MOUNT RUAPEHU, NEW ZEALAND

By N. E. ODELL

'AETNA! What business has an ascent of Aetna in the chronicle of the doings of the Alpine Club?' So questioned the Rev. J. F. Hardy in 'Peaks, Passes, and Glaciers' (1859) at the commencement of his classic account of an ascent of the eminent European volcano. And similarly, perhaps, might an objector take umbrage at the following record of the ascent of New Zealand's highest volcanic summit of the North Island in lieu of some more worthy peak of the Southern Alps of the South Island. But it should be realised that in this country such umbrage might well be tinged with the traditional prejudice, if not rivalry, as to the superior merits of the features of their respective Islands which is maintained by all good New Zealanders! However, a somewhat cosmopolitan mountaineer and rambler, who is also a scientist, and a geologist at that, must needs sometimes turn his eyes, and his interest, from the high Alps to the less spectacular and very special type of mountain that volcanoes compose in almost all parts of the world: particularly so when the volcano in question has been the cause of a national disaster.

For, as the world heard on Christmas Day, 1953, a railway accident, unprecedented in the history of New Zealand, had occurred the previous evening, when the Wellington–Auckland express, just north of Tangiwai, crashed through the bridge over the Whangaehu River, then a raging torrent, involving a total casualty list of 151 persons. This river has its source in the Whangaehu Glacier[1] which lies high on the south-eastern flank of the crater of Ruapehu. Actually the crater is composite, and consists of an outer rim, enclosing an area of about a mile long from north to south and half-a-mile wide, within which is an inner volcanic cone with a central crater occupied by a lake. The latter is nearly circular and approximately 600 yds. across, whilst permanent fields of névé fill the depression between the inner cone and the outer rim on the north, west, and south, and form ice-cliffs in places along the border of the lake. On the east side of the lake rises a cone of scoriae and ash, culminating in Cinder Peak (Peretini), often called the Pyramid, whose outer slope falls steeply to the Whangaehu Glacier. Ruapehu's highest point, Tahurangi, 9,175 ft., is situated on the crater-rim to the southward, and overlooks the lake. It was during what has been claimed to be the first complete ascent of the mountain in 1879 by George Beetham and Joseph P. Maxwell, of Wellington,

[1] Pronounced Wha-nga-e-hu: *not* 'Wong-gy-hoo' as frequently heard, *vide* Sir Peter Buck, *The Coming of the Maori*, p. 76.

that this crater-lake was discovered, and surprisingly found to be hot.[2] On only two subsequent occasions has it been reported as frozen over; for usually it is warmed by volcanic vapours from below, and at times it steams strongly. Often a sulphurous scum is scattered over its surface, which otherwise is of a milky colour. There is interesting evidence of variation in depth of the crater, and therefore of the depth of the lake, in the recent past. At the time of the great eruption of Ruapehu in 1945, a mass of molten lava rose to form first an island in the lake, and later to occupy the whole floor of the crater. This was subsequently withdrawn, or blown out by explosion, and a pit of about 1,000 ft. resulted, which was eventually filled up with water. In 1950, however, an adventurous party of the N.Z. Canoeing Association ascertained that the greatest depth of the re-formed lake was 264 ft. at the point of principal eruptive activity of 1945, whilst soundings over much of the bottom elsewhere indicated anything from 60 ft. to 130 ft. Since the Tangiwai disaster, further enterprising canoeists, carrying their craft to the top of the mountain, again embarked on the mysterious foaming waters of the crater-lake, and they have recorded approximately the same depths as previously.

