begun after the disappearance of the ice-sheet and when sea and land had, approximately, attained their present relationship.)

The marine fauna of the Champlain deposits in the St. Lawrence and Ottawa valleys was studied by Sir J. W. Dawson, J. F. Whiteaves, H. M. Ami, and other geologists, and considerable information has been published regarding the character and distribution of the fauna, but the significance of the fauna with regard to the oscillations of sea-level has not been fully considered.

The following is a brief summary of the results of field work done largely during the field season of 1915. The area in the vicinity of the city of Ottawa was especially studied, but numerous localities in the Ottawa valley, from Montreal 100 miles east of Ottawa to Renfrew 60 miles west of Ottawa, were also examined.

Acknowledgments are due to J. Keele of this Department for co-operation in the field work during part of the field season, and to I. E. Stewart who acted as assistant.

THE GLACIAL DEPOSITS AND DIRECTIONS OF ICE MOVEMENTS.

The glacial deposits in the Ottawa valley consist of till or boulder clay and fluvioglacial sands and gravels. These deposits are generally concealed by a covering of marine sediments, but in places they appear at the surface. Where seen in sections they are generally found to have no great thickness. They are irregularly distributed and over large areas the bedrock outcrops with little or no drift covering. In places, also, the marine clays rest directly on the bedrock. In some sections the glacial deposits show the three-fold division, upper till, middle sands (fluvioglacial), and lower till. In places, the fluvioglacial sands appear at the surface with no till covering and outcrop as ridges or irregularly shaped hills. Their fluvioglacial origin is shown by the markedly cross-bedded character of the bedding, the coarseness of much of the material, and by the faulting and crumpling of the beds as if from settling following the melting of included ice masses. They probably have little significance as regards a lengthy retreat of the ice. The upper till sheet, in places, includes lenses or irregular masses of stratified sands and gravels