

BIOCHEMISTRY

Duplicating Life Chemicals

Supersonic vibrations break down germ cells to remove all signs of life, but the cells can still react chemically, thus giving method of synthesizing proteins.

► HOW LIVING cells duplicate their own kind of tissue is a mystery now on the way to being solved because a research team has found the right experimental approach.

Different kinds of nucleic acids can make other life-stuff line up to produce different proteins in a new synthesis method announced in *Nature* (June 26).

The research team, Dr. E. F. Gale and Joan P. Folkes of the Medical Research Council Unit for Chemical Microbiology, report their experimental work on protein synthesis at the University of Cambridge, England.

The role of nucleic acids as templates for the formation of protein structures has been suggested frequently.

"But any proof of the part they play," say these scientists, "let alone its mechanism, awaits the preparation of an experimental system which can synthesize protein and on which an effect of nucleic acids can be demonstrated. Such a system has now been obtained by disruption of suspensions of *Staphylococcus aureus* by exposure to supersonic vibration."

Starting with the common germs responsible for boils, and subjecting them to "silent sound" vibrations for about half an hour,

a suspension of broken-down germ cells was obtained that had lost all signs of life, but was still capable of chemical combination under the proper conditions.

Adding one by one or in combination the chemicals that are known to take part in building living tissue, the research team is learning the different rates at which the individual amino acids take part in the formation of living matter.

The original template chemical is deoxyribonucleic acid, which is able to start the organization but cannot form protein until some ribonucleic acid has been formed.

"It may be that it is the ribonucleic acid which collects, organizes and orientates amino-acid residues before they split away as protein," the Cambridge scientists say, "or it may be that deoxyribonucleic acid combines with and organizes amino-acid residues which cannot combine into a peptide chain until they have been taken over by the corresponding ribonucleic acid."

Light is thrown on the action of penicillin by one line of experiment they report. The antibiotic, in their studies, stopped growth by preventing the formation of ribonucleic acid.

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and cortisone, 29% could be kept alive for one year. Now that 6-MP, the newest agent, has been added to the group, 52% are living for at least one year after the start of their disease.

Chemicals that are tested in the Institute's program are received for trial from leading industrial and pharmaceutical laboratories throughout the world, many of which have cooperative contracts with the Institute for the synthesis of new compounds.

This work is supported by the American Cancer Society, the Damon Runyon Memorial Fund, the National Cancer Institute of the U. S. Public Health Service, the Black-Stevenson Fund and by direct contributions from the public.

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VITAL STATISTICS

More Boys Than Girls Born During World War II

► AN INCREASE in the proportion of male births occurred in the United States toward the end of World War II, supporting a common belief based on European experience that male births outnumber female births during periods of war.

Reported by Dr. Brian MacMahon of the State University College of Medicine, New York, and Dr. Thomas F. Pugh of the Harvard School of Public Health, the increase was particularly noticeable in Connecticut, Massachusetts, New Jersey, New York and Rhode Island. Statistics from these states were analyzed because of their completeness of birth registrations.

Male births increased during the year 1945 to 1947, with a peak in 1946. The scientists do not attempt to explain the larger proportion of male births, but they did determine that it was not the result of changes in distribution of births by age of mother or father or by order of birth.

In the *American Journal of Human Genetics* (June), they report the effect was most marked in first births and occurred before the peak of postwar marriages.

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METEOROLOGY

We Usually Have "Unusual" Weather

► "THE UNUSUAL weather we are having this year is not essentially different from the abnormalities we have had in previous years," Dr. Francis W. Reichelderfer, chief of the U. S. Weather Bureau, has stated.

Previous years, Dr. Reichelderfer explained, means "prior to the days we had any means of putting artificial nucleating agents in the atmosphere."

"There is certainly," he said, "no direct evidence of any effect of atomic or hydrogen bombs on the weather."

Dr. Reichelderfer pointed out that back in 1915 many people were blaming abnormalities of the weather in that year on the then "new-fangled" radio waves.

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MEDICINE

100% Rat Cancer Cures

► ALL OF the animals bearing one type of transplanted cancer can be cured by chemical injections, it is announced in the seventh progress report of the Sloan-Kettering Institute of Memorial Center for Cancer and Allied Diseases, New York.

Of 2,866 animals with many types of cancers, 1,700, or 59%, were cured by one or another compound tested.

Regular cure by chemicals of cancer in animals could foreshadow similar results in man. This is the history of other public health problems whose conquest has been preceded by their control in the laboratory.

The Sloan-Kettering investigators injected animals with a compound after growths of transplanted cancer had become well established. Over 23 different types of solid tumors, 18 mouse cancers and five rat cancers were used routinely in the experiments.

Ten compounds have been found that produce permanent cure in one or more of these types of animal cancers.

For example, TEM, a compound developed by Sloan-Kettering, routinely cures 95% of Flexner-Jobling carcinoma in rats, 100% of Jensen sarcoma in rats.

A related compound, TSPA, cures 83% of Ridgeway osteogenic sarcoma in mice. Over-all cures of 67% of animal cancers other than leukemia were reported.

Effects of chemicals against six different strains of mouse leukemia were reported. A combination of P-165, or O-diazoacetyl-L-serine, and 6-MP, or 6-mercaptopurine, developed by Sloan-Kettering in cooperation with Parke-Davis and Wellcome Research Laboratories, respectively, results in cures of 98% of one type of leukemia in mice, 75% of another type. Over-all cures of 44% of the group of mouse leukemias were achieved.

These agents since have been tried in man or are currently being tested. No chemicals have been found that cure any type of cancer or leukemia in man, although compounds have been developed that temporarily restrain certain types of human cancer, particularly the leukemias.

A few years ago, when there were no chemicals available for the treatment of acute leukemia in children, only five percent of the youngsters survived for one year. After the discovery of amethopterin