

## PALEONTOLOGY

**Passenger Pigeon Bones  
In La Brea Fossil Pits**

**T**HE passenger pigeon, that remarkable bird that passed from almost unbelievable abundance into complete extinction within a few generations, has "arisen from the dead" to present new evidence concerning its distribution many thousands of years ago.

Listed always as a typical eastern and northern species, there have been no authentic records of its occurrence in California. That at one time it lived in this region, however, is now attested to by the identification of six bones of this famous bird in the Los Angeles Museum collections from the Ice Age asphalt pits at Rancho La Brea, Los Angeles, Calif.

This occurrence in the thinly wooded country of Pleistocene Rancho La Brea, unfortunately, does not provide definite evidence as to the abundance of passenger pigeons in the West at that early time. The species may actually have been as rare as these scant remains would indicate. On the other hand, since in recent times it was always a typically forest-loving bird, it may have been abundant in more thickly forested areas nearby, while rare in the immediate vicinity of Rancho La Brea.

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## ASTRONOMY

**New Light-Counter Aids  
Astronomers' Investigations**

**R**ESearch in radioactivity and cosmic radiation is providing the astronomer with a new and valuable instrument for his investigations. Called the "Geiger-Mueller counter," the device was invented early in this century by Prof. H. Geiger in Germany and improved upon several years ago by Prof. W. Mueller, another German. Its particular claim to usefulness is its ability to detect the presence of a single electron—a single "atom of electricity."

So small is the amount of electricity carried by a single electron that an ordinary ten-watt electric light bulb requires a billion billion of them every second to keep it lit. One can well imagine the value to scientists of any device which will respond to a single one of these atomic particles.

But where does the astronomer come in? He is interested because he is constantly on the look-out for devices to supplement his own eyes in his study

of stars. First, and still the most important, of these aids is the photographic plate. Then came the photoelectric cell, an instrument which permits an electric current to flow when light (as from a star, for example) is allowed to enter it.

"Electric seeing" with a photoelectric cell is made possible by the ability of light to remove pieces of electricity (electrons) from metals. From the strength of an electric current the astronomer knows how much light is entering his telescope from the star upon which it is focussed.

But there is a limit to the smallness of an electric current that can readily be measured. Unless the starlight is strong enough to generate thousands of electrons per second in the "photocell" the observer is unaware of its presence. Hence the great appeal of the Geiger-Mueller counter—a counter of single electrons.

Dr. G. L. Locher of the Bartol Research Foundation of the Franklin Institute has reported on his work in the development of Geiger-Mueller counters for astronomical use. Of long experience in the design of such counters for radium research and cosmic ray investigations, Dr. Locher explained that their field of astronomical application has scarcely been touched.

Theoretically the G-M counter's sensitivity to one electron should enable it to "see" a star a very great deal dimmer than can be studied with a photocell. But unfortunately it is more difficult for light to produce electrons inside G-M counters than in photocells. At the present time their ability to "see stars" is just about equal to that of a good photocell. A definite point of superiority is their ease of handling and Dr. Locher believes that further research will greatly increase their response to very feeble light. Even now they are more sensitive than photocells in certain spectrum bands.

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## RADIO

**Four-Inch Radio Waves  
Studied in China**

**R**ADIO waves only 10 centimeters (four inches) long are being studied by Dr. Meng Chao-ying of Yenching University, Peiping, China. This is a continuation of work he did in America where he was credited with constructing the smallest vacuum tube, producing one-centimeter waves.

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**IN SCIENCE**

## FORESTRY

**Fire "Bad Medicine"  
For West's White Pine**

**F**IRE in the forest, which is now actually used in the South as a tool for the control of yellow pine timber growth, is still wholly "bad medicine" for Western white pine.

So declares E. F. Rapraeger of the U.S. Forest Service, who has recently completed a study of fire effects in the great historic timberlands of Idaho, which Lewis and Clark saw on their famous exploration trip during the presidency of Thomas Jefferson. Mr. Rapraeger has studied extensive areas of Western white pine in this region, and finds that the effects of even "mild" ground fires are never beneficial.

He found that fire damage was discernible in three different ways: through understocking and reduced yields, through decay started in burn-wounds on the trees, and through the encouragement of excessive branching which results in rough timber of lowered market value.

Mr. Rapraeger concludes: "Evidently complete protection from fire is essential from infancy to maturity if the aim is to grow Western white pine of high quality."

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## PHYSICS

**New Musical Instruments  
Invented in Russia**

**A**N INSTRUMENT resembling the organ, which produces sounds of oriental music as well as those of western music, has been invented by A. S. Ogoltevets. The octave of this instrument has 17 intervals.

Demonstrated before the Academy of Sciences of the U.S.S.R., the new instrument won high praise, Tass, official Soviet news agency, reports.

Soviet musical inventors have produced interesting results by using electricity to intensify the sound of violin and guitar music. Recent electric musical instruments introduced include the Emirton, Violena and Equodin.

