

## TEACHINGS OF GEOLOGY.

"The progressive improvement which the state of the globe seems to have undergone in past ages, and is now undergoing, presents the plans of the Deity to our contemplation in an interesting light. In the earliest condition of the earth, the soils on its surface must have been meagre, and scarcely adapted to the support of vegetable life. But the processes of degradation, that have always been going on, and the accumulation of animal and vegetable matter, must improve their quality, and increase their quantity. It appears too that there has been a constant increase of limestone since the stratified rocks began to be deposited. Now the calcareous are the richest of all soils, and the most prolific in vegetation. From this cause, then, we see progressive fertility produced. Accordingly, there are some reasons for supposing that each successive creation of animals and vegetables has been more numerous than the one that preceded it; and we know that there has been a progression in the complication and curious structure of their natures.

"These facts teach us that the same admirable adaptation of the different parts and processes of nature, which we observe in the present creation, has always been prominent in every previous condition of the globe, indicating the unerring and ceaseless exercise of the same infinite wisdom in all ages. We see, secondly, in these facts, evidence that the plans of the Deity have always been devised with such admirable skill, that from apparent evil real good is always produced in the end. At first view we cannot but regard the tremendous revolutions which the earth appears to have undergone with painful emotions, and as evidence either of penal inflictions, or of a defect of contrivance on the part of the Creator. But here we learn that every revolution of this kind is improvement, and that its object was to fit the world for more numerous and perfect beings. This view of the subject changes the painful aspect of these revolutions into displays of benevolence, and defect of skill and contrivance into a demonstration of infinite wisdom.

"Upon the whole, however, geology gives the greatest expansion to our views of the plans of the Deity, by furnishing us with a clue to one of the grand conservative and controlling principles of the universe. But two of these principles have yet been discovered. Newton developed the great mechanical power by which the universe is sustained, when he unfolded and demonstrated his theory of gravitation. The other, the chemical power—the second right hand of the Creator—it was reserved for geology to bring to light. A third, perhaps, the electrical power, may yet be disclosed by some future Newton. Gravitation binds the universe together, and controls the movements of its larger masses. But were no chemistry at work in these masses, to transmute their elements into successive forms of beauty and life, it would be literally the bands of death which gravity would impose. But chemistry is at work unceasingly through all the dominions of nature, and perpetual change is the result. This perpetual change is the great conservative and controlling principle to which we referred. On the surface of the globe, and especially among animals and plants, this constant change, this perpetual increase and diminution, renovation and destruction, have always been most obvious: and it is usually regarded as a defect or penal infliction, rather than a wise and universal law of nature. Especially does diminution and decay affect us with painful emotions. And we would not deny that such may be the circumstances under which these changes occur, as to make them real penal inflictions. Indeed, natural theology cannot but regard in this light the diseases and dissolution to which man is subject. Still geology in connexion with astronomy shows us that perpetual change of form and condition is a universal law of nature; that it is not limited to the organized creation, but extends an equal dominion over suns and planets.

"We see it, in the first place, in the geological history of our globe. There is an increasing agency at work all around us to wear down the mountains, and to fill up the valleys; we see the evidence of powerful diluvial action in comparatively modern times, in the accumulation of detritus; and in the grooves and furrows which the surfaces of rocks exhibit. As we descend into the solid strata, we meet with perpetual proof, in the chemical and mechanical characters of the rocks, and in their organic remains, that a multitude of changes have been going on during their deposition: or rather that there has been unceasing change.

