Professor Mitchell, of course, discusses fully the eclipse observations to test the Einstein Theory. He gives an outline of the theory and the status, at the time the book went to press, of all the attempts to verify it.

Throughout the book there are numerous references to original sources, so it will serve not only to give the layman a comprehensive idea of ancient and modern eclipse problems, but will also furnish the scientist with an invaluable book of reference.

The book is well written, well printed and profusely illustrated.

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SPECIAL ARTICLES

ABNORMAL DIPS NEAR THE EASTERN BOUNDARY FAULT OF THE CONNECTICUT TRIASSIC

ONE of the principal means of establishing the exact position of the faults which have broken the trap sheets of the Connecticut Triassic is by observing drag dips along the fault zone. The normal dips of the sediments are towards the east, but, if exposures may be found in the vicinity of the fault zones, they frequently show decreased angles of dip or the dips may be shifted towards the west.

In contrast with fault zones which cross the valley the eastern marginal fault zone, which is supposed to have the largest throw, shows only exceptional drag dips. As one approaches the Eastern Upland the dips of the Upper Triassic sandstones rapidly increase from approximately 10° or 15° E at a distance of one half of a mile from the fault line to 40° or 50° E near the fault line. An occasional drag dip may be noted, as in a quarry on the grounds of the Connecticut State Hospital at Middletown, but, in general, Longwell[1] and others have noted the occurrence of steepened dips in the vicinity of the eastern marginal fault.

Similar increased dips have been noted near the faults which cut the rocks of the Grand Canyon district. D. W. Johnson[2] and others have argued that the conditions were produced by monoclinal folds towards the east, followed by normal faulting towards the west. No one has ever argued, and it is not believed, that the Connecticut sediments were ever folded towards the east before the boundary fault developed. A considerable body of evidence goes to prove that the depression within which the Connecticut valley sediments collected was developed by fault movements along its eastern border, taking place *pari passu* with the deposition of the sediments. Such a hypothesis can not account, therefore, for the abnormal dips observed.

For reasons stated elsewhere[3] the writer is wholly convinced that the boundary fault to the east is a normal fault with a hade towards the west. The fact is further established by driven wells along this zone which penetrate from Triassic sandstone above to crystalline rocks at depth. In view of the number of cases of drag dips found near the fault lines crossing the Connecticut valley the writer has been greatly puzzled by the increased dips to the east characteristic of the boundary fault.

Only one possible hypothesis to account for the facts has suggested itself. The condition of tension near the earth's surface which allowed the Triassic fault valley to develop is believed by most geologists to be abnormal. Compressive strains resulting from the earth's contraction usually dominate within the earth's crustal rocks. After the development of the Triassic fault valley of Connecticut is it not possible that the abnormal tensional strains were replaced by the normal compressional strains which were propagated across the valley from the west by the competent sandstones and trap sheets of the Newark series, to be dammed back at the eastern border by the resistent rocks of the crystalline uplands, and that these strains developed a slight monoclinal fold to the east at the contact between the two unlike formations. Certain facts combine to make this hypothesis plausible:

(1) Anticlinal structures similar to the one occurring immediately east of Cedar Mountain, south of Hartford, are known within the valley. They are cut by the faults crossing the area and hence must have been developed between the two faulting periods, *i.e.*, between the period of the eastern fault which developed the trough in which the Newark sediments rest and the period of the cross faults which break the trap flows. The compressional movements which formed the anticline would have effected the dips along the earlier fault zone but could not alter the drag dips along the later fault zone. Thus the abnormal dips at the east may be accounted for.

(2) A study of the crystalline rocks shows that the preTriassic compressional stresses were directed from the west causing overthrusting towards the east in the Eastern Upland. The Triassic thrusts follow, therefore, the usual direction within the area.

And (3) the two distinct periods of faulting seem to call for an intermediate period of compression which must have produced at least minor disturbances at the eastern boundary fault.

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[1] C. R. Longwell, *Am. Jour. Sci.*, Vol. 4 (1922), p. 236.

[2] Proc. Boston Soc. Nat. Hist., Vol. 34 (1909), p. 158.

[3] *Cf.* W. G. Foye, *Jour. of Geol.*, Vol. 30 (1922), pp. 690–99.