

SIDEWALK MIRAGES

TO THE EDITOR OF SCIENCE: A number of communications, published in SCIENCE during the past year, on "Sidewalk mirages" having recently come to my attention, I would like to add my experience with this phenomenon to those which have been related. I have driven over a stretch of road, part asphalt and part concrete, daily for the past two years, and have looked for mirages under every condition of the weather. Over the distance of the three miles of roadway I have marked every spot where the mirage occurs.

The nature of the road surface seems immaterial, but the effect of a "water surface" can be obtained wherever the level of the eye approaches that of the road surface. The mirage is not visible in cold winter weather and it is best during the very hot days in July and August. I believe that the intensity of the effect is unquestionably a function of the temperature of the road surface and the air immediately above it. That one observes a true mirage in this phenomenon and not a simple reflection can be demonstrated by the fact that an object "mirrored" on one of these surfaces will show an angle of incidence of probably 45° or greater, whereas the angle of reflection is, as stated previously by another observer, very small, approximating a few degrees only.

Mirror-like effects on asphalt roads are common, but have not the clarity of the images seen in a mirage, nor can mirror effects, due to reflection simply, be seen on a concrete road, so far as I have observed.

The position of the sun is of no influence, as mirages have been observed at the same spot at all times of the day.

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DISCOVERY OF A PREHISTORIC ENGRAVING REPRESENTING A MASTODON

TO THE EDITOR OF SCIENCE: It may be of interest to you to learn of the recent reexamination of Jacobs' Cavern, a prehistoric rock-shelter located in extreme southwest Missouri, some three miles from Pineville, county seat of McDonald County. This

cavern was examined by Dr. Charles Peabody and Mr. Warren K. Moorehead, of Phillips Academy, in 1903, report of their examination appearing in 1904 in Bulletin No. 1, "Exploration of Jacobs' Cavern."

Subsequent periodical and amateur investigations carried on by the writer, who now owns the land upon which this cavern is located, have resulted in the discovery of a number of very interesting artifacts. Chief among these are bone and horn awls, flint implements, engraved and polished implements of stone, and shaft straighteners and smoothers. Portions of an adult human skeleton, accompanied by an engraved sandstone pipe, have also been found.

The latest discovery was made on April 17, 1921, when the writer and Mr. Vance Randolph exhumed several engraved, perforated, and otherwise ornamented bones. These were apparently firm and sound but as a precautionary measure pen drawings were made immediately. Nevertheless, upon being examined a few weeks later, it was found that the bones were rapidly disintegrating. Immediate preservative treatment was resorted to but was so limited by local conditions that it was found impossible to save more than the most important specimen.

In many respects this bone is very interesting. One side bears an engraving which prominent archaeologists have agreed seems to resemble a mammoth or mastodon. The reverse side bears two rows of parallel zigzag lines, lengthwise of the bone, the design corresponding closely with those found on the sandstone pipe. This design is also accompanied by another evidently intended to represent some member of the deer family.

The writer felt that Phillips Academy was naturally entitled to priority rights of reexamination of the cavern. However, Mr. Moorehead found it impossible to visit the cavern and recommended that Dr. Clark Wissler, of the American Museum of Natural History, make the examination. Dr. Wissler is now on the ground for that purpose.

Photographs of the most important specimens are in process of preparation and a