

elephant and hippopotamus of Africa and Asia. The isle of bones has served as a quarry of this valuable material for export to China for five hundred years, and it has been exported to Europe for upwards of a hundred. But the supply from these strange mines remains undiminished. What a number of accumulated generations does not this profusion of bones and tusks imply!

It was in Russia that the fossil elephant received the name of mammoth, and its tusks mammoth horns. Pallas asserts that the name originates in the word "mamma," which in the Tartar idiom signifies earth. The Russians of the north believe that these bones proceed from an enormous animal which lived, like the mole, in holes which it dug in the earth. It could not support the light, says the legend, but died when exposed to it. According to other authors, the name proceeds from the Arabic word behemoth, which, in the Book of Job, designates an unknown animal, or from the epithet mehemot, which the Arabs have been accustomed to add to the name of the elephant when of unusual size.

Of all parts of Europe, that in which they are found in greatest numbers is the valley of the Upper Arno. We find there, a perfect cemetery of elephants. There bones were at one time so common in the valley, that the peasantry employed them indiscriminately with stones in constructing walls and houses. Since they have learned their value, however, they reserve them for sale to travellers. It is very strange that the East Indies, one of the two regions which is now the home of the elephant, should be the only country in which its fossil bones have not been discovered. But from the circumstance that the gigantic mammoth inhabited nearly every region of the globe, we are drawn to the conclusion (to which many other inferences lead) that, during the geological period in which these animals lived, the general temperature of the earth was much higher than it is at present.

A noteworthy circumstance is that, in still earlier times, an elevated temperature and a constant humidity do not seem to have been limited to any one part of the globe. The heat seems to have been the same in all latitudes. From the equatorial regions up to Melville Island, in the Arctic Ocean, where, in our days, the frosts are eternal from Spitzbergen to the centre of Africa, the carboniferous flora presents an identity. When we find almost the same fossils at Greenland and in Guinea, when the same species, now extinct, are met with under the same degree of development at the equator and the pole, we cannot but admit that, at this epoch, the temperature of the globe was alike everywhere. What we now call *climate* was, therefore, unknown in geological times. There seems to have been but one climate over the whole globe. It was only at a later period, that is in the tertiary epoch, that, by the progressive cooling of the globe, the cold began to make itself felt at the polar extremities. What, then, was the cause of that uniformity of temperature which we now regard with so much surprise? It proceeded from the excessive heat of the terrestrial sphere. The earth was still so hot in itself, that its innate temperature rendered superfluous and inappreciable the heat which reached it from the sun. M. Figuier makes a comparison between this state of things and the climate of equatorial Africa; but no human being, not the toughest negro, could support such a course of stewing, steaming, and broiling.

Let us now, as a cooling contrast, glance at what geologists called the glacial period, the winter of the ancient world, and which we must consider as the most curious episode, however certain, in the history of the earth. For, although the cold might be explained by plausible hypotheses, the grand puzzle is to know how the earth got warm again. M. Figuier has the courage to admit that no explanation presents itself which can be considered conclusive; adding, that "in science its professors should never be afraid to say, *I do not know*."

At this visitation, the vast countries which extend from Scandinavia to the Mediterranean and the Danube, were overtaken by a severe and sudden loss of their usual genial warmth. The temperature of the glacial regions seized them. If

this cooling still remain an unsolved problem, its effects are perfectly appreciable. The result was the annihilation of organic life in the northern and central parts of Europe. All the water-courses, the rivers and rivulets, the seas and lakes, were frozen. As Agassiz says in his first work on Glaciers, "A vast mantle of ice and snow covered the plains, the plateaus, and the seas. All the sources were dried up: the rivers ceased to flow. To the motions of a numerous and animated creation the silence of death must have succeeded. Great numbers of animals perished from cold. The elephant and rhinoceros were killed by thousands in the bosom of their grazing grounds, and were thus effaced from the list of living creatures. Other animals also were overwhelmed, but their race did not entirely perish."

To attain a full and clear belief that such things really did occur, it is necessary to visit, at least in idea, a country where glaciers still exist. We shall then discover that the glaciers of Switzerland and Savoy have not always been confined to their presents limits, and that they are only miniature resemblances of the gigantic glaciers of other times. And (Professor Tyndall informs us) not in Switzerland alone—not alone in proximity with existing glaciers—are the well-known vestiges of ancient ice discernible; on the hills of Cumberland they are almost as clear as among the Alps. Round about Scawfell, the traces of ancient ice appear, both in rounded hog-backed rocks and in blocks perched on eminences; and there are ample facts to show that Borrowdale was once occupied by glacier ice. In North Wales, also, the ancient glaciers have placed their stamp so firmly on the rocks, that the ages which have since elapsed have failed to obliterate even their superficial marks. All round Snowdon these evidences abound. The ground occupied by the Upper Lake of Killarney was entirely covered by the ancient ice, and every island that now emerges from its surface is a glacier-dome. North America is also thus glaciated. But the most notable observation, in connection with this subject, is one recently made by Dr. Hooker during a visit to Syria. He has found that the celebrated cedars of Lebanon grow upon ancient glacier moraines or trunks of broken rock that had fallen on the ice and been carried by it to a lower level.

