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 archæologists 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

detailed report of operations will be made public as soon as practicable.

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SOME SUGGESTIONS FOR PHOTOGRAPHING FOSSILS

For some time the writer, when photographing fossils, has used the whitening process contributed by Professor S. H. Williams, but, with many others, he has found it not altogether satisfactory. In order that the whitened specimen should contrast with a white background it has been necessary to over-expose or over-develop the prints. Because of this, many of the minor details of fossils have been lost in reproduction, and the pictures, as a rule, have seemed flat and "lifeless." In addition, it is usually the practise to opaque the background of the negative as an aid in determining how far to carry the development of the print. This process is painstaking and slow at best.

Some time ago, the writer, with the assistance of Mr. Parke Bryan, developed a slight variation in the photographing of whitened fossils that seems to be a decided improvement. The time required is materially shortened, in that the negative requires no opaquing, and the results are so gratifying in the way of improved reproductions that it seems worth while to outline briefly the method.

The method is a combination of the common lighting arrangement used in portrait photography, and the whitening process of Professor Williams. The specimen is mounted on a slender stick with modeling clay and then coated with a thin film of white. A dull white background, placed some distance behind the specimen, is turned at an angle such that it receives the full light but does not reflect it toward the camera. After the photographing table is orientated so as to give the conventional light direction and the desired light-shade contrast to the relief features, a screen is placed between the specimen and the source of light so as to intercept the direct rays. The screen consists of one or more thicknesses of cheesecloth sewed on a wire frame, the number of thicknesses depending on the intensity of the light. Every feature of the fossil now shows clearly on the ground glass of the camera, although the specimen appears dark against a pure white back.

It has been found that the shadows on the under side and away from the light source are more intense than the image on the ground glass indicates, and except in the case of relatively flat specimens it has been necessary to use a slight back reflection. A sheet of dull finish white cardboard held at the proper angle has in every case been sufficient for this purpose. If an actinometer is used to determine the time of exposure, it is obviously the light of the shaded specimen that is to be tested.

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SCIENTIFIC BOOKS

Vitamines: Essential Food Factors. By Benjamin Harrow, Ph.D. New York, E. P. Dutton & Co., 1921. Pp. 219. Price $2.50.

The author of this book has been at great pains to popularize a subject which the laity will certainly be glad to have so clearly presented. About half the volume is preliminary to the specific topic; it is a general account of nutrition and the story is well told. One is disposed to wonder whether readers who require such a very elementary introduction will appreciate the later chapters which are of necessity more difficult. However, a rare degree of order and simplicity is maintained to the end. The writer has a judicial attitude; he does not assert opinions of his own but quotes others with fairness and has evidently been in correspondence with the leading investigators that he may accurately express their views.

Of course not much space can be devoted to controverted matters in a book of this character. But a dogmatic tone is avoided. It should be plain to the reader that many problems await solution. Among the questions not fully settled may be mentioned the