

they will pass on to their next victim. Health officials in other countries are just as concerned as our own about this problem. The British in India are especially worried, since the yellow fever centers in Africa have been brought so close by air travel. India also has countless numbers of the yellow fever mosquito. In addition her millions of people have probably no resistance at all to the disease, which has never appeared in that country, and it is impossible to enforce throughout the country sanitary regulations such as screening of houses and isolation of the sick. Importation of one yellow-fever-infected human or mosquito would probably mean disaster in India.

### International Pact

To avoid such catastrophe, Great Britain along with the United States and about twenty other nations have signed an International Sanitary Convention for air travel. The signatories have agreed to keep persons from yellow fever areas under surveillance, before they board a plane, for a long enough period to determine whether or not they have been infected and are about to develop yellow fever.

While these precautions are in effect, scientists are at work seeking still better methods of protection against yellow fever. This search has gone on almost ever since Walter Reed and his men found what is still the only practical method of prevention: blocking the route between yellow-fever mosquitoes and man. Even this method, which is also a malaria preventive measure, is only practical in settled regions. In the African and South American jungles it is practically impossible to apply anti-mosquito measures.

A protective vaccine against the disease is what scientists have hoped for. The search for this has been shadowed by tragedy. Despite all precautions, the men engaged in the research ran a fearful risk. Over a score suffered attacks of yellow fever, and five gifted scientists, Adrian Stokes, Hideyo Noguchi, William A. Young, Paul A. Lewis and A. Maurice Wakeman, lost their lives. The search went on, however, other scientists picking up the work where the last martyr had unwillingly dropped it.

Eventually success crowned the brave and daring efforts. A successful vaccine was developed by Drs. W. A. Sawyer, S. F. Kitchen and Wray Lloyd, working in the laboratories of the International Health Division of the Rockefeller Foundation. The trick was turned by mixing yellow fever virus, greatly weakened by passage through hundreds of mice, with human immune serum, that is, blood serum of persons who had recovered from yellow fever. This vaccine was used successfully on members of the Rockefeller staff engaged in yellow fever work, and since its development no more cases of the disease have been acquired in the course of research on it, either in the laboratory or in the field.

### Disadvantages

This vaccine had certain disadvantages. One, resulting from the fact that the virus had to be weakened by passage through mice, has been overcome by development of a method of growing the virus on tissue cultures outside the animal body. The other pertains to the human immune serum used in preparing the vaccine, and is the feature which still makes it impossible to vaccinate humans against yellow fever on a large scale. The serum must be purchased from donors, which makes the cost of a single vaccination high. In addition, the protective property of the serum does not remain at a high level for long after the person has recovered from the disease. Consequently there is a rather limited supply. Efforts to obtain immune serum from immunized animals, such as is done in the case of other protective vaccines, are now under way at the Rockefeller Foundation's laboratories.

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Science News Letter, November 7, 1936

White gold being scarce in Germany, dentists there are using more white metal alloys for crowns, fillings, and other dental work.

### ARCHAEOLOGY

## Digging Up India's Past Reveals "Modern" Houses

AMERICAN archaeologists have unearthed a buried city in India, showing more vividly than ever before what the most ancient civilization of India was like.

The ruins, found under mounds of earth at Chanhudaro, northwestern India, date back five thousand years in their oldest era. The modern world can find much to wonder at, in ruins and relics of the dead city.

Chanhudaro had homes of burnt brick, and the brick was of well-fired clay and well shaped. The houses had bathrooms and drains that are pronounced superior to the sanitary arrangements in cities of other civilizations of their time. The people were industrious at many lines of skilled labor. They made toys for children of cities around the country. They were workers in bronze and copper. They turned out quantities of beads, making some so tiny that forty to an inch could be strung, and boring holes so fine that nothing coarser than a hair would thread these beads.

As Chanhudaro was on a trade route, the goods of the city were dispatched by ox-load or peddler's pack to other, distant cities.

The picture of a trade town of ancient India, as old as the famous ruined city of Mohenjo-daro, is the result of excavation by two institutions, the Boston Museum of Fine Arts and the American School of Indic and Iranian Studies. It is only within three years that the Indian government has changed its law, to permit outside universities and archaeological organizations to dig in this region.

The Indus Valley, where Chanhudaro stood, had its trouble with floods, like Ur of the Chaldees and many another ancient town. The field director of the expedition, Ernest Mackay, finds that at least three great floods attacked the city. After such a flood, the people

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## RADIO

November 10, 5:15 p.m., E.S.T.

