

cone-bearing trees, carried down some river to the sea, where becoming water-logged, perhaps, they sank to be envelope by the limestone forming below. Towards the close of this age, the evidences are more determinate, no longer mere fragments of wood, denuded of bark and rudely chafed by the tossings on the water, but now branches of trees with bark preserved and even the leaves with all their strike intact, so perfect as to admit of description.

Resting upon those of the Devonian, the Age of Fishes, we find the strata of the Carboniferous Age, the age of coal, of all ages the most important to man in its economic bearings. Here are our alternations numerous, sandstone, shale, coal and limestone, an ever-varying round, a complex puzzle, ever surprising the student with some new wonder. Here laid up for man's use are the coal and iron, the results of the labors of the plant-world for many ages, interstratified with shales and sandstones, the wash of the ocean shore, and limestones the burial place of countless myriads of corals and sea-shells. Formed in marshes of vast extent and lining the sea-shore, the coal and its accompanying shales show no storm-tossed fragments of wood, finding here an accidental resting place. Here we find the primeval forests, standing as they grew, roots and trunks, while in, and directly above the coal we often see the impression of their leaves, with those of humble ferns, all preserved as though they had been formed but yesterday, the fineness and perfection of their lines rivalling the most beautiful specimens of modern plants in our herbaria. Words cannot describe the matchless beauty of the roof as exposed by the removal of the coal beneath, where, in endless confusion, these impressions are spread out. Well have geologists called this the age of land-plants, for then, even in our latitude, the forests must have been as dense as similar low marshy regions of the torrid zone to-day. In the sea swarmed gigantic sharks, while mollusks, corals and stone-lilies still contributed to the richness of the fauna.

Next comes the Age of Reptiles. In the Devonian and Carboniferous seas fishes were supreme, but now the Reptiles. In the air the Pterodactyl, a flying dragon, with four feet spread of wings, flattered in the stead of birds, on the land were gigantic lizards seventy feet long, in the shallow waters the Plesiosaurus, with its large crane-like neck, lurked in the sea-weed, while farther from the shore, the huge Ichthyosaurus, or fish-like reptile, scoured the sea for its prey. Strange animals these, descriptions of which "seem more like the dreams of fiction and romance, than the sober results of calm and deliberate investigation." Yet to any who will examine the evidence upon which our conclusions rest, no more doubt can remain that these once lived than can exist respecting the former life of the mummied men, apes and crocodiles now found in the catacombs of Egypt. During this age we have fishes still, corals, stone-lilies, mollusks and horse-shoe crabs, yet all inferior to the reptiles which now attain their maximum, and are henceforward to dwindle. On land we find a new feature, plants like those of our own time, but strangely mingled with others unrepresented to-day. Yet birds are almost wanting, and the mammalia are represented only by small insect-eaters.

Following this comes the Age of Mammals. Faintly foreshadowed by the little insect-eater, this age bursts upon us with all the grandeur of a new creation, without gradual evolution as in its predecessors. In the Bad Lands of our West, in the Gypsum quarries of Paris, in the Sivalik hills of India, we find the remains of huge-mammals, which once swarmed over the surface of the globe, but which now, like the Great Auk of our northern seas, have forever disappeared, leaving behind them no descendants. During this age lions, tigers, elephants and hyenas of extinct species peopled the British Isles, associated with extinct species of rhinoceros and hippopotamus. In the Missouri country strange carnivorous animals allied to the hyena, dog and panther were associated with the rhinoceros, horse, deer and tapir-like animals. The elephant reached even to the borders of the great lakes, while the gigantic mastodon roamed over all our land east of the Mississippi. In the sea whales, seals, dolphins and the walrus lived. On the land birds were numerous, and the forests in which they sported wear a very familiar look. There were oaks, chestnuts, poplars, willows, tulip-trees and nearly all our common species. The lower orders of marine life are like our own. In the early epochs no species are identical with those now existing, but later on we find twenty per cent., and at the close ninety per cent. of the shells undistinguishable from species of our own day.

Last of all the ages comes that for which all the others were preparatory—Man appears upon the earth. Now we find mammals, birds, reptiles and fishes. We have the articulates, the mollusks, and the corals, with their related sea-urchins and star-fishes; but as each grade in its turn gave way to one higher, so now do they all give way to man, for whose benefit they have been created.

Of these seven ages the first four are fully represented in the Appalachian Zone, and in the troughs bordering it on the east we see the earlier epochs of the fifth. It is evident that the great revolution forming this zone ended during the Carboniferous Age. The relative position of the rocks belonging to the Reptilian Age, and found in troughs along the eastern border, shows that they were deposited after the mountains in this vicinity had assumed their folded condition. To determine the time when this revolution began is attended with some difficulty. The Blue Ridge contains few strata younger than those belonging to the Eozoic Age, while in the other belts we find all the ages represented from the Eozoic to the Carboniferous inclusive. It would seem reasonable, therefore, to suppose that the operations producing the Blue Ridge took place at a much earlier date than those causing the other belts, or else that in the neighbourhood of the Blue Ridge there was dry land from the Eozoic time till now. It is probable, however, that the whole Appalachian Zone is marked by the results of successive operations, and that the older mountains, those first formed, are in the south-eastern division.

The importance to us of the Appalachian uplifts can hardly be over-estimated. They have given birth to innumerable streams, which, cutting out the mountain sides and transporting the material thus set free, have found the alluvial plains of the Atlantic border and the Ohio valley, while uniting they afford broad highways for commerce. The waves of the strata have brought to the surface many beds of coal and iron, which otherwise would have been buried so deeply that man could not have discovered them, or had he discovered could not have worked. Iron beds, well exposed and accessible in the Alleghany Mountains, lie eight thousand feet below the surface in the Ohio valley at the Kanawha River. At the same time many strata were changed in structure; bituminous coal became anthracite, coarse layers of limestone were converted into statuary marble, and the crude carbonates of iron were reduced to oxyds. It was only part of a far-reaching plan, in whose slow development the Creator looked forward to the introduction of man and prepared all things for his coming.

### THE CASTLE BONCOURT.

FROM THE GERMAN OF CHAMISSO. TRANSLATED AND RENDRED INTO VERSE BY PROF. J. R. JACQUES, A. M.

[The Poem is a touching reminiscence of the castle from which the author had been driven in youth by the furies of the French revolution. The castle was destroyed and its site became a plowed field.]

I dream myself back to my childhood,  
While trembles my snowy-white head.  
How ye follow me ever, ye fair forms,  
That long I had thought to be dead!

Towering high from the shady enclosure,  
The Castle now gleams all immortal.  
I know the old ramparts and towers,  
The old bridge of stone and the portal.

From the gateway the lion's heraldic  
Looks on me with love as of yore,  
I greet the dear friends of the old-time,  
And haste to the court-yard once more.

There lies the sphynx by the fountain,  
And yonder old fig treee is green.  
Within yonder windows, in childhood,  
The dream that I dreamed first was seen.

I enter the church of the Castle,  
And seek for my ancestor's grave.  
There it is! There hangs on the pillar  
The armor once worn by the brave.

Not yet can my tear-bedimmed eyes  
Read the lines of the record aright,  
Though thereon through the window panes spangled,  
Falls in fullness the brilliant light.

Thou standest, O home of my fathers,  
True and firm in my heart, e'er abiding,  
Although thou hast vanished from earth,—  
O'er thy soil the plow they are guiding.

But myself I must now tear away,  
And carry my harp in my hand,—  
The realms of the earth to rove over,  
And sing over many a land.