

must have been regulated by fixed laws, only a few of which are as yet known to us.

Beyond these general considerations, we have others of a more special character, based on palaeontological facts, which show how imperfect are our attempts as yet to reach the true causes of the introduction of genera and species.

One is the remarkable fixity of the leading types of living beings in geological time. If, instead of framing, like Hæckel, fanciful phylogenies, we take the trouble with Barrande and Caudry, to trace the forms of life through the period of their existence, each along its own line, we shall be greatly struck with this, and especially with the continuous existence of many low types of life through vicissitudes of physical conditions of the most stupendous character, and over a lapse of time scarcely conceivable. What is still more remarkable is that this holds in groups which, within certain limits, are perhaps the most variable of all. In the present world, no creatures are individually more variable than the protozoa; as, for example, the foraminifera and the sponges. Yet these groups are fundamentally the same, from the beginning of the Paleozoic until now, and modern species seem scarcely at all to differ from specimens procured from rocks at least half-way back to the beginning of our geological record. If we suppose that the present sponges and foraminifera are the descendants of those of the Silurian period, we can affirm that in all that vast lapse of time, they have on the whole made little greater change than that which may be observed in variable forms at present. The same remark applies to other low animal forms. In forms somewhat higher and less variable, this is equally noteworthy. The pattern of the venation of the wings of cockroaches, and the structure and form of land snails, gally-worms and decapod crustaceans were all settled in the Carboniferous age, in a way that still remains. So were the foliage and the fructification of club-mosses and ferns. If, at any time, members of these groups branched off, so as to lay the foundation of new species, this must have been a very rare and exceptional occurrence and one demanding even some suspension of the ordinary laws of nature.

Certain recent utterances of eminent scientific men in England and France, are most instructive with reference to the difficulties

which en-
English
bridge,
alternat
"consti
rials an
"evolut
by the
compar
conclud
which h
these a
reprodu
success
of them
or on t
the two
yet beg
tion as
show t
under
evoluti
only th
charac
arisen-
menta
tions
gymn
presen
that t
their
weigh
the n
mals.

At
the
is, "
The
"W
"P