

PSYCHOLOGY

More Chemistry Finds Made by Young Than Old

CHEMISTS make their most important as well as their greatest number of discoveries when young, an Ohio University psychologist reports.

To reach this conclusion, Dr. Harvey C. Lehman studied 44 histories of chemistry by authors from Germany, France, England, Italy and the United States.

Statistics from the 44 histories showed that chemists become less productive as their age increased, he reports in the *American Psychologist*, 15:128, 1960. For example, in a five-year period 57 chemists aged 30 to 34 years made 19 of their best yearly reports of discoveries. The same chemists who lived until they were between 50 and 54 made only one contribution.

Dr. Lehman reports that although the work done by an older scientist is apt to receive more attention from historians since his name is known, it generally turns out that work done by the scientist in his younger years is the most significant. He cites Einstein as an example. Although Einstein received acclaim for work done in later years, the papers on relativity and light quanta that he did when he was about 25 are his most important.

Of 6,347 contributions made to chemistry each of which was mentioned in one only of the 44 histories, 94% were made by chemists at age 25 or older, 66% at 35 or older, 38% at 45 or older, 17% at 55 or older, and six percent at 65 or older.

Of 101 contributions each of which was mentioned in 20 or more histories, 95% were made at age 25 or older, 52% at 35 or older, 13% at 45 or older and one percent at 55 or older.

Science News Letter, May 7, 1960

PSYCHOLOGY

Study How Brain Signals May Influence Behavior

HOM MUCH the brain's electric signals have to do with the way an individual behaves is being studied at the University of California.

Dr. Walter J. Freeman is at work on a project in which he hopes to map the location of cerebral electric fields and to determine the extent of the relationships between brain waves and behavior. Experiments have already indicated some correlation, he reports.

Scientists have long known that a normal "noise" emanates from the mammalian brain in the form of tiny electric currents. They have recorded them by means of electrodes placed on the scalp and attached to an electronic instrument known as an electroencephalograph. The currents have thus been termed EEG waves.

Recent advances have made it possible to implant electrodes deep within the brain so that electrical activity in separate brain segments may be recorded.

EEG waves are now used in clinical study on humans to diagnose epilepsy and other brain disorders. Other researchers,

working with animals, are looking for changes in EEG wave activity that may occur with learning.

Dr. Freeman, on the other hand, is mainly interested in the normal EEG wave patterns and in the spontaneous changes in brain "noise" occurring during different types of normal behavior.

He has implanted into cats under anesthesia up to 18 electrodes in a three-dimensional rectangular grid covering the surface and interior of the frontal lobe of the brain. Awakened and apparently unaware that they have been "wired for sound," the cats were connected to the electroencephalograph and their brain structures were searched for the predominant foci of electrical activity.

Guided by the cerebral "maps" thus obtained, Dr. Freeman is observing EEG wave activity during a whole sequence of normal behavior including sleep, exercise on a treadmill, fear, hunger and feeding. He is analyzing and measuring any changes he can detect in the electric patterns that appear to be related to behavior. Finally, he plans to compare results from different individuals to see whether any apparent "personality differences" in the cats can be detected.

Dr. Freeman has already established a significant link between electrical activity of the brain's prepyriform cortex and several behavioral states.

Science News Letter, May 7, 1960

ROCKETS AND MISSILES

"Inbred" U.S. Rockets To Enhance Space Success

AMERICA'S stable of work-horse rockets will be more and more inbred in the future. The idea will be to develop more sure-fire winners.

This is the policy to be pursued by the National Aeronautics and Space Administration, a NASA rocket engineer told a meeting in Washington, D. C. sponsored by the U.S. State Department.

Eldon W. Hall said NASA will seek to develop a few basic and reliable rocket engine units that can be put together in various numbers and ways to produce final space-going rockets with high reliability. He said, for instance, that the design of the second stage of one rocket could be modified and used as the third stage of another. He said this engine probably would be more likely to perform properly than a new, specially designed engine.

There also will be less emphasis on making United States rockets sophisticated, he said. Instead, NASA engineers will strive "to make them work." He said he thought Russia's rockets probably were more simple than those of the U.S., but could not say whether this had given Russia a smaller percentage of failures.

Ultimately destined to be put out to pasture, as far as the civilian space program goes, are the Juno II rocket and part of the Delta rocket, he said. NASA already has killed its Vega program in the interests of simplifying its space stable.