While stating these facts, the professor suggests the most probable clue to their explanation. To determine the conditions which permitted the formation of those vast masses of ice, the aim of all writers who have treated the subject has been the attainment of *cold*. Some eminent men have thought that the reduction of temperature during the glacier epoch was due to a temporary diminution of solar radiation; others, that, in its motion through space, our system may have traversed regions of low temperature, and that, during its passage through these regions, the ancient glaciers were produced. Others have sought to lower the temperature by a redistribution of land and water. But the fact seems to have been overlooked, that the enormous extension of glaciers in bygone ages demonstrates, just as rigidly, the operation of heat as the action of cold.

Cold alone will not produce glaciers, it must have the fitting object to operate upon; and this object—the aqueous vapour of the air—is the direct product of heat. But by directing our speculations to account for the *high* temperature of the glacial epoch, a complete reversal of some of the above-quoted hypotheses would in all probability ensue. It is perfectly manifest that, by weakening the sun's action, either through a defect of emission or by the steeping of the entire solar system in space of a low temperature, we should be cutting off the glaciers at their source. In a distilling apparatus, if you required to augment the quantity distilled, you would not surely attempt to obtain the low temperature necessary to condensation, by taking the fire from under your boiler; but this is what is done by those philosophers who produce the ancient glaciers by diminishing the sun's heat. It is clear that the thing most needed to produce the glaciers is an *improved condenser*. We cannot afford to

lose an iota of solar action; we need, if anything, more vapour; but we need a condenser so powerful, that this vapour, instead of falling to the earth in liquid showers, shall be so far reduced in temperature as to descend in snow.

It was only after the glacial period, when the earth had resumed its normal temperature, that man was created. Whence came he?

He came—M. Figuier answers—whence the first blade of grass which grew upon the burning rocks of the Silurian seas came, whence came the different races of animals which have from time to time replaced each other upon the globe, gradually rising in the scale of perfection. He emanated from the will of the Author of the worlds which constitute the universe.

We conclude with a few concluding sentences of M. Figuier's Epilogue relative to a problem for which neither induction nor analogy furnishes us with any clue—namely, the perpetuity of our species. Is a man doomed to disappear from the earth one day, as all the races of animals which preceded him, and prepared the way for his coming, have done? Or, may we believe that man, gifted with the attribute of reason, stamped with the divine seal, is to be the last supreme end of creation?

As he has dared to say "I do not know," so here he reverently states "I will not presume to guess." Science cannot pronounce upon these grave questions, which exceed the competence and go beyond the circle of human reasoning.

During the primitive epoch, the mineral kingdom existed alone, the rocks, silent and solitary, were all that was yet formed of the burning earth. During the transition epoch, the vegetable kingdom, newly created, extended itself over the whole globe, which it soon covered from one pole to the other with an uninterrupted mass of verdure. During the secondary and tertiary epochs, the vegetable kingdom and the animal kingdom divided the earth between them. In the quaternary epoch, the *human kingdom* appeared. Is it in the future destinies of our planet to receive yet another lord? And after the four kingdoms which now occupy it, is there to be a *new kingdom* created, which will ever be a mystery to us, but which will differ from man in as great a degree as a man differs from animals, and plants from rocks?

We must be contented with suggesting, without hoping to resolve this formidable problem. This great mystery, according to Pliny's fine expression, "is hidden in the majesty of nature," or, to speak more in the spirit of Christian philosophy, it is hidden in the knowledge of the Almighty Creator of the world, who formed the universe.

## THE AQUAMARINES.

BY J. G\*\*\*, MONTREAL.

### CHAPTER I.

"They met but once, in youth's sweet hour,  
And never since that day  
Hath absence, time, or grief had power  
To chase that dream away." MOORE.

IT was a pleasant afternoon in June, and countless throngs were passing through the busy streets of one of our largest English cities. Men of business, looking hurried and anxious, were posting towards the banks before the hour of closing should arrive. Idle young men were lounging about with canes and eye-glasses, who complimented the pretty nursery-maids with an admiring stare as they passed onwards to the parks with their prattling charges. It was the favourite time of day for shopping, when the ladies appear simultaneously, as if by some preconcerted signal, to wile away the hour which else might hang heavily on their hands, in an occupation which possesses a charm to the female mind, quite incomprehensible to the more obtuse intellects of the lords of creation. Doubtless, many among that moving mass possessed histories replete with interest, were they only made known—from the little pale-faced urchin, with premature care and sagacity painfully legible in his countenance, who was peering with longing eyes at the unattainable luxuries within the confectioner's window, to the wealthy occupant of