By subjecting various kinds of fabrics to these tests, the Moscow Laboratory of Climate assists in creating the most convenient and appropriate clothing for all kinds of industrial conditions.

Science News Letter, August 15, 1936

GENERAL SCIENCE

Technical Encyclopedia Serves Practical Persons

IT HAS been more than two decades since an encyclopedia devoted exclusively to technical and scientific matters has appeared. Now the needs of teachers, students, artisans and even scientists is served by 2,468 pages, some 25,000 titles, and thousands of illustrations in a four volume British-written work, *Hutchinson's Technical and Scientific Encyclopedia,* edited by C. F. Tweney and I. P. Shirshov (Macmillan).

Browsing through these volumes, many unfamiliar words tease one's ignorance. The last volume is labeled: "Petrol Engines to Zymurgy." Petrol engines is easy if one knows a little British; it means "gasoline engines" as gasoline to the British is "petrol."

Zymurgy? Easy—"the branch of technical chemistry which deals with processes of fermentation. See Brewing; Fermentation."

At the very beginning of the book—what? A. You know what that means? Do you?

"A (Astron.) A band in the solar spectrum produced mainly by oxygen in the terrestrial atmosphere; named by Fraunhofer."

Open the fourth volume to its center:

"Slicker (Leather Manufac.)—A tool used in leather manufacture for setting-out, smoothing, or stretching leather. May be made of brass, slate, stone or vulcanite."

Gangway

And in the middle of volume 2:

"Gangway (Mining)—A main haulage road or main level."

One might go on picking out item after item from this comprehensive work. The electrical sciences, chemistry and engineering are particularly well covered. The longest articles on the more basic principles of the sciences are less elaborate and academic than those found in a larger work like the Britannica but serve well the more practically-minded audience for which the volumes are intended.

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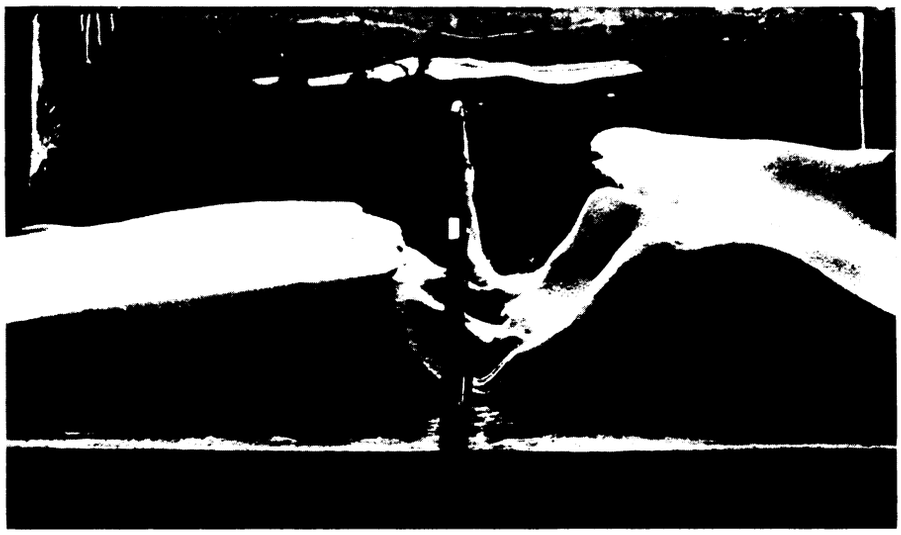
The ancient Chinese, and later the Romans, cultivated oysters.



DRIFTED HIGH

Snow piles high against this snow fence in the Laboratory of Climate in Moscow.

MEDICINE

Waste Product Heals Wounds By Stimulating Growth

UREA, ordinarily considered a waste product of the body, is good medicine for slow-healing wounds. Its successful use on patients by physicians all over the country is reported by Dr. William Robinson, entomologist of the U.S. Department of Agriculture (*American Journal of Surgery*).

A two per cent solution of urea, made with sterile water, is applied directly to the wound. Relief of pain and rapid healing has followed in cases of varicose and diabetic ulcers, carbuncles, extensive infected burns, mouth infections, osteomyelitis and certain skin infections. No ill results have so far been reported from this use of urea, and its low cost, about fifty cents a pound, makes its extensive use quite practicable. The solution is bland, colorless and odorless, and as used medicinally comes from a manufactured product having no connection with body wastes.

The urea solution apparently achieves its effect by stimulating a "vigorous growth" of new tissue with abundant blood supply. It does not have any direct germ-killing effect on the organisms involved in chronic, pus-forming wounds. Its cleansing effect on these wounds is produced indirectly through the stimulation of the growth of new healthy tissue.

The healing effect of urea was discovered through investigations Dr. Robinson made of maggots. A war-time discovery by the late Dr. William S. Baer, American surgeon, showed that these tiny creatures, loathsome as they might seem when crawling around in an open wound, had the power to clean up the wound and stimulate healing of the tissues. Dr. Baer died before he could find why the maggots in many cases surpassed other means of healing wounds. Government scientists continued his work, breeding clean, germ-free maggots and studying them. First clue to the maggots' healing power was the discovery that they produced allantoin, which in itself is a healing agent.

Further study showed that this was not the only substance with healing power present in maggot excretions. The chemical structure of allantoin suggested the possibility that urea, which can be formed by adding hydrogen to one of the chemical groups that make up allantoin, might be the active agent with which maggots were healing wounds. Whether or not this is the case, the suggestion led scientists to a trial of urea itself, with the success reported by Dr. Robinson.