It was the bursting of its barrier of scoriae, ash and névé, at the lowest notch in the crater-rim south of the Pyramid, and the sudden outlet of the lake-water, that was the cause of the flooding of the Whangaehu River, with its load of volcanic mud and boulders, which travelled a total distance of 25 miles to Tangiwai. But two points initially were not clear: (1) whether renewed volcanic activity had played any part in causing the sudden collapse of the barrier, and (2) if the latter consisted predominantly of névé and had thus been melted through. It can be said at once that the report of Mr. James Healy, of the N.Z. Geological Survey, before the Board of Inquiry on the Tangiwai disaster (cited briefly in *The Times* of May 11, 1954), stated categorically that there was no evidence of earthquake or volcanic disturbance to bring about the collapse of the lake-barrier, and allow the release of the large body of water that formed the destructive 'lahar,'[3] or mud and boulder flow, in the lower reaches of the Whangaehu River.

Our first attempt in February, 1952, to reach the top of Ruapehu and view the crater-lake, was fraught with disappointment, since my

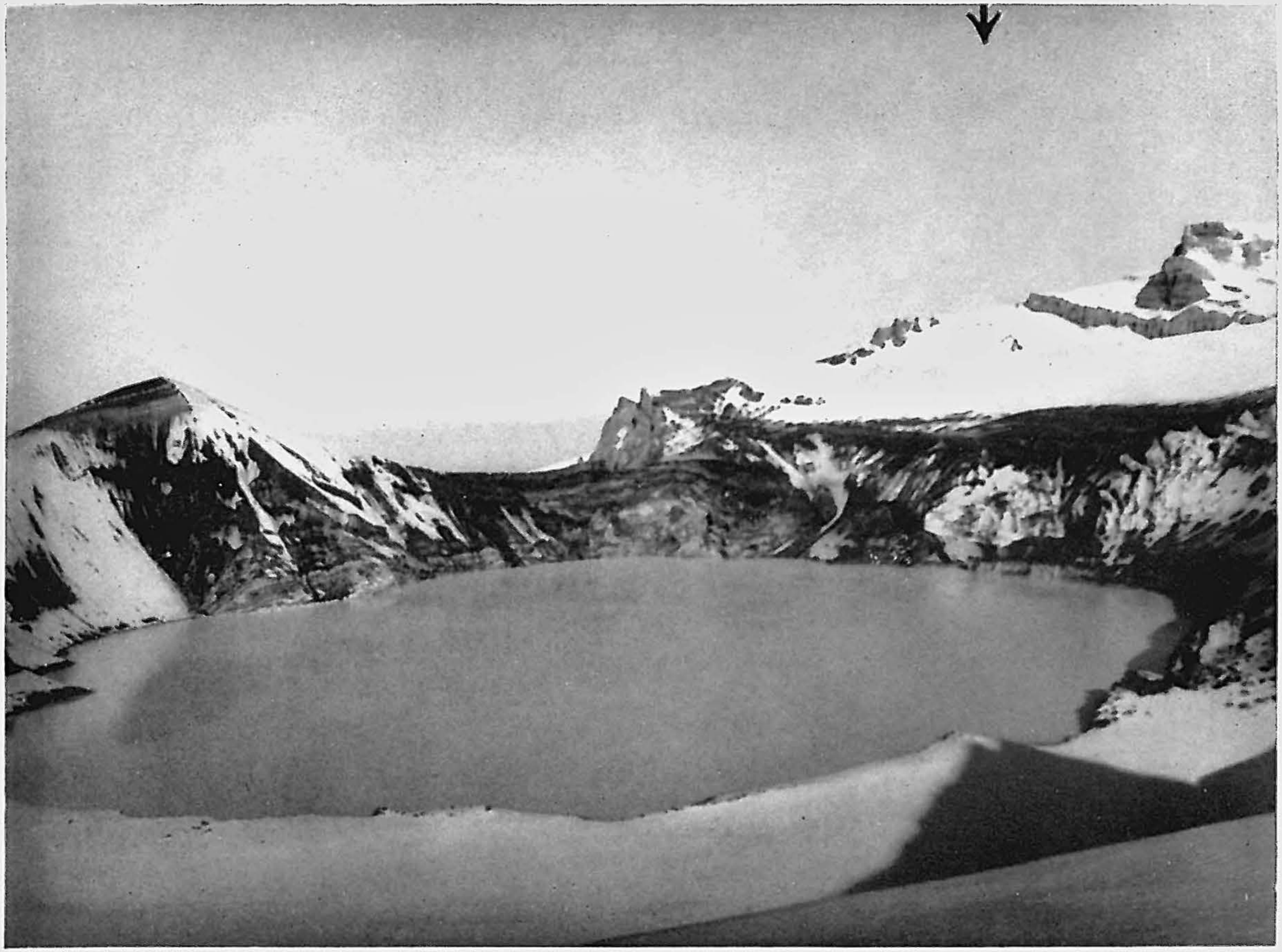
[2] *The First Ascent of Mount Ruapehu, N.Z., and a Holiday Jaunt to Mounts Ruapehu, Tongariro and Ngauruhoe.* George Beetham. Privately printed. London: Harrison & Sons, 1926.

