

The bases of some of the other pyramids are also known from my surveys. That of King Sneferu at Meydum immediately preceded the Great Pyramid, and was planned on a similar system of measures. Both have the proportion resulting from the height being the radius of a circle equal to the circuit of the base, the angles found being

By π theory	$51^{\circ} 51' 14'' \cdot 3$
Khufu's pyramid	$51^{\circ} 50' 40'' \pm 1' 5''$
Sneferu's pyramid	$51^{\circ} 52'' \pm 2' ?$

The dimensions found are :

Khufu's, height 7, circuit 44, $\times 40$ cubits.
Sneferu's, ,, 7, ,, 44, $\times 25$ cubits.

The modulus of design being thus 40 or 25 cubits shows the deliberate intention to embody the proportion of 7 : 22. The cubit required would be 20.61 or 20.66 respectively, and the best examples of early masonry elsewhere show a cubit between 20.62 and 20.65 inches. The mass of theories, which extend from good reason into a morass of impossibilities, would be too much to touch on here.

The accuracy of construction of the measured pyramids is, in inches :

Dynasty.	King.	Place.	Base.	m.d.	Azim.	m.d.
III	Sneferu	Meydum	5682.0	6.3	-24' 25"	5' 30"
IV	Khufu	Gizeh	9068.8	.7	- 3 43	12
IV	Khafra	"	8474.9	1.5	- 5 26	33
IV	Menkaura	"	4153.6	3.0	+14 3	1 50
XII	Senusert II.	Lahun	4168.5	1.9	- 2 8'	2 30
?	?	S. Dahshur	7459.0	3.7	- 9' 12"	4 3
			2064.6	1.1	-14 8	10 12

From these measures it seems that Menkaura and Senusert II. laid out 200 cubits as a base, and the South Dahshur pyramids are of 360 and 100 cubits on each side.

In the XIIth dynasty the passion for accuracy led to regarding that as the finest sacrifice in honour of the dead; the granite sarcophagi, which were never intended to be open to examination, or even seen, have mean errors from a straight line, and from true planes, of 1 in 15,000, or on one edge 1 in 23,000. No race ever seems to have appreciated so keenly the charm of perfection of work as did the magnificent men of the pyramid age.

Current Topics and Events.

IN a recent series of papers in the *Chemical News* (Oct. 30, Nov. 6, 13, 20 and 27) Messrs. Druce and Loring put forward claims that they have identified the elements of atomic number 75, 85, 87 and 93 by an X-ray examination of certain manganese salts. The element 75 is that recently isolated by Noddack and Tacke (rhenium), the others are in the radioactive region. An examination of the evidence on which these claims are based suggests that it is far from sufficient definitely to establish them. The element 75 is identified by two lines, 1.430 and 1.233, which are taken to be the α_1 and β_1 lines of its *L* spectrum; 85 by two lines, 1.086 and 0.895; 87 by a single line 1.040, and 93 by two lines, 0.895 and 0.693, the 0.895 line being the same as that used for the identification of the element 85. Of these six lines four, 1.430, 1.233, 1.040 and 0.895, are within error limit identical with the $K\alpha$ line of zinc and the three strongest lines ($\alpha_1, \beta_1, \gamma_1$) of the mercury *L* spectrum. The authors quote a control experiment in which a six hours' exposure with a copper anticathode gave only the copper spectrum. This is rather surprising, as mercury is used to evacuate the tube and brass for the window of the tube and the slits of the spectrometer. Also, in a recent experiment made elsewhere and suggested by past experience, a two hours' exposure with a copper anticathode and apparatus similar to that used by the authors gave, in addition to the copper lines and the silver and bromine absorption bands, lines which were identified with the zinc $K\alpha$, the mercury $L\alpha_1, L\beta_1$, and $L\eta$ (?), and other lines at 0.950, 0.72 and 0.67. These are of doubtful origin but are possibly due to irregularities in the crystal oscillation or imperfections in the crystal. The authors in their papers give at least five lines which they observed and are unable to explain, although from the other six lines they identify four elements.

