BOTANY

Saffron is Propagated 3,700 Years Without Seed

SAFFRON, widely used as a drug and dyestuff, is unique among plants in having been cultivated for more than 3,700 years without ever having borne seed. It bears small offsets at the base of its corms, or "bulbs," as do all the members of the crocus group of plants, of which saffron is a member. The antiquity of saffron cultivation is attested by a Cretan fresco discovered by Sir Arthur Evans in the Temple of Minos, showing a man gathering the yellow flowers that yield the drug.

Other plants, such as the common potato, are cultivated without the use of seed, but these tend to "run out" eventually, due to some degeneration or accumulation of diseases. Saffron, however, seems to have resisted all such tendencies for thirty-seven centuries.

Science News Letter, August 13, 1932

PHYSIOLOGY

New Sex Hormone Affects Pituitary Gland

EVIDENCE that a second powerful hormone, hitherto unrecognized, is produced by the male sex glands is reported by Dr. D. Roy McCullagh of the Cleveland Clinic Foundation in *Science*. One function of this newly discovered hormone is the control of the growth-regulating pituitary gland. It also affects the adrenal glands.

Scientists have known for some time that the pituitary, adrenal and sex glands were related, but the exact nature of the relationship remained obscure. Dr. McCullagh's investigations shed considerable light on this. For example, when animals are castrated the pituitary gland becomes enlarged and over active, causing growth and other disturbances in the rest of the body.

Extracts of male sex hormones prepared in fatty solutions will, if given immediately after castration, prevent wasting of the secondary sex glands in castrated animals. Even when given after these glands have undergone considerable change, the extract will cause their regeneration. But it has no effect on the enlarged over-active pituitary gland that follows castration.

Dr. McCullagh found that a solution in water of male sex-gland extract which contained only an infinitesimal amount of the substance that regenerates the secondary sex glands, could prevent the overgrowth and overactivity of the pituitary gland following castration. He calls this new hormone "inhibin." The original male sex hormone, soluble in fat and affecting sex glands only, he calls "androtin."

In his preliminary report in *Science*, Dr. McCullagh points out that while nearly all the experiments in connection with this new discovery have been performed in his laboratory, the theory could not have been established had it not been for many careful studies in other laboratories. More intensive study of the subject is now under way.

Science News Letter, August 13, 1932

ARCHAEOLOGY

Tiny Churches Followed Egyptian Temples In Sarra

HOW THE early Christians adapted and made use of buildings of the ancient Egyptians is revealed by J. H. Dunbar in a communication to the British School of Archaeology at University College, London.

Mr. Dunbar reported the examination of the deserted mud town of Sarra, up the Nile, about 15 miles north of the second cataract. Sarra was built almost 2,000 years before Christ as a fortress to protect traders from attack as they carried goods along the Nile.

Christians settled at Sarra and nearby places when the region was Christianized, between the ninth and eleventh centuries A. D. Their churches, built of mud-bricks, were very small, Mr. Dunbar reports. The largest would hold not more than 50 people. The smallest has room for eight.

These medieval Christian churches have vaulted roofs over nave and aisles, and usually a dome. The original altar is to be seen in one church. It is a solid cube of mud about three feet high, with two niches scooped out of the back to hold the sacred vessels, indicating a double dedication. In another church is a large slab of granite taken from an Egyptian temple and put to use as an altar or holy-water stoup.

The walls were plastered and painted with brightly colored, crude pictures of saints and evangelists, and with prayers in Coptic and Greek.

Nearby are shafts which had been cut in the rock by the Egyptians, and which the Christians used as graves. These were so narrow that the coffin must have been lowered head or feet first.

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IN SCIENC

METEOROLOGY

Warm Weather Continues Into Present Year

THE HIGH temperatures of 1931, warmest year of U. S. Weather Bureau records, still persist, but not to the sweltering extent of the record year.

"Temperatures so far during 1932 have had a general tendency to range above normal, though not markedly so most of the time," said J. B. Kincer, chief of the division of agricultural meteorology of the U. S. Weather Bureau. "Only one month, March, had decidedly sub-normal temperatures while three months, January, February and July, were abnormally warm over much of the country. January and February, however, were decidedly cold west of the Rocky Mountains, and July was of normal warmth over a large area.

"Moderate temperature tending to be somewhat warmer than normal were recorded for the other three months, April, May and June."

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PHYSIOLOGY

Brains of Exercised Rats Weigh More

BRAINS seem to profit, at least in size, by bodily exercise.

This is indicated by a research undertaking reported by Dr. Henry H. Donaldson of The Wistar Institute of Anatomy and Biology in Philadelphia. Dr. Donaldson knew from previous investigations that the brains of white rats weigh from 12 to 14 per cent. less than those of their wild relatives, the Norway rats. So he let a lot of white rats have plenty of exercise in revolving cages, and in due time chloroformed them and removed and weighed their brains. He found that the exercised rats showed increases of from two to three per cent. in brain weight, and also gains in the weight of other body organs.

He continued the experiment through seven generations of rats, but did not find any evidence that brain weight increases are inherited.

