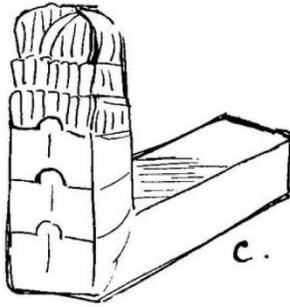


the capital (*c*) of the column, turning upwards and being carved to represent the rattles on a rattlesnake's tail, with the addition, in some instances, of a plume of feathers.

It is this peculiar form of capital which has done so much to ensure the ruin of the façades of the Chichén Itzá temples; for the weight of the projecting tail tilted the capital outwards as the wooden beam above it decayed.

Some of these queer-shaped capitals (*c*) can be found lying on the slopes or at the bottom of the pyramidal



foundations of the temples; and it is only in the case of the Castillo, where the projecting tail has been broken off, as shown in Fig. *a*, that the façade of the temple has escaped destruction.

On page 132 it is stated that "the lintel beams of the doorway (temple of the Tigres), three in number, and set as indicated in the section, are covered with well-executed glyphs." For "glyphs" must be here read "ornaments," as there is no trace of any hieroglyphic inscription.

I notice that in describing the painted mural decoration of the interior of this temple no notice is taken of the picture above the doorway of a human sacrifice, and I greatly fear it must have disappeared since I traced it in its already mutilated condition in 1889.

Mr. Holmes was not able to attempt any detailed examination of the great group of colonnades and temples which lie to the east and south-east of the Castillo. These I surveyed in 1889, but had no time to make satisfactory excavations, and I greatly envy Mr. E. Thompson the opportunity he has of making a thorough exploration of these most interesting remains.

There is one point on which I hope Mr. Holmes will give us some further enlightenment. On page 102 he states, without quoting his authorities, that Chichén Itzá was occupied by its builders for nearly 200 years after its discovery by the Spaniards.

I have endeavoured to show in my own account of the ruins (*Biol. Centr. Am.*, vol. iii. pp. 5-9), that the statement that the Spaniards encamped at Chichén in 1528 must be received with caution, and neither Bishop Landa, nor the report drawn up at Valladolid in 1579, appear to me to indicate any occupation of Chichén by the Mayas at the time of the conquest, although it may still have been held in reverence as a place of pilgrimage.

Part i. of Mr. Holmes's report ends with the description of Chichén Itzá. The descriptions throughout are lucid, and the illustrations numerous and excellent. All students of American archæology will eagerly look forward to the succeeding issues, and will, I feel sure, join me in hearty congratulations to Mr. Holmes on the excellence of his work, and to the Field Columbian Museum on having thus been able to utilise his services; and all of us, who have expensive scientific hobbies, must wish that there were more Alison Armours in the world to give such splendid and timely help to scientific research.

ALFRED P. MAUDSLAY.

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MEASUREMENT OF CLOUD HEIGHTS AND VELOCITIES.¹

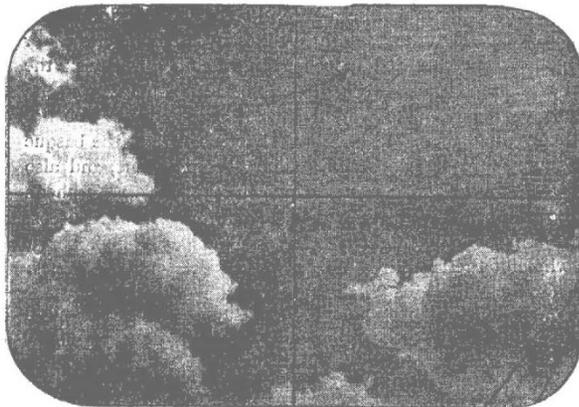
THE study of the form and motion of the clouds has been a favourite subject with meteorologists and physicists from the earliest times. Among the first works, since the invention of printing, may be mentioned one by J. Alkindus (Venice, 1507), dealing with clouds in general, and one on the height of clouds, by J. Bernoulli, "Nova ratio metiendi altitudines nubium" (Lipsiae, 1688). But it is only during the last quarter of a century, since it has been recognised that cyclones and anticyclones form part of the general circulation of the atmosphere, that the importance of a systematic study of the upper air-currents by means of clouds has been fully appreciated. For this purpose various methods, both with and without instruments, have been employed. In 1878 the Meteorological Council decided upon undertaking a series of experiments at the Kew Observatory, with a view of obtaining records of the height and velocity of clouds, by means of photography, for which purpose cameras fitted with theodolite mountings, and provided with altitude and azimuth circles, were used. The results of subsequent investigations, in which the exposure of the plates was effected by electrical means, were published in the *Proceedings* of the Royal Society, vol. xlix. p. 467. In vol. viii. p. 108, of the *American Meteorological Journal*, Mr. Rotch gives an account of the measurements of cloud velocities at Blue Hill Observatory, Massachusetts, by timing the movement of shadows cast by the clouds at points whose distance apart was known. During the present year, owing to the action taken by the International Meteorological Committee, cloud observations are being made in all parts of the globe, and instructions for the use of special instruments have been drawn up, at the request of the Committee, by Dr. Hildebrandsson, of Upsala. The majority of stations, if they use instruments at all, restrict themselves to the use of simple nephoscopes, which give the direction and apparent velocity of the clouds, by means of a mirror and graduated circles; in these instruments the observations are not influenced by the effects of perspective, which are the same in the sky and in the mirror. At



some of the principal observatories theodolites and photogrameters are being used. Each of the last two methods has its advantages and disadvantages; theodolites are simpler and cheaper, while photogrameters require a certain amount of skill in photography. The

