SCIENCE.

The Variation of Animals and Plants under Domestication. By Charles Darwin, M.A., F.R.S. Second Edition, revised. (London: John Murray, 1876.)

THE origin and history of our domestic animals and plants is assuredly not the least interesting department of natural history. The dog was, in all probability, the first animal which was domesticated by man; and even in very early times there were already distinct varieties. On an Assyrian monument, probably belonging to the seventh century before Christ, a large mastiff is represented, and on Egyptian monuments, from the fourth to the twelfth dynasties—that is, from about 3400 B.C. to 2100 B.C.

—several kinds of dogs are figured. A form allied to the greyhound is most frequent, but others also occur, including one with short and crooked legs, very like the recent turnspit. From the remarkable similarity between the domestic dogs of various countries and the wild species still inhabiting the same localities, Mr. Darwin is of opinion that the balance of evidence is strongly in favour of the multiple origin of our domestic dogs.

As regards the horse, Mr. Darwin considers all the existing races to be probably derived from a single dun-coloured, more or less striped, primitive stock, which probably inhabited a region annually covered with snow, as is indicated by the instinct, still retained, of scraping it away to get at the herbage underneath.

The common ass is, there can be little doubt, descended from the *Asinus Taeniopus* of Abyssinia. Its original desert origin is even now shown in its strong dislike to crossing the smallest stream of water, and in its pleasure in rolling in the dust.

The pig has been shown by Nathusius to be divisible into two great groups, one of which resembles, in all important respects, and is no doubt descended from, the common wild boar, *Sus scrofa*. The other group, on the contrary, appears to be of Eastern origin, and has been named by Nathusius, *Sus Indica*. Its wild parent form is, however, unknown. Our domestic cattle are also, as has been shown by the researches of Nilsson and Rütimeyer, almost certainly derived from more than one wild form. Following Rütimeyer, Mr. Darwin thinks that these sources are three in number: *Bos primigenius*, from which some of the larger races on the Continent—as the Friesland, &c. —and the Pembroke race in England, are probably derived. According to Prof. Rütimeyer, the Chillingham wild cattle are less altered from the true primigenious type than any other known breed. The second source of our domestic cattle is the *Bos longifrons*, or *brachyceros*, a very distinct species, of small size, having a short body, with fine legs. From this form the Welsh and Highland cattle, as well as some of the Swiss breeds, are probably derived. The third source is the *Bos frontosus* of Nilsson, who regards it as the parent of the mountain cattle in Norway. The sheep also is probably descended from several distinct species; but naturalists are very much divided in opinion as to the number—one bold speculator having even hazarded the opinion that there were originally eleven wild species of sheep in Great Britain alone.

As regards goats, it would appear that all our existing breeds are descended from the *Capra aegagrus* of the mountains of Asia, mingled, perhaps, with the allied *C. Falconeri* of India.

The rock pigeon, *Columba livia*, may be confidently regarded as the parent form of all domesticated pigeons, although the races are now very distinct, and extremely numerous; probably not fewer than 150.

Pigeons were domesticated at a very early period. Representations of them occur on Egyptian monuments of the fifth dynasty, about 3000 B.C., and they are mentioned in the bill of fare of a feast under the previous dynasty. The Romans gave immense prices for them, and Akbar Khan is said to have had no less than 20,000, which he carried about with his Court. So great was, at one time, the passion for pigeon-fancying in Persia, that, according to Tavernier, Christians, not being permitted to keep pigeons, turned, in some cases, Mohammedans, for the purpose of doing so.

The barndoor fowl, though now represented by several very distinct breeds, seems, like the pigeon, to have descended from a single stock, though many fanciers are of a different opinion, and one even denounces his opponents by asking, "Do we not perceive, pervading this view, the spirit of the Deist?"

Of the less important domestic animals I will only refer to the gold fish. Fish with vermilion scales are said to have been first raised in confinement during the Sung dynasty, which commenced A.D. 900, and most of Mr. Darwin's readers will, we think, be surprised to hear that the Chinese have no less than eighty-nine varieties.