Urea can be made by combining am-

monia with carbon dioxide. It occurs in human tissues and also is of common occurrence in plants. Its rather distasteful name comes from the fact that it was first discovered in one of the body's waste products. If, as Dr. Robinson points out, it had first been discovered in spinach, where it also occurs, it would probably have a better-sounding name.

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GENETICS

Cancer-Like Disease of Blood Follows Mendelian Law

Leukemia, Highly Fatal Disease, Is Due to Wild Growth of White Blood Cells and Determined by Heredity

CANCER-LIKE behavior on the part of the white blood corpuscles, a wild uncontrolled growth that turns them from their normal role of "cops" to the malignant one of "robbers," follows a definite hereditary pattern, Dr. E. C. MacDowell of the Carnegie Institution of Washington has discovered, in the course of researches conducted at the Institution's Department of Genetics.

Leukemia, the disease is called in medical circles. The name is Greek for "white blood," because of the terrific excess of white blood corpuscles that crowd the circulatory system and congest the vital organs. Because the white blood corpuscles are free to move about the body, leukemia is not susceptible to the kinds of treatment that can eradicate or check malignant tumors occurring in the "stationary" tissues. Hence leukemia is a highly fatal disease.

In his efforts to learn the causes of leukemia, Dr. MacDowell has worked with mice instead of men, for a number of obvious reasons. By the closest kind of inbreeding, he has produced a leukemic strain of black mice, of which it can be confidently predicted that only one individual in ten will escape the disease. By similarly close inbreeding, he has produced another strain, light-colored, of which only one in a hundred develops it. He has carried this breeding of leukemic and non-leukemic mice through 36 mouse generations—equivalent to over a thousand years, in terms of human generations.

When mice of the two strains are crossed, about half the offspring become leukemic, and the other half do not, although all the hybrids have the hereditary factor that makes for the development of the disease.

Dr. MacDowell interprets these results as meaning that in the "pure-line" leukemic mice heredity is so strong a factor that environmental influences cannot avail to check it; as if fated, the mouse develops the disease regardless. But in the hybrids, the hereditary dose of doom is not so large, so that some of the individuals respond to ameliorating factors in the environment and the malady does not develop.

As Dr. MacDowell phrases it: "Putting all this together, we find evidence that wild growth does not depend merely upon a change in the cells, but also upon the relation of this change to the growth-controlling forces of the particular individual. . . . Heredity sets limits, environment decides the exact position within these limits."

Dr. MacDowell's researches were conducted in cooperation with the Department of Pathology at Columbia University, supported by funds supplied by the Carnegie Corporation of New York.

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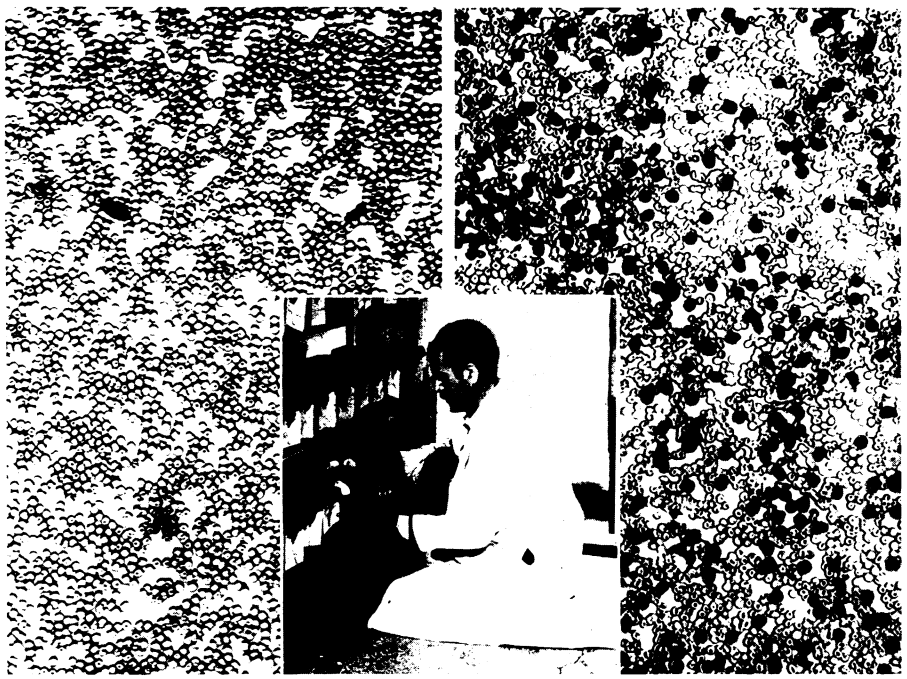

HEALTH AND DISEASE

Dr. E. C. MacDowell in his leukemia laboratory at Cold Spring Harbor, N. Y. Left background: Highly magnified photograph of normal blood. Right background: Blood of leukemic mice on the same scale. Note the large number of cells that show black in the leukemic blood. These are white blood cells that were stained dark to make them prominent in the photomicrograph. The small cells are red blood corpulscles.

CHEMISTRY

Six "Synthetic Rubbers" Now on the Market

OUTSIDE of the technical industries concerned, most people may yet feel that "synthetic rubber," or rubber-like material, is still a laboratory curiosity and still in the Sunday science supplement stage of the newspapers. How many know, for example, that six products now on the American market are rivals of rubber? Some are true synthetics, built in the laboratory, while others are derived from natural rubber but have special and desirable properties. They are described in the *Bulletin of American Society for Testing Materials* (July).

Pioneer of the rubber-like substances is Thiokol, which is available in sheets, as a liquid, or as a powder for molding.