

lived a hundred million years ago, more or less, in the Cretaceous age.

The skeleton around which the restoration has been built was collected in the Red Deer region of Alberta, Canada, by Barnum Brown of the American Museum of Natural History, and was purchased by the Peabody Museum. Almost all the bones were recovered.

When the skeleton was assembled at the Peabody Museum it was placed in a walking posture, its feet set to match certain three-toed dinosaur tracks on slabs of rock in the region where it was found; these tracks may possibly have been made by the same or a similar species.

#### Leaves Framework Visible

The restoration of flesh and skin was undertaken for one side only, leaving the bony framework visible from the other side. The mount thus gives a graphic illustration of how scientists reconstruct the probable living appearance of a long-extinct animal.

Each muscle was modeled separately in plasteline, thus building up the entire contour of the head, body, limbs and tail. Part of a *Monoclonius* skin has been recovered, and is now in the American Museum of Natural History. Using this as a pattern, a mould was prepared, showing the studding of small bony plates that apparently gave the creature a partial armoring. Into this the plastic materials for the skin were pressed.

#### Reptile Color

After the restored skin was mounted on the specimen, the whole creature was painted a sort of general "reptile color," following the hues of animals of that class living today, but without imitating any particular one of them.

*Monoclonius*, in spite of his formidable appearance, was a vegetarian, and probably not at all fierce. The wide frill that projected from the edge of his skull over the back of his neck afforded that vital region some protection, and possibly his forward-projecting horn could be used as a defensive weapon. There were four additional horn-like appendages to the bony skull-frill, whose usefulness, if any, has not been determined.

*Science News Letter, July 8, 1933*

The great Nassak diamond, from the eye of the god Siva in an Indian temple, is now in a cabinet so protected that a blow to the glass case causes the gem to sink into a drill-proof safe and at the same time a flood of tear gas is released.

#### BACTERIOLOGY

## Scientists Isolate Bacteria That Cause Stone Decay

### Inoculation of New Structures Expected to Produce Castles Centuries Old in Just a Few Years

**A**MERICAN millionaires who were wont to import picturesquely mouldering English castles and abbeys and plant them on their country estates will not need to pursue that strange traffic any more—that is, supposing any representatives of that curious genus survived the Great Ice Age of 1929. Thanks to the researches of four English scientists, they will be able to build their castles out of new stone, inoculate them with the right kind of germs, and in a short time have them in as venerable a state of decay as though they had been standing in an English drizzle since the Wars of the Roses.

The current *Philosophical Transactions of the Royal Society of London* contain a study of the relationship of micro-organisms to the decay of stone by Sydney G. Paine, Frank V. Lingood, Freda Schimmer and Thomas C. Thrupp. It might, in fact, be termed a study of the bacterial diseases of building stones. This team of scientists have isolated not less than 58 strains of bacteria from decaying stone, have planted cultures of some of them on new stone fresh from the quarry, and have made at least a good beginning of an understanding of the means by which bacteria help to ruin building materials.

The stones they examined came from some of England's most ancient edifices; castles whence crusaders once rode, abbeys antedating the Reformation, London buildings erected by Christopher Wren. Bacteria were found not only on their surfaces, but buried in their hearts as much as two feet deep. The organisms appear to be related to those of the soil, yet they constitute in a way a microflora of their own.

Physiologically, two things are significant about their biology. Many of the strains isolated produce carbon dioxide, and carbon dioxide is a chemical enemy of all limestones and marbles. There were also several strains of the bacteria that are able to oxidize sulphur, getting at least a part of their energy-food out of the element, indigestible to

higher organisms. That means that such bacteria will weaken any rock in which sulphur or sulphur compounds form any significant part; it constitutes them an especial enemy of any plaster or stucco containing gypsum, which is calcium sulphate.

But that is not the only, or indeed the chief, capacity for trouble possessed by these sulphur-eating bacteria. The investigators found that their cells secrete a mucilage-like stuff, which accumulated in the pores of the rock. Now mucilage, or any similar colloid, soaks up water when it gets a chance and swells most amazingly, and in swelling exerts a force little short of explosive in its disruptive power, even though it makes no great bang or fuss about it. Bacterially deposited mucilage beneath the face of a stone could easily split off flakes year after year, until in the course of time you would have as dilapidated a ruin as any nineteenth-century novelist could wish.

*Science News Letter, July 8, 1933*

#### PHYSIOLOGY

### Stomach Ulcers May Result From Lack of Vitamin A

**E**VIDENCE that stomach ulcers may result from diets lacking in vitamin A was presented to the American Society for Experimental Pathology by Dr. Ira A. Manville of the University of Oregon Medical School.

Dr. Manville reported that white rats fed a diet deficient in vitamin A developed stomach ulcers and erosions. Nearly two-thirds of all the animals fed on diets that were deficient to various degrees in the vitamin showed these sores. As the vitamin deficiency became more severe, the number of animals affected became greater until nearly 100 per cent. were found to have ulcers.

Vitamin A, found in liver, butter, egg yolk, cheese, cod liver oil, spinach and the leaves of plants, is necessary to promote normal growth. In its absence growth is stunted and a severe

eye disease develops. This vitamin is also considered necessary for normal functioning of the mucous membrane of nose, throat and breathing apparatus, and urinary and gastro-intestinal tracts. In this connection it has been claimed that vitamin A prevents colds.

