

It was in relation to the neutral territory referred to that the representatives of the University felt it necessary to receive further explanations. It was at first proposed by the authorities of the Institute that a joint permanent Committee should be formed, and that while the University and the Institute respectively should be entitled to have the use of the central hall and the east conference hall on certain occasions to be specified beforehand, the occupation of the rooms on other occasions should be settled by arrangement with this Committee. But grave inconvenience and the possibility of future complications were foreseen in such an arrangement. From the first it had been impressed upon the Treasury that the relations of the University should be with the Government alone, and that any plan which assumed that the University should be either tenants or partners with another institution would certainly be unwelcome to the Senate. The Committee therefore insisted that, in accordance with the letter of Sir Francis Mowatt of Christmas Day 1898, the University should be the tenants of the Government only. As a result the following formal communication, dated May 16, was received by the Vice-Chancellor from Sir Francis Mowatt:—

“With reference to our recent discussions as to the conditions on which the Government is prepared to offer to the University improved and enlarged accommodation in the Imperial Institute building, I am authorised by the Chancellor of the Exchequer to inform you that the original intention of the Government remains unchanged, namely, to take over *all* the present building for the use of (a) the University of London, and (b) the authorities of the Imperial Institute, and that he has caused notification to this effect to be communicated to the Council of the Institute.

“I am at the same time instructed to forward to you the enclosed memorandum indicating that the University will hold direct from the Government.”

The memorandum enclosed was as follows:—

“In any arrangement under which the University is invited to occupy a part of the Institute building, it will be an absolute condition that the University holds directly and solely from the Government and not in any form or degree from the Institute.

“This is true equally of the part to be occupied exclusively by the University and of the part to be occupied alternately by the University and by the Institute under arrangements to be approved by the Treasury.”

The exact nature of the arrangements here referred to between the University and the Treasury, with respect to the central portion of the building, the galleries, and the east conference hall, will be fixed from time to time on the understanding that the full and exclusive use of these portions of the building will be secured for the University at all times at which they are required for purposes of examination, for the annual ceremony of the presentation for degrees, and for the meetings of Convocation. The Senate will also afford, as it has been accustomed to do during many years, accommodation to meetings and congresses of a national and international character, as well as for assemblies of graduates or others interested in the promotion of collegiate or advanced education.

Subject, therefore, to any reservation which the Treasury may make as to the use of the central portion of the main building for occasional meetings of the Imperial Institute, the building, with the exception of the west wing, will either belong exclusively to the University or will be at its disposal when required. The main entrance will be used by the University and by the Imperial Institute jointly. An additional University entrance and staircase will give access to the east wing, and will serve for candidates for examination and for other purposes.

The assent of the Council of the Imperial Institute to the Government proposals was notified in a letter dated June 5 from Lord James of Hereford to Sir Francis Mowatt.

With regard to the future appropriation of land adjacent to the building, it is understood that, in view of the probable future requirements of the University, especially in the direction of scientific and literary research and of post-graduate lectures and studies, the University will be entitled to a first claim on any vacant ground which may hereafter prove to be needed. The area thus available is very large.

It is understood that the Government is prepared to undertake the whole cost of the removal of the effects of the University to its new quarters, and that the Chancellor of the Exchequer will include in the estimates for this year a sufficient

sum to meet all charges for furnishing the rooms, for adapting them to the purposes of the University, and also for effecting such structural and other changes as may be found necessary in subsequent consultation between the officers of the University and the architect of the Board of Works. At present no change is proposed in the financial arrangement by which the charges of the University for the maintenance and care of the building, the provision of stationery and stores, the salary of the officers, and the expenses of administration are borne by the Treasury, and are provided, so far as they exceed the amount received from candidates in the form of fees, by an annual vote in Parliament.

This arrangement is, however, wholly exceptional, and does not apply to any other University in Great Britain. It undoubtedly relieves the authorities of the University from all financial concern or responsibility. But it cannot be regarded as a permanently satisfactory settlement, or one which is likely to conduce to the repute and independence of the University, or to its due development in the future. It has the obvious and serious result of discouraging endowments and gifts, and of diminishing the interest which the inhabitants of London ought to take in their chief academic institutions. So long as the University is dependent for its maintenance on an annual vote in Parliament, it can hardly be expected to receive much voluntary support. Such generous gifts from private persons or from municipal bodies as have enriched the colleges of the Victoria University, and have recently been promised to the contemplated University of the Midlands, are not likely to be forthcoming in London while the University exists on its present financial basis. But it may well be hoped that under different conditions the University will evoke similar local patriotism to that which has been so conspicuously shown in Manchester, Liverpool, Leeds, Cardiff, Newcastle and Nottingham, and that the citizens of London will become conscious of a new responsibility, and will take a pride in strengthening and enlarging from time to time an institution which ought to serve as a great centre of intellectual life for the whole metropolis.

