

## OUTLINE OF THE PHYSICAL GEOGRAPHY OF CANADA

Of the early American continent--its formation and subsequent outline, as it passed through the ages leading up to the habitation of the seas by living forms--we can form but a shadowy mental picture. Fragments of very early sediments are found, which indicate the presence of land areas; and in even the oldest of these there is a suggestion of the character of the material surface from which they were derived. Many interesting problems relating to the origin of these early beds have been solved; but in the search for the original crust all efforts have been vain. We must conclude, therefore, that the original crust or first consolidated land, as well as the first sediments derived from it, has been worn away from a large part of the continent; and where it has not been removed, has been entirely altered by contact with molten masses or by subsidence to zones of high temperatures. A comparatively stable continent can, however, be traced back to about the period at which the seas became habitable, or to the dawn of life on the planet. The continent, at the time of our first fairly clear conception of it had already passed through a long history; its mountains had been worn down, and the only topographic features of importance, except its outline, consisted of sears or depressions marking weakly-supported areas. Various changes in its outline, caused by subsidence and elevation, have been traced; but its early, though somewhat larger form, bore a distinct resemblance to the present continent. It extended to Greenland and probably to the Asiatic shores, but was not definitely connected to the South American land area.

The great erosion, which resulted in the general flattening of this old continent, exposed granites and other crystalline rocks which, while in a molten condition, had played their part in the destruction of the original crust. The general surface thus exposed may be likened to a mosaic in which the base, mostly of light-coloured plutonic rocks, is ornamented by the insertion of green and grey patches of sedimentaries, volcanics and various highly coloured rocks. This old surface which forms the basis of the present continent is generally referred to as the Canadian Shield. Its subsequent history includes a further smoothing of the surface by erosion, a deformation of its borders by tangential strains, and an invasion of its surface by the sea when, during periods of crustal strain, large portions were depressed. The occurrence of these periods of depression followed by elevation is proved by the marine sediments now found on the continent. The entombed remains of once living organisms show a gradual change in the forms of life, sufficient, with the crustal movements, to form the basis for a chronological division of the time elapsed, sometimes estimated at thirty million years, since the beginning of life on the planet. During this time the continent regained its original area three times after equally long periods of instability; but during the last three million years there has been very little change in its outline, though in that time the Rocky mountains have been built and many of the channels through the Arctic archipelago have been formed.

The topographic features of the present surface of the continent admit of its division, in Canada, into several physiographic provinces. The exposed surface of the old pre-Cambrian continent forms one of the largest divisions and has been called the Canadian Shield, the Archean peneplain and in its southern portion, the Laurentian Highland. The mountainous country of the west constitutes the Cordillera, while the mountains of eastern United States, in their continuation across the border, form the Appalachian Highlands of eastern Canada. The Great Plains, with various subdivi-