

vidual and the palæontological history of development, etc.; and they ought to have some idea of the deep *mechanical, causal connection* between all these series of phenomena. It is self-evident that a certain degree of general culture, and especially a philosophical education, is requisite; which is, however, unfortunately by many persons in our day, not considered at all necessary. *Without the necessary connection of empirical knowledge and the philosophical understanding of biological phenomena, it is impossible to gain a thorough conviction of the truth of the Theory of Descent.*

Now I ask, in the face of this first preliminary condition for a true understanding of the Theory of Descent, what we are to think of the confused mass of persons who have presumed to pass a written or oral judgment upon it of an adverse character? Most of them are unscientific persons, who either know nothing of the most important phenomena of Biology, or at least possess no idea of their deeper significance. What should we say of an unscientific person who presumed to express an opinion on the cell-theory, without ever having seen cells; or of one who presumed to question the vertebral-theory, without ever having studied comparative anatomy? And yet one may meet with such ridiculous arrogance any day in the history of the biological Theory of Descent. One hears thousands of unscientific and but half-educated persons pass a final judgment upon it, although they know nothing either of botany or of zoology, of comparative anatomy or the theory of tissues, of palæontology or embryology. Hence it happens, as Huxley well says, that most of the writings published against Darwin are not worth the paper upon which they are written.

We might add that there are many naturalists, and even