

PICTURE OF THE MONTH

Vortex Look-Alikes : Juxtaposition of an Arizona Tornado and Dust Devil

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Tornadoes and dust devils are often thought of as two quite different phenomena. At times, however, they can be very much alike in both size and intensity (Fujita, 1973) and morphological characteristics (Idso, 1974b). These similarities are especially manifest in the deserts of southwestern United States, where tornadoes are frequently very short-lived and of small cross-sectional area. Indeed, during inclement weather in these regions, it is often difficult to distinguish between the two types of whirlwinds; and the general public frequently confuses them with sometimes unfortunate results.

A good example of the morphological similarities of many Arizona dust devils and tornadoes is presented in Fig. 1. The vortex on the right is a very common type of intense dust devil that often occurs on the Arizona deserts in summer, while the vortex on the left is a tornado that has just moved over a lake to become a waterspout. Both funnels exhibit a hollow central core, sheathed by sand and dust in the case of the dust devil and by water particles in the case of the tornado-waterspout. Neither appears to connect with a parent cloud, a fact that often leads to confusion between the two phenomena; yet, in this instance, an earlier photo of the tornado-waterspout (Fig. 2) showed it extending from the base of a moderate-sized cumulus convection cell.

Although these two types of vortex wind motion are thus readily differentiated from each other in this case, there are other circumstances in which they are not so easily distinguished. In particular, I refer to the vortices that form in association with duststorm frontal boundaries, whose precise identity is still unresolved. Ingram (1973) has recently referred to them as "eddy tornadoes," due to their high incidence of occurrence in the lee of local minor mountain systems. These are the vortices which are really difficult to identify, for there is much evidence for both types of whirlwinds occurring under these conditions. A comprehensive discussion of their characteristics plus additional examples of tornado-dust devil similarities may be found in the recent review article of Idso (1974a). Weather forecasters have recently become acutely aware of these violent but very transient systems; and a large-scale observational network has recently been established in central Arizona to obtain more firsthand information on them.

REFERENCES

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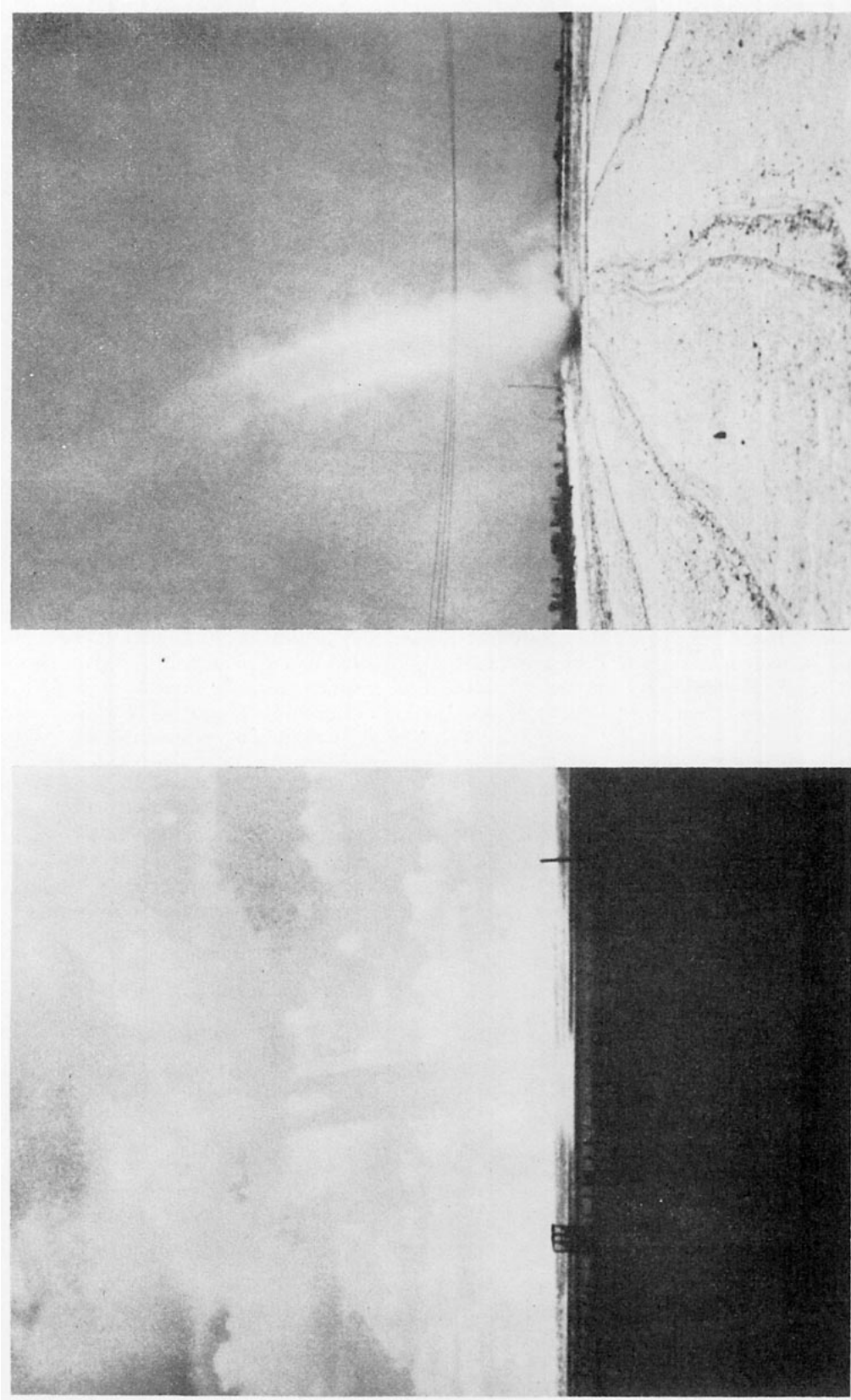