"At this point geology connects itself with astronomy, and the two sciences are made to reflect mutual light upon each other. Astronomy discloses to us certain facts in respect to other worlds, that lead the geologist strongly to suspect, that they too are undergoing those changes and that progressive improvement which the earth has experienced. The comets appear to be in the very earliest stages of these transmutations. They appear to be even in a gaseous condition, through excessive internal heat; and are not yet brought into such a state that any animal or vegetable natures with which we are acquainted could inhabit them; though the remarkable history of the extinct cometary beings of our own globe, should lead us not to be very confident on this point. To become the first resi-

dence of such natures as ours, by the operation of natural laws, will surely require periods of almost incalculable length. Still further removed from the condition of our globe appears to be that of the nebulae; consisting apparently of the wonderful materials out of which comets might be formed: though here, too, uncertain conjecture is our only guide. But the point which we wish to be borne in mind is, that these bodies, as well as the comets, seem to be in a condition analogous to what the records of geology lead us to conjecture might have been the state of our globe at some period of the immense past. The moon, we may reasonably conjecture, seems to be so far redeemed from the excessive violence of volcanic agency, as to be adapted, perhaps, to the natures of some organized beings; though it is doubtful whether that globe has such an element as water, or any atmosphere, upon its surface. This fact, however, by no means militates against the idea that it may contain living beings. For to infer that water and air are essential to all organized existence, because such is the case on this globe, would be the conclusion of a narrow-minded philosophy. Jupiter, on the other hand, it would seem, may be covered as yet with one shoreless ocean; and there perhaps such leviathans may now be playing as once sported in the earlier seas of our globe.

"Such are the motions and orbits of the asteroids of the solar system, that ingenious men have been led to conjecture that they once constituted a single planet between Mars and Jupiter, which was burst asunder by some internal force. And if such a process of refrigeration has taken place in other planets as in our own, might we not admit, that, under possible circumstances, such a terrific disruption might have taken place? and that, too, in exact accordance with the most wise and benevolent plans of the Deity?

"Those solid meteors that sometimes fall to the earth appear to have been in a state of fusion: and, indeed, they are usually intensely heated when they descend. May we not regard these facts, too, as perfectly consonant with the idea that all the bodies of the universe are undergoing important changes by powerful agents, not the least of which is heat?

"Is it not most natural and philosophical to regard the sun as an immense globe of heated matter, constantly radiating heat into space, and therefore gradually cooling? And what are the spots on its surface, but the incipient crust? And what is the zodiacal light, but elastic vapours, driven by heat from the sun's surface, and made to assume an oblate and almost lenticular form?

"Shall we regard those fixed stars that have in passages disappeared from the heavens, and those which now shine only periodically, as evidence of disorder and ruin among the works of God? Rather let the analogies at which we have hinted lead us to view them as worlds in particular stages of those mighty changes to which we have reason to believe the universe is subject, and without which all would be stagnation and death.

"We acknowledge that these astronomical facts afford us but faint glimpses of the geology of other worlds. Nevertheless, they seem to us to lead the mind that is conversant with the geological history of our globe irresistibly to the conclusions, that similar causes are in operation, and similar changes are in progress, in other worlds; and that perpetual change is not an anomaly peculiar to our planet, but the very essence of a vast system embracing the wide universe.

"Faint as the light that is yet thrown upon this subject, yet what an immense field for contemplation does it disclose to our view! And how do the plans of the Infinite Mind enlarge and ramify as we gaze upon them until we see them connecting past eternity with that which is to come; the two extremities being lost in the dimness of distance! God is here exhibited to us as employing the same matter, under successive forms, for a great variety of different purposes; all, however, connected into one vast system; and all bearing upon the happiness of animated nature?"—*Dr. Hitchcock.*

## CURIOSITIES IN THE ARTS.

Petrus Ramus tells us of a wooden eagle and an iron fly, made by Regiomontanus, a famous mathematician of Nuremberg, whereof the first flew forth out of the city, aloft in the air, met the Emperor Maximilian a good way off, coming towards it; and, having saluted him, returned again waiting on him to the city gates. The second, at a feast, whereto he had invited his familiar friends, flew forth from his hand, and, taking a round, returned thither again, to the great astonishment of the beholders; both of which the excellent pen of the noble Du Bartas rarely expressed.