MR. HAROLD J. COOK, in a communication to *Science* for November 25, maintains that "good

dependable evidence of human artifacts in the Pleistocene of America" has at last been found. The evidence in question comes from a point near the Colorado River, near the south-eastern end of the Staked Plains and near the little town of Colorado, Texas, on Lone Wolf Creek. The first work leading up to the discovery was done in the summer of 1924, when fossil animal bones were discovered by Mr. Nelson Vaughan. The site was visited by Mr. Cook, who checked the geology of the area in May 1925. In taking up a large block of material containing the articulated ribs and vertebræ of a fossil bison, of which the whole skeleton was discovered in association and splendidly preserved, the first artefact, a point, was found under the cervical vertebræ. A second point was found under the femur, and a third was found "in position with the body of this skeleton." These artefacts are large arrow heads or lance points, and are of unexpectedly fine workmanship, being more refined than modern types found in the area, and of distinct culture and design. It is suggested that the animal had been wounded and died on this spot, as the condition in which the remains were found appears to preclude the possibility of its having been water-borne or otherwise deposited. A number of other fossilised remains have been found, but in the season just past no further evidence of man has been brought to light. These fossils occur in valley gravels solidly cemented by calcareous deposits which rest between the present stream erosion and the old triassic walls of the former valley. Everything points to these deposits being entirely undisturbed. Similar bones and types were found in all places where fossils could be located, and included, besides the extinct bison—*Elephas*, *Equus*, and *Camelus* or *Camelops*, as well as others at present unidentified.

THE Linnean Society of New South Wales has just issued a history of its fifty years of activity since its foundation in 1874, for "The cultivation and study of the science of Natural History in all its branches,"

with illustrations of its various homes, and of its successive presidents. It has published forty-nine volumes of *Proceedings* during its career, and is a standing witness to its benefactor, the late Sir William Macleay (1820-1891), who sustained its early efforts and finally provided it with a permanent building and adequate endowment. It has never exceeded 200 members, so that the constant support of its first president has been of essential help to its maintenance. More than twenty thousand pounds were devised by its benefactor for the general use of the Society, the appointment of a bacteriologist and the Macleay fellows. It suffered a terrible misfortune in 1882, when the building in which it was housed was completely destroyed by fire, but by outside help its library was renewed, though all its possessions and official records for the first eight years of its existence were lost. The volume ends with an account of the eighteen Macleay fellows who have benefited by the ample foundation. Few societies can boast of the constant and generous support which this Society has enjoyed and made so effective.

PART 4 of volume 26 of the *Transactions of the Optical Society* is devoted to a description by Dr. W. H. Steavenson of the instruments and apparatus in the possession of Sir William Herschel at the time of his death in 1822, and now preserved by two of his grand-daughters in the old Observatory House at Slough. The collection includes one of the mirrors of the famous 40-foot telescope, one of the mirrors of the 20-foot instrument, a number of mirrors for smaller instruments, flat mirrors for Newtonian telescopes, a number of eyepieces and a complete 7-foot telescope. The apparatus has all been marked by Dr. Steavenson and the grand-daughters of Sir William, and a list is given of all the items with a short description of each. In the case of the mirrors, after cleaning with ether and lemon juice they have been examined as to their optical properties, and they show to what perfection the figuring of them had been brought by Herschel 130 years ago. The whole of the eyepieces are single lenses, the most powerful a double convex of 0.02 inch diameter and 0.01 inch thick. They substantiate Herschel's claim that he obtained powers between 1000 and 6000 on his 7-foot telescopes. Twelve photographs of instruments and observatory complete an interesting and valuable document.

WITH the commencement of our issues for the New Year we shall conduct and publish a column, to be continued weekly, under the title "Contemporary Birthdays." In this the dates of birth of various men of science resident in Great Britain, our Dominions, and in foreign countries will be recorded, and the essential details of the careers of some of them will be set forth, in so far as is possible under the limitations of space which NATURE must observe. The first of the series will appear on January 2.

A CURIOUS problem of the Arctic is noted in the *Geographical Journal* for December. In August 1924 Dr. Livingstone, of the Canadian Government ship *Arctic*, found on Pim Island in Smith Sound, about half a mile inland from the north-west end, part of a

small leather case bearing the Royal Crown and the cypher V.R.I. in gold. The Director of the National Resources Intelligence Service of Canada suggests that this is part of a spectacle case dropped by an officer of the Nares expedition of 1875. The vessels of this expedition appear to have been the only British naval vessels to land parties on Pim Island during the reign of Queen Victoria. A drawback to this explanation is that Queen Victoria did not acquire the title of Imperatrix until 1876, the year of the expedition's return. Furthermore, it seems doubtful if any member of the Nares expedition had an opportunity of going so far from Payer Harbour, some few miles along the coast of Pim Island. The editor of the *Geographical Journal* would welcome information that could throw light on this problem, especially on two matters: evidence of the use of the cypher V.R.I. before 1876; and knowledge of any visit to the north-western extremity of Pim Island before 1924. An illustration shows the leather case. It has not been possible to trace any such gift to any member of the Nares expedition.

