

bees is not as rational a pastime as observing a game of base-ball, and shouting one's self hoarse over the changing tide of victory and defeat as it ebbs and flows during such a game. I am one of those who hope yet to see a class of amateur bee-keepers on the American continent, who will keep bees for the love of the thing and not merely for the money there is in it.

WARFLECK.

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Toronto's Ice Age.

IN the third volume of the *Journal of Geology*, and in the third edition of his "Great Ice Age," the eminent British geologist Dr. Geikie has named and described six different glacial epochs, viz: The Scanian, Saxonian, Polandian, Mecklenburgian, Lower Turbarian and Upper Turbarian. He has also named and described five interglacial epochs or stages, occurring in order between the foregoing glacial epochs as follows: Norfolkian, Helvetian, Neudeckian, Lower Forestian and Upper Forestian. Prof. Chamberlain, of the Chicago University, has named and described three American glacial epochs, the Kansan, Iowan and Wisconsin, which correspond respectively to the second, third and fourth European glacial epochs of Geikie; whilst the interglacial deposits which constitute the Scarborough Heights near Toronto are regarded as belonging to the time between the Iowan and Wisconsin, that is, between the third and fourth glacial epochs.

No mention appears to be made of the moraines and other evidences of a true glacial epoch occurring in many places north and east of Toronto, although we may infer that these belong to the Wisconsin (fourth) epoch.

More recently, in a paper read before the annual meeting of the American Association for the advancement of science, Mr. Warren Upham, formerly of the U.S. Geological Survey, has given a different classification of the ice periods. Upham agrees with Dr. Frederick Wright, the late Prof. Dana, Hitchcock and others. He regards the glacial period as continuous, "comprising the glacial epoch of ice accumulation and the camplain epoch of ice departure," with intervals of recession of the ice, but no complete departure of the ice-sheets except the final one. His divisions of the ice-accumulating epoch are:

(1.) The Lafayette uplift, affecting Europe and North America, raising the glaciated area to such great altitudes that they received snow throughout the year and became ice-covered. "Rudely chipped stone implements and human bones in the plateau gravels of southern England, 90 feet and higher above the Thames, and the similar traces of man in high terraces of the Somme valley, attests his existence there before the maximum stages of the uplift and of the ice age. America appears also to have been already peopled at the same early time."

(2) The Kansan stage, the farthest extent of the ice-sheet in the Missouri and Mississippi river basins, and in New Jersey.

(3) The Helvetian or Aftonian stage, the recession of the ice-sheet northward some 500 miles in the west, about 250 miles in Illinois, and much less towards the east side of this continent.

(4) The Iowan stage, renewed ice accumulation extending about 350 miles southwards in the west, that is, in Minnesota and Iowa, about 150 miles in Illinois, and very little in the east.

Upham's divisions of the epoch of ice-departure are:

(1) The Champlain subsidence or Neudeckian stage.

(2) The Warren stage, the glacial lake Warren held on its north-east side by the retreating ice-border, and covering the present lakes, Superior, Huron, Michigan and Erie, and adjacent portions of land.

(3) The Toronto stage.

(4) The Iroquois stage.

(5) The St. Lawrence stage.

Of the Toronto stage of the ice-departure Mr. Upham gives the following account:—"Slight glacial oscillations, with temperate climate, nearly as now, at Toronto and Scarborough, Ont., indicated by interbedded deposits of till and fossiliferous stratified gravel, sand and clay. Although the waning ice-sheet still occupied a vast area on the north-east, and twice readvanced, with deposition of much till, during the formation of the Scarborough fossiliferous drift series, the

climate then, determined by the Champlain low altitude of the land, by the proximity of the large glacial lake, Algonquin, succeeding the larger lake, Warren, and by the eastward and north-eastward surface atmospheric currents and courses of all storms, was not less mild than now. The trees, whose wood is found in the interglacial Toronto beds, now have their most northern limits in the same region."

During the Iroquois stage the old glacial lake (known to geologists as Lake Iroquois), occupied the place of the present Lake Ontario, and extended some distance northward. This lake had its outlet by way of Rome, New York, to the Mohawk and Hudson rivers. The surface of Lake Iroquois was about two hundred feet above the present level of Lake Ontario. It existed for many years, and formed a well-marked shore-line, the Iroquois beach, along which the sands, gravels, and smooth and furrowed boulders may be found in abundance.

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Montreal Affairs.

MONTREAL has had much to interest it of late. Politically there has been much of a history-making character happening; for it is quite clear that the crisis at Ottawa in the Ministerial ranks, which may result in a change of government, has been very largely due to the two reverses suffered by the Government on the island of Montreal—the very citadel of Canadian Conservatism since 1878. The explanations of these defeats have been, in number, like the sands of the seashore; but to the Montrealer who kept his eyes and ears open there was nothing surprising in the election of the Liberal candidates, nor any great difficulty in locating the cause. In this column at the outset of the Montreal Centre contest, I stated that the chances were that Mr. McShane would win despite his marked inferiority to his antagonist. His majority was due principally to two causes: an almost solid vote in his favour by the French workingmen, and a marked falling off in the English Protestant Conservative vote. Mr. McShane had a majority in the Irish-Catholic sections of the constituency, but it was much less than he had expected; while everybody was amazed at the majority piled up for him in East Ward, which is almost exclusively French. In West Ward, where the English Protestants vote, the Conservative majority fell from about 500 to less than 200. On the following Monday in Jacques Cartier the English vote went almost solidly against the Government, while in the French parishes the Liberals made enormous gain. Thus, in both these constituencies the Government was defeated because it failed to get the usual English vote while large numbers of its French supporters also broke away from its candidates. Now what were the causes for this astounding turnover? Are they local and temporary? or general and permanent? Obviously, if the latter, there is before the Government, in this Province, nothing but a hopeless rout; for when the French and English vote one way in Quebec they elect their man. I should say that the extraordinary falling off in the Conservative English vote was due in great part to local causes which may be removed before the general elections; but the breaking away of French Conservatives to the Liberal forces is the result of a movement general throughout the Province of Quebec. The experience of Jacques Cartier and Montreal Centre, in this respect, will be repeated all over the Province at the elections—provided that Mr. Chapleau tarries within the gates of Spencerwood.

The death of M. Mercier and the virtual retirement of Mr. Chapleau left Mr. Laurier the one great French-Canadian figure in Canadian public life; and there has been a drift towards him by his countrymen which is becoming irresistible. His policy on the Manitoba schools question is one that is not as likely to win votes in this province as the attitude assumed by Sir Mackenzie Bowell; but his commanding personality more than makes up for the deficiency. It is but justice to Mr. Laurier to say that he has never sought to advance his popularity among his own people by appealing to race prejudices as Mr. Mercier did: but blood is thicker than water and it is not at all strange that the French-Canadians are massing themselves solidly behind one of their own countrymen who is the undisputed leader of a great political party and, therefore, likely enough to be premier. Mr. Laurier's fortunes are indeed rising like a