It is an interesting fact, and one which, as Mr. Galton showed some years ago, throws much light on the domestication of animals, that the passion for pets, and especially for pretty pets, is by no means confined to the higher races of man, but is, on the contrary, largely developed even among the lowest savages, some of whom, indeed, have even hit upon ingenious devices for improving on nature. Thus, according to Mr. Wallace:—

"The natives of the Amazonian region feed the common green parrot (*Chrysotis festiva*) with the fat of large Siluroid fishes, and the birds thus treated become beautifully variegated with red and yellow feathers. In the Malayan Archipelago the natives of Gilolo alter, in an analogous manner, the colours of another parrot, namely, the *Lorius garrulus* (Linn.), and thus produce the Lori rajah, or King Lory."

The same excellent observer also states that the—

"Indians [of South America] have a curious art by which they change the colours of the feathers of many birds. They pluck out those from the part they wish to paint, and inoculate the fresh wound with the milky secretion from the skin of a small toad. The feathers grow of a brilliant yellow colour, and on being plucked out, it is said, grow again of the same colour without any fresh operation."

After thus dealing with domesticated animals, Mr. Darwin has some very interesting chapters on the vegetable kingdom, in which he treats of the number, parentage, and geographical distribution of cultivated plants, the first steps in cultivation, the ancient history of different varieties, the effect of change in habits and of selection. The history and origin of many of the cultivated plants is lost in the past—although it is remarkable that the earliest known flower-garden in Europe (namely, that at Padua) dates only from the year 1545. Passing on, then, from the consideration of individual species, Mr. Darwin in his subsequent chapters proceeds to deal with inheritance, reversion or atavism; the effects of crossing, and the evil of close interbreeding; the influence of domestication on fertility, and the advantages and disadvantages of changed conditions of life; on hybridism, selection by man, variability, the direct action of external conditions, the laws of variation, and the provisional hypothesis to which he has given the name of Pangenesis, in favour of which he certainly brings forward very strong arguments, and which has, moreover, been strengthened by the considerations so ingeniously urged by Mr. Sorby in the remarkable address which he delivered at the last annual meeting of the Microscopical Society.

In concluding this notice, it may be convenient to mention some of the principal additions and corrections in the present edition, viz.:—

Dr. Burt Wilder's observations on the brains of different breeds of the dog; difference in the number of the lumbar vertebrae in the races or species of the horse; hairy appendages to the throats of goats; movements like those of the tumbler-pigeon, caused by injury to the brain; additional facts with respect to the black-shouldered peacock; Major Hallett's "Pedigree Wheat;" the common radish descended from *Raphanus Raphinistrum*; an abstract of all the cases recently published of graft-hybrids in the potato, together with a general summary on graft-hybridisation; an erroneous statement with respect to the pollen of the date-palm affecting the fruit of the Chamaerops omitted; new cases of the direct action of pollen on the mother plant; Dr. Brown-Séquard on the inherited effects of operations on the guinea-pig; other cases of inherited mutilations; an additional case of reversion due to a cross; inheritance as limited by sex; two varieties of maize which cannot be crossed; some additional facts on the advantages of cross-breeding in animals; discussion on the effects of close interbreeding in the case of man; additional cases of plants sterile with pollen from the same plant; Mr. Sclater on the infertility of animals under confinement; Prof. Jäger on hawks killing light-coloured pigeons; Prof. Weismann on the effects of isolation in the development of species; the direct action of the conditions of life in causing variation; Mr. Romanes on rudimentary parts; some additional cases of correlated variability; on Geoffroy St. Hilaire's law of "soi pour soi." The chapter on Pangenesis has been largely altered and remodelled; but the essential principles remain the same.

Ellen Lubbock.

SCIENCE NOTES.

ASTRONOMY.

The Great Meteors of September, 1875.—In an appendix to the *Astronomical Register*, Capt. Tupman has carefully discussed all the observations of these meteors which he has been able to collect. Of the three remarkable meteors seen last September, that of September 3 was coming to us in the direction of the star *a* Cygni, while those of September 7 and 14 came nearly in the direction of *a* Pegasi. All three appear to have been moving in parabolic orbits, with a relative velocity of something less than twenty miles a second, and Capt. Tupman identifies their paths with those of two well-determined streams of shooting-stars; an important conclusion, as the identity of fireballs with ordinary meteors has been denied by some. It is an interesting fact that the meteors of September 7 and 14 should have been moving in paths so nearly similar, and