DISCUSSION

THE FALLING OF THE DEW

THE problem of the "falling" of dew has long been one concerning which there are many men of many minds, and their confusion is still confounded, as evidenced by several recent articles about it in *Nature*. One group, esthetic and poetical, says that dew falls, and says it in language often so beautiful that it would be all but sacrilege to question its truth. Another group, looking at the other side of the shield, or, literally, the underside of the leaf, insists that it rises. A third, and pacifist group, urges that both are right, that dew rises and dew falls. This leaves room for only the iconoclast, and that room is taken, for there are those who are emphatic in their statements that it neither rises nor falls. Well, as usual, they are all right and all wrong—each right according to his own definitions of the terms used, and wrong according to the other fellow's definitions.

According to my understanding, all dew is liquid water, except, of course, mountain dew, if any one insists on being so meticulous. Furthermore, it is that particular liquid water that has condensed onto relatively cold objects (objects whose temperatures are below the current saturation or dew point) from immediately adjacent water vapor. According to this definition dew, a mass of liquid water, does not fall. That would be rain, drizzle or the settling of fog or haze—the descent of water-drops. But even so we can speak of the falling of the dew in the same correct sense that we speak of the falling of the night, that is, in the sense of gathering as if by falling, or merely in the sense of occurring. And this, I believe, is what most of us, poets and all, mean when we speak of the falling of the dew—merely that it is forming or gathering.

However, one may insist, and some do so insist, that even if dew is formed by the condensation of water vapor, the vapor molecules had to get to the place of condensation by motion in some direction—down, up or sidewise. If the air is still, and if the top of an object is bedewed (a very common occurrence) we doubtless would be right in insisting that the final travel of the vapor was downward, wherever it originally started from and however tortuous its intervening path. In this sense, the sense of final course of the vapor molecules that go to make it, some dew does fall—does go down—not owing to gravitation, but to difference in vapor pressure, a pressure that is least at the place of condensation where the vapor is continuously disappearing or flowing away as if into a sink. In exactly this same sense the dew on the underside of an object, a leaf, for instance, has risen.

Many of the "dewdrops" on the tips of grass and other growing vegetation have not been produced by condensation at all, but by exudation—the flow of water up the leaf and out at its tip or tips. This false dew has, in general, risen. Also it may happen that the absolute humidity (quantity or mass of water vapor per unit volume) immediately over a bedewed lawn, say, is quite as great during the formation of the dew as it was immediately before, owing to an abundant supply of vapor from the damp sod beneath. In this case it may be said that all the dew has risen, the dew on the upper side as well as that on the under side of each and every object.

If, therefore, we adequately prepare the way by definitions appropriate to our needs, we can correctly say that dew falls (in either of two senses), rises, does both or does neither.

How then about frost—is that frozen dew? Dew in the sense above used, liquid water condensed from vapor, freezes whenever, after it has formed, the temperature falls sufficiently low, whereupon it becomes a kind of frost, but not the fine, white, feathery sort known as hoar frost. This latter variety, by far the more common, is formed by the direct condensation of water vapor into ice. It does not pass through the liquid state, hence never was dew and therefore is not frozen dew, as dew is here defined.

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RETREAT OF CAVELL GLACIER

A NOTEWORTHY instance of the retreat of a valley glacier was confirmed by the Princeton International Summer School of Geology and Natural Resources during the past summer. Two years ago Dr. E. M. Kindle, of the Canadian Geological Survey, established a datum point and line of measurement to the foot of Cavell Glacier, on the north side of Mount Edith Cavell in Jasper Park, Alberta. On July 17, 1927, the measurement made by Dr. Kindle from the datum point to the ice front was 322 feet 6 inches. About a month later, on August 22, the distance had increased to 342 feet, showing a retreat of 19 feet 6 inches in 35 days. At this time, the glacier was visited by the 1927 party of the Princeton Summer School, in company with Dr. R. M. Field, Mr. E. B. Bailey, Dr. L. A. Collet and Dr. Kindle, and several general observations were made. On July 26, 1929, the glacier was revisited and measured by the writer and other members of the Princeton party. The distance from datum point to ice front had increased to 415 feet. This indicates a retreat of 92 feet 6 inches in two years.[1]

The direct evidence of retreat is supported by other observations showing changes in the surface features

[1] For photographs of this glacier see "The Geological Story of Jasper Park," by E. M. Kindle, pp. 38–40, 1929, National Parks of Canada, Department of Interior, Ottawa.