

Coachella District of the Metropolitan Water District of Southern California, has reported to the *Engineering News-Record*.

At present thirteen contractors are at work on 58 miles of tunnels, in addition to the Metropolitan Water District's crews, working on the other 33 miles. Each contractor maintains an independent camp, roadway, and water facilities. Because of excessive heat many of the camps are equipped with air-cooling systems.

The East Coachella tunnel, running through a range of hills whose peaks rise to about 3,000 feet is the longest in the series. Its length of 18.3 miles will exceed that of the 18.1-mile Shandaken Tunnel in the Catskill aqueduct to New York City, which is at present the world's longest tunnel.

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## ENGINEERING

## New Motor Roads Planned For Hundred-Mile Speeds

**P**REPARING for the automobile of the future, progressive highway engineers are designing roads to accommodate cars travelling at speeds of 90 to 100 miles an hour.

Oregon is now designing roadways for twice the normal driving speeds by adjusting curves, visibility distance, and smoothness of road, the current *Engineering News-Record* reports. Highway officials of the neighboring state of Washington are planning their roads on a similar high-speed basis.

Until the automobile is improved to the point of being able to average 100 miles per hour the new highways will mean much greater safety for cars travelling them at the present average speeds of 45 to 50 miles per hour. They are far smoother, the curves more open, and the driver is permitted to see much farther ahead than on the ordinary roadway as now constructed.

Foresight in the construction of roads has been encouraged by the example of the past. There are many trunk highways built a dozen years ago that can now, with the advances in automobile design, permit only the leisurely gaits of the past decade.

The Columbia River Highway was cited as an example of this. Built a little over 12 years ago, it was designed to fulfill adequately the conditions of that time. Now it can qualify only as an artery for easy sightseeing travel.

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## PALEONTOLOGY

# Dinosaur Teeth Give Hope Of Finding Rare Skull

## Paleontologist Expects to Use Airplane in Search For More Saurian Sites at Close of Season's Work

**Q**UESTION Mark Quarry, near Billings, Mont., now being "mined" for dinosaur fossils by the American Museum-Sinclair Dinosaur Expedition under the leadership of Dr. Barnum Brown, may be on the eve of yielding a skull, to "head up" at least one of the hitherto quite skull-less dozen saurian skeletons found piled together as in a titanic charnel-house.

Dr. Brown describes the find in a statement given to Science Service:

"The first trace of the whereabouts of any of the skulls of the twelve sauropods in the fossil deposits on which we are working, is a group of eight teeth lying parallel and evidently in normal position close to and partly beneath a large vertebra. The roots of the teeth, which are about two inches long but very narrow, extend into thin bone which I believe to be part of the skull.

### May be Barosaur

"The finding of this skull is a matter of vast relief as all other parts of a skeleton have been discovered and naturally headless sauropods would not make a complete exhibit. An important angle of the finding of the teeth is that they give the first indication of the type of sauropod we are dealing with. Such casual study as I have given them indicate that the creature to which they belonged may have been a hitherto undescribed type of Barosaurus, of which no skull has ever been found.

"It goes without saying that we are going ahead with the greatest possible vigilance so that not a bone fragment will escape us."

If Dr. Brown's conjecture that the teeth and possible skull fragment belong to a Barosaur, the find will be of outstanding importance, for though skeletons of this type of dinosaur have been found in the past, none of them has ever had a skull with it. The Barosaurs resembled the Diplodocus type of dinosaur: enormous potbellied creatures that walked on all fours, with tremendously long necks and even

longer tapering tails. Diplodocus heads were ridiculously small, in comparison to their huge size; it is not improbable that Barosaur heads resembled them. Dr. Brown's new find may help to throw light on this point.

Dinosaur hunting from an airplane is the thrill that awaits Br. Brown after he has completed his summer's work on his great "mine" of dinosaur fossil bones. This airplane dinosaur hunt will not be a romantic search for a Wellsian "lost world" of still-living monsters. The last dinosaurs died millions of years ago. Only their fossil bones remain, but these are worth the search for their scientific value. The formations in which they are embedded are frequently so situated that they are hard to approach from the ground, yet are easy to see from the air. Hence Dr. Brown's plans for an airplane reconnaissance, to be made some time late this month or early in September.

"The job we have before us—packing and preparing fully 50,000 pounds of fossil bones for shipment—is a major undertaking," Dr. Brown continued. "I figure that we will have about 4,500 bones to look after. They range from hip bones that weigh several hundred pounds apiece to tail joints that tip the scales at only a few ounces."

### Searching the Dust

"Our task of removing the top layer is a ticklish one lest we should disrupt or ruin any of the underlying bones. We are moving entirely in the dark, and the fact that we have to proceed with great caution may make it necessary for us to prolong our work beyond the late summer or early fall.

"Another factor that slows us up is the continual cropping up of small but important pieces of fossil. We virtually have to sift every handful of soil to make sure that such items as fragments of petrified skin, teeth and bones of diminutive sauropods are not thrown into the discard.

"As the result of steadily growing importance of this deposit I may be

compelled to postpone my search for further trace of the bantam dinosaur I discovered in Montana last year.