However, the actual first ascent of one or other of the summits of Ruapehu appears to have been made in the late 1850's or early 1860's by Sir George Grey, who initially experienced great difficulties, as had others, on account of the tapu placed on the mountain by the Maories: *vide N.Z. Alpine Journal II.*, 1895, 75.

[3] 'Lahar,' a Javanese term, referring to a torrential mudflow, caused by the bursting of a volcanic crater-lake; or the melting of snow and ice by volcanic heat; or by the action of rain on ash deposited on the steep flanks of volcanoes.

wife and I experienced very bad weather, and on the upper snow-fields, in thick cloud and freezing wind, we were unable to see anything beyond a few yards, fearing eventually to stumble into the lake itself. However, in May last, en route to the Science Congress in Auckland, we turned aside to the Château Hotel in Tongariro National Park, and in perfect weather again made the ascent by the north-north-western side. From the Château, at 3,710 ft., one can motor up to *ca.* 5,100 ft. by the skiers' road, and the remaining 4,000 ft. involves an easy walk, with a minimum of scrambling and the final straightforward slopes of the Whakapapa Glacier. This glacier, incidentally, like others on the mountain, seems to be in a state of slow bulk-shrinkage; but according to Mr. L. O. Krenek, of Wanganui, it has not in recent years shown such evidence of terminal retreat as have the others. As to extant indications of maximum advance of these glaciers during or since the Pleistocene Epoch, polished rocks are to be found not lower than about 6,000 ft. on the northern side of Ruapehu. Moraines are conspicuous by their absence; and only in the case of the Waikato (or Mangatoetoenui) Glacier, on the eastern side of the mountain, are there any clear signs of old moraines, terminal or otherwise, whilst this glacier, I understand, indicates no lower elevation of former glaciation than in the case of the Whakapapa. The compact and massive character of the lavas, varying in composition from hypersthene-andesite to basalt, may be a factor which inhibits rock-fragmentation and the formation of morainic material. But other contributing (negative) factors are no doubt the sluggishness as well as the thinness of these névé, rather than true glacier, masses.

During a perfect morning, when light cloud still lingered in the valleys, we were surprised on the upper glacier to see a magnificent mushroom-like column of smoke, simulating that of an atomic bomb explosion, suddenly arise from the summit of Mt. Ngauruhoe (7,515 ft.), some 10 miles away to the north-east. It was just one event in a succession of gas-explosions and lava-emissions that have been intermittently continuing for many months down to the time of writing (September, 1954) from New Zealand's single active volcano. On reaching the Dome (or Patatua, 8,700 ft.) at the head of the Whakapapa Glacier, we obtained at once a commanding and impressive view of the crater-lake, backed by the highest serrated portion of the crater-rim, which culminates in the peak of Tahurangi. The lake is enclosed by steep banks of snow and scoriae on the northern, eastern and southern sides, whilst cliffs of névé inter-bedded with ash drop some 50 or 60 ft. along its western margin. The water appeared a milky blue, streaked with whitish and pale yellow exudations from its depths, which, in the rich golden lighting of the late afternoon upon its serrated rocky and snowy frame, formed a peculiarly romantic and beautiful scene. The thought struck one that the early Maoris had denied themselves much by placing such a strict tapu on any ascent of the mountain and thereby forbidding access to this lovely and indeed divine scene! Time did not permit of our proceeding beyond the



