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Some Deformations of Southwestern Iowa

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PLUGGING ABANDONED WATER WELLS

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Underground waters are one of the most valuable mineral resources of Iowa and each year they are being more widely used. Since the supply of potable waters is limited, their conservation is a matter for careful consideration. Every effort should be made to guard against contamination and loss.

One of the chief causes of mineralogical and bacteriological contamination and loss of desirable water is underground circulation from one water-bearing horizon to another in old or abandoned wells.

Plugging abandoned wells, provided it is properly done, is the best method known to prevent underground circulation. The advantages of cement, mud-laden fluids and other plugging media are discussed. The various methods of emplacing the plugging media are outlined.

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SOME DEFORMATIONS OF SOUTHWESTERN IOWA

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Possibilities of oil production have recently revived interest in the structure of southwestern Iowa. Along the Missouri River is a series of low major synclines and of two major anticlines trending east-northeast. The largest, the Brownville syncline, extends from southeastern Nebraska into southwestern Iowa. On the north it is bounded by the Jones Point deformation, consisting of the asymmetric Redfield anticline and the Union fault. Both the Jones Point deformation and the Union fault were originally described in Nebraska, but are now traced across the river into Iowa. Possibly other minor faults occur in the south flank of the arch. North of the Redfield anticline the strata dip down into the shallow Bartlett syncline and then rise abruptly in the La Platte deformation opposite La Platte, Nebraska. The deformation seems to consist of an asymmetric anticline or of a normal fault similar in nature to the Jones Point deformation.

Attempts to connect the Jones Point deformation with anticlines or faults in Iowa near Red Oak, Milford, Redfield, and Ames, either as the Thurman-Wilson fault or as the Redfield anticline are not based on sufficient field evidence. They do not form a single straight structure with approximately the same magnitude the entire distance. At the only place where this projected structure has been crossed by a traverse other than along the Missouri Valley the structure was lacking. This traverse is the Middle River traverse by Condra and Upp. Furthermore, where best exposed (i.e. at Jones Point, Nebraska and near Thurman, Iowa) the structure plunges to the northeast 65 feet in 4½ miles. At this rate it would soon die out. While it is true that there is some deformation of strata in this region, the paucity of well records and of exposures and uncertainties as to the exact correlation of the strata do not reveal the magnitude of the displacement.

It is more likely that there is a series of deformations, possibly en echelon, forming a broad zone of faulting and monoclinal or anticlinal folding. Many small faults and folds are exposed in the field, paralleling this structure. Therefore a zone of faults or folds several miles in width would best explain the displacement of the strata.

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MISSOURI EQUIVALENT OF CEDAR VALLEY LIMESTONE

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When Louis Agassiz delivered, at the University of Iowa, in 1867, his now famous lectures on Ancient Coral Reefs, he selected for his main theme the great coral reef upon which Iowa City was built. Reputation of Iowa's great Coral Reef was established. This reef was, as we now know, the main median body of Owen's Cedar Valley limestone. Now this great coral reef appears not to extend very far south of Iowa City, and seems to be altogether unrepresented in Missouri. Inasmuch as in Missouri the Cooper limestone appears to be the equivalent of the Wapsipinicon limestone of Iowa, the Mineola limestone the extension of the Solon limestone of Iowa, and the coral reef to be absent in the south, it leaves the Callaway limestone representative not of the whole of the Cedar Valley section of Iowa, as commonly assumed, but