

on its way to the ocean, or the equivalent of 217 tons every twenty-four hours. At this rate it would, under present conditions, require about 3,800,000 years to double the size of the Red Deer River valley and the valleys of its tributaries. It is necessary to add "under present conditions," for if the atmosphere of the earth was twice as dense four million years ago as it is to-day, it would have precipitated twice as much moisture, and the rivers would have carried down to the ocean, in consequence of the double volume of rainfall, twice as much mineral matter in a given time as is the case to-day.

Now, before the aforesaid Red Deer River—or for the matter of that, any river—existed, the area of its watershed was beneath the surface of the ocean, which means, of course, that no river was in existence. But the moment this area was raised above sea-level, that moment the river began to come into existence.

About four million years ago, then, the earth was in collision with some other planet. The area of the collision extended from a point west of Cape Horn to a point in the far north, between Alaska and Siberia. As a result of this collision the earth's crust was crushed in and its broken parts were shoved or piled up on each other in an easterly direction. To understand what happened, it may be well to refer briefly to some of the characteristics and the natural laws of our planet.

Geologists estimate that the earth has a hard crust of four to nine miles in thickness. Beneath this