In the twentieth year of Queen Elizabeth, Mark Scalliot, a blacksmith, made a lock consisting of eleven pieces of iron, steel, and brass, all which, together with a pipe key to it, weighed but one grain of gold. He also made a chain of gold, consisting of forty-three links, whereto having fastened the lock and key before mentioned, he put the chain about a flea's neck, which drew them all with ease. All these together, lock and key, chain and flea, being weighed, the weight of them was but one grain and a half.

Inyrmacidea was also excellent in that kind of workmanship. He wrought, out of ivory, a carriage, with four wheels, and as many horses, in so small a compass that a fly might cover them all with her wings. The same man made a ship, with all her tackling to it, so small that a bee might hide it with her wings.

Oswaldus Norhingerus, the most excellent artisan of this or any former ages, made sixteen hundred dishes of turned ivory, all perfect and complete in every part, yet so small, thin, and slender, that all of them were included at once in a cup turned out of a pepper-corn of the common bigness. Johannes Carolus Shad, of Mittelbrach, carried this wonderful work with him to Rome, showed it to Pope Paul the Fifth, who saw and counted them by the help of a pair of spectacles; they were so little to be almost invisible to the eye. He then gave liberty to as many as would see them, amongst whom were Gaspar Scioppius, and Johannes Faber, of Bamberg, physician in Rome.

FREAKS OF A RAVEN.—There was a raven kept a few years ago at Newhaven, at an inn on the road between Buxton and Ashbourn. This bird had been taught to call the poultry, and, like the parrot of Paraguay, could do very well too. One day—the table being set out for the coach passengers' dinner—the cloth was laid, with knives and forks, spoons, mats, and bread, and in the state it was left for some time, the room door being shut, though the window was open. The raven had watched the operation very quietly, and, as we may suppose, with a strong ambition to do the like. When the coach was just arriving the dinner was carried in—but behold! the whole paraphernalia of the dinner-table had vanished—silver spoons, knives, forks, all gone! But what was the surprise and amusement to see through the open window upon a heap of rubbish in the yard, the whole array very carefully set out, and the raven performing the honours of the table to a numerous company of poultry which he had summoned about him, and was very consequentially regaling with bread.

## THE PEARL.

HALIFAX, SATURDAY, JUNE 10, 1837.

THE THUNDER STORM.—Reader, hast thou ever witnessed a storm at sea? If so there is no need to tell thee that it is a very different affair from any land-storm however grand and terrific. On terra firma the lightning may blaze with a ghastly, blinding splendour, and the thunder explode with a horrible crash, but you have not the earthly glare of the one, or the deep, fathomless sound of the other, as on the broad and heaving surface of the great waters. The screaming of birds and the howling of beasts may echo disuasally from the mountain steeps, but you are not dinned with the tremendous roar of the angry ocean mingling with the dreadful blast of the skies. With invincible patience do the hills and valleys, the plains and fields bear the fury of the tempest; but the ocean, not so tame and submissive, maddens with rage—lashed into foam, the waves leap up to war with the battling heavens—above you cloud contends with cloud—beneath you billow bourn on billow. At fearful intervals, floods of flame may leap up the black expanse, and bursts of horrid sounds assault you with their hideous noise, still in the climax of the storm, the solidity of the ground on which you tread spires you with confidence and fills you with hope; but on the briny deep, even this consolation is denied you—demon of the air flaps his glittering wings and pours his fiery phials on your head, whilst at your lettering the greedy sea opens her monstrous jaws to devour you.

In the days of our childhood we took a strange delight in the perusal of the sublime descriptions which our poets afford of the terror and grandeur of the storm—and whatizing upon the feeble essay of the painter to spread out canvass all the majesty of the tempest, our attention was ever deeply excited and our spirits filled with awe. To converse with the thunder, play with the lightning, call the winds and dance on the waves, gave us a kind of satisfaction not to be expressed in words. Foolishly wishing to see in vivid reality what we had so often read in poetry and beheld in painting, in the year 1830 we sailed to the land of our fathers, and committed ourselves to the billowy bosom of the great deep. The common currencies of a sea voyage transpired during the days of our passage, but on the 25th of September the winds awoke from their slumber, the waves answered