"I do plan, however, to make a survey by airplane of the fossil beds in northwestern and southwestern regions during the latter part of August or in September."

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## PALEONTOLOGY

## Rhino With "Schnozzle" Found In Oregon Fossil Bed

EQUIPPED with a pronounced "schnozzle," the skull of a unique species of extinct rhinoceros has been discovered by a party of scientists from the California Institute of Technology, working in the fossil-rich John Day Beds in Oregon. The specimen, which is the most complete rhinoceros skull found in this region for many years, shows by its outline that the animal had an extended proboscis, instead of the bluntly rounded nose of modern rhino species.

The skull found while Dr. Chester A. Stock, paleontologist, and Eustace L. Furlong, curator, were scouting for new beds to explore, contains a full upper set of teeth, including the front teeth that form the "schnozzle."

The lower jaw was in fragments, most of which had disappeared. The fossil was removed from Miocene geologic strata, giving the animal an age of at least 10,000,000 years.

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## PSYCHOLOGY

## Sleep Preferences Not Set by "Handedness"

WHETHER you are right-handed or left-handed does not determine the side on which you prefer to go to sleep, Drs. Richard Stradling and Donald A. Laird of the Psychological Laboratory, Hamilton, N. Y., report in an article soon to appear in the *Journal of Abnormal and Social Psychology*.

A questionnaire filled out by persons listed in *Who's Who* revealed that the majority of both right- and left-handed persons prefer the right side for sleep, but the proportion preferring the left side is somewhat larger among the left-handed. Another investigation by the same authors indicated that sleep comes more quickly, and is more restful when attempted on the preferred side.

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## ASTRONOMY

# Shooting Star Light Tells Speed of Meteors

SHOOTING stars seen a few nights ago, when the Perseid swarm of meteors intercepted the orbit of the earth, gave off brilliant light, but they were probably not much larger than an eighth of an inch across—just about twice the size of the head of a pin. Even the larger ones probably weighed only about one-fifth of an ounce. Most of the bright streaks of light visible came from about 70 miles above the surface of the earth, far higher than man can now hope to rise in the stratosphere.

Prof. C. C. Wylie of the University of Iowa tells how it is possible for scientists to sit in their observatories on the earth and predict how large and how heavy a shooting star will be, as it streaks across the sky above their heads.

The light from shooting stars, Prof. Wylie indicates, is visible evidence that the tiny specks of cosmic matter have energy due to their motion. It seems reasonable, he adds, to assume that the same fraction of this motion energy is converted into light in the case of the small shooting stars as it is for the large meteors which have survived their journey through the earth's atmosphere and reached the globe's surface, there to become known as meteorites.

Some meteorites which have fallen in different parts of the world weigh about 800 pounds. From the intensity of the light they emitted in falling (some were said to have turned night into day), Dr. Wylie estimates that their mass when high above the earth could have been as much as 10,000 pounds. The approximate velocity of these great meteors is known (probably it is fifty-five miles per second), while the mass is the five tons indicated. By estimates on the comparative light emitted by a great meteor and the tiny shooting stars astronomers calculate that the relative masses are 40,000,000 to one. Or the mass of the shooting star is 114 milligrams, just about one three-hundredth part of an ounce.

It is generally said that the light from the shooting stars is caused by their combustion as they strike the air of the earth. It is now agreed that much of the light from a shooting star is caused by the compression of the gas ahead of

the meteor which makes it glow and give off radiation. Later, if the meteor is large enough to survive to reach lower levels, it becomes heated up to incandescence and then emits the thermal radiation. For the tiny shooting stars, however, this last kind of light may very well be the exception. For the great meteors surviving to reach the earth the reverse situation is probably true.

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## ASTRONOMY

## Atmosphere of Venus Thick With Carbon Dioxide

VENUS, the planet perpetually enshrouded in a fog-like atmosphere, has great quantities of carbon dioxide in the air above it.

Investigation by Drs. Walter S. Adams and Theodore Dunham, Jr., of Carnegie Institution's Mt. Wilson Observatory, demonstrated the existence of carbon dioxide on Venus in 1932, but an estimate of the quantity present was virtually impossible because it was not known how much the gas absorbed light passing through it.

Dr. Arthur Adel of the University of Michigan reports in a letter to the editor of the *Physical Review* that he has succeeded in obtaining the same carbon dioxide absorption bands in the laboratory as the Mt. Wilson astronomers found in the light from Venus. Dr. Adel's measurements make it possible to form an estimate of the quantity of carbon dioxide present in the planet.

"In the upper strata alone," he says, "Venus possesses 10,000 times as much carbon dioxide as is present in the entire atmosphere of the earth."

Dr. Adel, as a physicist, does not speculate on what such a vast quantity of carbon dioxide on Venus means in terms of possible life on the vapor-obscured surface of the planet. The presence of carbon dioxide is so closely connected, however, with life of some sort, either animal or plant, that one can wonder what the surface conditions of the planet would disclose if science ever finds some way of piercing through the fogs which now shut out the view.

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