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E FIELDS

CHEMISTRY

Acetic Acid Made Direct From Wood

A NEW METHOD of producing acetic acid direct from wood without first producing acetate of lime has been used successfully in a chemical plant in Memphis, Tenn., and has just been introduced into the plant of an associated interest in Crossett, Ark., Emerson P. Poste has reported to the American Chemical Society.

The process, which was devised by a Viennese chemist, Hermann Suida, is hailed as wresting victory from defeat for the wood distillation industry which has been so hard hit by the development of synthetic methanol and synthetic acetic acid.

The resulting acetic acid is of sufficient purity to be used commercially without further refining, and is used chiefly in the manufacture of solvent esters, such as butyl and ethyl acetates, important as solvents for lacquers.

The by-products of the process are also of considerable commercial importance. From a single cord of average hard wood, it is reported that the following products are obtained: charcoal, 1330 pounds; oil for wood preserving, etc., 4.5 gallons; pitch 40-45 pounds; acetic acid 120 pounds; and methanol, 9 gallons.

Science News Letter, August 13, 1932

PHYSICS

Million-Volt X-Ray Tube Begins Operation

THE NEW million-volt X-ray tube of the California Institute of Technology is now being operated regularly and at a potential up to 1,200,000 volts. The research staff in charge of the large tube, headed by Dr. Charles C. Lauritsen, has made careful measurements of the intensity of the radiation produced and the limit of the length of short wave radiation has been determined by means of a special crystal spectograph.

In quantity of radiation produced the million-volt tube equals many times the amount of radium available for medical use in the world at present, the intensity being twenty roentgens at a distance of seventy centimeters from the target. This is equivalent, according to measurements made at the New York Memorial Hospital, to the raying power of at least two kilograms of radium, which would cost at present prices about $120,000,000.

The shortest wavelength radiation produced is twelve x-units, which is less than most of that produced by radium.

Some research is now being done on the effects of the X-rays from this tube upon animals. The tube is to be used especially for biological work.

The million-volt tube is essentially a large and much modified edition of the conventional X-ray tube used in medical radiology but is operated with alternating current. In this it differs from tubes of lower voltages at the Memorial Hospital in New York City and at Schenectady. To supply the tube with current at a million volts potential, large transformers were built to order. These deliver sufficient current to light three hundred 100-watt lamps.

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ENTOMOLOGY-INVENTION

Bright Lights Lure; Insects Leave Porch

INSECTS bothered Prof. H. W. Matlack of Grinnell College. He has a broad, comfortable screened porch, with subdued lights, where it is very pleasant to sit on warm summer nights. But insects leaked into it in the innumerable ways insects can find, attracted by the lights. The smallest and peskiest of them came right through the meshes.

Prof. Matlack gave considerable thought to the matter, and at last had a flash of inspiration. Like many strokes of genius, his solution was simple.

Under the eaves of his porch, outside the screen, he fitted one bright light, much brighter than any of the shaded lamps on the porch itself. Immediately all the insects on the porch turned their backs on the subdued lights and went straight for the bright bulb. The littlest ones went out through the meshes as they had come in, and danced around the light, drunk with the strong radiation. The larger ones crowded crawling on the screen as near as they could get to it. No more insects invaded the porch.

And the joke about it is that Prof. Matlack is not an entomologist—not a scientist at all. He is a member of the faculty of the department of music, and teaches pipe organ.

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PLANT PATHOLOGY

Virus Disease Can Be Hammered to Death

THE FILTERABLE virus of the mosaic disease of plants, a living organism so minute that it can pass through the pores of a porcelain filter, can be killed by long-continued pounding, resulting in the extremely fine pulverization of the plant tissues it infests.

This has been demonstrated by Drs. Peter K. Olitsky and Filip C. Forsbeck of the Rockefeller Institute for Medical Research. They dried the top leaves of several hundred tomato plants infected with mosaic, and gave them a preliminary grinding with a mortar and pestle. Then they put small quantities of the ground material into specially made bottles of strong glass, together with four steel balls in each bottle. The bottles were then shaken for varying lengths of time on a shaking-machine, causing the balls to pound the leaf material into an almost impalpably fine powder.

Attempts to inoculate healthy plants with this pounded-up material failed in the majority of cases. Some of the tests, with material subjected to the pulverizing shaking for four hours or more, yielded totally negative results. The experimenters conclude that tomato mosaic virus loses its infectivity when tissues containing it are treated by the method they used.

The full report of their work was made to *Science*.

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ENTOMOLOGY

Poison Spray Materials Drive Off Japanese Beetles

JAPANESE beetles find lead arsenate so disagreeable that they leave foliage sprayed with it, without eating enough to poison them. Other spray materials repel them in similar fashion, even when they are not poisonous. These include such things as slaked lime, barytes, chalk and china clay. Paris green, however, proved attractive to the beetles in some of the experiments.

This has been demonstrated by E. R. Van Leeuwen of the U. S. Bureau of Entomology, in a number of experiments. He found that in general most of the beetles, will leave a tree within three hours after it has been given a lead arsenic spraying, while many new arrivals merely hover in flight and refuse to alight.

Science News Letter, August 13, 1932