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# E FIELDS

## ARCHAEOLOGY

### Bricks Help To Trace Early Western History

**A**DOLBE BRICKS from ruins of a Dominican mission in Lower California have preserved evidence of a smallpox epidemic that ravaged the Indian population in 1781.

Two California scientists who have been examining bricks from old missions made the discovery of bones in bricks from San Vicente mission. It is supposed that builders of the Mission must have shoveled in bone fragments from unmarked graves of smallpox victims when they were getting earth to make the brick.

Mission bricks are yielding many clues to early western history, according to the two brick investigators, Prof. G. W. Hendry of the University of California, and M. K. Bellue of the State Department of Agriculture. On some bricks are footprints of men, dogs, coyotes, birds; and in other bricks have been found nut shells, leather trimmings, pottery, copper fragments, and seed of plants grown in early days in the west.

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## MATHEMATICS

### Famous Mathematical Problem Solved at Chicago

**H**AILED as one of the greatest recent advances in the science of numbers, Prof. Leonard Eugene Dickson of the University of Chicago has produced the first rigorous proof of an extension of one of the problems that has wrinkled the brows of mathematicians since the Middle Ages.

Ranking with the famous and impossible trisection of the angle as a brain puzzler, the task Prof. Dickson set himself and solved is what is called "additive number theory" or the "Waring problem."

In its simplest form, the one that was discussed during the middle ages, the problem concerns the fact that every whole number is either an exact square or the sum of two, three or four squares. By a coincidence, the famous mathema-

tician Fermat in 1636—the year of the founding of Harvard which is now being celebrated—first discovered the general theorem.

Many of the best brains in the world have set themselves the task of working out the rules, formulae and proofs, and as early as 1772, a mathematician named Euler—son of a more celebrated mathematician—worked out the formulae for any power.

Amateur mathematicians may wish to ponder over it. Here it is. To express any number as the sum of two other numbers raised to any selected power, for convenience designated mathematically by the small number  $n$ , the maximum number needed of numbers so raised to the selected power is found by raising two to the selected power, subtracting two and then adding the fraction three over two raised to the selected power, discarding the decimal fraction.

For squares the answer is four, for cubes it is nine, and for fourth powers it is 19, for fifth powers it is 37, and so on.

Mathematicians know and have confidence in this rule but it had never been rigorously proved for any but squares and cubes.

#### Proved For all Powers

Prof. Dickson's achievement is to prove it rigorously for all powers from the seventh power to infinity powers.

How did he do it? He did not even try to tell in the one lecture he gave. He explained that it would take 120 lectures to mathematically-trained listeners to give full proof.

There are still three powers in additive number theory that have not yet been conquered, the fourth, fifth and sixth powers. Prof. Dickson believes that, given time, he will work out the proof of these also.

Prof. Dickson glories somewhat in the impracticality of this particular branch of mathematics. It has been useful in the mathematics of the new quantum theory of physics, wave mechanics, and so on. But it hardly is useful as yet to practical chemists, physicists and engineers who apply science to everyday life. That does not mean that it will not be useful in the future.

Going back to the formula for a minute, Prof. Dickson on the back of an envelope worked out the maximum number of terms in a series of seventh powers that will add up to any number. It is 143. Got a pencil and paper? You can work it out for yourself.

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## PUBLIC HEALTH

### Pointed Lollipop Stick Is a Death Weapon

**P**POTENTIALLY a lethal weapon," the pointed lollipop stick must be outlawed, believes Dr. William A. Schonfeld, New York physician.

Lollipops on blunt sticks may be permitted to a child but he should be cautioned against running about with one in his mouth.

Following the recent death of a two-year-old patient, Dr. Schonfeld becomes a militant crusader against the pointed lollipop stick. He describes the little boy's sad death from infection following a lollipop injury in the forthcoming issue of The Journal of the American Medical Association (Jan. 16).

The little boy fell down with a lollipop in his mouth and the sharp stick penetrated the hard palate. He cried but there was no bleeding and the parents never discovered the site of the injury.

Eight days passed, and the little boy fell ill. Six days later he was dead, in spite of medical treatment. Infection, Dr. Schonfeld discovered, spread along the pterygopalatine canal, causing inflammation of connective tissue. This spread to the brain, producing local meningitis, encephalitis and abscess of the outer membrane of the brain.

Some candy manufacturers favor the pointed lollipop stick because it speeds up production, Dr. Schonfeld states. Parents should forbid the purchase of these lollipops at all times.

Although injuries from lollipop sticks are frequent, they are usually innocuous, the physician finds. Only occasionally do they lead to serious complications and death. Most of them are preventable.

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## MEDICINE

### Acid Destroys Gallstones Dog Experiments Show

**G**ALLSTONES apparently can form and survive only by "staying on the alkaline side," it appears from the report of researches by Dr. Maurice Feldman and associates of the University of Maryland School of Medicine. They implanted human gallstones in the gallbladders of dogs. The stones dissolved, apparently because dog bile is more acid than that found in the human gallbladder. Gallstones similarly implanted in guinea pigs, which have alkaline bile, failed to dissolve.

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