

## Do You Know?

A hen takes some 80 pounds of *feed* a year whether she lays or not.

A radio-equipped *helicopter* was recently used to direct highway traffic.

Paper pulp, supplemented with molasses and soybean protein, is a good *cattle feed*.

*Decks* of American vessels of the future will be made of resin-treated compressed American woods instead of Far-East teakwood.

The moth that is seen flying around the house does not eat clothing itself; it is the tiny caterpillar-like larva that does the damage before it changes into the winged adult.

A "sustained yield" *forest* unit is one in which permanency is maintained by the cutting of only the fully-grown ripe trees and the adding of replacements if necessary.

National Bureau of Standards states.

The first effects of sunspot decline will probably be felt on the 50-megacycle amateur band. Within a few months communication on this frequency will no longer be dependable for distances much greater than 75 miles.

The overall effect will be to jam all radio communication into an ever narrowing band of frequencies for worldwide communication. From a usable frequency band whose upper limit is now around 50 megacycles, it will narrow down, at sunspot maximum, to an upper limit of approximately 20 megacycles for continent to continent transmission.

This narrower band makes it possible for relatively slight disturbances to be more disastrous than at sunspot maximum when the usable range of frequencies is larger. At sunspot minimum, a minor storm in the ionosphere may effectively crowd out all usable frequencies. At maximum, it takes a violent storm to completely disrupt communications.

During the last year or so there have been both more spots on the sun and some of the largest sunspot groups of all time. The three largest groups ever photographed appeared in February and July, 1946, and in March-April, 1947.

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### NUCLEAR PHYSICS

# Atomic Particle Created

Major step in the exploration of matter is the first artificially created meson or mesotron. Consider it key to mystery of atomic heart.

► THE elusive atomic particle, called both meson and mesotron, has been created artificially for the first time in the largest of the University of California cyclotrons. (See *SNL*, Jan. 10, Feb. 14.)

Hearts of helium atoms (alpha particles), accelerated to energies of 400,000 electron-volts, were used to give rise to mesons. Cosmic rays of similar energy create them naturally in the upper reaches of the atmosphere. It is understood that word of the achievement was passed out to some of the investigators of the atomic nucleus in this country. It is recognized as a major step in the exploration of matter.

The meson is considered the key that may unlock the mystery of the forces that hold the atomic heart together, just as the neutron discovered in 1932 was the key to atomic energy release in the first chain-reacting pile a decade later, and the atomic bomb in 1945.

There are theoretical grounds for hoping that the meson can blast energy out of heavy elements even more effectively than the neutron. The future may bring a meson atomic bomb, now that the scientists can create mesons under control.

Actually there are probably four or more varieties of particles called mesons. The most usual one found in cosmic ray bursts is about 200 times the weight of the electron. All of the kinds of mesons are intermediate between the electron, lightest subatomic particle, and the proton, heart of the hydrogen atom. The proton and the neutron are each about 2,000 times the weight of the electron.

Now that mesons can be made in the Berkeley giant "atom smasher" much more should be learned about them. Although mesons live only a fleeting fraction of a second, they can be studied and used as experimental tools once they are created at will.

Theoretical physicists suspect that mesons are a sort of go-between in allowing neutron and proton to turn into one another. They have evidence for this strange performance but do not yet understand what happens. The closest picturization would be the meson being

passed back and forth like a ball between two basketball players.

Within the year four other accelerators—those building at Columbia, Rochester, Cornell and Harvard Universities—should be able to create mesons artificially. When these new machines come into use there should be greatly accelerated inquiry into the nature of the forces within the atomic nucleus.

It may be discovered that the proton and the neutron, both considered in the past as ultimate particles, may themselves be able to give rise to other, as yet unidentified, particles.

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### MEDICINE

## Ephedrine Found To Have Pain-Killing Effects

► FOR your next operation you may get as anesthetic the modern version of an old Chinese drug, ma haung. Ephedrine is the name of the modern drug extracted from the same Chinese plant. It is related chemically and in its effect on the body to adrenalin and has been used for many patients with allergies, low blood pressure or other conditions in which adrenalin is also sometimes used.

The anesthetic and pain-killing effects of ephedrine are reported by Drs. J. Eugene Ruben, Patricia-Mary Kamsler, and W. Lyall Howell, Jr., of Philadelphia General Hospital in the journal, *Science*, (Feb. 27).

A 43-year-old woman with diabetic infection of the foot had two toes amputated and extensive cutting and drainage of the foot under the anesthesia produced by a dose of ephedrine injected into her spinal canal. The drug did not put her completely to sleep, and she felt the operation but had no pain.

The use of ephedrine to prolong the effects of other spinal anesthetic drugs is now rather common practice, the Philadelphia group points out. But except for one scientist who found that ephedrine was a spinal anesthetic in frogs, no one has investigated the drug's anesthetic effect when used alone.

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