum*, 18 p., illus., paper, 50 cents. Descriptions of the new types found by the Philippine Zoological Expedition in 1946-1947.

PERSONALITY DEVELOPMENT IN ADOLESCENT GIRLS—L. K. Frank, R. Harrison, E. Hellersberg, K. Machover, and M. Steiner—*Child Development Publications*, 316 p., illus., paper, \$4.50. A report based on the responses to five personality tests by 300 adolescent girls.

PHILOSOPHY: An Introduction—Archie J. Bahm—*Wiley*, 441 p., \$4.50. Designed to provide a grasp of the nature of philosophy, its problems, its types, its main issues and main types of solutions.

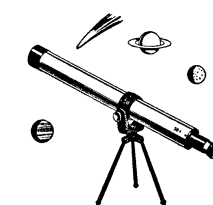
THE PSYCHOLOGY AND PSYCHOTHERAPY OF OTTO RANK: An Historical and Comparative Introduction—Fay B. Karpf—*Philosophical Library*, 129 p., illus., \$3.00. A summary of the more important views on theory and therapy, and an account of the career of this student of Freud.

THE ROAD TO ABUNDANCE—Jacob Rosin and Max Eastman—*McGraw-Hill*, 166 p., \$3.50. A survey of chemistry's achievements to date in producing synthetic products, and a forecast of its role in achieving "Freedom from Want."

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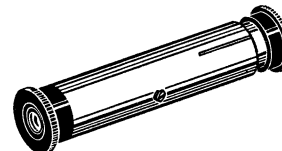
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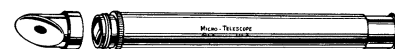
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THE ROLE OF BACTERIA IN THE FORMATION OF ACID FROM CERTAIN SULFURITIC CONSTITUENTS ASSOCIATED WITH BITUMINOUS COAL: Parts I and II—W. W. Leathen, S. A. Braley, Sr., and Lois McIntyre—*Mellon Institute*, 8 p., paper, free upon request direct to publisher, 4400 Fifth Avenue, Pittsburgh 13, Pa.

A SILICIFIED FLORA FROM MEXICO—Claude B. Bronaugh—*Memphis Museum*, 5 p., illus., paper, 15 cents. Describes 3 plant forms found near Sierra Madre Occidental in Mexico.

SOCIETY—DEMOCRACY—AND THE GROUP: An Analysis of Social Objectives, Democratic Principles, Environmental Factors, and Program in the Practice of Social Group Work—Alan F. Klein—*Woman's Press* (William Morrow), 341 p., \$4.00. Deals with group work's social goals and aspirations.

THE SUPRARENAL CORTEX—J. M. Yoffey, Ed.—*Academic Press*, 232 p., illus., \$6.80. Papers on the effects of the steroid hormones that were presented at the Fifth Symposium of the Colston Research Society held in the Univ. of Bristol, April 1-4, 1952.

TV MANUFACTURERS' RECEIVER TROUBLE CURES, VOL. III—Milton S. Snitzer, Ed.—*Rider*, 119 p., illus., paper, \$1.80. The makers provide hints on how to make their television sets work better. Covering models from Kaye-Halbert to Philco.

TREES AND THEIR STORY—Dorothy Sterling—*Doubleday*, 119 p., illus., \$2.50. Beautifully illustrated with photographs, this is a simple and concise introduction to the whole story of trees. Ages 8-12.

THE TRUTH ABOUT AMERICAN CARS!—Andrew J. White—*Motor Vehicle Research*, 48 p., illus., paper, \$1.00. Outlines the many design faults of present automobiles, and points out that safe car design would eliminate injury and death in up to 60% of the accidents.

WELDING ALUMINUM: Including Brazing and Soldering—G. W. Birdsall, Ed.—*Reynolds Metals Co.*, 186 p., illus., paper, \$1.00. A handbook to welding aluminum by the metal-arc, carbon-

arc, atomic-hydrogen, inert-gas-shielded-arc and gas processes as well as by the various forms of resistance welding.

WHAT'S YOUR PROBLEM?—Alfred Blazer—*Citadel*, 372 p., \$3.50. In a question and answer form, a psychiatrist discusses many of the problems of modern day living.

YEAR'S BEST SCIENCE FICTION NOVELS, 1953—Everett F. Bleiler and T. E. Diky—*Fell*, 315 p., \$3.50. Contains five short science-fiction novels.

YANKEE DIPLOMACY: U. S. Intervention in Argentina—O. Edmund Smith—*Southern Methodist Univ. Press*, 196 p., \$3.00. A review of U. S. foreign policy in relation to Argentina, 1933-1950, based on the assumption that our intervention in Argentina has damaged our prestige.

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Sweets From Trees

► HONEY THAT you find on the market is most commonly labeled "clover honey" or "alfalfa honey."

That is understandable enough, for there are enormous acreages in alfalfa and the various kinds of clover, and since every flower that is to produce merchantable seed must be visited by a bee, there is naturally going to be a lot of honey produced from their nectar.

However, there are a number of flowering trees that are copious producers of nectar, and that in their season are eagerly visited by bees. Their honey is not always identified for market purposes; but persons with a discriminating sweet tooth know their special fragrances, and will proclaim the virtues of their favorite tree honeys as connoisseurs enthuse about their pet wines.

Excellent honey is produced, for example, from the nectar of tulip-tree flowers. The tulip-tree is abundant over most of the country east of the Mississippi, and although its flowers do not last long, they produce a

ENTOMOLOGY

One of Largest U. S. Moths Leaving Cocoon

See Front Cover

► THE CECROPIA moth, shown on the cover of this week's SCIENCE NEWS LETTER after emerging from its cocoon, is one of the largest American moths. The wings of the adult may stretch six inches across, while its colorful body is about four inches long.

This handsome insect, *Hyalophora cecropia*, is found from the Atlantic coast to the Rockies. In the North Atlantic states there is a similar, though smaller, species, *Hyalophora columbia*. On the West Coast, *H. rubra* represents the genus, while in the Rocky Mountains and Arizona, *H. gloveri* occurs.

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copious nectar-flow, enabling the bees to fill much comb with this type of honey in a short time.

A related type of fragrant honey, sometimes met in the South, comes from the flowers of the tulip-tree's close kindred, the magnolias.

Of the South also, and the Southwest, is orange-blossom honey, which carries with it some of the fragrances of the flowers themselves. It is one of the lightest-colored of the tree honeys, a point in its favor so far as the market is concerned.

A hardy tree of the North, whose flowers are the source of a most excellently-flavored honey, is the linden or basswood. Its clustered little flowers are inconspicuously greenish but intensely sweet-scented, and while they are in bloom, the bees simply go mad over them.

Many honey-tasters declare that the best-flavored of all honeys comes from the sourwood tree. This is a tree of rather limited distribution, being abundant only in parts of the Appalachian highlands, but where it does grow, and bees are given a chance at it, they will produce from its clusters of heather-like bloom a most unforgettable sweet.

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TECHNOLOGY

Spark Plugs Get "Rubber Boots"

► SYNTHETIC RUBBER "boots" for spark plugs that will keep auto engines running in wet weather were described to the American Chemical Society's rubber chemistry division meeting in Boston by Dr. Ward J. Remington, a Du Pont chemist.

The "boots" will be made of "Hypalon" rubber, which is a chlorosulfonated polyethylene. Tests show that these boots remain serviceable for 72,000 miles at average driving speed.

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