FIG. 1. Two amazingly similar vortices of supposedly very different nature. Left: the Mormon Lake tornado-waterspout, which occurred at about 1100 on 30 July 1966. (Photo courtesy of the National Weather Service.) Right: a rather common form of intense dust devil often observed on Arizona deserts. (Photo by the author.)

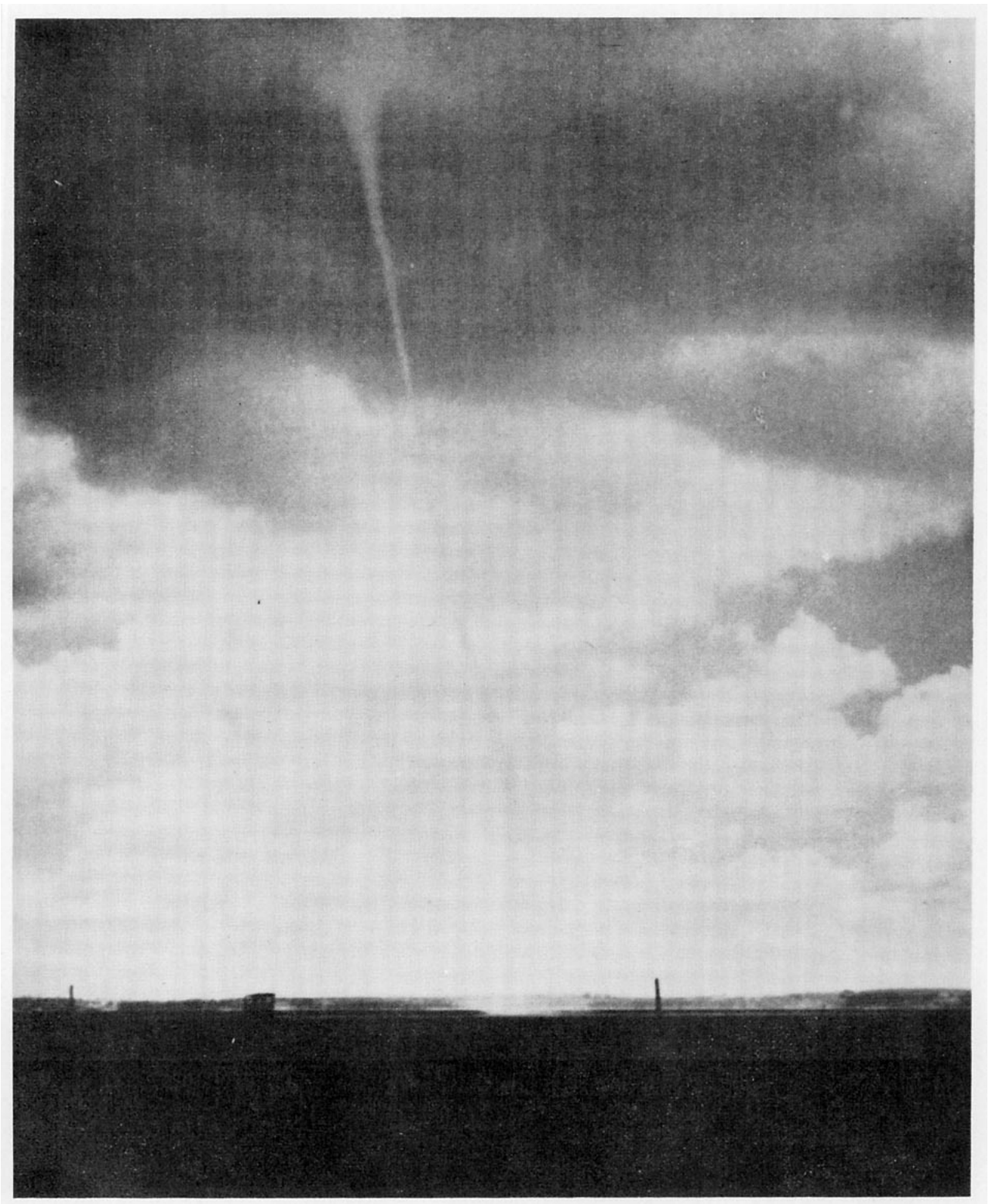


FIG. 2. An earlier photo of the Mormon Lake tornado-water-spout showing its dynamic connection to the base of the clouds above it. (Photo courtesy of the National Weather Service.)