

The Glacial Cause of Changing Climates

climatic change the retreating European glaciers also prove.

20. The historic evidences from Southern Russia and Siberia confirm that conclusion, as also do the records of the International Boundary Commission for Nigeria, who found the Sahara Desert continuously drifting southwards between their different years of survey, just as the United States and Canadian surveyors found the Alaska ice-cap receding northwards, as demonstrated on Plate III, and conclusively proved by the photographs on Plate I.

ALASKA AND CANADA NOW BEING RELIEVED
FROM THEIR SURPLUS ICE AND SNOW,
WHICH THE WINDS ARE CONVEYING
AND DUMPING UPON GREENLAND

21. It is particularly interesting for Canadians to note that the glacial ice now disappearing yearly from Alaska and Canada is being transported by the prevailing winds to Greenland, because between the ice-clad mountains of Northwest America and Greenland the absence of any intervening mountains enables those winds to convey a large portion of the moisture they absorb as they pass from the Pacific Coast ranges until their clouds, chilled by contact with the vast heights of Greenland ice, have to deposit their moisture as snow. Thus, though winter snow is scattered over Northern Canada, the heavier snowfall is precipitated in Greenland.

22. We are only enabled by adjacent railways and coasting ships to partially trace the vast climatic change that is now improving the climates of the Northwest, as evidenced by the melting back of such glaciers as the Illecillewaet, Yoho, etc., and the remarkable group around Glacier Bay in Southern Alaska (see Plate II). That melting registers continuously the local temperature throughout every moment of the year, hence if the annual snowfall is about equal through a series of years and the glaciers yearly advance, that evidences the advance of that part of the world into a colder climate, whereas if the glaciers collectively retreat (as those of North America and Europe are doing) that indicates climatic progress towards warmer latitudes.

23. Some minor exceptions result as small temporary glacial advances occur when shoulders of mountains are being bared by the melting of the over-capping ice-mass, where the valleys, filled with ice

to the brim, have their ice-mass reduced below the level of the shoulder, which sometimes cut off the flow from one valley, forcing the flow down another glacial direction, as seen on Plate II, where the chain of "Nunataks" (peaks protruding through glacial ice), west of the Muir Glacier, having cut off part of the ice-flow from the Cushing ice plateau, diverted that part towards the Queen Inlet, causing the Cushing Glacier to temporarily advance, although the ice-mass all around evidenced by wide-spread melting that all that area was drifting into a warmer climate.

24. The summary of ice-bared areas around Glacier Bay, inset in the lower-left corner of Plate II, proves that after allowing for those temporary advances, which only amount to 3 per cent., the average area bared of ice merely within the seal-level inlets around Glacier Bay averaged 2,054 acres per year.

It is estimated that the melting and berging of those 2,054 acres of ice yearly implies a clearance of about 8,000,000,000 tons of ice per year from the area surrounding Glacier Bay. As the area of Alaska is 591,000 square miles, or 2,000 times that shown on Plate II, and there is a very large area of Northern British Columbia under glacial ice now yearly being melted, the mass of ice thus swept from Northwest America must be many thousands of millions (American billions) per year, a large part of which is being wafted over towards Greenland without any regret from Canadians and Alaskans, who find that the Alaskan winter frosts now penetrated about 15 to 18 inches less depth into the ground they are constantly mining for gold.

25. That mighty transfer of ice-weight from Alaska and British Columbia, now accumulating on Greenland, includes part of the icebergs and understreams shed from the Northwest and later transferred by evaporation. These together are weighting down Greenland and so changing for the better the wonderful climate of British Columbia, Canada and the dear home-lands of Europe, as the earth's crust is thus tilted in the direction from Greenland down the mid-Atlantic. The same mighty force is likewise tending to make Australia and South Africa warmer, as they are being tilted up towards the Equator.

Thus whilst the climatic zones are con-