

land summers are colder than our winters. Cover India with an ice sheet, and its summers would be colder than those of England.

“*Second*, Another cause of the cooling effect is that the rays which fall on snow and ice are to a great extent reflected back into space. But those that are not reflected, but absorbed, do not raise the temperature, for they disappear in the mechanical work of melting the ice. For whatsoever may be the intensity of the sun's heat, the surface of the ground will be kept at  $32^{\circ}$  so long as the snow and ice remain unmelted.

“*Third*, Snow and ice lower the temperature by chilling the air and condensing the vapor into thick fogs. The great strength of the sun's rays during summer, due to his nearness at that season, would, in the first place, tend to produce an increased amount of evaporation. But the presence of snow-clad mountains and an icy sea would chill the atmosphere and condense the vapor into thick fogs. The thick fogs and cloudy sky would effectually prevent the sun's rays from reaching the earth, and the snow, in consequence, would remain unmelted during the entire summer. In fact, we have this very condition of things exemplified in some of the islands of the Southern Ocean at the present day. Sandwich Land, which is in the same parallel of latitude as the north of Scotland, is covered with ice and snow the entire summer; and in the island of South Georgia, which is in the same parallel as the centre of England, the perpetual snow descends to the very sea-beach. Captain Sir James Ross found the perpetual snow at the sea-level at Admiralty Inlet, South Shetland, in lat.  $64^{\circ}$ ; and while near this place the thermometer in the very middle of summer fell at night to  $23^{\circ}$  F. The reduction of the sun's heat and lengthening of the winter, which would take place when the eccentricity is near to its superior limit and the winter in aphelion, would in this country produce a state of things perhaps as bad as, if not worse than, that which at present exists in South Georgia and South Shetland.

“The cause which above all others must tend to produce great changes of climate, is the deflection of great ocean currents. A high condition of eccentricity tends, we have seen, to produce an accumulation of snow and ice on the hemisphere whose winters occur in aphelion. The accumulation of snow, in turn, tends to lower the summer temperature, cut off the sun's rays, and retard the melting of the snow.