

other, with an eager, hungry look, most painful to witness. He made us describe, repeatedly, our last glimpse of the unconscious victims, and then, pressing our hands with a vice-cold grip, said, in a dry whisper, —

“Where are they?”

We led him to the door. He went in, and we softly closed it after him. As we went up-stairs to our own room, we heard deep groans of anguish. We knew that his heart could not relieve itself by tears.

My husband read the “prayer for persons in great affliction,” and then we sat silently looking out on the peaceful sea. In the great stillness of the house, we heard the calm wave splash up on the

smiling sands, and watched the silver specks in the distance as they hovered over the blue sea. So soft, so still, it had been the day before, — and where we now saw the placid wave we had seen it then. Yet there had two lives gone out, as suddenly as one quenches a lamp.

Thinking, but not speaking, we waited. The report of a pistol in the house struck us to the heart. I believe we felt sure, both of us, of what it must be. He had loved her so much! And now we were sure, that, in the tension of his grief, reason had given way. When we saw them next, there were three where two had been, in the marble calm of death.

THE FORMATION OF GLACIERS.

THE long summer was over. For ages a tropical climate had prevailed over a great part of the earth, and animals whose home is now beneath the Equator roamed over the world from the far South to the very borders of the Arctic. The gigantic quadrupeds, the Mastodons, Elephants, Tigers, Lions, Hyenas, Bears, whose remains are found in Europe from its southern promontories to the northernmost limits of Siberia and Scandinavia, and in America from the Southern States to Greenland and the Melville Islands, may indeed be said to have possessed the earth in those days. But their reign was over. A sudden intense winter, that was also to last for ages, fell upon our globe; it spread over the very countries where these tropical animals had their homes, and so suddenly did it come upon them that they were embalmed beneath masses of snow and ice, without time even for the decay which follows death. The Elephant whose story was told at length in the preceding article was by no means a solitary specimen; upon further investigation it was found that the disinter-

ment of these large tropical animals in Northern Russia and Asia was no unusual occurrence. Indeed, their frequent discoveries of this kind had given rise among the ignorant inhabitants to the singular superstition already alluded to, that gigantic moles lived under the earth, which crumbled away and turned to dust as soon as they came to the upper air. This tradition, no doubt, arose from the fact, that, when in digging they came upon the bodies of these animals, they often found them perfectly preserved under the frozen ground, but the moment they were exposed to heat and light they decayed and fell to pieces at once. Admiral Wrangel, whose Arctic explorations have been so valuable to science, tells us that the remains of these animals are heaped up in such quantities in certain parts of Siberia that he and his men climbed over ridges and mounds consisting entirely of the bones of Elephants, Rhinoceroses, etc. From these facts it would seem that they roamed over all these northern regions in troops as large and numerous as the Buffalo herds that

wander over our Western prairies now. We are indebted to Russian naturalists, and especially to Rathke, for the most minute investigations of these remains, in which even the texture of the hair, the skin, and flesh has been subjected by him to microscopic examination as accurate as if made upon any living animal.

We have as yet no clue to the source of this great and sudden change of climate. Various suggestions have been made,—among others, that formerly the inclination of the earth's axis was greater, or that a submersion of the continents under water might have produced a decided increase of cold; but none of these explanations are satisfactory, and science has yet to find any cause which accounts for all the phenomena connected with it. It seems, however, unquestionable that since the opening of the Tertiary age a cosmic summer and winter have succeeded each other, during which a Tropical heat and an Arctic cold have alternately prevailed over a great portion of the globe. In the so-called drift (a superficial deposit subsequent to the Tertiaries, of the origin of which I shall speak presently) there are found far to the south of their present abode the remains of animals whose home now is in the Arctic or the coldest parts of the Temperate Zones. Among them are the Musk-Ox, the Reindeer, the Walrus, the Seal, and many kinds of Shells characteristic of the Arctic regions. The northernmost part of Norway and Sweden is at this day the southern limit of the Reindeer in Europe; but their fossil remains are found in large quantities in the drift about the neighborhood of Paris, where their presence would, of course, indicate a climate similar to the one now prevailing in Northern Scandinavia. Side by side with the remains of the Reindeer are found those of the European Marmot, whose present home is in the mountains, about six thousand feet above the level of the sea. The occurrence of these animals in the superficial deposits of the plains of Central Europe, one of which is now confined to the high North, and the

other to mountain-heights, certainly indicates an entire change of climatic conditions since the time of their existence. European Shells now confined to the Northern Ocean are found as fossils in Italy,—showing, that, while the present Arctic climate prevailed in the Temperate Zone, that of the Temperate Zone extended much farther south to the regions we now call sub-tropical. In America there is abundant evidence of the same kind; throughout the recent marine deposits of the Temperate Zone, covering the low lands above tide-water on this continent, are found fossil Shells whose present home is on the shores of Greenland. It is not only in the Northern hemisphere that these remains occur, but in Africa and in South America, wherever there has been an opportunity for investigation, the drift is found to contain the traces of animals whose presence indicates a climate many degrees colder than that now prevailing there.

But these organic remains are not the only evidence of the geological winter. There are a number of phenomena indicating that during this period two vast caps of ice stretched from the Northern pole southward and from the Southern pole northward, extending in each case far toward the Equator,—and that ice-fields, such as now spread over the Arctic, covered a great part of the Temperate Zones, while the line of perpetual ice and snow in the tropical mountain-ranges descended far below its present limits. As the explanation of these facts has been drawn from the study of glacial action, I shall devote this and subsequent articles to some account of glaciers and of the phenomena connected with them.

The first essential condition for the formation of glaciers in mountain-ranges is the shape of their valleys. Glaciers are by no means in proportion to the height and extent of mountains. There are many mountain-chains as high or higher than the Alps, which can boast of but few and small glaciers, if, indeed, they have any. In the Andes, the Rocky Mountains, the Pyrenees, the