HOW MUCH?—Ralph W. Smith of the  
National Bureau of Standards.

November 17, 5:15 p.m., E.S.T.

A CENTURY OF INVENTIONS—  
Thomas Midgley, Jr., Chairman, Ex-  
ecutive Committee, Centennial Celebra-  
tion of the American Patent System.

In the Science Service series of radio dis-  
cussions led by Watson Davis, Director,  
over the Columbia Broadcasting System.

were forced to leave the place entirely, and in some sequences of the city's history debris piled over the abandoned ruins before settlers came to rebuild.

After the Harappa culture, as the oldest civilization at this site is named, there followed a people of about 2000 B.C. who lived in matting houses, and had only rough paving under their feet. These people made great quantities of pottery which the archaeologists hope will shed more light on the migrations and trade relations of their era.

Chanhu-daro seems to have had its greatest importance early. The later settlements shrank. Last on the site were a few primitive folk who made dark gray pottery and marked it with geometric designs. This curious ware is unfamiliar even to archaeologists well acquainted with the clay styles of the past. Wandering gypsy-like tribes, Mr. Mackay believes, may have been the last industrialists in the once-flourishing trade city.

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painted too, but with eyes and toe- and finger-nails of mother-of-pearl.

At some ancient time, however, the last incense was burned, and then the rooms were packed with earth and rock. The temple together with the pyramid on which it stood were covered over, and made into the solid core of what is now known to the Indians as the Pyramid of Kukulcan, the "Bird-Snake," great god or king who ruled in Yucatan a few centuries before Columbus came. The Spaniards always called it "El Castillo," The Castle, because there they fortified themselves in their first tragic effort to conquer the peninsula of Yucatan, when the Aztec mainland of Mexico had already been overcome by Cortes.

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### PALEONTOLOGY

# Dinosaurs Will Have Place Among Mountain Sculptures

## New Project Provides for Showing Ancient Beasts in Stone Right Where They Have Laid for Untold Ages Past

**S**TATESMEN and soldiers will not have a monopoly on mountainside sculpture when a new joint project of the U. S. National Park Service, the State of Utah, and the American Museum of Natural History is completed. Much earlier inhabitants of America than any Revolutionary or Civil War notable will also have their carven places in the rock strata of the West.

This new project will have the added distinction of presenting not merely lineaments in stone, of originals who lie buried elsewhere, but will show the originals themselves, in stone, in the place where they have lain buried for almost unimaginable ages. The subjects of the new mountain-sculpture are the mighty dinosaurs that ruled the American West during Jurassic times, 140,000,000 years ago. Their fossil remains cram the rocks of Dinosaur National Monument in Utah, like raisins in a pudding.

Already the project is well advanced into the roughing-out stage. Under the direction of scientists of the American Museum of Natural History, various groups of emergency workers have carved a great cut into some of the most promising strata. The excavating work has now been taken over by the National Park Service, and will be pushed to conclusion as rapidly as possible.

When the rock layers containing the dinosaur bones have been suitably exposed, museum specialists of the American Museum, using air chisels, will carry on the critical job of carving away the stone matrix in which the fossils are embedded, leaving them exposed in bold relief. This is an especially touchy job, in some ways more difficult than that of the conventional sculptor, for the museum chiselmens must follow the lines of a model unknown to them until they actually uncover it, millimeter by millimeter.

Finally, when the great job of carving a stretch of artificial cliff 190 feet long and 30 feet high has been polished off, the National Park Service will erect a great building over the whole thing, to protect the exposed fossils from the

weather. The rock wall itself will form the north wall of the building, and on the opposite wall will be a great mural painting showing how the creatures looked in life.

The State of Utah will develop a road to enable people to reach this unique educational exhibit, and the National Park Service will provide the necessary water system, maintenance buildings, parking grounds, and general facilities for handling the great crowds of people who will certainly go out into the desert, there to behold and wonder over this vivid presentation of the story of the giants who were once in our earth.

*Science News Letter, November 7, 1936*

### TECHNOLOGY

## Paper Makers in China Making Use of Grass

**C**HINA, the world's first paper making country, is now so short on wood pulp that swamp reeds and grasses are being tried as paper materials.

Despite political disturbances, experiments with these materials are going forward at Nankai University. One paper mill has obtained a patent on making paper from reeds.

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