

radio reception and sunspots, Dr. Stetson has found that radio signals are much more strongly received when the moon is below the horizon. Furthermore, this effect is modified at different times of the month, depending upon whether the moon is more nearly over the northern or the southern hemisphere.

"The curves of radio reception which we have obtained," he says, "are very suggestive of a tidal effect in an ionized atmosphere far above the stratosphere. If this should be substantiated by further measurements now in progress, we shall have the problem of electronic tides in

the ionosphere, rising and falling in response to the moon's motion, like ocean tides."

Just how the moon produces these tides is difficult to say, Dr. Stetson admits. "But were we to speculate that the moon is an electrically charged body with a different potential from that of the earth, or that it were capable of emitting some mysterious radiation similar to gamma rays, we might have a hypothesis for finding the source of the moon's effect in producing these mysterious ionic tides."

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MEDICINE

## C.C.C. Workers Prove Value Of New Pneumonia Vaccine

### Thousands of Young Men Completely Free of Disease As Result of Preventive Vaccination This Winter

**T**HOUSANDS of young men at C.C.C. camps who have been completely free of pneumonia this winter are the living proof of the success of a new pneumonia vaccine discussed with Johns Hopkins Medical School physicians by Dr. Lloyd D. Felton of Harvard Medical School.

After proving its safety by trying it on himself nearly two years ago, Dr. Felton has given the vaccine to some three thousand men. None of these developed pneumonia. In a control group of fourteen thousand who did not receive the vaccine, about forty cases of pneumonia developed.

#### Chemical Treatment

The vaccine is made by chemical treatment of the pneumonia germ, *Pneumococcus*. A remarkable feature of the new vaccine, fellow scientists point out, is that it protects against any of the four types of pneumonia germs which may cause the disease. Serums developed for treating pneumonia are only successful against specific types of the germ and before they can be used, the physician must make a test to find which type of germ has caused the disease in his patient.

Dr. Felton has devoted himself for years to the problem of pneumonia and developed one of the serums used in treatment. He says that the vaccine for preventing the disease will not be ready

for public use until many more tests have been made, but he is very encouraged over the results so far obtained.

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TOMBS IN "WORLD'S OLDEST CITY"

*Older by several centuries than the famous royal burials of Ur of the Chaldees, these unripped tombs have been unearthed at Tepe Gawra, by Charles Bache (inset). The tombs show that early funerals in Mesopotamia, 3750 B.C., called for wooden coffins and the placing of valuable possessions with the dead. Thousands of beads, and beautiful ornaments of gold and electrum—a natural alloy of gold and silver—were among the objects found.*

ARCHAEOLOGY

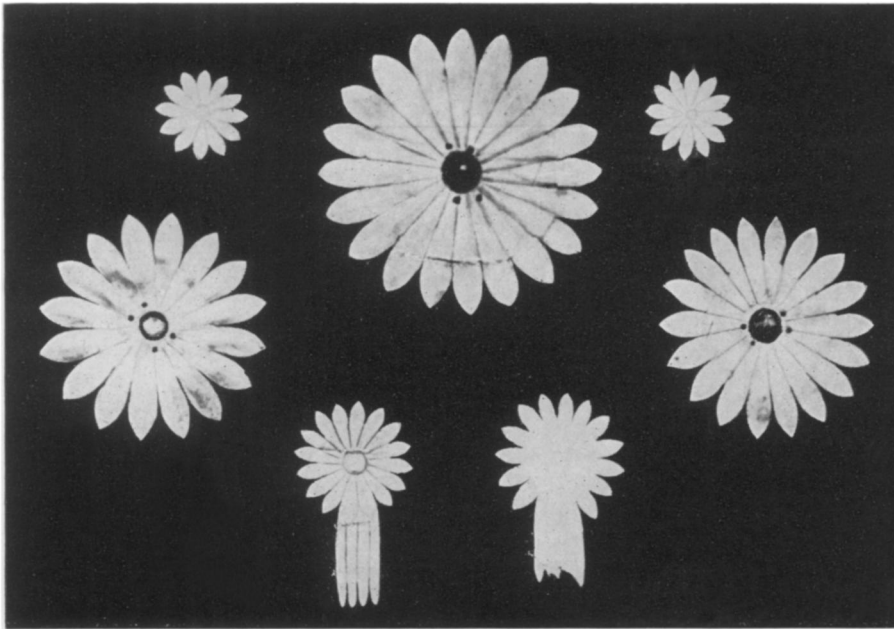
## City 5,700 Years Old Under "Oldest City"

**T**EPE GAWRA in Mesopotamia, already famous as the oldest known city in the world, has had more centuries added to its hoary pre-history by new discoveries reported to the University Museum by the joint expedition of the American School of Oriental Research and the Museum. The expedition has just added to this already ten-layered archaeological "cake" an eleventh layer representing the oldest settlement thus far explored at this now classic site. Its estimated date is about 3750 B.C., according to Charles Bache, field director.

