

## BIOLOGY

## Plant and Animal Cells Grow Well in Mixed Culture

**A**N ARTIFICIAL mutual aid society of mixed animal and plant cells that grew better together than they did separately, has been organized by Dr. Ralph Buchsbaum of the University of Chicago.

Dr. Buchsbaum received his inspiration from similar colonies of mixed organisms that occur in nature, in which both sides seem to receive some benefit. The phenomenon is known to biologists as symbiosis, which is made of two Greek words meaning simply "living together."

Dr. Buchsbaum arranged a symbiosis such as never occurred in nature. He took cells of a tissue culture of embryo chick, of the type first made by Dr. Alexis Carrel. Into this culture he mixed a quantity of one-celled lower green plants called *Chlorella* by botanists.

Growing alone, the *Chlorella* cells were pale and not very energetic, but in partnership with the chick tissue cells they thrive and multiplied, seeming to be quite happy in their strange partnership. Similarly, certain degenerative changes which appeared in chick cells grown without the companion plant cells did not put in an appearance in the mixed culture.

The commonly accepted theory of natural symbiosis is that the plant cells receive carbon dioxide and nitrogen from the animal cells, and in return provide them with part of the food they manufacture, together with the oxygen which is a by-product of food formation in plants. Dr. Buchsbaum is continuing his experiments, to see whether this or some other mechanism explains the success of his artificial mixed cultures.

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## ASTRONOMY

## 19-Ton Unit of 200-Inch Telescope Arrives in West

**T**HE LARGEST unit of the great 200-inch diameter telescope being built for California Institute of Technology has reached Pasadena, Calif., after an ocean voyage from the East by way of the Panama Canal. It is the lower end of the telescope tube, weighing 19 tons, which will eventually be the containing unit for the block of glass soon to be shipped from the Corning Glass Works.

Los Angeles and Pasadena, with their proximity to Hollywood, have seen

queer sights, but few more strange than the great wood-crated telescope unit being hauled slowly through the streets. It looked like some gigantic cheese, projecting over each side of the trailer by more than five feet.

The trip from San Pedro harbor to the laboratory took five hours, an average of only five miles an hour. Only the widest streets could be used.

Three more hours were spent in maneuvering the trailer up a ramp and around close clearances, with sometimes only three inches to spare, into the huge room where the frame is to be used first as a cell to hold the great glass disk while it is being ground and polished.

Once inside the grinding room, further skidding over greased steel plates was unnecessary. A great crane already tested with 60-ton loads picked up the unit and put it in place.

After serving as a holder for the glass disk during the mirror grinding, the frame will be moved to Mt. Palomar, where the new observatory is being built.

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## PALEONTOLOGY

## Elephant Fossils Show Plains Were Once Forest

**E**LEPHANTS were the "thundering herd" of the West, in great forests where the Great Plains are now, declares Dr. Erwin Barbour of the University of Nebraska. In what is now the driest part of Nebraska, where only short grasses will grow, there have been uncovered literally tons of fossil elephant bones, representing at least thirty or forty species of the great beasts.

There were elephants among them beyond the wildest dreams of the present-day circus-going small boy. Elephants with seven-foot tusks, elephants with shovel-shaped tusks, elephants with four tusks apiece, elephants with no tusks at all. They reigned over what is now the central Great Plains area for some millions of years before and during the Great Ice Age.

Presence of so many and so varied elephants, Dr. Barbour holds, is evidence that the Great Plains were once forests rather than dry grasslands. Elephants love the woods. A big elephant needs about a ton of green fodder a day. And grasslands cannot supply this quantity of provender, while forests can. The West, then, must be thought of as a jungle rather than a pasture, in the days when the elephants roamed.

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# IN SCIENCE

## PHYSIOLOGY

## Normal Individuals Not Helped by "Pep-Up" Drugs

**D**ON'T expect to pep yourself up with coffee, alcohol, cocaine, morphine, strychnine, insulin, and adrenalin if you are a normal healthy person, just because they help sick people.

Drugs that are good for weak individuals may have an entirely opposite effect on one in good health, Dr. Walter R. Miles of Yale University, reports. Dr. Miles reached his conclusions after a series of experiments with animals demonstrating this dual action of common drugs on efficiency as shown by ability to run a maze.

The normal rat is not aided by any one of the drugs tried. But a blind rat, that is lacking in muscle tone, lying soft and limp in your hand if you pick it up, is helped by strychnine, by cocaine, and by thyroxin.

Neither caffeine nor alcohol helped them at all.

Morphine and insulin both reduced their skill somewhat and adrenalin had an even more disadvantageous effect.

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## ENTOMOLOGY

## Flying Grasshoppers Sing With Hind Wings Only

**H**OW DO flying grasshoppers produce the shrill song they utter as they sail through the air?

Naturalists have puzzled over this not a little. And disputed a bit over it, too. European scientists have held that the insects rub their wings together, while their American colleagues have claimed that they rub their wings against the wing-covers, which are toughened and hardened forewings. (Grasshoppers are fairly "typical" insects, in that they have two pairs of wings.)

Prof. F. B. Isely of Trinity University, Waxahachie, Texas, settled the question very simply. He caught a lot of the long-winged noisemakers and removed their wing-covers. Then he let them fly. They produced their shrill song just as well as ever.

