

Russian explorer in the Central Asiatic steppe lands. A reindeer head is another art work by the mammoth hunters.

Most striking of the art exhibits is the statue of a mammoth complete. The prehistoric sculptor captured the characteristic form of the shaggy giant, the back drawn upward, its plump and heavy legs, all familiar to science from reconstruction of real mammoth remains.

The ancient hunters made "combination tools," Prof. Absolon's collection shows. One three-fold implement is a blunt stiletto at one end, a notched trowel at the other, while from beneath it is a chisel. A saw with serrated teeth is another tool of this Old Stone Age.

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## GEOLOGY

## Whetstones Contain Ancient Climate Record

**W**HEN a farmer leans upon his scythe while he whets its blade, he may be unconsciously sharpening his modern tool with a record-in-stone of an ancient climate. For the widely used banded whetstones made from a peculiar type of gritstone quarried in Orange and Perry Counties, Indiana, tell of alternating seasonal abundance and scarcity of rainfall during the early Pennsylvanian geologic age, a quarter of a billion years ago, when "slimy things did crawl with legs" out of the water and onto the land, laying the foundation of the since proud line of land-living vertebrates.

The dark bands in the stone indicate the presence of abundant organic matter, the light bands point to its scarcity or absence. There were good seasons and bad in those remote times, and their traces were left in the sands deposited under water, that have since turned into stone.

This is the story read in the banded stones of Indiana by Dr. David White, associate in geology of the U. S. National Museum.

Similarly layered under-water deposits of other geologic periods have been interpreted as showing series of mild and severe seasons in cyclic succession. Thus far, however, the banded gritstone material examined by Dr. White has been too scanty to justify any definite conclusions regarding seasonal cycles during the Lower Pennsylvania.

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## ENGINEERING

# Is One-Rail Train Next Step For Land Transportation?

**T**HE VISION of a train or car rushing along on one rail, kept from falling over by a spinning gyroscope, has been pursued by a number of inventors and engineers since the turn of the century.

Now with railroads going modern, streamlining their locomotives, lightening their rolling stock, using single car trains diesel-electric propelled, it may be that serious thought will be turned to the monorail for land transportation. It may be a method of allowing the railroad to follow not too far behind the increasing speed of the passenger and freight carrying airplane.

### Bicycle Shows Safety

The problem of using gyroscopic stabilization has been investigated by a British engineer, Dr. J. F. S. Ross, and his inquiry is reported in a book: "The Gyroscopic Stabilization of Land Vehicles." (Edward Arnold & Co. in London; Longmans, Green & Co. in New York.)

"To the sceptic who distrusts the practical safety of the monorail I would commend the object-lesson of the bicycle," Dr. Ross says. "Who now, apart from a small minority of invalids and eccentrics, regards the tricycle as a better means of locomotion than the bicycle, or casts aspersions on the latter as unsafe in itself and liable suddenly to flop over? So it may well be with the monorail; if once the arduous (and expensive) stage of experiment is successfully surmounted, we may look back upon double-rail traction as antiquated and clumsy, and marvel that people ever thought the monorail unnatural or unsafe."

### Seems Contrary to Nature

Even the spinning top, which is a form of gyroscope with which all are familiar, gives a vague feeling of distrust, Dr. Ross observes.

To the ordinary, non-expert person, the behavior of a gyroscope is apt to seem contrary to the laws of nature. He cannot understand why, being top-heavy, it does not fall over, nor why, when pushed in one direction, it moves in a quite different direction. He can-

not quite believe that its behavior is perfectly normal and explicable, and he has a lurking suspicion that, if he were to rely on the gyroscope as a monorail mechanism, sooner or later it would let him down by suddenly ceasing its eccentricities and behaving in what he would consider a more normal way.

Though there are no good grounds for such views, in Dr. Ross' opinion, it must be admitted that there are considerations which may serve to excuse them. In the first place, no one has yet produced a large-scale monorail car which gives evidence of that complete reliability in all circumstances which is essential for commercial success; and, in the second place, the explanation of gyroscopic phenomena, and the calculations necessary in connection with gyroscopic apparatus, involve a certain amount of mathematics of a somewhat specialized character.

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## ENGINEERING—ARCHAEOLOGY

## Model Shows Building Of Famous Appian Way

**F**AMOUS highway construction of a distant day and how the ancient road was used are illustrated with an elaborate model of the Appian Way which has been built by the U. S. Bureau of Public Roads for the National Museum. More than one hundred carefully designed figures of men and animals, with their tools and vehicles, are working on the highway or passing over the newly finished surface.

The chief difference between the ancient Roman road and the modern highway is that the present-day engineer relies upon the soil to bear the load; the pavement should act as a wearing surface and a roof to protect the supporting subgrade soil. The Romans relied solely on massive construction. Using modern ideas, the roadbuilder of today has been able to build more extensive highway systems at a small part of the cost of Roman roads.

This road, which endures after twenty centuries, was 16 feet wide with 2-foot