

Isidore St. Hilaire, (1805-1861) son of Geoffroy St. Hilaire, advanced the theory that species were limited in their mutability. He claimed that new characters may be produced as a result of two forces:

- (1) The modifying influence of new surroundings,
- (2) The conserving influences of heredity.

Dr. W. C. Wells in 1813 was the first to apply the principle of "The survival of the fittest." He based his theory on the observation that no two individuals are alike and that those which are best fitted to withstand the exigencies of a particular country or locality are most likely to survive. In 1831 Patrick Matthews applied a similar view in a book on naval timber.

THE DARWINIAN THEORY.

It remained with Chas. Darwin (1809-1882), to bring out a well rounded theory attempting to explain the origin of species and varieties. His great work under this name was inspired by an essay by Malthus on "Population" written in 1798. After many years of most thorough work in which he collected an immense amount of evidence he crystallized his views on the subject into a theory known as the "Theory of Natural Selection." In a word this theory implies that favorable variations are preserved while the injurious or inferior variations are rejected. That is to say that in the struggle for existence only the strongest individuals survive while the weaker succumb to the various active forces of nature. This principle assumes that constant variation is going on within the race and that by the gradual accumulation of slight favorable variations new species are formed. Darwin based his theory of natural selection largely upon the results realized by man in artificially selecting from his flocks and herds. He recognized that variation might be induced as follows: (1) By environment. (2) By the use or disuse of parts. (3) By certain inherent forces causing definite variation. (4) By the tendency of variations to become co-related. (5) By reversion. (6) By telegony. Two main classes of variation were recognized, viz.: fluctuating variation and discontinuous variation. Darwin believed that fluctuating variations had been utilized most by the breeder although it is difficult to distinguish between the two. According to Quetelet, Galton and others, these fluctuating variations are grouped around a "mean" in such a way that approximately half are below the mean and half above.

Wagner claims that variation, isolation or selection, and heredity constitute the tripod of organic evolution. In other words, plants are constantly changing in character, and, since like tends to beget like in plants just as in animals, the isolation