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# E FIELDS

## MEDICINE

### Safer Vaccines Made By Chemical Treatment

**P**PROMISE of a way to make safe vaccines against diseases for which there are as yet no safe vaccines appears in a report of Drs. Joseph T. Tamura and M. J. Boyd of the University of Cincinnati College of Medicine.

Instead of killing the disease germ by heat to make a vaccine, these investigators treat it with ketene. This chemical is produced by decomposing acetone, the chemical used in finger-nail polish remover.

Germs that cause dysentery were treated with ketene and used to vaccinate rabbits. The vaccinated animals were immune to doses of the untreated bacillus which killed unvaccinated rabbits in four days, the investigators report. (*Science*, Jan. 17)

While the investigations of the Cincinnati scientists were limited to one kind of "germ"—*B. dysenteriae* Shiga, by scientific name—it may develop that ketene can be used to detoxify the organisms that cause other diseases, so that they can be safely used for vaccination.

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## MEDICINE

### TB Sanatoriums in U. S. Are Rated as "Fine"

**T**HE MOST complete data ever obtained on the hospitalization of tuberculosis patients in the United States are presented by the American Medical Association in its Journal. (Dec. 7)

American sanatoriums, or hospitals for the tuberculous, provide beds for 95,198 patients and are on the whole fine institutions, the survey shows. Sixty per cent. of their patients are definitely improved by the treatment given. These special hospitals represent an investment of \$330,000,000, including land, buildings and equipment. Veterans' hospitals for the tuberculous cost on the average \$4,000 a bed. In most other institutions, both private and public, the cost per bed is less, but there are extremes in variation.

Elaborate plants and expensive equipment bring the cost of some tuberculosis hospitals as high as \$10,000 a bed. One sanatorium built with public money cost \$13,043 a bed.

The use of tuberculosis departments in general hospitals has been endorsed by the American Medical Association, the American Hospital Association and the National Tuberculosis Association. The endorsement, however, requires adequate segregation for the protection of other patients and personnel.

In a few of the sanatoriums, the survey revealed, adults and children are allowed to associate in various ways. In a few cases, too, it was found that children with tuberculosis of the lungs were hospitalized with children in the preventorium unit. Such conditions call for prompt correction, the Association's Journal makes plain in an editorial commenting on the survey.

No attempt was made to give a relative rating to the individual institutions. The comment that would characterize the tuberculosis institutions of the United States in general would in most cases be commendatory, states the Association's council on medical education and hospitals, under whose direction the survey was made.

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## ECOLOGY

### Northern Insects Found In West Florida Ravines

**L**ONG before Northerners started going to Florida for the winter, other creatures in the North had the same idea. And some of them stayed.

Colonies of the curious long-legged insects called craneflies—which many people mistake for big mosquitoes, and mistreat accordingly—that have been found in moist ravines of western Florida have a decidedly Northern aspect. R. Edward Bellamy of the University of Florida has found such a "disjunct" cranefly colony in a spot only four miles north of Tallahassee, known as Hydrangea Ravine because of its abundance of wild hydrangeas. The northerly aspect of the region is emphasized by the curious character of the forest there, which is composed of a mixture of the beech of Northern woods and the magnolia of the South.

Similar isolated colonies of Northern insects have been found elsewhere in western Florida by Prof. J. Speed Rogers, head of the zoology department of the University, Mr. Bellamy said.

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## MINING

### Soviets Set Coal Mines Afire for Gas Content

**I**N SIBERIA and in North Caucasia, U.S.S.R. mining engineers are burning coal mines underground for their gas content. Suggested by the famous British chemist Sir William Ramsay before the turn of the century as the most economical way to use coal deposits of the lower grades, the scheme of coal gasification projects has been little used elsewhere in the world.

Sir William argued logically that for many purposes it was wasteful to dig mines and extensive cross shafts, send men down to dig out the coal, ship it hundreds and thousands of miles and finally burn it to make coal gas for illumination, cooking and power. He recommended setting a coal deposit afire and then by controlled draft and flues leading away the coal gas to the surface.

According to Russian tests the labor spent on the gas is only from one-tenth to one-sixth of that needed in mining. Moreover, it is possible to obtain gas from very narrow seams of buried coal which would be unprofitable to mine in the ordinary sense.

In the process of burning coal beds for their gas content, a shaft is dug down to the coal and exhaust outlets sunk in other places over the coal deposit. The coal is ignited at the main shaft and air forced down to sustain combustion. The fumes from the burning coal are sucked out the exhaust pipes only partially burned. There is much carbon monoxide present, for example, which can be piped to the site of use, or used by industry near the coal gas source.

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## BOTANY

### Sixty-Foot Tobacco Plants Found Growing in Andes

**T**OBACCO plants as tall as trees, "unbelievable and unforgettable," are among the strange vegetation of the Andean country now being investigated by an expedition from the University of California, under Prof. T. H. Goodspeed. One of the tremendous tobacco growths measured by Prof. Goodspeed was sixty feet high.

The expedition is engaged primarily in a search for wild relatives of the common cultivated tobaccos, to be used in hybridization experiments.

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