the Col des Ravines Rousses ; we got down a short distance but the rocks were loose and rotten, covered with ice, and it was very cold, so we came up again and went round by the Col des Plines, the ordinary way down.

This ended my climbs for last season ; pleasant days and delightful experiences, the memory of which will always be refreshing to look back upon.

The Volcanoes Bromo and Krakatau : a brief Account of a Visit to them.

By the late Dr. TEMPEST ANDERSON.

FROM Tosari, near Surabaya, in Eastern Java, Dr. Tempest Anderson, who was accompanied by Mr. Leslie Taylor, of Clare College, Cambridge, wrote as follows :

'I have visited the (at present) most active parts of Goentoer (Kawah Kamodjan), Papandajan and Galoengoen (Telega Bodas), and am waiting to go to Penandjaan and Bromo from here on an early day. The mode of procedure in all these has been the same : start two or three hours before daybreak ; ride eight or ten miles in a conveyance of which the English farmer's tax-cart is a roomy, comfortable, and generally improved edition ; meet guides and horses (previously ordered) about daybreak, then ride over mountain paths, often through magnificent tropical jungle, to the foot of the final cone, or sometimes to the crater itself. Except in the case of Papandajan, where the fumes keep down the vegetation, the inside as well as the outside of the craters are covered with impenetrable jungle, which would require a large force of men with hatchets to make a path. For this reason if for no other we did not get to the highest crater of Galoengoen, but we saw a very beautiful crater lake (Telega Bodas), with many bubblings of gas, and the water all milky with sulphur. Dr. Brouwer, of the Geological Survey, collected some specimens there for us, but generally everything is covered with vegetation growing in red clay (weathered tuff), and very occasionally weathered and decomposed lava. Goentoer has a large crater with several craterlets in the bottom, mostly with mud puffs or

hot springs, some large enough to form lakelets, but all smothered in jungle and difficult of examination, or even some of access, in consequence.

'I had hoped great things from Papandajan, having examined it with the binoculars from a distance, as there is an extensive solfatara with active blowholes and deposit of sulphur going on. The guide, however, who knew no civilized language, got a good start of me and before I could stop him poked a pole into the holes to make them roar and thereby spoiled the new formation of sulphur which I hoped to have observed. The clouds generally came up (or down is it ?) about 9 or 10 and drove us down.

'I went on April 23 (Wednesday) to Bromo, which proved the most interesting excursion I have yet made.

'We left the hotel about 3.30 by the light of a moon only two days or so past full, and consequently at its best for the purpose. I had a horse (a very bad one, by the way, which tried to kick me repeatedly while mounting), and Taylor walked. This place is on the slopes of the massif, of which Bromo, Smeroe, and others are the chief summits, and the whole, composed of tuff, weathered in most places into red clay, consists of a series of ridges and deep valleys which remind me strongly of the Soufrière of St. Vincent and Montagne Pelée. The original jungle has unfortunately been cleared, and where replanting has been done the plantations lack the beauty and diversity of the primeval forests. The path wound upwards along the slopes, occasionally crossing a ridge and descending a little till we got to the edge of an old crater like a magnified Somma, or the Canadas of Teneriffe, with the active Bromo and several dormant cones on its floor. A very steep descent took us into the "Sandsea" or plain in the bottom; crossing and winding round the foot of Batok we came to the foot of Bromo, the abode of the god still worshipped by the Tenggerese natives. It is quite devoid of vegetation and strongly reminds me of the Soufrière, and has a crater of which I tried to secure photographs, which, if they come out, might almost pass for some of those I got in 1907, only, instead of the crater lake, there is a very active pit in the bottom of the funnel, out of which enormous volumes of steam etc. escape with a continuous roar and occasional loud explosions, some of which are audible here.' *

Dr. Anderson and Mr. Taylor started from Tanjong-Priok,

* *i.e.* at Tosari.

the port of Batavia, with Dr. Koenigsberger, of Buitenzorg, and Dr. Brouwer, in the steamer *Brak* on May 6 at 10 A.M. They spent the whole day amongst beautiful islands, all covered with vegetation to the water's edge. They enjoyed retrospective views of Salak and Gede, the latter especially striking at and before starting. They arrived at the end of Java before dusk and anchored in a safe bay.

At daylight on May 7 they steamed for the opening between Krakatau and Lang Island, went entirely round Krakatau—the light improving momentarily—and anchored for breakfast-time in front of what Dr. Anderson calls the main section near Schwarte Hook. Dykes were very striking, and the view improved as the day went on. They landed and Dr. Anderson walked to Schwarte Hook with Dr. Koenigsberger. They returned for tiffin, and after tea landed again. They started after dark and arrived at Tanjong-Priok, the port of Batavia, on May 8, about 8 A.M.

Dr. Anderson observed on Krakatau :

'The outer face of the island is evidently thickly covered with ejecta showing characteristic umbrella denudation, completely covered now with returned vegetation.