¹ "Wolkenhöhenmessungen," von E. Kayser (*Schriften der Naturforschenden Gesellschaft in Danzig*, 1895); "Des principales méthodes employées pour observer et mesurer les nuages," par H. H. Hildebrandsson et K. L. Hagström (Upsala, 1893).

theodolite requires the two observers—each placed at one end of the measured base—to agree by telephonic correspondence on one fixed point in the cloud, which it is not always easy to do, as well as on the precise instant at which the observation should be taken; the calculation of the observations is subsequently made from trigonometrical formulæ, or by a slide-rule, or plotting machine. The photogrammeter, which is a theodolite provided with a small telescope and a camera obscura, possesses one great advantage from the fact that the two observers have no need to agree as to the special point to be observed; it is sufficient that both photograph the same part of the sky at the same moment. On each photographic plate the coordinates of a point of intersection are known, and by placing it upon a glass scale graduated to millimetres the coordinates of as many points as may be desired can be fixed; it is only necessary to determine, once for all, how many minutes correspond to a millimetre on the plate. Once the coordinates are found, the calculations can be made as in the case of the theodolites. As these researches require the calculation of a great number of observations, it is indispensable that the methods employed in reducing them should be as simple as possible. This desideratum has been solved by M. Åkerblom, in a very satisfactory manner, in a pamphlet entitled "De l'emploi des Photogrammeters"



(Upsala, 1894), which has been distributed by Dr. Hildebrandsson to intending observers. Easy methods of reduction, giving approximately correct results, have also been devised by General R. Strachey and Sir G. Stokes.

We have before us a valuable investigation by Dr. Kayser, containing some 1500 cloud measurements made under the auspices of the Philosophical Society of Danzig, between May and August 1895, by means of photogrammeters. In various respects the camera used appears to be an improvement on some of the instruments hitherto adopted, being of simple construction, well balanced, and combining ease of movement with necessary rigidity, while the altitude and azimuth circles are sufficiently large to admit of accurate reading. The accompanying plates are reproductions of a pair of photographs of a cumulus cloud observed by this means on May 25, 1895. The mean height of the cloud from several measurements was found to be 1714 metres, the distance between the two observing stations being about 679 metres. In order not to delay the publication of the Society's volume, no classification of the heights of the various clouds has been made; but in the *Meteorologische Zeitschrift* for May, Dr. Sprung has attempted this, and finds the mean values in metres to be as follows:—Stratus, 1704; cumulus, 2856; strato-cumulus, 2196; alto-cumulus, 4098;

cirro-cumulus, 6834; cirrus, 10,043. The daily variation of altitude cannot be deduced from these observations, because they were not distributed sufficiently uniformly throughout the day. Dr. Kayser's work contains useful materials for the study of observers during the international cloud year, and we are glad to see that the observations are to be continued this summer.

NOTES.

ON Wednesday in last week, the Queen invested Lord Kelvin with the Riband and Badge of a Knight Grand Cross of the new Royal Victorian Order.

SIR WILLIAM MACCORMAC has been elected President of the Royal College of Surgeons of England.

GENERAL M. RYKATCHEF has been appointed Director of the Central Physical Observatory, St. Petersburg, in the place of Dr. H. Wild, resigned. For many years General Rykatchef has had charge of the maritime meteorological branch of that Observatory.

IN the House of Commons on Friday last, Sir S. Northcote asked the President of the Board of Trade if he would introduce this Session a Bill to deal with the metric system, in order that chambers of commerce and other parties interested might have sufficient time during the recess to consider the proposals of Her Majesty's Government on this subject. Mr. Ritchie replied that he would be glad to introduce the Bill, but without any intention of proceeding with it this Session.

THE large male Indian elephant which was brought home by the Prince of Wales from India in May 1876, and which died in the Zoological Society's Gardens on March 8 last, has been successfully mounted by Mr. E. Gerrard, jun. The specimen is at present placed in the Central Hall of the Natural History Museum, just opposite the principal entrance; but it will be ultimately moved to the Mammal Gallery, which is now in process of rearrangement, when space has been found for it.

A FINE example of the Pangolin, or Scaly Anteater, is now on view at the Zoological Society's Gardens, having been placed there, on deposit, by the Hon. Walter Rothschild. Pangolins are seldom seen in captivity, being very difficult to keep in good health. There has been no example of this form in the Society's collection for nearly twenty years. The present specimen, which seems likely to do well, belongs to the species called the Short-tailed Pangolin (*Manis temminckii*), of which a good figure is given in the third volume of "The Royal Natural History," lately published. It is said to have been obtained in the Transvaal.

DR. KLEIN recently delivered three lectures on the subject of "Recent Researches in the Identification of the Typhoid Bacillus and the Cholera Vibrio," being the Harben Lectures in connection with the British Institute of Public Health. The lectures are the property of that Institute, and will be published in its official organ, *The Journal of State Medicine*. The first lecture has just been published in the July number. The other lectures will appear in the August number.

BY means of a rearrangement of existing scholarships at the Charing Cross Hospital Medical School, and by the establishment of a special fund, memorials have been founded to Dr. Livingstone and Prof. Huxley, both old students of the school. The memorial to Livingstone takes the form of an entrance scholarship of 100 guineas per annum, and that to Huxley of (1) an entrance scholarship of £55, open to the sons of medical men; (2) a second year's prize in anatomy and physiology; and (3) a lectureship dealing with recent advances