GENETICS

Chemistry Aids Genetics

Study of molds show how heredity is linked with ability to make from its food medium the necessary compounds to sustain life.

➤ CHEMISTRY has come to the aid of biology in solving some of the more difficult questions of how parental characters are passed on to offspring—and of how these characters sometimes change, giving rise to new evolutionary lines or pinching off old ones.

Specifically, it is biochemistry that is thus helping forward the study of genetics, Prof. G. W. Beadle of Stanford University declared, in a lecture given under the auspices of the Society of Sigma Xi at the University of Oregon. This was the first of a series of national Sigma Xi lectures by Prof. Beadle at various universities throughout the nation.

Earliest studies in genetics, like the classic researches of Mendel, concerned themselves with easily visible differences in organisms, such as color of flowers or seeds in plants, shape of wings or kind of hair in animals. A great deal of profitable work is still being done along those lines.

However, plants and animals also have definite modes of inheritance in their invisible internal chemical reactions. What they do with their food, how they build it into their body substance, how they may sicken and die for lack of an indispensable hormone or vitamin, are as definitely controlled by their genes as are color, shape or size of body parts. These intricate reactions in life-chemistry are the present subjects of research by Prof. Beadle and his associates at Stanford University, and of other investigators elsewhere.

The special organism chosen by Prof. Beadle is a species of red bread mold, which makes a very desirable vegetable guinea-pig for a number of reasons, outstanding among which are the ease with which it responds to breeding techniques and the sharpness of the differences its new strains show in their biochemical reactions.

The mold is induced to undergo gene changes by bombarding it with X-rays, ultraviolet radiation or neutrons. Sometimes a gene drops out of its makeup. In some of these cases, the result is a new strain of mold that cannot put together the simpler compounds in its food medium to make some necessary item in an organism's life-equipment—vitamin B_1, for example.

Ordinarily, of course, such a deficient strain would die, but by artificially supplying the lacking food element it is possible to keep alive and to continue studies on its hereditary behavior.

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***CHEMICAL LAB**—A view of the chemical laboratory of the Timber Engineering Company in Washington, D. C., where research into lignin and other chemical phases of wood is conducted. Left to right are: Carl Rishell, Director of Research; Dr. Eduard Farber, Director of Chemical Research; S. Sibelius and Dr. M. Sciascia.*

CHEMISTRY

Wood Products Laboratory Opened in Washington

➤ A NEW LABORATORY for improved physical and chemical utilization of wood and its products was officially opened in Washington, D. C. The Teco-Shop Laboratory of the Timber Engineering Company is appropriately located in the middle of a wooded area. Hosts for the day were C. A. Rishell, director of research, and Harry Uhl, president.

The laboratory is composed of two divisions. Dr. Eduard Farber is in charge of the chemical division, which has already made advances in the study of the utilization of lignin, partner of cellulose in wood, but all too frequently regarded as a waste product. J. L. Stearns heads the physical department where soft grades of wood are made hard under impregnation. Gaily hued pieces of wood have been colored not just on the surface, but throughout, by this process.

The wood products development shop and wood chemistry laboratory are expected to provide an additional link between basic research organizations such as the U. S. Forest Products Laboratory and practical application of this research.

Science News Letter, January 27, 1945

AERONAUTICS

8-Passenger Helicopter Has Two Engines

➤ DESIGN DETAILS of a new helicopter that will carry eight persons reveal that it has two 300-horsepower engines and windmill-like rotor blades 56 feet

long. The length of the blades is greater than the wingspan of some of our top fighter planes, including the P-38J, P-40, P-47 and P-51. The two engines will thrust the craft through the air at a cruising speed of 90 to 100 miles an hour, according to Agnew E. Larsen, of Rota-Wings, Inc., the manufacturer, in a report (*American Aviation,* Jan. 1).

"The failure of one engine will not result in any appreciable change in the operating characteristics of the craft," Mr. Larsen remarked.

In the event of one engine failure it would take less than one-tenth of a second to switch over to single-engine operation.

The overall height of the proposed helicopter is 13 feet. It will weigh 4,450 pounds and carry a load of over a ton. Estimated cost, without engines or radio, is $37,000. Mr. Larsen states that the new craft can gain altitude at a rate of 1,400 feet a minute.

