

hope that an interesting man who lived in a most interesting period may yet find a biographer who will adequately bring him into the light out of the shadow of the giants who were in the earth in those days—Cromwell, Milton, Newton, Spinoza, Boyle—in the midst of whom he moved, and by whose great names his own has hitherto been too much obscured.

HERBERT RIX.

#### THE NATURAL HISTORY OF EAST EQUATORIAL AFRICA.

THE geology of East Equatorial Africa has been recorded in a very general way in the maps of the region published by Mr. Jos. Thomson in his "Through Masai Land," and in the more recent one of Prof. Toula; from these it was known that the area consists of a basal plateau of gneiss and schists, covered by a series of lavas in the interior and marked along the coast by patches of Jurassic rocks. My work therefore lay in the main in the examination of the gneisses and schists with a view to the determination of the method of their formation; also to the study of the volcanic rocks—which range from basalts to quartz trachytes—and of the relations of the old lava plateaus and sheets to the craters of various ages which play such a striking part in the scenery of the district. The most interesting part of the work consisted in the examination of the great "Graben" or valley of subsidence which runs north and south across the district; on the floor and on the sides of this are many old lake deposits now buried by lava flows, while the walls are also marked by terraces formed by the existing lakes when at a higher level than at present, or by old ones that have long since disappeared. In some of these terraces are shells with Nilotic affinities, though the localities are now far from the Nile basin. The collections made from the coast Jurassics will allow the age of these beds to be definitely settled, and the fossils—*Ammonites*, *Lytoceras*, *Belemnites*, &c.—suggest that they are probably Callovian. An interesting addition to the geology of tropical Africa has been the discovery of some Palæozoic shales, more than 130 miles from Mombasa, which have yielded a fairly good fauna, though richer in individuals than species.

The evidence collected proves the existence of a former race of men who used obsidian implements, and who lived in a period long prior to any existing tribes; and also, that the glaciers on Mount Kenia once extended several thousand feet further down the mountain than at present; in fact, a regular sheet or cap glaciation preceded the existing valley glaciation.

Zoologically the district is somewhat barren, and in many parts only animals with great powers of migration or hibernation are to be seen. In some of the country most famous for its game, none can be found, as it was killed off by last year's drought. Cattle disease is responsible for the disappearance of many species; thus, whereas buffalo used to be extremely common, only three were seen; only one herd of giraffes was met with. Zebra and ostriches are abundant in places, while the commonest antelopes seen were the hartebeest, mpalla, and water buck; topi are numerous on the Tana. The sparseness of dense forest, except on the higher parts of the district, accounts for the rarity of monkeys. *Colobus guerazi* was seen at over 9000 feet on Kenia, and some baboons amid the rocks of one of the ridges of the basin of Lake Kibibi. Hyena and a small bush buck range up into the lower Alpine zones on Kenia, while a small rat, Hyrax, and elephants occur in the woods of *Senecio johnstoni* in the upper Alpine zone. Another high record is the occurrence of fresh water crabs (*Telephusa*) in some swamps on Leikipia at the height of about 8000 feet.

The rarity of limestones doubtless helps to the scarce-

ness of mollusca. As is well known, most of the species live on trees, whether in river valleys, such as the Sabaki, or among the forests of Kenia, where some small delicate species are common from 8000 to 10,000 feet.

Botanically also, the country is somewhat barren and monotonous; vast areas are covered by nothing but low, umbrella-shaped acacias. The country may be roughly divided into seven zones. The first includes the coastal plain and river valleys, characterised by the abundance of palms, such as the Dum palm (*Hyphaene thebaica*) and the Borassus palm (*B. flabelliformis*); the former is abundant along the coast and fringes the rivers, being found up the Tana as far as south of Kenia, and up the Sabaki to Tzavo. The Screw palm (*Pandanus*) is rarer, but has a similar range. The salt marshes and lagoons are bordered by the mangrove, while the she-oak, or *Casuarina*, occurs on the ends of exposed promontories on the coast. These have doubtless grown from cones carried by currents from Australia, just as the Krakatão pumice, which now forms banks along the shore, has floated from Malaysia. This zone is succeeded by great sandy steppes covered with mimosa and acacia scrub, with large baobabs, which occur also on the coast. The most typical plants have large and white flowers, a species of *Convolvulus* being the commonest. Aloes, and especially the species known to the Suahili as "nkonge," are abundant. The two next zones are the steppes and woods of the high plateaus; the most striking feature of the former is the high grass, which, when the seeds are ripe and yellow, reminds one of the great cornfields of Dakota.

In places the forests of the plateaus pass upward gradually into those of the flanks of the higher mountains, such as Kenia and Settima. The prevalence of lofty junipers which replace the trees of lower horizons, and the dense jungles of bamboos, with a carpet of *Selaginella* characterise the fifth or bamboo zone.

Above this are the Alpine pasturages. In the lower part there are numerous orchids, *Gladiolus*, &c. With the upper zone there appear species of the "everlasting plants" of the Cape, while the only trees are *Senecio johnstoni*. Beyond this is the zone above the snow line, where except for a few diminutive yellow composites and lichens, we have passed beyond the realms of plant or animal life.

J. W. GREGORY.

#### NOTES.

DR. POTAIN has been elected a member of the Paris Academy of Sciences (Section of Medicine and Surgery), in the place of the late Prof. Charcot.

WE are sorry to learn of the death of Dr. H. H. Ashdown, on October 10, at the age of thirty-four. He was a Fellow of the Royal Society of Edinburgh, and published several memoirs on his physiological investigations.

WE regret to announce that Mr. T. C. Bain, the Government surveyor and geologist at the Cape, died at Rondebosch, Cape Town, on September 28. He was born in 1830, and his father was the engineer of the well-known Mitchell's Pass Road, at Cape Colony. Mr. Bain was appointed irrigation and geological surveyor in 1888. The British (Natural History) and Cape Museums contain a number of geological specimens collected by him, among which may be mentioned the collection of reptilian remains from the lacustrine beds of the Karoo.

A STATE MUSEUM is now in course of formation at Pretoria. Mr. P. Krantz has been appointed a curator, and he has, with an entomological assistant, just started on a collecting expedition, which may probably occupy a space of two years. Their mode of transit is in a large wagon drawn by twenty donkeys, these animals having been chosen as best able to withstand the