CRATER LAKE, MT. RUAPEHU, FROM BELOW THE DOME. POINT OF DISCHARGE INTO ICE-TUNNEL BELOW ARROW; PART OF TAHURANGI RIGHT BACKGROUND.

[*To face p.* 110.

Dome on this occasion; so leaving the top at 4.15 we descended in fast time to the car at the head of the road, and were back at the Château by 6.30.

A brilliant day followed, and I decided to make another ascent for the purpose of closer examination of the crater-like outlet, and hoping to reach the highest point, Tahurangi. Travelling solo, in quick time I made my way up by the same glacier route, halting only for occasional observations; and skirting the Dome, proceeded westward and southward along the inner flank of the crater-rim below Paretetaitonga (9,025 ft.) to the Mangaturuturu Glacier. The latter forms an extended shelf of névé to the foot of Tahurangi, and to reach it from the girdle traverse that I had embarked upon, it was necessary to descend several hundred feet of steep and schrund-rent ice-slopes. Fortunately I had provided myself with crampons which greatly reduced the amount of step-cutting necessary, and ere long I had reached the snow-crest of the crater-rim at the north-western foot of Tahurangi. Thence followed some two to three hundred feet of steep ice-draped rocks, and by about 4.10 P.M. I was standing on Ruapehu's culminating point. A truly amazing panorama is commanded from this eminent point: across and beyond the partially shadowed crater-lake below was Ngauruhoe, with its billowing tower of ashy cloud sharply confined at some 6,000 ft. above its summit to a mere fantastic stratum; round westwards to the far horizon one gazed beyond a glowing mist-flecked terrain to the symmetrical cone of Mt. Egmont (8,260 ft.: N.Z.'s 'Fujiyama'), precisely 80¼ miles distant; and then southwards one could identify, some 13 miles off, the site of the calamity at Tangiwai, lying just clear of the mighty cone of purple shadow cast from Ruapehu by the fast-sinking sun. These scenes from a mountain-top at sunset must always be not merely impressive but almost overwhelming: such as to rivet one to the spot in breathless adoration. But I still had a long way to go and some further important observations to make. Dropping down the eastern ridge and ice-slopes towards the Pyramid, I soon found myself on the broken ashy névé in the vicinity of the outlet of the crater-lake. The latter was clearly draining, as for long it has, through a tunnel in this dirt-choked névé, and over a lip of solid lava and/or scoriae; and then after appearing in a chasm formed by a collapse of the névé cover, the water could be seen to take its plunge beneath the main mass of the Whangaehu Glacier. Briefly, it would appear to have been the movement, settlement and crevassing of the mixed névé and ash on the crater-rim at this point that released the waters of the lake which had, for an unknown period, become pent-up above the sill, or lip, of compact lava. Thus, when critical pressure had been exceeded, or progressive melting had proceeded, or both, the dam must have finally given way on Christmas Eve. It is intended, incidentally, to discuss some further details of these matters in an early issue of the *Journal of Glaciology*.

Failing light prevented my lingering; and climbing a long steep snow-slope, now frozen to hard ice, I reached the sharp ridge of the

Pyramid, which rises perhaps 400 ft. above the lake on its eastern side. As I passed along the ashy and snowy crest, the moon was rising, and soon through a clear sky its light afforded all that was necessary for rapid progress. Whilst making my way down the Whakapapa Glacier, its surface sparkling in the moonbeams, I fell to wondering why climbers are so prone to rush early from their summits and thus miss the glories of sunset dissolving into moonlight upon the mountains.