THE annual report of the Director of Research to the Council of the British Photographic Research Association shows that members of the research staff are continuing their investigations into the principles that underlie the practice of photography, and that during this year nine papers have been published in various scientific journals. In addition, various summaries of literature and more popular articles have been written, and various confidential investigations carried out for the members of the Association. The staff took a very active interest in the sixth International Congress of Photography held in Paris, and submitted to the Congress the only concrete proposals on the standardisation of plate-testing methods. It is to be hoped that the discussion of this subject at Paris will lead to more uniformity in the expressions of sensitivity and the other properties of photographic plates. The selenium density meter designed by the staff, and referred to in last year's report, has extended the possibility of work on experimental emulsions, and has been appreciated by many other laboratories.

REPORTS of committees appointed to award the Godard and Brocas prizes in the gift of the Société d'Anthropologie of Paris are published in the recent issue of the Society's bulletin (t. 5, sér. 7, fasc. 4-5-6). The Godard prize for 1924 is awarded to Dr. Maurice Neveux for a thesis entitled "Religion des noirs: Fétiches de la Côte d'Ivoire," which embodies observations made in 1909-1910 and 1914-1915, when the author was in charge of the medical services of that area. Two awards of the Brocas prize are made. The prize for 1922 is awarded to Dr. Fritz Sarasin, of Basle, for his work on the anthropology of the New Caledonians, and to Dr. E. Pittard, of the University of Geneva, for his book on the peoples of the Balkans. The prize for 1924 was divided between Dr. Antoine Delattre for a thesis on the comparative anatomy of the axis in mammals, M. Chaine, of Bordeaux, for his work on the digastric muscle, and M. Cipriano Lidio, of Florence, on the human patella.

THE brief account by Prof. R. R. Gates of his trip up the Amazon during the summer vacation of 1925, which is published in the *Quarterly Summary of the Royal Botanic Society*, Regent's Park, for October, is a timely reminder that improvements in communication are throwing open this interesting botanical region under much more favourable conditions than previously. The Botanic Garden of Rio de Janeiro has recently circulated particulars of a new biological station, attached to the forest reserve of Itatiaya, which is available for visit by biologists. It is situated in a region where tropical and alpine floras co-exist within a small area, with a range above sea-level from 800 to 3000 metres. A small library is attached to the laboratory at the station, for which the Director of the Botanic Garden solicits further publications from naturalists. The address of the new station is, Estacao Biologica de Monte Serrat, Barão Homem de Mello, Estado do Rio, Brazil.

THE *Marine Observer* for December, issued by the Meteorological Office, Air Ministry, completes the second volume, the publication having been issued in monthly parts for two years (London: H.M. Stationery Office; 2s. net each part). The Marine Superintendent of the Meteorological Office is quite sanguine that it fills the place intended, and while it has already stimulated considerable interest from the Mercantile Marine, he appeals to those afloat to contribute articles, sketches, and photographs to add to the value, attractiveness, and utility of the journal. The publication takes the place of the *Monthly Pilot Charts* previously issued, and by preserving the copies intact, much information of value to the navigator is at hand, and, with the index to the separate volumes, there is easy access to the information. No. 24, for December, contains an article by Captain L. A. Brooke Smith, the Marine Superintendent, on "Developments in Wireless and Weather: An Aid to Navigation," and it is clearly shown how valuable the weather information will be to airships over the sea. Much value is attached to the weather registers kept for the Office by the captains and officers in the mercantile marine.

THE *Sitzungsberichte der Physikalischen-medizinischen Societät* at Erlangen is always worth reading. A recent issue (Band 54 und 55, 1922, 1923) contains a number of interesting papers by various authorities, among whom we are pleased to note Prof. Eilhard Wiedemann. Prof. Wiedemann, whose output of articles on the history of science is rivalled only by that of Prof. von Lippmann, here contributes a short study on the history of music among the Arabs. He gives translations of the appropriate sections of the encyclopædic *Mafātīh ul-'Ulūm* (Keys of the Sciences) and of Al-Akfānī's *Irshād al-Qāsid* (The Right Guidance of the Seeker), and illustrates them with very interesting notes and explanations. Other articles of importance are (i.) On a method of estimating the melting-point of gelatin solutions, by Rudolf Reiger and Fritz Gernert, and (ii.) On the construction of the world according to Ibn al-Haitham, by Karl Kohl. A lighter note is struck by Alexander

Gutbier in a popular lecture on "Die chemischen Elemente und der Weltenraum." On the medical side, Reinhold Wissmann gives a long account of his work upon war injuries to the eyeball. This occupies some 150 pages and deals with the subject in a masterly and exhaustive fashion.

WE sincerely share the regret, expressed by Dr. F. H. Gravely in the Report of the Madras Government Museum for 1924-25, "that limitations of staff make it impossible to continue, without neglecting other work of still greater urgency, the ethnological investigations so admirably begun years ago by Mr. Thurston." It is urgent enough that ancient customs rapidly disappearing under modern influences should be recorded without delay. On the other hand, one is glad to note that the University of Madras, by arrangement with the Fisheries Department, is establishing a Marine Biological Station on Krusadai Island in the Gulf of Manaar. Dr. Gravely is therefore preparing an introduction to the littoral fauna of the island.