Construction of a mockup of the plane is beginning, and it is expected that the craft will be in production within a year.

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COMMUNICATIONS

Civilian "Walkie Talkie"

May become a part of your household equipment, following FCC approval. Bands set aside for industrial and medical radio to prevent interference.

➤ "WALKIE-TALKIE," the powerful one-man broadcasting station that provides reliable short-range communications between military units today, may become a part of your household equipment, just like your radio or refrigerator. Under the heading of "Citizens' Radio Communication Service" the Federal Communications Commission has allocated the portion of the radio spectrum between 460 and 470 megacycles to the new radio service.

The news about "walkie-talkie" for civilian use was released as a part of a preview of America's postwar radio spectrum in a proposed frequency allocation plan issued by the FCC.

Housewives will be able to keep in direct touch with their husbands, with "walkie-talkie" installed in automobiles and stores. Doctors, farmers and professional men can use "walkie-talkie" to keep in contact with their offices or homes while making calls. Department stores, dairies, laundries and other business organizations can use the service to communicate with their delivery vehicles.

No technical knowledge will be required by the FCC to operate one of these devices. "Walkie-talkie" equipment in one popular form consists of a small box containing transmitting and receiving devices, with a microphone and earphone built into a hand-set like a familiar telephone unit. It is powered by batteries, has a practical range of several miles and weighs about 35 pounds.

At FCC hearings in September, the railroads demonstrated that radio would contribute to the safety of life and property and should be of almost universal benefit to the public. Therefore the Commission has set aside several channels for such use.

Three bands have been assigned for industrial and medical radio equipment, to prevent interference with other radio services. This means that a diathermy machine operating nearby will not interfere with the reception of programs on your radio.

Rural telephone service, a new communication service to furnish a radio-telephone link for isolated communities, farmers, ranchers, miners and others who cannot be or are not served by regular telephone wire systems, will share the band of frequencies allocated to television by the FCC.

Commercial television is going to remain roughly where it is, thus settling for the time being one of the most controversial questions discussed at the allocation hearings, whether television should stay in the lower part of the spectrum, or move to higher frequencies. In its report, the FCC stated that commercial television should not be denied the public until a system in the ultra-high frequencies can be developed and proven, since the time that may elapse before such a system can be worked out is indefinite and depends upon the resourcefulness of industry in solving many technical problems. However, the FCC has set aside space in the ultra-high portion of the spectrum for experimental development of color pictures and wide-channel television.

This means that you can expect about the same kind of television pictures that were possible before the war, with some wartime improvements, and that television sets selling from $75 up will probably go on the market soon after the war.

You need not expect to see television at your local movie house for some time to come. Since theater television is still in the experimental stage, the FCC has not allocated any specific frequencies for the service.

Likewise, no specific allocation is made for subscription radio, the service which would carry no advertising but would be supported by rental of a device to eliminate a "pig-squeal" superimposed on the program being broadcast.

You may be able to have a newspaper printed in your own home by facsimile broadcasting, a system that permits the transmission of printed or typed material, drawings or pictures through the air to be reproduced on paper exactly as they are sent at the receiving end.

Since public interest requires that FM (frequency modulation), staticless radio, be established in a permanent place in the radio spectrum before a considerable investment is made by the listening public in receiving sets and by the broadcasters in transmitting equipment, the FCC has allocated 90 channels to FM, an increase of 50 channels over the present space held by the service, and has moved it up in the radio spectrum to a point between 84 and 102 megacycles.

About 160 educational institutions have expressed interest in non-commercial educational radio which may profoundly affect not only American education but our democratic institutions as a whole. Therefore, the FCC has allocated 20 of the 90 FM channels to this service.

Criminals of the future will find the way of the transgressor harder as the police build up radio communication networks with a greatly-increased number of frequencies allocated by the FCC. These channels will make possible facsimile networks for transmitting photos and fingerprints from one police department to another and to the FBI in Washington. Fire departments will also be able to use radio, since the FCC has increased the space allocated to this service.

G. I. Joe, returning from war and desiring to set up his own amateur station, will have plenty of spectrum to work in. The FCC has boosted the number of channels for this service which is one of the oldest in radio, whose development closely parallels that of the entire radio art.

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