

serious work in the Antarctic, or to equip an adequate British expedition to co-operate with them by conducting simultaneous observations on the other side of the unknown area. An expedition a few years hence would be much less serviceable, because the value of consecutive work is at most additive, while that of simultaneous work is as the square, or some higher power, of the numbers engaged.

For the first time a south-polar map on a good scale is now available, thanks to the enterprise of Herr von Haardt of Vienna, and his publisher Hölzel. It is on a polar projection, and the scale of 1 : 10000000, approximately 160 miles to one inch. A special feature is made of ice-conditions and ocean currents, and the tracks of all the important southern voyages are laid down. But the most impressive feature is the vast central blank wherein lie hitherto untouched gold-fields of scientific data.

HUGH ROBERT MILL.

THE HEIGHT OF LUMINOUS CLOUDS.

IN the *Astronomischen Nachrichten* (No. 3347), Dr. O. Jesse gives a short condensed account of some of the main results that have been obtained from a discussion of all the observations made during the years 1889-91. The full discussion, entitled "Die leuchtenden Nachwolken," will, however, soon appear in the Publications of the König. Sternwarte in Berlin.

Perhaps the most interesting part of this work is that which is based, for the most part, on a series of photographs taken simultaneously at Steglitz, at the Urania Observatory, at Nanen, and at Rathenow, which brings out prominently the fact that the height of these clouds since the beginning of the phenomenon in 1885 has remained for the most part constant. The first table given by Dr. Jesse shows to a remarkable degree this almost constant value obtained for the mean height of the clouds, the actual total mean value being 82.08 kilometres  $\pm 0.009$ . The apparent constancy in the value thus obtained for the height of these luminous masses is even more surprising when it is remembered that the observations were not made exactly simultaneously, a task by no means easy, so that the fast movements of the clouds were liable to influence the results to some marked extent.

An examination of the facts, however, seems to indicate that if the observations had been made strictly simultaneously, then the zone in which these nocturnal masses move might be considered narrower than the observations have as yet indicated.

As the observations used in this discussion were made for the most part after midnight, the computed value of the height to which they extend can only be said to hold for those clouds observed at this time. As a matter of fact, however, the few observations made before midnight indicate also roughly the same elevation as above obtained, but the paucity of the observations renders impossible any degree of certainty being attached to the result obtained.

Another part of the investigation related to the question as to whether the apparent height of the clouds had always been the same as that deduced from the observations extending over the years 1889-91. To answer this, an examination of all the observations since 1885 was made to see whether the zenith distances for the same depression of the sun below the horizon had always been the same; which would necessarily be the case if the distance of the clouds from the earth's surface be assumed to be nearly always constant.

The observations employed were those made by Backhouse, of Sunderland, in Kissingen, and by Dr. Jesse himself in Steglitz. A condensed form of the table given by the latter is as follows:—

Number of observations.	Depression of sun below horizon.	Zenith distance of the clouds.	Probable error of observation.
6	9.9	69.9	2.5
9	11.2	77.8	1.4
8	11.8	80.3	0.8
5	12.5	81.7	0.6
7	13.8	85.0	0.5

In the year 1889 the phenomenon of luminous clouds occurred on July 2, and was, fortunately, unusually bright, rendering it possible to make numerous accurate measures; these Dr. Jesse gives in the following table, and compares the results with those given above. The numbers are as follows:—

The Difference of the Zenith Differences on July 2, 1889, from those found in earlier Years.

Depression of sun below horizon.	Zenith distance of the highest point of the clouds.	Difference.	Variation in height for 1" error in measured Z.D.
1889, July 2.		From table.	km.
11.4	77.5	78.6	+1.1
11.7	79.1	79.9	+0.8
12.6	82.7	82.0	-0.7
12.9	83.1	82.7	-0.4

After allowing for the numerous sources of error which might account for some part of the large differences in the fourth column, Dr. Jesse adds that the magnitudes of these are such as to lead him to assume another source of explanation, namely, in the arrangement of the particles composing the clouds themselves. It is probable that the clouds vary very considerably in thickness vertically, which would also affect the differences to some extent; thus with decreasing zenith distances a largely increased impression on the measured zenith distance of the clouds would result.

Setting aside, however, the question of the origin of these small differences, the important main result of the investigations still remains intact, namely, that from the years 1885-91 the luminous clouds have always had nearly the same mean height, namely 82 kilometres, or about 51 miles.

W. J. S. L.

THE BISHOP OF RIPON ON HUXLEY AND SCIENCE.

AT a meeting convened by the Leeds Philosophical and Literary Society, held a few days ago, a resolution was unanimously adopted appointing a Committee, consisting of the Mayor, the members of the Council of the Philosophical and Literary Society, and all others who volunteered to join, for the purpose of raising subscriptions in aid of the Huxley Memorial Fund. We rejoice at the formation of the Leeds Committee, but another cause of gladness is the address delivered by the Bishop of Ripon in support of the object for which the meeting was held. In no uncertain voice, Dr. Boyd Carpenter declared himself a supporter of the principles which guided Huxley's noble life, and proclaimed the righteousness of scientific truth. It is not often that dignitaries of the Church speak so boldly for science as Dr. Carpenter did at the Leeds meeting; and on this account, and also because many of our readers will be glad to see this public recognition of Huxley's integrity of thought and purpose, we gladly print a report, though an abridged one, of the address.

It would not be surprising to discover there are many in this meeting who would be prepared to point out one or two special and specific objections or difficulties they have felt in regard to Prof. Huxley's teaching. I think, however, you will agree with me that if we demand complete harmony of opinion, that stupid unanimity which betrays either ignorance or thoughtlessness, before we dare to speak in honour of any one whose