

Here is the Hall apparatus on a small scale. It is simply a carbon-lined iron crucible, and a thick stick of carbon. As already mentioned, the crucible is the cathode, the stick of carbon the anode.

As the process takes time to get into full operation, it was commenced some hours ago, and at the rate at which it has been working we should by now have produced several ounces of aluminium. In beginning the process the charge has first to be melted. This is done by bringing the carbon stick into contact with the bottom of the crucible, so as to allow the current to pass from carbon to carbon to develop heat between the electrodes.

The alumina compound, which, when melted, forms the bath, is added, in powder, little by little, and, when sufficient is melted, the carbon stick is raised out of contact with the bottom, and the electrolytic action then commences.

I will now ask Mr. Sample to empty the crucible and let us see the result of the operation, and while he is doing so I take the opportunity of expressing my very sincere thanks for his having so kindly and so successfully carried out this most interesting demonstration of the latest and one of the most important of all the applications of electricity to metallurgical operations.

Here is the result of our experiment. It is not very large certainly, but it is quite enough for our purpose, which is to illustrate the principle of a newly developed electro-metallurgical industry directly derived from discoveries made at the Royal Institution.

MOUNT MILANJI IN NYASSALAND.

HIDDEN in the recesses of one of the recently issued Parliamentary Papers (Africa, No. 5, 1892) will be found a very interesting report on the mountain and district of Milanji, in British Central Africa, by Mr. Alexander Whyte, F.Z.S., one of Mr. Commissioner Johnston's principal assistants in the task of ruling and developing the new British Protectorate of Nyassaland. Mr. Whyte was sent to Milanji by Mr. Johnston in October last, and dates his report from the "Residency, Zomba, British Central Africa," in the month following. Milanji is a large mountain mass in the extreme south-east corner of Nyassaland, drained on the west by the head waters of the Ruu, one of the affluents of the Shiré, and on the east by the Lukuga and other smaller streams, which run into the Indian Ocean north of the Zambesi. It is described by Mr. Whyte as an isolated range of, for the most part, precipitous mountains, the main mass forming a huge natural fortress of weather-worn precipices or very steep rocky ascents, sparsely clothed with vegetation. Many of its gullies and ravines are well wooded, and in some of them fine samples of grand African virgin forest are met with. Mr. Whyte's ascent, on the 20th of October, was made up the south-east face of Milanji, over steep grassy hills and across rocky streams, full of large water-worn granite boulders. Further on precipices were encountered, and it was necessary to clamber up, holding on by tufts of grass, roots, and scrub, after which a wooded gorge was entered, and welcome shade was obtained from the forest trees.

Here an interesting change in the vegetation was at once perceptible, the plants of the lower slope being mostly replaced by other species. These in many cases approached the flowers of temperate climes, such as brambles and well-known forms of *Papilionacea* and *Composita*. Ferns, too, became more numerous, and now and again were encountered perfect fairy dells of mosses, Selaginellas, and balsams, with miniature water-falls showering their life-giving spray on the little verdant glades, while overhead hoary lichens and bright festoons of elegant long-tasselled Lycopods hung from the moss-covered trees. After they had passed through some dense thickets of bamboo, and climbed up an ugly barrier of precipitous cliffs, another hour's ascent, the latter part of which was through a steep grassy glen, brought Mr. Whyte and his companions to the highest ridge of Milanji.

Hence was a splendid view over rolling hills of grassy sward divided by belts of dark-green forest, and the climate was found to be delightfully cool and bracing, with a clear dry atmosphere of about 60° Fahr. Altogether two weeks were spent at three different sites on this high plateau, and good collections of its natural history were made, although rain and mist occasionally interfered with the operations of the naturalists.

The flora of the mountain proved to be of great interest,

being quite distinct from that of the surrounding plains, and even from that of the lower slopes. Tree-ferns were found to attain a great size in the damp, shady forest, and one was measured 30 feet in height and 2 feet in diameter at its base. The display of wild flowers is described as "gorgeous." Creamy-white and yellow helichrysums mingled with purple and blue orchids and irises, and graceful snow-white anemones were all blooming in wild profusion, and rearing their heads from a bed of bright green grassy sward. But the most striking botanical feature of the Plateau of Milanji was the cypresses formerly apparently quite abundant, but now confined to a few of the upper ravines and valleys, where the annual bush-fires, which take place in the dry months of August and September, cannot reach them. In some places hundreds of these giant trees thus destroyed lay prostrate, piled one above another, in every stage of destruction. One of these dead conifers was found to measure 140 feet in length and 5½ feet in diameter at 5 feet from its base. The foliage of this cypress is juniper-like. The timber, of a dull reddish-white colour, is of excellent quality and easily worked. Ripe cones of this fine tree were procured, and, as stated in a subsequent letter, have already germinated in the experimental garden at Zomba.¹

The fauna of the mountain was found to be of nearly equal interest to the flora, but in the short space of time available it was not possible to make so nearly a complete collection. Raptorial birds were very scarce, but Passeres were plentiful. The grassy lands of the summits were tenanted by a small dark brown quail, a pipit, two grass-warblers, and the ubiquitous great-billed raven (*Corvus albicollis*), which, however, was not so numerous as on the plains below. In the adjoining forest bird-life was abundant. Bul-buls, fly-catchers, warblers, finches, and honey-birds joined in chorus in celebrating the springtime and nesting season, which was then in full progress. Altogether about 200 specimens of birds were obtained. Of mammals few were met with. The beasts of prey consisted of the leopard, the spotted hyæna, the serval, and an ichneumon. Examples of three species of *Muridae* were also obtained, and a little antelope, probably of the genus *Neotragus*, was observed, but not procured. A few snakes were likewise met with.

As regards the question of establishing a sanatorium on the Milanji Plateau, to which special attention had been directed, Mr. Whyte has no hesitation in saying that the climate of this district contrasts very favourably with that of some of the hill-stations in India and Ceylon. The year is pretty equally divided between wet and dry months, the former lasting from November till May, while the other six months are stated to be fine, clear, and bracing, the thermometer at night in the months of May, June, and July occasionally falling below the freezing point. In the month of October the air was found to be delightfully pure and balmy. We believe that steps have already been taken to build a small station on Milanji, but to render this of much use it will be necessary to form a road to it from the falls of the Ruu up the Lutshenya valley. This could be made with fairly good gradients, and would be of great advantage as an outlet for the cypress-timber, which now lies useless and decaying in the forest.

We are pleased to be able to add that Mr. Whyte's collections above spoken of, along with others from Mount Zomba, have already reached London, and are in the hands of Mr. Sclater, to whom Mr. Johnston has entrusted the task of getting them worked out and described. Mr. Oldfield Thomas has already commenced to determine the mammals, Captain Shelley will name the birds, and Mr. Boulenger, it is believed, will undertake the examination of the reptiles and batrachians. The plants will be examined in the Botanical Department of the British Museum, in which institution Mr. H. H. Johnston has directed the first set of specimens in every department to be deposited. The zoological results will be published in the "Proceedings" of the Zoological Society of London.

OBSERVATIONS OF THE PLANET MARS.²

I OUGHT to have written to you before on the subject of the planet Mars, which I have been studying for over four months with our great equatorial. My great desire to verify the

¹ Some cones of this supposed "Cypress" have also reached the Botanical Department of the British Museum, and have proved to belong to a Conifer of the genus *Widdringtonia*, probably of a new species. But this point cannot be definitely settled until more perfect specimens of the tree have been received.

² Letter from M. Perrotin to M. Faye, *Comptes rendus*, September 5.