The Government has throughout this negotiation shown a strong desire to make the best provision in its power to meet the needs of the University and the wishes of the Senate and the Graduates. And, having regard (1) to the fact that the present accommodation is insufficient, and that there are no means of enlarging it upon its present site; (2) to the size and dignity of the Institute building and its capacity for adaptation and expansion; (3) to the fact that no alternative proposal for the housing of the University in a more appropriate place is likely to be made; and (4) to the consideration that the building, though not geographically central for London, is placed in the midst of a group of institutions—the Royal College of Science, the Natural History Museum, the City and Guilds of London Institute, the College of Music, and the Science and Art Galleries and Museums—which are all in various ways cognate in their objects with the purposes and work of the University, the Committee conclude by expressing the opinion that the proposal of the Government has been conceived in a fair and liberal spirit, and that it deserves the favourable consideration of the Senate.

PHYSICAL MEASUREMENTS IN ANTHROPOLOGY.

THE question of the value of physical measurements is one that lies at the base of physical anthropology. Large numbers of often very extended series of measurements are continually being published, new methods are constantly being proposed and tried; but in spite of all this, it is questionable whether the value of the results obtained is proportionate to the trouble expended. Unfortunately there is variability in the methods employed, which may change according to the nationality of the investigators; some methods are complicated like those of Benedikt and Toeræk, or, as in the case of the latter anthropologist, who takes 5000 measurements on a single skull, they may be impracticably numerous. Very precise measurement with refined instruments gives an apparent exactitude which appears to be more scientific than it really is. Preferable is the system that adopts a small number of measurements which can be readily made, and which have a better chance of being taken on a large number of subjects. The

extreme exactitude of cranial measurements, especially when based, for example, on the cephalic index only, has often led to creating imaginary races among a given people.

These and other wholesome warnings are uttered by O. Hovorka Edler von Zderas in the *Centralblatt für Anthropologie*, iii. p. 289, who also points out that there is no need to calculate indices to the first or second decimal, and he also states that in the analysis of a people one should not take account of differences of less than ten units in the index.

As all investigators are well aware, the cephalic index gives no information upon the real form of the skull; this has been well emphasised by Sergi, who has sought to establish a more rational system of skull nomenclature. M. L. Laloy supports (*l'Anthropologie*, x. p. 105) Hovorka's general contention, and refers to the clever visual analysis of the inhabitants of Bretagne by Dr. P. Topinard, which was published in the *Journal of the Anthropological Institute* (1897, xxviii. p. 99). In the last number of the *Journal* (new series, i. p. 329) Dr. Topinard gives the results of the trip which he made to Cornwall last year in order to compare the anthropological types there with those he had previously ascertained in Bretagne. But in our own country Dr. J. Beddoe has long adopted a similar method of investigation, and his acute and trained powers of observation have thrown a flood of light on the problems of the races of Britain. The methods of the *doyen* of British anthropologists are those of the field naturalist, and there are many who realise that what is generally known as "natural history," is as integral a part of biology as is the most refined laboratory technique. It is well to use one's eyes for other purposes than for reading off scales on instruments.

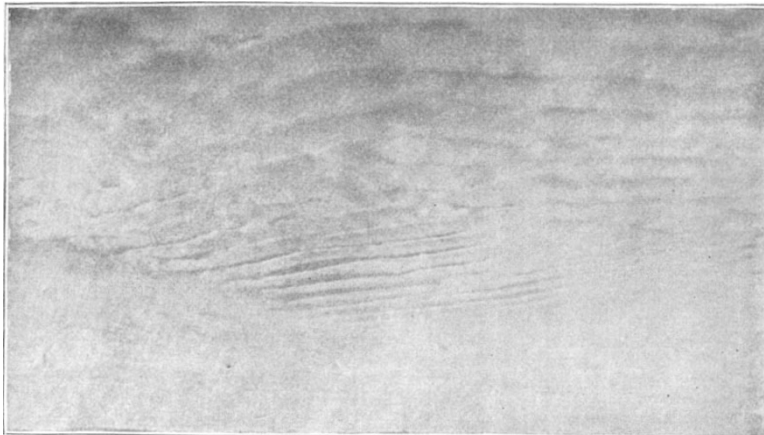
WAVE OR BILLOW CLOUDS.