Science News Letter, May 7, 1960

IN SCIEN

AGRICULTURE

Radioactive Uptake From Soil Said to Be Small

THE AMOUNT of radioactive fallout products taken up by plants from soil is said to be "relatively small"—with most of it concentrated in leaves and to a lesser extent in fruits, seeds—or grain—and edible roots.

A study of uptake of fission products by plants from flats of soil exposed to contamination by nuclear detonations at the Nevada Test Site was carried out by Dr. H. Nishita, E. M. Romney and K. H. Larson of the Laboratory of Biophysics and Nuclear Medicine of the University of California Medical Center, Los Angeles.

They found that radioactive strontium was the fission product most readily taken up followed by radioactive iodine, barium, cesium, and ruthenium. Radioactive cerium, yttrium, promethium, zirconium and niobium were taken up only in trace amounts.

There were considerable differences in uptake of fission products among the plant species, kind of soil, and the conditions of plant growth. Of the plants studied, beans and radishes accumulated more radioactive strontium than carrots, lettuce, and barley in that order. In all plants, far more fission products accumulated in the leaves than in seeds or edible roots.

The addition of non-decayed organic matter to soil tended to inhibit uptake but it took unusually large amounts of it to make significant differences. Addition of calcium to soils deficient in calcium tended to inhibit the uptake of radioactive strontium. Similarly, the addition of potassium to potassium deficient soil inhibited the uptake up radioactive cesium.

Science News Letter, May 7, 1960

ASTRONOMY

Telescope in Nose Cone To Measure Ultraviolet

A NEW TYPE telescope, equipped with six photo-amplifiers, will be used to send television-type pictures back to earth of ultraviolet light from beyond the earth's atmosphere.

Scientists at University College, London, developed the flying telescope. It will be tested soon at Woomera range, South Australia, British Information Services reported. The telescope will be sent aloft 100 miles before the pictures are taken.

Dr. R. D. F. Boyd, in charge of the development of the telescope, expects it to take pictures of the ultraviolet spectrum never made before. New information about the atmospheres of stars is expected, and objects radiating invisible ultraviolet light may be discovered.

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CE FIELDS

ASTRONAUTICS

No Space Suits Needed In 1965's Manned Moon

A SATELLITE with laboratory cells in which scientists can work without space suits might be put into orbit in 1965. It would be a step advanced from the Mercury program for orbiting a single man and a step forward toward more ambitious space travel.

Three engineers, John W. Dorsey, Michael Stoiko and Gerald G. Kayten, all of The Martin Company, Baltimore, Md., proposed such a satellite at a symposium in Los Angeles sponsored by the Institute of Aeronautical Sciences, The Rand Corporation and the National Aeronautics and Space Administration.

The engineers said the 16-ton laboratory is technically feasible. It would be capable of carrying four to six men. Personnel would not need elaborate space suits because a healthy, balanced atmosphere would be supplied to the whole satellite.

The satellite would be a double-shell, three-compartment cylinder. An outer shell, made of beryllium, would serve as a meteoroidal bumper and thermal shield. Mr. Dorsey said the satellite could have biological and chemical, astronomical and geophysical and medical laboratories. It could later be used for manned reconnaissance of the moon.

Science News Letter, May 7, 1960

ZOOLOGY

Epic Flight by Hoary Bat Started Hawaiian Species

SEVERAL thousand years ago, a pregnant bat lost her way in the northward spring migration and flew a record distance of 2,000 miles, all the way from the west coast of North America to Hawaii.

And that, says Dr. David H. Johnson, curator of mammals at the Smithsonian Institution, is probably how Hawaii acquired its bat population.

The animal was a hoary bat, a fairly common species in western North America. It has probably been in Hawaii for thousands of years, arriving long before man, Dr. Johnson says. During this time it has undergone various changes, but its relationship with the mainland bat is unmistakable.

Unlike most kinds of bats, the hoary bat is a solitary creature which roosts in trees and in winter migrates instead of congregating in caves. The female bears three or four young rather than the usual one or two. So it would have taken only one pregnant female to start the bat population in Hawaii, once she accomplished the almost miraculous feat of getting there, Dr. Johnson said.

