

WRAGGE'S OBSERVATORY

By C. D. V. Heyde

IT is unfortunate that our alpine region is not well served with meteorological stations; the would-be investigator has very little data. The most interesting experiment was that established in 1897 by Clement Wragge (the famous "Inclemency" Wragge) on the very summit of Mount Kosciusko. The following summary of the records of this observatory for 1898 and notes on the experiences of the staff are drawn from writings by Wragge and particularly from his "Report on Mount Kosciusko Observatory and allied stations for 1898" (Queensland Government Printer, 1902), and his "Almanac for 1900". I am indebted to Mr. R. T. Ward for assistance in preparation of the data.

Wragge's Observatory at Mount Kosciusko:

Wragge, who had done meteorological work in Scotland, persuaded the Tasmanian Government to put an observatory on Mount Wellington in June, 1895. In 1897 he was Government Meteorologist for the Colony of Queensland (before Federation, hence before Federal control of meteorology), and obtained the ap-



The Observatory, Spring, 1898.

From "Wragge's Almanac, 1900."

proval of the "then Honourable Minister" (Wragge's own words) of the project of establishing an observatory on the summit of Mount Kosciusko, which project had been discussed at the International Meteorological Conference, held in Paris the previous year, and unanimously approved after its proposal by Wragge. Mount Kosciusko was particularly selected, not only on account of its height, but also because it occupies a position in the track of the most important meteorological disturbances and would yield more revealing records.

Government funds were not forthcoming, and an appeal was made for private subscriptions. £150 from Adelaide enabled operations to commence. The observers were provided with an arctic tent, pyramidal in form, together with arctic sleeping bags of tanned sheepskin. The personnel was: Overseer, Captain Hliff, of Cape Moreton, a retired shipmaster; First Observer, Bernard Ingleby, of Adelaide; Second Observer, B. de Burgh Newth, of Candelo. Wragge led the party to establish the observatory. The party left Brisbane on November 28, 1897, obtained final stores at Jindabyne and left that township on December 2. Detained by bad weather for a day, they reached the summit in the early afternoon of December 4. (The first ski ascent of Kosciusko had been made by



From "Wragge's Almanac, 1900."

Eastern Slopes of Kosciusko, 1898.

Kerry's party in the previous winter. See A.S.Y.B., 1928, p. 43.—Editor.) In the teeth of an easterly gale, the tent was pitched and "the sleeping bags provided great comfort". All instruments were set up by December 10 and Wragge left for Merimbula on the coast, where he established the corresponding low-level station. Wragge's son was left in charge.

By January 1, 1898, both observatories were functioning. On February 13 a storm carried away the tent. "Papers and clothing went flying to leeward, while the plucky fellows, *in extremis*, fled for their very lives; not however till the records and instruments were safely secured, for the Union Jack was there, impelling a duty faithfully done. Perilous was the descent to Jindabyne; hazardous the fording of the Snowy River. Yet a few days later back were the plucky three again on the mountain top, 'Ready, aye Ready!' to duty's call. Sheltering as possible by rock and crevice they stuck to their post. The remains of the tent were patched and mended, once more affording a temporary shelter. Thus the work continued and summer waned. Great swarms of flies visited the summit of Kosciusko in March, biting more sharply than the mosquito and sucking the blood. The first snows of winter fell in March, hence instant action became necessary for carrying on the duties during the winter months. An appeal was made once more to the Premier of the Mother Colony. Ever ready to assist a

genuine undertaking, the Right Honourable gentleman again came to the rescue. A substantial hut was erected, having two apartments, on the very summit of Kosciusko, walled around with mountain stone".

"Winter clothing, special waterproofs, gum boots, snow shoes and Norwegian 'skies', with other necessaries of a like nature, were also provided. . . . Now a member of the party in 'warm' December turned into his sleeping bag with twenty-nine articles of clothing all told. Thus readers can form some conception of conditions on the mountain during winter. . . ."

