

heaped up on this ice field in various parts. Then, if a hole be pierced through, the water will rise with increased likelihood to overflow. Now these piles of ice exert an effect similar to that of upraised wrinkles in the crust. So it appears that volcanoes may be an incident of the earth's contraction, as before stated, and that mountain-making may be another incident of the same. But there is more to be said. In many places must occur some crushing together. In the mountain folds where the internal constitution and firmness have been strained by flexures, there must be weakness; and there must occur some of that *mashing together* which develops heat, independently of any supply from the molten interior. It is quite intelligible, therefore, that a mountain wrinkle or fold is a zone where *heat* must be generated, even if lava is not produced, and does not escape from within. Along a mountain fold, in other words, is a zone where the rocks must be subjected to that baking or semifusion in connection with water, which produces the changes called *metamorphism*.

It would not be proper to leave the subject in this state, though you have already the gist of the theory of mountain making. If you observe shrewdly, you will discover two features in our mountains on which no light has been thrown. You may experience some difficulty in understanding the explanations. But let us try. You know well that all our great mountains exist as long ranges—mostly as groups of ranges, and that the prevailing direction of mountain trends is approximately north and south. Now, when we consider the wrinkles on the skin of a withered apple, we find them short, and having also, no uniformity of trend. The analogy is imperfect. There must have been some other cause than uniform shrinkage to develop the actual mountain folds.

Let us glance back over the early history of the earth. They tell us it once revolved much more rapidly on its axis than at present. It is not difficult to understand why its rotation has been retarded, but we will pass that by. If the rotation has slackened, then the equatorial protuberance has diminished. That is, the equatorial circumference has been shortened more