DESERT MIRAGE

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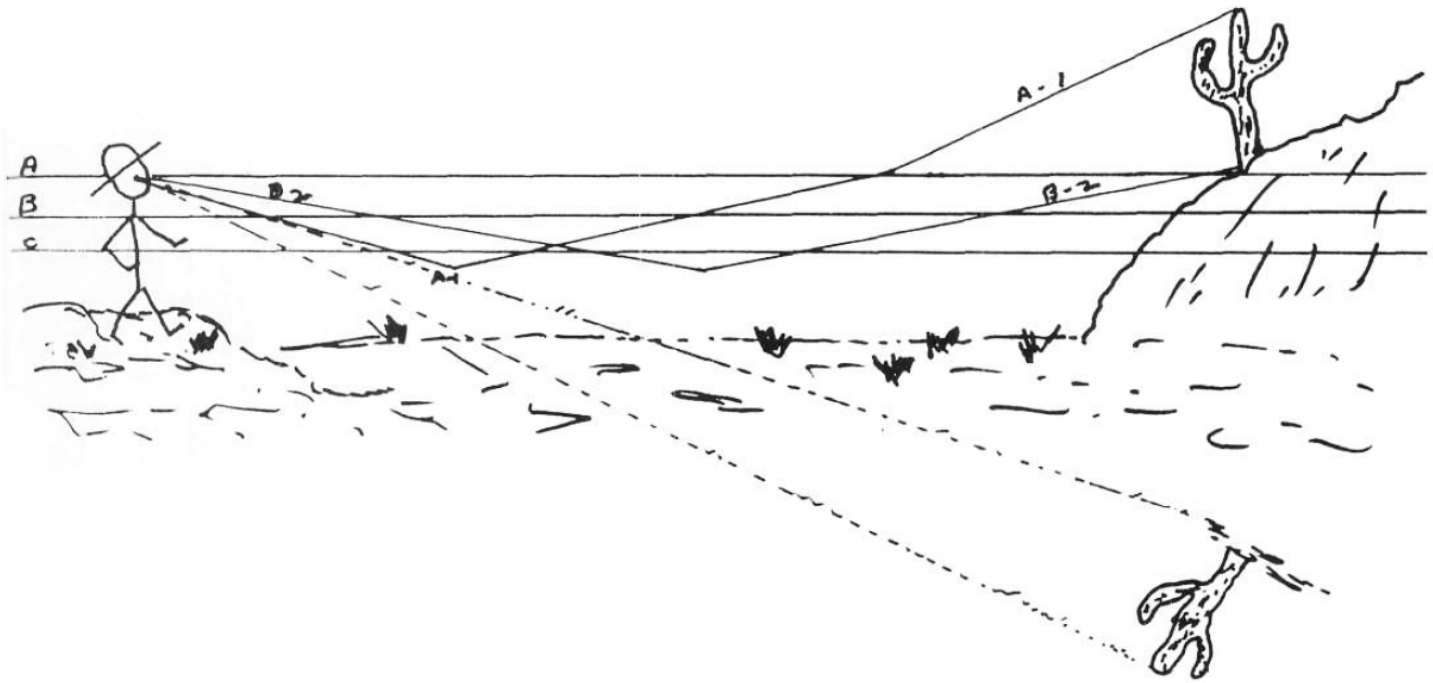
HOW OFTEN have you driven down the highway on a bright sunny day and suddenly noticed the roadway ahead of you appears to be submerged under water? Most of us have witnessed this phenomenon - what we have seen is a "mirage"

Mirages can occur anywhere - but they are most often associated with the desert. Many a prospector, his throat parched and dry, has stumbled hopefully Inward what appeared to be a cool lake, only to find he never reaches the shore. The lake he visioned remains a waste of sand - a mirage.