"Now, Galton in his 'Art of Travel' speaks of the 'warmth of dirt', and disagreeable though it may appear to delicate ladies and the more fastidious élite of civilization, it is nevertheless a fact that during many long weeks in the winter season the boys on Kosciusko never washed at all, following the example, and well they did, of the famous Nansen. Yet we must except a sluice to the face once a week and a wash of the hands every two or three days. . . . At intervals of a month or six weeks, a member of the staff went to Jindabyne on snow-shoes to post the records to the Chief Bureau at Brisbane, experiencing great difficulty in returning when the squalls of the antarctic disturbances formed heavy snow drifts. In fact, on the weather side of the steeps and slopes, drifts would form to a depth of over a hundred feet, necessitating the greatest caution in 'navigating' the ascent."

The cold was too much for Captain Iliff, who returned to Queensland. A young Dane, Jensen, joined the party. At the end of the year he and Ingleby retired and R. L. Burcher joined Newth at the summit.

"On one occasion, in August, the gallant lad Jensen, having reached Jindabyne with the mails and accompanied by Mr. Newth, was overtaken by the seductive 'snow-sleep' on returning to the mountain, nearly losing his life. . . ."

"The vapours of the easterly winds on striking any object, such as the disk on the trig-cairn, froze into horizontal icicles of exquisite form and beauty, reaching two feet long, with the points facing the wind. . . . To obtain water the plucky lads broke off these icicles, carrying them in arm-fulls to thaw in the hut. For amusement and recreation, snow-shoeing was in favour, trips being made to Cootapatamba Lake, not far away. Norwegian ski-shoes were largely used, Mr. Newth obtaining a speed of the quarter-mile in thirty-one seconds—18 chains in 16 seconds downhill is the snow-shoe (i.e., ski) record of Kiandra. . . . Occasionally an owl went screeching past with a note like unto the wail of a lost spirit, and the boys, ever fertile in resource, promptly called it 'the Kosciusko Ghost'."

The only records I could find were those for the year 1898, and it is believed that the later records were destroyed by fire in New Zealand, where they were taken by Wragge after the observatory was closed; I cannot substantiate this report. Early visitors to Kosciusko will remember the remains of the hut on the summit which were there for many years. A photograph taken of it in 1910 appears in the 1929 *Year Book*.

Analysis of Wragge's figures for 1898:—

Barometric Pressure: Mean pressure for year was 22.957 in. Monthly range (difference between highest and lowest observed) was small (about 0.75 in.), except during July, when it rose to 1.146 in. Readings taken every four hours show a decrease at 4 a.m.—less marked during the winter—then an increase until mid-day, followed by a decrease to 4 p.m.—especially marked during autumn—and an increase during the evening—especially marked during spring. Spring readings were lowest, and late summer readings highest.

Temperatures: During the coldest month (July) a mean temperature of 23.8° Fahr. was maintained, with a mean maximum of 25.0° and a mean minimum of 22.4°. 4 a.m. was the coldest time. The temperature then increased slowly, and there was little change by 8 a.m. During autumn and early winter the



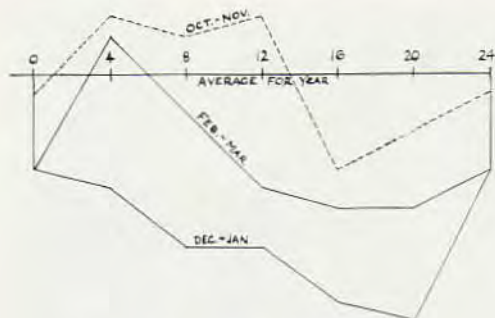
The Staff on Kosciusko Summit, December, 1897.

temperature had considerably fallen by 4 p.m., but in mid-winter and onwards the temperature was maintained until this time. A fall of decreasing rapidity then took place until the minimum. The colder the month, the smaller the changes. The absolute minimum for the year was 11.8° in September.