The Pacific Islands have a very scanty

mammal population. Most of the islands are coral atolls or the tops of volcanoes that that came into being long after mammals were well established on surrounding continents.

Warm-blooded animals could have reached the islands only by swimming, by hitching a ride with migrating man or by flying.

Of all these ways, Dr. Johnson noted, the least likely is flight—especially flight west over long stretches of sea, in which there are no islands to serve as resting places. Bats are the only mammals that could have arrived in this manner.

Although hoary bats are among the most efficient of flying mammals, they are poorly equipped for prolonged flight compared with birds.

And even for most feathered creatures, says Dr. Johnson, a non-stop journey of 2,000 miles would have been impossible.

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CONSERVATION

American Duck Numbers Are Down, Survey Shows

THE TOTAL North American duck population this year is 20% below what it was last year, the Department of Interior reports.

This information is based on the annual winter survey made by Interior's Bureau of Sport Fisheries and Wildlife. It includes the continent's four major flyways, or established air routes of migratory birds, the Pacific, Central, Mississippi and Atlantic Flyways.

The survey showed that in general the Arctic nesters, which were not affected by prolonged drought, were present in their usual numbers but that the prairie nesting waterfowl, which had been hit hard by three successive dry years, were in short supply.

Those species reported to have "held their own" or to have "increased slightly" are not necessarily in good shape, however, because 1959 was one of the very poor years for migratory waterfowl.

The redhead population dropped 73% below an already low 1959 level. Two other diving ducks, the canvasback and ruddy duck, were down 28% and 16% respectively. Other species showing decreases were mallards, down 22%; green-winged teal, down 32%; blue-winged teal, down 44%, and pintails, down 27%.

The black duck population was not sufficiently high to get out of the "same as last year" category but wood ducks were up 17%.

Canada goose numbers were slightly down but snow geese were up 13% and the whitefronts up 10%. Brant numbers were up 100% on the Pacific coasts and up 10% on the Atlantic coast. All other species of migratory waterfowl retained their numbers of last year.

A total of 1,691 persons throughout North America participated in the survey, registering 100,027 miles by air, 106,990 miles by car and 4,047 miles by boat.

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ZOOLOGY

Whistling Swans Dyed To Study Migration Route

THE U.S. FISH and Wildlife Service has been dyeing whistling swans vivid colors to learn more about their migratory movements.

With their wings, tails or other body parts colored blue, yellow, green or red, the swans are easier to observe both when flying and resting on the ground. The Service is interested in determining over which states the birds fly in their annual migrations.

There are about 77,000 whistlers in the U. S. A little more than half of these winter along the Atlantic Coast, especially the Chesapeake Bay area, while the remainder winter along the Pacific Coast. The swans nest in Canada, roughly from Alaska eastward to Baffin Island.

Actually only a very small sampling of the whistling swan population is being dyed. This is because of the difficulty in trapping the four-foot-long birds. Mass dyeing, however, is not considered necessary.

The dyes used normally do not remain on the swans for very long. When the swans molt after nesting, they lose their colored feathers.

Allen Duvall of the Service's branch of wildlife research said dyeing techniques have been used previously with snow geese with satisfactory results. Persons who spot dyed whistlers are asked to report their observations to the Patuxent Wildlife Research Center, Laurel, Md.

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ASTRONOMY

Star's Unseen Companion Ten Times Jupiter's Size

THE UNSEEN companion of a "nearby" star may be a planet ten times the size of Jupiter.

Its mass is now believed to be one-hundredth that of the sun, Dr. Sarah Lee Lippincott of Sproul Observatory, Swarthmore College, Swarthmore, Pa., reported to the American Astronomical Society meeting in Pittsburgh.

The invisible object, however, may shine in the infrared by its own light. Only a special infrared observing program will allow astronomers to determine for sure whether the unseen companion of the star fourth nearest to earth, known as Lalande 21185, is a planet or another small star.

Dr. Lippincott has found that the object has an eight-year period. Astronomers are not sure whether or not this is the closest possible planet. Barnard's star is closer, but deciding the status of its companion is not possible at this time.

Astronomers can tell whether a star is single, like the sun, or a double or triple star, by examining its light with a spectroscope. The magnitude of Lalande 21185 is about seven, too faint to be seen without telescopic aid. It is 8.1 light years from earth, or some 48 million million miles. The star has been observed at Sproul Observatory since 1912.

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