College of Preceptors.

EVENING MEETING. APRIL 23, 1879.

The Chair having been taken by W. Lawson, Esq., the Rev. George Henslow, M. A., gave a lecture, the substance of which is embodied in the following paper :—

"PHYSIOGRAPHY AS AN EDUCATIONAL SUBJECT."

Physiography as an educational subject may be defined as the Principles of Physical Geography practically applied. The word was adapted (from Mineralogy) by Prof. Huxley to this sense, and in explanation of it he observes :—

"I endeavoured to give, in very broad outlines, a view of the 'place in the nature' of a particular district of England, the basin of the Thames ; and to leave upon the minds of my hearers the impression, that the muddy waters of our metropolitan river, the hills between which it flows and the breezes which blow over it, are not isolated phenomena, to be taken as understood because they are familiar. On the contrary, I endeavoured to show that the application of the plainest and simplest processes of reasoning to any one of these phenomena suffices to show, lying behind it, *a cause*, which again suggests another ; until, step by step, the conviction dawns upon the learner that, to attain to even an elementary conception of what goes on in his parish, he must knw something about the universe ; that the pebble he kicks aside would not he what it is, and where it is, unless a particular chapter of the earth's history, finished untold years ago, had been exactly what it was."*

Hence, while Physical Geography in the old sense chiefly consisted of an enumeration and description of the *facts* of nature, Physiography enters into their causes and interactions, encouraging a personal examination and experience at every step ; so as to lead up finally to a comprehension of the Kosmos itself. Physical Geography pure and simple is often but little more than a collection of the drybones of Natural Science ; Physiography animates them with life. Nevertheless, they are not distinct branches of Natural History, but only differ in degree. In proportion as a teacher imparts facts only, he is communicating if not cramming information into his pupils ; but in proportion as he enters into causes and expounds the *rationale* of things, to the same degree does he teach intelligently, and his subject will be *educationally* valuable and worthy of the name of Physiography.

Sir C. Lyell advised a student to read the "Principles of Geology" first, and his manual of Geology afterwards ; because, in order to comprehend the facts of Geology, it is necessary to be thoroughly familiar with the operations of all the physical forces of nature in their present activity ; so that, by inductive reasoning, the same forces being presumed to have existed throughout all ages of the world, the phenomena of the past can be thus only interpreted by the phenomena of the present.

As Geology is a detailed description of the phenomena of the rocks of the earth, which represent the past history of the world, and as Physical Geography is a detailed description of the existing phenomena of the world ; so Physiography, which is to a large extent identical with the principles of Geology, is the link which binds the two together, and, while expounding the causes now at work, furnishes the *rationale* of the past.

One and a principal value of Physiography is the fact that it deals with the every-day phenomena of nature, and thus constantly appeals to the observing powers. This object should ever ever be in the teacher's mind ; and there will always be found an abundance of phenomena to illustrate its lessons in the neighbourhood of any school. Such, for example, are the effects of running water. Even a rill by the road-side will often beautifully illustrate in miniature all the phenomena of the largest river, producing lilliputian canons or gorges, then wide alluvial plains. It frequently shifts its course, and subdivides as rivers do, and lastly constructs deltas when it reaches a pool. Of course, a real river or a brook will also furnish illustrations on a larger scale of many of the phenomena of running water.

Again, all the phenomena of Meteorology can be easily studied anywhere, the formation and dispersion of clouds of various kinds, of mists and fogs,—their causes to be traced only require patient observation and careful record ; while the recorded experience of practical Meteorologists can be tested and corroborated, or locally qualified, as the case may be.

Again, on taking a general view of the neighbouring country, the contour of its surface, the direction of its river valleys, the character of its soils may all form matters of observation, and the causes of each detail entered into ; so that, with an active-minded teacher, Physiography *ought* to form one of the most attractive subjects of a school curriculum. As each school will have its own neighbourhood for the basis of the teacher's instruction, so the pupils should be made to observe all the physical features of the surrounding country, and then taught to construct their own Physical Map of the Parish. The different heights may be ascertained by an aneroid, and indicated by different colours ; while the distances may be reduced to any convenient scale from the Ordnance Map. The objects for observation in nature are endless ; and to an intelligent teacher hundreds of things will suggest themselves to be utilised for educational purposes, as he may think fit.

Having made these preliminary remarks, I propose illustrating the subject, and showing how Physiography justifies them. Physical Geography will furnish the facts. It is usual to divide the phenomena of the world into three departments—water, land and the atmosphere, while each is again subdivided into several departments. Thus, water may be considered as salt and fresh ; fresh water is again divided into springs, rivers, lakes, glaciers, &c., and each of these treated in detail as more or less isolated phenomena. Physiography perpetually asks of the Physical Geographer :—Why does this occur? what is the cause of that? how do you account for this exceptional case? and so on ; and then, supplying the answers, we gradually link together the different phenomena, and thus see the complicated interactions of the whole.

Suppose the subject be Springs. The teacher would begin by referring to some well-known spring in the neighbourhood, possibly a surface spring, such as that occurring in the superficial gravels of London ; the origin of them being either from rain alone, or by percolation from the river, just as cases in the desert are due to percolation of the Nile, while the subterranean condition of clay below, necessary to retain the water in the water-bearing gravel, must be observed. Then, the corresponding distribution of the dwellings of man may be shewn,—how, until the water companies were established, houses could not be built far north of Russell Square, as the Thames gravel ceases at about that distance ; while, in the country, villages are often

* *Physiography*, by T. H. Huxley, p. vii.