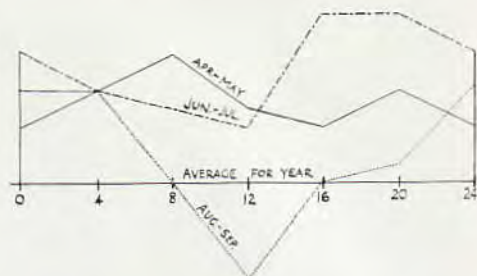
Relative Humidity: During the period June-September inclusive, readings were as follows:—Mean at midnight, 67%; 4 a.m., 67.75%; 8 a.m., 67.5%; noon, 69.5%; 4 p.m., 72.75%; 8 p.m., 69.75%. The increase in relative humidity about mid-day, combined with an increase in temperature, indicates a much larger quantity of water vapour in the air (approximately 15% more water vapour present during the day compared with the night). As the snow disappeared and summer conditions prevailed, the humidities fell below 60%.

Velocity of Wind: This is shown graphically in Figs. 1 and 2. The six months with least wind are shown in Fig. 1, and those with most wind in Fig. 2. During the windiest period, June and July, the least wind was at mid-day (12 on the chart), and the increase in wind velocity all took place between mid-day and 4 p.m. (16 on the chart). During the next two months—August and September—the average velocity was much lower, and the increase in velocity started at mid-day and continued throughout the afternoon and evening. During October and November the increase was four hours later. The commencement of the increase was again four hours later in December and January, when it was at 8 p.m. (20 hours). During February and March the greatest increase commenced at midnight and continued to 4 a.m., whilst in April and May it took place between midnight and 8 a.m. Thus there is a complete cycle throughout the year, and changes in weather may be expected between midday and 4 p.m. in midwinter; at the same time or during the evening in early spring; and during the late afternoon, evening, or very early morning in late spring. There appears to be a connection between these times and those of barometric changes, but it is not sufficiently definite to be commented upon.

Direction of Wind: Readings were taken every four hours. The figures in-



Left: Six months of least wind.



Right: Six months with most wind.

dicating the number of times the wind was observed blowing from the direction indicated during the period expressed as a percentage of the total number of observations.

	April-May.	June-July.	Aug.-Sept.	Oct.-Nov.
N.	2.8	1.4	0.3	Nil
N.N.E.	0.6	2.2	0.8	0.3
N.E.	1.4	1.4	0.8	Nil
E.N.E.	3.6	4.1	1.9	1.4
E.	1.4	8.3	5.8	2.8
E.S.E.	3.9	3.9	2.5	0.8
S.E.	9.6	3.3	3.6	Nil
S.S.E.	3.9	1.9	2.8	Nil
S.	0.6	1.6	4.2	Nil
S.S.W.	2.2	0.6	3.6	0.6
S.W.	1.4	1.4	4.9	1.6
W.S.W.	6.6	1.6	3.9	4.4
W.	7.4	12.2	3.3	5.3
W.N.W.	26.0	33.2	35.1	46.9
N.W.	14.3	15.5	19.6	28.6
N.N.W.	3.6	2.5	2.2	5.3
Calm	10.7	4.9	4.7	2.0

It can be seen that the W.N.W. wind increases towards the spring until, during October and November, the sector W.S.W. to N.N.W. inclusive contains 90.5% out of a possible 98.0%. Among the other directions E. is the greatest during autumn and S.E. during winter.

Amount of Cloud: During the winter months the sky was about 66% clouded at midnight. There was a gradual increase until 8 a.m., followed by a decrease to midday (63%), and a sharp increase during the afternoon (up to 72%). There was a gradual decrease as evening set in. In spring the principal decrease came long before midday. In summer the amount of cloud dropped to 35%.

Rainfall, etc.: Complete records of precipitation were not kept.