Biology

Next: Polyunsaturated cattle feed?

All corn plants are not alike. Although corn has only a few chromosomes, scores of different characteristics can be expressed—kernel color and size, plant height, ears per plant, etc. Now there is evidence that subtle differences in corn oil composition may be genetically controlled. And this is good news for the "green revolution."

Evelyn J. Weber and students at the U.S. Department of Agriculture's research facility in Urbana, Ill., found that the fatty acids present in corn oil are not arranged randomly on the oil (triglyceride) molecules as previously thought. They are, instead, arranged in various patterns which seem to be genetically controlled and which affect the nutritional and physiological properties of the grain.

The team found that when polyunsaturated fatty acids are present on the "outside" positions of the oil molecule, the corn oil gets rancid easily. But when saturated fatty acids fill the outside positions, the oil doesn't oxidize. Fatty acid placement also appears to affect digestion and efficient utilization of essential nutrients in test animals and may affect fat build-up in human blood vessels.

If the traits are genetically controlled, plant breeders may someday breed corn that can be stored longer, can feed livestock more efficiently and is safer for those prone to atherosclerosis.

Rotten willow good for the gallbladder

Western medical scientists tend to take a dim view of folk remedies, in spite of the fact that before digitalis was a staple cardiologist's prescription, herb women used to give decotions of foxglove to people with chest pains.

The Chinese attitude has been different. Medical scientists in the People's Republic are engaged in a systematic study of what they call the "national medical legacy." One part of this, recently reported in SCIENTIA SINICA, an English-language journal from Peking (Vol. 17, p. 392), concerns a decoction of decayed luminescent willow wood that Chinese herbalists give to people with gallbladder trouble.

This traditional therapy was investigated by the Microbiological Unit of Kiangsu Research Group of the Luminescent Fungus. From rotten willow wood they isolated a blue luminescent fungus identified as *Armillariella tabescens*, and, after determining that it was nontoxic, they showed that it has a therapeutic effect on cholecystitis or inflammation of the gallbladder.

Scratching the nickel itch

Scientists have known for many years that ingesting or breathing large quantities of nickel can lead to intestinal and lung disorders. A more common problem, though, is "nickel itch," a rash due to skin contact with the metal. Not much was known about it—until now.

A Rutgers University chemist, Sidney A. Katz, reported at the recent American Chemical Society meeting in Burlington, Va., that nickel has a tendency to "bind" to the skin. Prolonged contact with nickel-containing items such as coins, costume jewelry and clothing fasteners can lead to binding, dermatitis and sensitization, especially in women. If this happens, Katz says, "it can be expected to persist for many years and possibly for life."

Before his work, it was believed that skin-nickel interactions were "slight at best." Katz' information on binding will assist doctors in choosing the proper treatment for nickel itch, he says.

Physical Sciences

What is the muon for?

The muon is one of the most unusual particles in physics. It is often called the heavy electron because it behaves exactly like the electron except in cases where its greater weight— the muon is 270 times as heavy as the electron—affects the outcome. Physicists are unsure why the muon should exist, and they are trying very hard to find some other difference between the two particles.

For a while there seemed to be such a difference at last. If muons and electrons are sent against a target of protons, they behave identically, but some experiments seemed to show that when the target was atomic nuclei there was some difference in behavior. Such a difference would have to depend on the interaction of the two kinds of particles with neutrons since their interactions with protons are identical. It became important to check muon and electron actions with a single neutron.

Such an experiment has been done at the Fermi National Accelerator Laboratory by I. J. Kim and 17 others. Since it is impossible to make a target of neutrons, deuterons (nuclei containing one proton and one neutron) were used and the known proton interaction subtracted out. The result, reported in the Aug. 26 PHYSICAL REVIEW LETTERS, shows no difference between the interactions of the muon and the electron with the neutron.

A gravitational-wave pancake

According to Einstein's general relativity theory, the acceleration of massive bodies should produce gravitational waves. A prime suspected source of such radiation is the collapse of binary star systems, events in which for some reason the orbital radius of one star around the other suddenly declines from a large number to virtually nothing. The collapse of single stars has been neglected by theorists because such a collapse is expected to be spherically symmetric, and spherically symmetric accelerations cancel themselves out for gravitational radiation.

But wait. Suppose that a star can collapse not spherically symmetrically but into a flat disk, a pancake shape. Such an event has the characteristics necessary for producing gravitational radiation, and when T. X. Thuan and J. P. Ostriker of the Princeton University Observatory calculated it, they found that it will produce 91.6 times the energy produced by the collapse of a binary if certain initial conditions are present. Thuan and Ostriker suggest in the latest ASTROPHYSICAL JOURNAL LETTERS (Vol. 191, p. L105) that the collapse of a star 1.4 times the mass of the sun could be observed by gravitational wave detectors if it happened not more than 100 light-years away.

Twinkle, twinkle protostar

A protostar, a star at the very beginning of its existence, would radiate in the infrared part of the spectrum. There is controversy among astronomers over whether one has really been seen. The so-called Becklin-Neugebauer object in the Orion nebula has been a prime candidate for such an identification. Now there are more according to a report in the latest ASTROPHYSICAL JOURNAL LETTERS (Vol. 191, p. L121). The same Becklin, E. E., and Neugebauer, Gerry, are involved in this observation along with four others. In the same Orion nebula they have found a complex of infrared sources, one minute of arc across, and they hypothesize that this may be a group of protostars, possibly as many as five.