Technical Papers

Eocene Volcanism in Central Utah[1]

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Work during the past three field seasons in Long Ridge, central Utah, has disclosed several important stratigraphic relations in the regional geology of the area. They are presented briefly here in anticipation of a forthcoming longer paper so that they may be immediately available to other workers. Long Ridge is located about 10 miles east of the Tintic mining district and extends southward about 30 miles; the area specifically under consideration is at the southern tip of Long Ridge, about 7 miles southwest of Levan, Utah.

At this locality about 870 ft of thin-bedded Green River limestone and shale crops out in unbroken succession. In the upper 200 ft of the formation bentonitic tuffs are intercalated with the limestones, some of which contain much biotite. Conformably above this sequence is the Golden's Ranch formation, a series of tuffs, bentonites, and volcanic boulder conglomerates. This sequence can be seen along the new roadcuts of U. S. Highway 91 southwest of Levan.

Six miles to the northwest the same section is again found, except that the lower part of the Green River is covered. In addition, 820 ft above the base of the Golden's Ranch formation, a relatively pure limestone with abundant plant remains crops out. The plants in the limestone, which is here named the Sage Valley limestone member of the Golden's Ranch formation, have been determined as upper middle Eocene or lower upper Eocene by Roland W. Brown. A comparison of thin sections of boulders from the volcanic conglomerates *below* the Sage Valley limestone with those prepared from flows in the latite series of the Tintic area shows that the boulders are from the flow areas. Hence, the flows are clearly somewhat older than the boulders derived from them and are therefore middle or lower upper Eocene in age. Further, field tracing of the volcanic conglomerates in the Golden's Ranch brings to light the fact that they grade laterally into volcanic breccias that are an intimate part of the latite series in the northern part of the area and in the Tintic district (*1*).

The history of the area, during at least a part of the Eocene, as determined from the above observations, is briefly as follows: While calcareous and argillaceous sediments of the upper Green River were being normally deposited in a shallow lake, volcanic eruptions began in the Tintic area to the west. Flows and breccias were deposited on relatively steep slopes (*2*) while airborne volcanic products were being interbedded with the Green River sediments in the lake. Continued volcanism and the work of streams on the volcanic products resulted in the deposition of coarse volcanic conglomerates and tuffs and the cessation of lacustrine limestone deposition. At some time after the initiation of volcanism a new water body of probable local extent and irregular outline existed; in it was laid down the Sage Valley limestone. Above it were deposited more volcanic conglomerates and tuffs. Their age cannot yet be accurately determined.

The occurrence of plant fossils, associated with volcanics, together with the gradational relations between the well-dated Green River formation and the Golden's Ranch formation, and between the latter and the latite series, presents the first specific dating of the widespread volcanism of central Utah. Previously, this had generally been considered to be much younger (*1, 3*).

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Inadequate Stimulation of Olfaction

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Several workers in the field of olfaction have reported difficulties in obtaining test spaces for research purposes with an absolute zero level of odor. Such spaces are needed in olfactory research to serve as control rooms for comparison with test rooms of low odor levels, to act as reservoirs for the introduction of odors near threshold concentrations, and for the operation of odor test panels.

The use of activated carbon as an air-cleaning device to remove all sources of olfactory stimulation from a test space can be successfully carried out provided certain precautions, as described here, are taken. In the absence of such measures, a test space in which air has been purified by activated carbon sorbents may give rise to an odor variously described as "yeastlike" or "alcoholic," which, though not unpleasant and often even unnoticed by a lay observer, interferes with an olfactory research program (*1*). The theoretical implications of this phenomenon are of great interest. We have found that the olfactory stimulation in such cases is related to an inert aerosol, and hence is an "inadequate" stimulation of olfaction in the sense that no gas or vapor is invloved.

Experimental generation of the odor. Fig. 1 shows an arrangement of apparatus suitable for a reliable olfactory detection of the aerosol in question. *A* is a