It is in its effect on the mucous membrane of the stomach that Dr. Manville believes vitamin A is concerned in the formation of stomach ulcers. According to modern theory, stomach ulcers are formed when the acid normally present in the stomach is able to penetrate the lining of the stomach and so eat away part of the stomach wall. It is considered not so much a question of too much acid in the stomach as of a lessening or absence of factors that normally neutralize the acid.

In Dr. Manville's opinion, the mucous lining of the stomach acts as a protective device against the acid's action. Since vitamin A is necessary for the well-being of this mucous lining, he reasoned that ulcers might develop when the vitamin was lacking in the diet. Investigations with animals fed on diets that had little or no vitamin A seem to have borne out his theory.

*Science News Letter, July 8, 1933*

## SOCIOLOGY

## Values of Family Life In Soviet Challenged

THE "COLLECTIVIZED" family, common to apartment-housed American industrial communities and the deliberately planned Soviet social system, was sharply challenged by Dr. Dwight Sanderson of Cornell University in a discussion before the American Sociological Society.

"Will the Russian peasant ever obtain the personal satisfactions and advantages under the factory system of a collectivized farming, living in rural apartment houses with common eating rooms, that the American farm family has on its own homestead?" Dr. Sanderson demanded. "If efficiency and industrial output are the criteria, the Russian or the industrial system may be vindicated, but if human values are primary, it is desirable to determine by strictly scientific methods what human values are obtained by the more traditional type of family life and to what extent it may abdicate its former functions without thereby destroying its essential values."

*Science News Letter, July 8, 1933*

## BOTANY

# Big Tree of Tule Re-examined; Claimed as World's Greatest

THE OLDEST living member of the plant or animal kingdom, and therefore the oldest living thing in the world, as far as is known, is a cypress tree in the Indian village of Santa María del Tule, a few miles east of the City of Oaxaca in Mexico. This is the opinion of Dr. Herman Von Schrenk, consulting timber engineer of St. Louis, Mo., who, during a recent visit to Oaxaca, made a second study of the giant tree. The first was made just thirty years ago by Dr. Schrenk.

Dr. Schrenk believes the age of the Tule tree not less than 4,000 years, and bases his estimate on a boring he has just taken, with the permission of the Mexican Ministry of Agriculture, out of another giant cypress in the railroad yards at Oaxaca City. The ring count of the boring showed the second tree about a thousand years old, and by comparing its size with that of the Tule tree, Dr. Schrenk was convinced that the latter was at least 4,000 years old. The boring showed the Mexican cypress, or ahuehuete, as the Indians call it, to be of extremely slow growth.

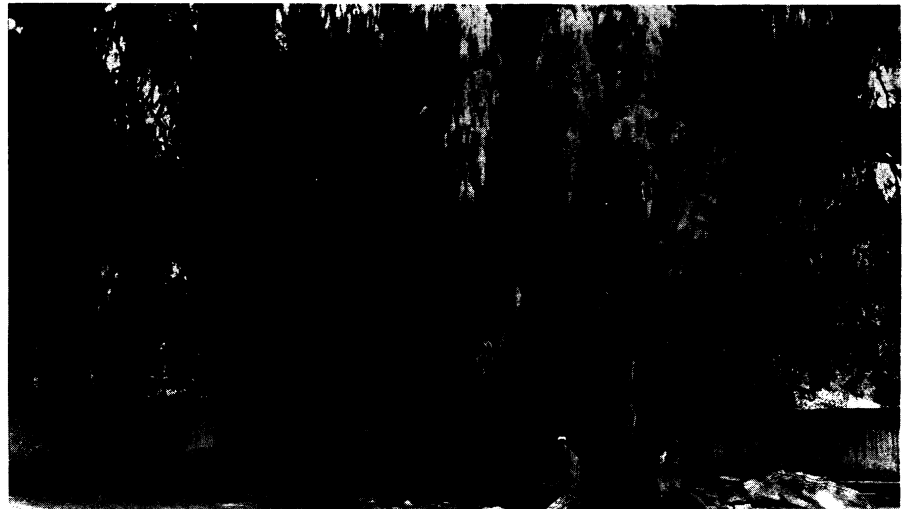
The Tule tree is about 140 feet high, and 24 men can span it with their arms, its circumference being about 117 feet at 40 inches off the ground. But the true circumference is hard to measure because of the great unevenness of the

trunk, which is far from being a true cylinder. This unevenness has caused many persons to believe that the tree is really three trunks grown together instead of one. But most botanists who have viewed it, admitting that this cypress can thus fuse its trunks and even branches, say that the Tule tree is really a single trunk, and that such unevenness is a characteristic of the species.

Like the Florida swamp cypress, the Tule tree loves water. The studies of Cosiano Canzatti, an Italian botanist long resident in Oaxaca, show that it is supplied by streams flowing underneath the roots. Geologists believe the valley in which the Tule tree stands was once a lake district, and that the water went almost to Mitla, ancient Zapotecan capital some 30 miles east of Oaxaca City. According to Indian history, too, lakes once filled the three-armed valley of Oaxaca, and these were drained a century before America was discovered, by Zapotecan engineers who widened a cut existing at the end of the southern branch of the valley.

*Science News Letter, July 8, 1933*

Cellophane cloth, made by fixing a layer of cellophane against a fabric backing, is a new shiny material for such things as book covers, shelf linings, costumes, and window displays.



OLDEST LIVING THING

*is this cypress tree near Oaxaca, Mexico, which is probably not less than 4,000 years old.*