

full grant would be earned, and nothing could be obtained from other subjects. It seemed to him, however, that the passes in reading and writing ought not to be made so difficult, but that three-quarters of the children should pass. No wonder that under those circumstances the Duke of Devonshire's Commission had reported that the present system had "unfortunately narrowed the instruction given in elementary schools, and, together with the lower standard consequently adopted in the training and examination of pupil-teachers, and the curtailment of the syllabus of the training colleges, exercises a prejudicial effect on the education of the country."

As to the question of expense for apparatus, Sir John Lubbock showed that this need be no obstacle; fully recognising that the kind of science to be taught must be no word knowledge, but a practical acquaintance with the actual facts of nature.

Schoolmasters had on more than one occasion said to him that it was impossible for them to teach science, because they had not the funds necessary to purchase apparatus, set up a laboratory, &c. Now, no doubt, much money might be profitably laid out in this way, but it was not necessary to do so. Mr. Tuckwell, who spoke from personal experience, said in a paper read before the British Association in 1871, that "it ought to be more widely known for how very small a sum sufficient apparatus can be obtained to teach natural history and experimental science. A laboratory can be fitted up for twenty boys at a cost of little more than 20*l.*, while each boy's private stock of glass and test solutions need not cost more than 8*s.* per annum. Botanical flower-trays, containing eighteen bottles, may be bought for half-a-crown; electrometers, telescopes, polariscopes, models of pumps, and pulleys, may be made, by a little instruction, by the boys themselves, who will learn in their construction far more of the principles which they involve than could ever be instilled into their minds by the choicest products of the shop."

After quoting the opinions of the late Prof. Faraday, Prof. Henslow, Dr. Hooker, and Prof. Huxley on the importance of early scientific education, Sir John said it was often urged that in science the very methods of teaching were still under discussion. This, however, was an unavoidable incidence of a commencement. It would be remedied by experience, and could be remedied by experience only. Mr. Arnold truly said that "when scientific physics have as recognised a place in public instruction as Latin and Greek, they will be as well taught."

Sir John Lubbock also referred to the miserable pittance which has as yet been allotted to research in science by our Universities; but as we have referred to this point so recently, we need not dwell upon it here. Altogether, we hope that this moderate and wise, but uncompromising address may give one more strong impulse to the already widespread feeling that we cannot with safety delay much longer in giving to science the place which it ought to hold in the educational system of the country.

#### THE NATURAL HISTORY OF SPITZBERGEN AND NOVA ZEMBLA\*

SO much public attention is now directed to the polar regions and their inhabitants, that we do not hesitate to bring before the notice of our readers the important contribution to our knowledge of Spitzbergen and Nova Zembla, recently published by Von Heuglin as

\* "Reisen nach dem Nordpolarmeere in den Jahren 1870 und 1871," von M. Th. von Heuglin. In drei theilen. Dritter Theil: Beiträge zur Fauna, Flora, und Geologie. (Braunschweig, 1874.)

the third part of his "travels" in those countries in 1870 and 1871.

In it will be found a complete *résumé* of the present state of our knowledge of the zoology and botany of those distant and inhospitable regions, and a chapter on what is known of their geology.

The mammals of these northern climes are few in number, consisting chiefly of seals and whales. The terrestrial mammal-fauna comprehends only two species of lemming (*Myodes torquatus* and *M. obensis*): the arctic fox, common fox, and wolf and sea-bear among the carnivores, and a single ruminant—the reindeer—seven species in all. The birds are more numerous, though here again the marine species far predominate, the land-birds being only ten in number out of a total of fifty. Amongst the former we are surprised to see recorded as an accidental visitor the Hoopoe, usually considered as rather an inhabitant of the tropics, but of which a single straggler was captured in Southern Spitzbergen by a merchant-vessel in August 1868. Reptiles are conspicuous only by their absence in Spitzbergen and Nova Zembla, but of fishes thirty species are recorded as having been obtained on various parts of the coast, all belonging to known forms either of the Atlantic or of the waters of Northern Asia.

The invertebrates of Spitzbergen are treated of more concisely by Herr v. Heuglin; but lists are given of the species of the different orders, and many references to previously published papers and works bearing upon this subject are added.

The account of the flora of Spitzbergen is mainly founded on Malmgren's paper, published in 1862, in the Proceedings of the Royal Academy of Sciences of Stockholm, to which, however, additions have since been made by Anderson, Fries, and Nyström. The Phanerogams enumerated are 117, the Cryptogams upwards of fifty. The botany of Nova Zembla and Waigatsch Island is separately treated of. Our knowledge of this subject is based upon the excellent researches of Von Baer and Trautvetter, published at St. Petersburg, and a paper of Blytt's, of Christiania. On these islands 146 Phanerogams and 144 Cryptogams have been discovered. Among the latter a certain number of new species are described in the present work by Prof. Ahle, of Stuttgart.

The geological chapter, which concludes the volume, is based upon the well-known researches of the Swedish naturalists Lovén, Torell, Blomstrand, and Nordenskiöld, who have laboured so long and so diligently upon this subject.

We can recommend Herr v. Heuglin's work as a very convenient handbook for the use of future visitors to the Northern Seas, and of explorers of those newly discovered lands of which we are now hearing so much.

#### HÆCKEL'S DEVELOPMENT OF MAN\*

*Anthropogenie oder Entwicklungsgeschichte des Menschen; gemeinverständliche wissenschaftliche Vorträge, von Ernst Hæckel. (Leipzig: Engelmann, 1874.)*

#### II.

IN tracing the genealogy of our race, Prof. Hæckel, while availing himself of the gradual changes in the fauna of the earth during geological periods, and of the

\* Continued from p. 5.