

question arises, How has this large number of kinds come into existence? Were they all created suddenly at some special time, or did the animal forms gradually go through a form of development, being modified descendants of some pre-existing simple primitive form?

The discussion of this question has led to the advancement of two theories, one known as the "special creation theory," and the other as the "development theory." It is with the latter theory we propose to deal in writing the "history of the horse."

The horse, according to the "creation theory," descended from one pair of horses originally specially created; but, according to the "development theory," the horse passed through several transitional forms before attaining the form familiar to us.

According to Professor O. C. Marsh, there are to be found among the fossils of Wyoming, the Upper Missouri region, the Rocky Mountain region and Oregon, a series of not less than thirteen transitional forms. The first form is known as the *Eohippus*, which was a little animal about the size of a fox, and having four usable toes with the rudiment of a fifth on the fore feet, and three on the hind feet; this was at the beginning of the Mammalian Age. The next form of horse was the *Mesohippus*, having three useful toes and one rudimentary toe on the fore foot, the middle toe being the longest. In the latter part of the Mammalian Age there was another genus of horse, the *Hipparion*, with three toes on the front foot, but the middle toe only was useful, the two toes outside not touching the ground; still another genus, *Pliohippus*, had only one toe on each foot, the middle, while the two outside toes are rudimentary.

The modern horse has on each foot but one toe, the third; two other toes are represented by rudiments in the shape of two slender bones, one on each side of the large toe, or foot, known as the "splint bones," and are clearly an evidence that the horse, at some former time, possessed more toes than the horse at the present day.

But the modification is not shown in the structure of the feet alone, but also in the gain in size, lengthening of the neck, and in the form of the skull; thus it has been proven, approximately, that the modern horse has attained its present characteristics through a process of development from a much simpler form of animal life.

EMMA B. REYNOLDS.

HOW WATER CHANGES THE SURFACE OF THE EARTH.

CORA M. POAGE.

As we look around over the fair face of Nature, we think with Jacob, of the "everlasting hills." But are they everlasting? In their perfect repose they seem to us the most unchangeable things in existence. Has the surface of this beautiful earth remained the same from the beginning until now? Let us investigate some of the various agencies which have so long been at work on the earth, and see if we can come to any conclusions in regard to the matter.

One of the most common, as well as one of the most powerful agents continually at work, is water in its various forms. Though water is something which we use every day, and without which we cannot exist, we seldom think about the immense amount of work it has accomplished.

After a rain-storm, let us go out to the roadside, and look around us. Here is a little stream trickling down a slight incline, here another, and here another, each with a number of little tributaries, all finally coming together and forming one stream, which empties into some depression and forms a puddle. If we look carefully, we may find another set of streams flowing from the other side of the incline into another puddle. Are not these comparable in every respect to river systems? Here is the water-shed between the two systems, each system drains a miniature river basin, and the water at last reaches the sea, here represented by the puddles. These little streams are doing work. The water is muddy. It is taking away the soil from the higher ground, and carrying it to the lower. The faster the water flows, the more soil it carries with it. Look carefully at this place after the stream and puddle have dried up. In the depressions where the puddles have been, we find a deposit of very fine matter over the surface, and below this a layer of coarser matter. A similar deposit is made in the lower part of the stream, where it did not flow so rapidly, but here the deposit is of the coarser materials. The water seems to deposit the material carried along in layers. Try a simple experiment to illustrate this. Take a glassful of water and stir up in it a handful of gravel, sand, and fine soil. The gravel falls to the bottom immediately, the sand in a short time, but it is some hours before the fine material is deposited. The deposit is arranged in distinctively defined layers, the coarsest at the bottom.