A SERIES of cloud photographs taken by Mr. Alfred J. Henry, of the United States Weather Bureau, and contributed to the *Monthly Weather Review* for February, is on several grounds specially instructive. It is too frequently the case that photographers content themselves with a single plate of a cloudy sky, which specially recommends itself to their notice by the grouping and arrangement of the vaporous patches. But in this instance we have a succession of pictures of the same clouds, showing their variation during the interval, and, moreover, taken in various azimuths at different stations, so that we get the same formation viewed from different standpoints. We regret that we can only reproduce one of the very admirable pictures that Prof. Henry has secured. It is the first of the series, and shows the typical arrangement of these clouds as they first arrested the attention of the observer. The altitude was probably that of the mean altocumulus level. Occurring as these clouds do at all possible heights above the surface, we are glad to notice that the term wave or billow, following the nomenclature of Helmholtz, is coming into use, since such a description more nearly expresses the character of the formation than do other terms which generally refer to the height alone.

We have here in the cause of the formation of these clouds an instance of the advantage of theoretical investigation over simple observation. The readings of meteorological instruments explain nothing of the origin or behaviour of atmospheric waves. Prof. Henry has recorded for us, with the care that becomes a meteorologist, that the wind was blowing steadily from the north-west with a velocity of twelve miles an hour. Rain had ceased shortly before, and the temperature, which had fallen to 34° during the night, had risen at the time at which the photograph was taken (8h. 25m. a.m.) to 36°. The direction of the parallel bands when first observed was approximately east and west. Later they took up a position about N. 80° W. to S. 80° E. In an hour and a half the typical appearance of the billow wave had passed away, leaving the sky about half covered with cirrus and cirro stratus. It is not unimportant to note, however, that the occurrence of

similar weather conditions gave rise to a similar formation of clouds (also photographed) some two months later.

This is all that instrumental registration and careful observation can teach us, and possibly the slow onward movement of meteorological science is traceable to the strict adherence we have generally shown to the record of instrumental indications, rather than a confident appeal to theoretical research. But the study of such a cloud formation as that pictured here goes a step beyond the reading of instruments, and places in our hands a powerful means by which to investigate the motion of the atmosphere. It cannot have escaped general notice that this regular arrangement of streaks presents the peculiarity of covering a considerable extent of the sky, almost simultaneously. On a comparatively clear sky these strips of cloud are suddenly formed; and on the other hand, a sky uniformly covered can, in a very short space of time, break up and offer the appearance of these billow waves. This sudden origin of parallel streaks finds a complete analogy in the formation of waves over still water, when a slight wind agitates the surface, and it is seen to break into ripples over a considerable area. Von Helmholtz, working on this suggestion, has shown conclusively that these billow waves are due to the existence of air strata of different temperatures moving with different velocities, and are produced at the surfaces of separation of these various strata. Travellers in balloons have confirmed this theory from actual experiment, and have shown that at very various altitudes this peculiar formation is encountered. It may be that the billow clouds are



Wave or Billow Clouds.

visible to us only under peculiar circumstances of moisture, but the wave motion in the invisible air is probably a most common phenomenon, and one that plays a large part in determining our weather conditions.

THE PROPOSED MAGNETIC SURVEY OF THE UNITED STATES.¹

THE present superintendent of the Coast and Geodetic Survey, Prof. Henry S. Pritchett, perceiving the need of expansion in the magnetic work of the Survey, has brought about the formation of a separate division, known as the Division of Terrestrial Magnetism of the United States Coast and Geodetic Survey. The chief of this division is to be Dr. L. A. Bauer, who will have full control of all magnetic work, both in the field and in the office.

The following preliminary outline will serve to give some indication of the character and scope of the work it is proposed to carry out with the enlarged opportunities.

SECULAR VARIATION INVESTIGATIONS.

The best evidence of the great demand for secular variation data is the fact that, thus far, eight editions of Schott's secular variation paper have been successively issued by the Survey.

¹ Abridged from an advance proof of a paper by Dr. L. A. Bauer in *Terrestrial Magnetism*.