BIOMEDICINE

Cottonseed chemical eyed as male pill

From China, from cottonseed oil comes the new leading candidate for an oral contraceptive for men. In clinical tests, daily doses of the chemical gossypol inhibit sperm formation after about a month. Scientists in the People's Republic of China report that gossypol acts without affecting male hormone levels in the blood of several types of experimental animals, but side effects in men have not yet been determined, according to the Feb. 19 CHEMICAL AND ENGINEERING NEWS. At the Population Council in New York, researchers now plan to begin animal studies on gossypol.

The mice that spread Lassa fever

A brownish-gray mouse common in African forests, fields and villages is the chief animal reservoir of Lassa fever virus, the cause of one of the most lethal human diseases known. Since the fever was first reported ten years ago, intensive taxonomic studies have been addressed at properly identifying the virus-carrying mice. Now Brian Robbins of the Smithsonian Institution's National Museum of Natural History reports that six extra chromosomes and a skull slightly different in size and shape distinguish a relatively harmless species from the disease-carrying animals. Zoologist John Krebs laid out a grid of 144 traps in and around a Sierra Leone village and another grid in the adjacent cultivated area. Trapped mice were weighed, measured and tagged, and blood samples were taken before each mouse was released. The initial data show that 40 percent of the mice with a chromosome count of 32 are infected with Lassa virus, while the mice with 38 chromosomes are free of that virus. Most of the mice trapped in the village have 32 chromosomes, whereas those from the fields have 38. Robbins is now exploring subtle anatomical differences between the two mouse species.

An automation of chromosome analysis

No more cutting and pasting of micrographs in the analysis of human chromosomes at NASA's Jet Propulsion Laboratory. California Institute of Technology scientists have developed for NASA a minicomputer-controlled system that analyzes blood samples automatically and pictorially displays a karyotype — the chromosomes lined up in pairs arranged by their size, form and number. To use this system a researcher feeds into an automatic microscope a stained slide of a blood sample. The analyzer finds cells in the cell-division stage where the chromosomes are most visible, and the researcher selects the best spreads. The computer locates, measures and classifies the chromosomes, preparing a digital image. The pictorial display is a standard karyotype. The system finally summarizes the information on a patient, listing suspected abnormalities.

Cooperative killing in immunity

Teamwork among the molecules released by immune system lymphocytes seems to be the key to their destructive powers. For several years Gale Granger and colleagues at the University of California at Irvine have puzzled over the behavior of lymphotoxin molecules released in tissue culture during foreign cell destruction. The individual molecules appeared incapable of killing most foreign cells, although the intact lymphocytes were effective and versatile cell destroyers. However, recent studies published in the December and February CELLULAR IMMUNOLOGY show that the molecules must group to be toxic. In the absence of the foreign cell, the molecules rapidly separate. Thus the lymphotoxins do not destroy nonforeign cells. How the lymphocytes deliver lymphotoxins remains in question.

PHYSICAL SCIENCES

Three upsilons and upward

The upsilon particles, the heaviest now known to physics, were discovered by the experimental consortium known as "Columbia-Stony Brook-Fermilab." Groups of this kind now have the status of informal corporations or colleges of cardinals. They continue in existence indefinitely with occasional changes of personnel. This one has been led by L. M. Lederman, who was recently appointed director of Fermilab. At the moment it consists of 15 physicists from the three institutions, who sign its paper in the Feb. 19 PHYSICAL REVIEW LETTERS reporting its latest upsilon studies.

The results come from observing upsilon production as high-energy protons (mostly those at 400 billion electron-volts) were struck against atomic nuclei. There seem indeed to be three kinds of upsilon, plain, prime and double-prime. The plain and prime have been seen elsewhere. Evidence for double-prime had been seen before at Fermilab. Now the evidence is given a statistical significance of 11 standard deviations (extremely far from chance). "We consider this convincing evidence for a third resonance." Its mean is 10.41 billion electron-volts.

These further studies also support the suggestions that the three upsilons are three different energy states of the same basic structure, a quark of the type designated bottom with its antiquark. This quarkonium structure (a particular kind of quark bound to its antiquark) is also represented in the psi particles, which are held to be a charm quark plus its antiquark. Another kind of quark that should form its flavor of quarkonium is the top quark, for which there is yet no experimental evidence. Using some relevant theory the group calculated the probable mass level at which top quarkonium might be found and conclude that it is likely to be higher than 14 billion electron-volts.

A galaxy in the dark

The sky is so full of a variety of things that often when a discovery is made, checks show that the relevant objects were on astronomical photographs all the while. People just didn't have the time or the interest to study them. Even so it seems a little surprising that something as blatant as a galaxy near our own could escape detection. Yet that is what happened in the case of the two Maffei galaxies, and that is what seems to have happened in a new instance put forth by Riccardo Giovanelli of the National Astronomy and Ionosphere Center at Arecibo, Puerto Rico, in the Feb. 1 ASTROPHYSICAL JOURNAL LETTERS.

In Maffei's two cases, and now in Giovanelli's, the reason for the previous lack of notice is the same. The galaxies are in parts of the sky where it is too dark to see. The directions in which they lie (the galactic plane for the Maffei galaxies, the constellation Orion for Giovanelli's) are obscured by clouds of dust.

In fact, Giovanelli made his discovery with a radiotelescope. He was studying the emission of hydrogen at 21 centimeters wavelength. Hydrogen pervades the space of many galaxies, and as he surveyed Orion, Giovanelli was able to make out the pattern of brightness contours typical of galactic structure. The pattern centered on a point at right ascension 05 hours 42 minutes 30 seconds and declination +05°00′00″. A check of plates of the National Geographic and Palomar Sky Survey shows an extended optical feature coincident with the radio pattern. A new red plate made by H. Quintana and J. Melnick at the Cerro Tololo Inter-American Observatory also shows such a feature.

The new galaxy appears to be moving away from us too fast to be a member of our own Local Group of galaxies. Yet it seems to be in the wrong position and moving too slowly to belong to any other of the groups into which our cluster of galaxies is subdivided. Perhaps it is a member of an entirely new small group, and there are more galaxies behind the dust of Orion.