'The face to the Eastern strait is precipitous—too steep for much vegetation. The main face to the explosion crater fully bears out its reputation. Most of the centre is still bare and shows dykes magnificently. To the west of this is a fine scree reminding one of the Sciara of Stromboli (but not fed by a crater).'

The following account of the terrible eruption of Krakatau in August 1883* is taken, by the kind permission of the author, from Mr. W. Basil Worsfold's book 'A Visit to Java' (London, 1893), and is an actual narrative of the personal experience of the second engineer on the steamship *Governor-General Lowden* given by him to Mr. Worsfold :

'We were anchored off Telokbetong, in Sumatra, when the chief officer and myself observed a dark line out at sea which bore the appearance of a tidal wave. While we were remarking this, the captain (who was just then taking his bath) rushed on to the bridge, and telegraphed to the engine-room to steam slow ahead up to the anchors. I was engaged in carrying out this order when the wave came up to the ship. First she dropped ; then heaved up and down for five minutes. There

* See also for a full description 'The Eruption of Krakatoa' (Report of Krakatoa Committee of the Royal Society, 1888).



Tempest Anderson, photo.

Bromo, from Moneggal Pass,
on edge of Tengger Crater.



Tempest Anderson, photo. Swan Electric Engraving Co. Ltd.

Krakatau, from N.E.

were three waves. When I came on deck again the long pier, which had been crowded with Europeans who had come out of the town (they had experienced a shock of earthquake during the night)—this pier, the houses and offices, had disappeared; in fact the whole town was gone. A Government steamboat lying at anchor (with steam up) in the bay was landed high on the tops of the fallen trees in company with some native boats. That was the first intimation we received that Krakatoa was in eruption, and from that time, eight o'clock, onwards through the day the rumbling thunders never ceased, while the darkness increased to a thick impenetrable covering of smoky vapour. Shortly after this we got under way, and proceeded until the darkness made it impossible to go on further. It was while we were thus enveloped in darkness that the stones and cinders discharged by the mountain began to fall upon the ship. In a short time the canvas awning and the deck were covered with ashes and stones, to the depth of two feet, and all our available men were employed in removing the fallen mass, which would otherwise have sunk the ship. We had a large number of natives on board, and a hundred and sixty European soldiers. The latter worked with the energy of despair at their task of clearing the deck, in spite of the twofold danger of being burnt and stunned by the hot falling stones. While we were engaged in this struggle, and enveloped in the sheer blackness of a veritable hell, a new and terrible danger came upon us. This was the approach of the tidal wave caused by the final eruption, which occurred about 12.30 to 1 P.M. The wave reached us at 2 P.M. or thereabouts, and made the ship tumble like a see-saw. Sometimes she was almost straight on end, at other times she heaved over almost on her beam-ends. We were anchored and steaming up to our anchors as before, and as before we managed to escape destruction. All the passengers and the crew gave themselves up for lost, but there was no panic, and the captain handled the ship splendidly throughout. He received a gold medal from the Government in recognition of his indomitable courage in saving the ship and passengers. Well, you can fancy what it was like when I tell you that the captain was lashed with three ropes alongside the engine-room companion, while I was lashed down below to work the engines. The men were dashed from one side of the engine-room to the other.

'When we reached Angier we found no trace—neither a splinter of wood nor a fraction of stone—of the buildings of

that once flourishing seaport. At Batavia the water was so dense from the floating lava * (the deposit reached fifteen feet in depth) that we made our way to the shore on planks. Telokbetong was closed for three or four months, and on our return to Achin we could not land our passengers. At Batavia the tidal wave had penetrated almost to the town, where, in the lower portion, the houses were flooded by the Kali Bezar (great river). Business was suspended except by a few determined spirits who worked on by gaslight, so great was the alarm at the darkness and thunderous noises.'

The Pointe du Pousset and the Becca Dentavu.

By THE EDITOR.

THE POINTE DU POUSSET.

ON August 11, 1913, we left Cogne at 3.15 A.M. I rode a mule, and Benjamin Pession carried a lantern to show the way. The guide Pierre Gérard, of Cogne, and the owner of the mule accompanied us. The morning was cold, not to say very cold, and the sky was bright with innumerable stars. By and by a clear cold light gave signs that the sun would be with us soon. He came in a fleckless sky, but soon afterwards clouds became visible to the east. Elsewhere nothing but fleeting scarves of vapour and these far apart appeared, and they did nothing to dim the morning's brightness. A cold wind blew at first from Mont Blanc, but later from the east. When I dismounted at 6.5 at the King's Camp at Lauzon the air was still almost arctic.

I made inquiries from Gérard as to whether the King was satisfied with his sport this year, and he replied that the King had never been so pleased before. I fancy the number of bouquetin killed was unprecedented. The beaters received double pay.

The mule dismissed, we went some way along the Lauzon track and then, still on a King's hunting path, turned up towards the Colle della Nera.

The last part of our journey to the colle was up steep rock. I noticed on our way *Campanula Cenisia, Eritrichium nanum,*

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* *i.e.* pumice.