#### Ten Earlier Cities

But even this eleventh Tepe Gawra is not the end. Exploratory trenchings already made indicate the existence of at least ten still earlier cities on that site, dating back beyond 4000 B.C., and eventually in all likelihood to a thousand years earlier still.

For all its antiquity, the newly-explored eleventh Tepe Gawra had a complete civilization. Discoveries there include carefully arranged graves, indicat-



GOLDEN FLOWERS FROM TEPE GAWRA

ing religion; cosmetics, toilet articles and ornaments, sure signs of social amenities; workaday objects like pottery and leatherworkers' tools which point to a well-diversified industry; signature

seals, the mark of commerce and law; and jewels of lapis-lazuli from quarries beyond the Caspian Sea, evidence of foreign trade.

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## ARCHAEOLOGY

## Two Vanished Civilizations Found in South America

**T**WO INDIAN civilizations wiped out of existence many centuries ago, one after the other, have been re-discovered for history by Alfred Kidder 2d, young Harvard anthropologist.

Mr. Kidder, son of the well-known archaeologist, Dr. A. V. Kidder of the Peabody Museum of Harvard, led the expedition to Venezuela, which has announced the discoveries.

Remains of the two civilizations, one buried below the other, were found in a region where there has been little scientific excavation.

Selecting a site on Lake Valencia, on the Peninsula of La Cabrera, Mr. Kidder excavated through two distinct layers of cultural remains. The older civilization, which may have dated from about 1000 A.D., lay in stratified sand and gravel extending from about three feet under the surface down 25 feet or more. The later civilization which followed was discovered in the top soil, or humus cap, three feet thick at the earth's surface.

Though the two civilizations inhabited the same site, the remains indicate practically no relation between them, suggesting that the early civilization may have been destroyed by inroads of a hostile tribe.

The later people held the Lake Valencia site when the Spanish invasion took place, and were completely wiped out by the Spanish, the expedition discovered. This is deduced from complete absence of glass beads, metal ware, or other trade objects which Indian settlements that survived conquest soon acquired.

Thousands of pieces of ancient Venezuelan pottery, most of them shattered and corroded by nearly a thousand years' burial, have been brought back to this country and are being cleaned and assembled.

One of the most interesting finds in the deeper levels of sand and gravel at Lake Valencia are pottery pipes evidently used by the natives in smoking tobacco. Well polished, they are made of

the same clay as the fine pottery, and are often decorated with grotesque faces and torsos. These pipes, according to Mr. Kidder, have no relation with those of any other area in the surrounding regions, either north or south. He points out that most of the natives in the West Indies and in South America did not use pipes, but smoked cigars.

One of the particular differences noted between the civilizations was in the methods of burial. The earlier people practised primary burial, in which bodies are buried immediately after death and left undisturbed. Secondary burial, practised by the later civilization, consisted of exposing the bodies after death, only the bones being buried in urns.

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## METALLURGY

## Rapid Analysis of Steel Made From Its Waste

**A** NEW method of analyzing steel while it is still in the open hearth furnace by "seeing what comes out to tell what is left in" has increased steel production by two per cent.

Since open hearth furnaces produce 85 per cent. of the nation's annual 50,000,000 tons of steel, the seemingly small two per cent. increase could add a potential 850,000 tons each year.

Earl C. Smith, chief metallurgist of the Republic Iron and Steel Co., described the new method of steel analysis before the meeting of the American Institute of Mining and Metallurgical Engineers.

As the steel is melted in the furnace a small sample of worthless slag is run off. A tissue-paper-thin slice of this slag is mounted on a microscope plate and studied under powerful illumination. By knowing what substances are present in the slag metallurgists can make accurate estimates of what materials are left behind and are still in the steel.

The method is like that used by a detective who finds a glove and shoe belonging to a man known to have been fully dressed. From the evidence the detective concludes that the man still has on a hat, tie, coat and so on.

The slag analysis method, Mr. Smith said, tells what is going on inside the furnace more accurately, more rapidly and more reliably than present lengthy chemical analyses.

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It was bad luck, even in the Indian days, for a skunk to enter a house.