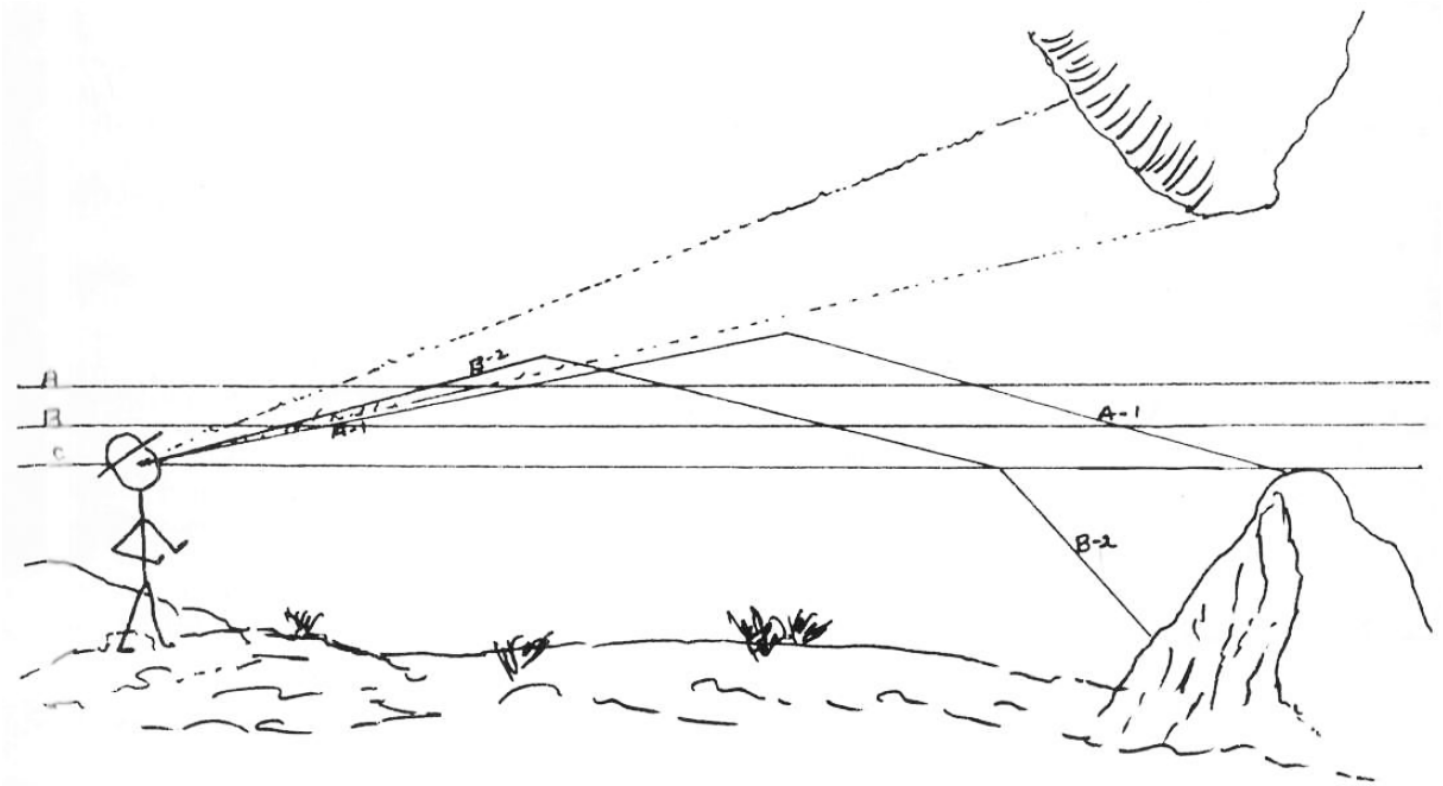
People have witnessed mirages since the beginning of time, but the explanation of their existence was not revealed until 1781. In this year, a man named Tobias Gruber made the discovery that mirages were caused by the bending of light waves in the atmosphere.

There are two basic types of mirages, the inferior mirage, and the superior mirage. Combinations of these two types also appear, and they are capable of producing fantastic sights.

To understand how mirages occur, you must first become acquainted with two facts. First, light will travel through the normal density of air at the rate of 186,337 miles per second. Second, as light rays travel through a layer of air that is of normal density into a layer that is less dense, its speed is increased, and at the same time, it will bend forward. The bending of the light rays, as they contact different densities is called a "refraction."



INFERIOR MIRAGE: Man standing with eye level on A, warm to hot layer of air. B and C are the cooler layers of air. A-1 and H-2 are oblique rays and travel downward into the warm refracting layers. When they reach total reflection, they bend upward and invert the object to a mirror image to the eye. Note: Distance from man to cactus would normally be a mile or more.



SUPERIOR MIRAGE: Man standing with eye level on C, cool layer of air. Band Care warmer layers of air. Rays bend as described in the inferior mirage illustration, but in the superior the reflection layer is at the top and the image is reversed. The man will see the butte image in the sky. Note: Distance from man to butte would normally be a mile or more.

Of the different types of mirages, the inferior mirage is the simplest. In this type of mirage, objects are reflected base to base - much the same as a mirror would reflect when placed at the base of an object - or reflection in water.

As light rays strike an object, they shoot out in all directions - some go straight, while others bend. The indirect or bent rays are called oblique rays. The straight rays are the horizontal. In observing an inferior mirage, we view an object by two sets of rays. We see the object in its true position with the horizontal rays. The oblique rays will bend as they come in contact with the heated layers. These oblique rays will travel forward and downward until they reach a point where they become totally reflected. The rays now begin an upward curve, similar to the original downward curve, (see drawing).

When the oblique rays finally reach the level of the eyes of the observer, the reflected image will appear to be upside down. To have witnessed an inferior mirage, chances are you are located in a position with your eyes at about the level where warm to hot layers of air have dispersed into cooler layers of air.

The superior mirage is an inverted image, which appears above the object - top 10 top. A superior mirage is most likely to occur when the observer stands in a layer of cool air, and the air blends off into a warm to hot layer above his horizontal view. This situation places the oblique rays high above the horizontal sight of the viewer, and the total reflection layer is at the top.

There are now well defined layers of air temperatures, as marked off in the drawings. As hot air rises, it becomes blended with other cooler layers and different densities.

In an article in Desert Magazine, September, 1943, Jerry Laudermilk relates his excitement in viewing a mirage. Mr. Laudermilk tells of traveling on a road across California's Calico dry lake, directly west of Yermo. About half way across the lake bed, there appeared a beautiful lake with cottonwood trees, a water tank, houses, and a depot. All these objects were reflected in the form of an inferior mirage. The water on the reflected surface even seemed to ripple at times - a sight that would have deceived anyone not familiar with the area.

Always having had the desire to chase a mirage, he headed his car across the dry lake bed, straight toward the lake. He never caught up with it - the lake always remained out of reach. Having finally reached the opposite shore of the dry lake bed, he stopped the car and looked beyond. The city of Yermo lay silently unaware of the spectacular mirage that had occurred to the east of its boundaries.

Mirages are a natural phenomena, and as such are capable of being photographed. This author never seems to get her camera and the sight of a mirage together at the same time. Nor have I been fortunate enough to witness a mirage such as Jerry Laudermilk did. However, now that you and I know what to look for, and how they occur - you bring your camera - in my excitement, I will probably forget mine!