THE Academy of Natural Sciences of Philadelphia, having managed for more than a century to perform admirable service under an act of incorporation and by-laws dating from 1817, but altered from time to time, at last found it necessary in 1924 to amend the charter and totally to revise the by-laws. The results are set forth in the Year-Book recently issued. Administration by council and curators has been abolished, a board of trustees created to manage the administrative and financial affairs of the academy, and a new council established to act in matters relating to the pursuits of the scientific staff. A new position of director of the museum has been created, and to it Mr. Witmer Stone has been appointed. The various sections of the Academy—geological, ornithological, etc.—have ceased to exist, but their place is taken by the Philadelphia Mineralogical Club, the Delaware Valley Ornithological Club, the American Entomological Society, and the newly formed Leidy Microscopical Club. Thus an easier opening is made for younger students.

ON Tuesday, December 15, the Priestley Club celebrated its jubilee by a dinner in the University of Leeds, to which a number of distinguished guests, representing various phases of activity, in pure and applied sciences, were invited. Sir J. C. Irvine, in proposing the toast of the Priestley Club, contrasted the conditions of experimental work in the days of Joseph Priestley with those which have been made possible by the development of institutions of the type of the newer universities in Great Britain. The advantages afforded by a general scientific society such as the Priestley Club in bringing together for the purpose of discussing scientific topics the various research workers in specialised provinces, were emphasised by Prof. A. Smithells, who pointed out the debt the present members of the Club owe to its founders, amongst whom were the late Sir T. E. Thorpe, Sir Arthur W. Rücker and Prof. L. C. Miall. Other guests included the Vice-Chancellor of the University of Leeds and the Rev. W. L. Schroeder, who

in succession to Priestley is the pastor of the Unitarian Chapel at Mill Hill, Leeds.

MESSRS. Casella and Co., of Parliament Street, London, have recently issued a price list of barometers. The list is well illustrated and a good description is given with each instrument, together with the price and any extra charge for the National Physical Laboratory certificate. Barometers of all descriptions are catalogued, standard instruments of the highest scientific principle as well as more ordinary mercurial barometers for observing stations and for use on board ship, for fishermen or lifeboat stations, and also a pit or miner's barometer. Aneroid barometers of various designs are shown, both large and small, for ordinary use, for mining and surveying, or for special use in aeroplanes. Barographs are listed, and these instruments, which are of great interest to the ordinary public, are of a reasonable price, the guarantee of the firm being of the highest order.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—A deputy curator of the Public Libraries, Museum, and Art Gallery of the County Borough of Sunderland—Chairman of the Libraries, Museum, and Art Gallery

Committee, Town Hall, Sunderland (January 4). A junior assistant (a botanist with good knowledge of chemistry, preferably biochemistry) at the laboratories of the British Cotton Industry Research Association—The Director, Shirley Institute, Didsbury, Manchester (January 13). An assistant at the Mount Stromlo Observatory, Australia—The High Commissioner for the Commonwealth of Australia, Australia House, Strand, W.C.2 (January 15—*extension of date*). The De Beers professorship of mechanical engineering in the University of the Witwatersrand, Johannesburg—The Secretary, Office of the High Commissioner of South Africa, Trafalgar Square, W.C.2 (February 1). A professor of social anthropology (who will be also the director of the school) and a senior lecturer in social anthropology at the School of African Life and Languages in the University of Cape Town—The Secretary, Office of the High Commissioner of South Africa, Trafalgar Square, W.C.2 (February 15). A pharmacist under the Government of Iraq—Crown Agents for the Colonies, 4 Millbank, S.W.1, quoting M/14126.

ERRATUM.—In NATURE of December 12, p. 861, five lines from end of first column, for 15^4 ergs read 10^4 ergs.

Our Astronomical Column.

COMETS.—The *Times* of December 16 contains the announcement of the discovery of a new comet in the constellation Reticulum by Mr. J. Ensor of the Pretoria General Hospital. It is stated that the comet is not visible to the naked eye, but that it has been observed at the Union Observatory, Johannesburg, and that its tail is 15' long.

The position of the comet on December 14 was R.A. $3^h 38^m$, daily motion minus 12^m . S. Decl. 61° , daily motion $24' S$.

NAKED EYE SUNSPOTS.—The solar activity recently commented upon in these columns has continued. During the first half of December, two naked eye spot disturbances have been observed. The first of these was seen without a telescope only by persons of keen sight, but the second has been a distinct marking on the sun's disc when screened by fog or artificially with a dark glass. The former group was on the central meridian on December 10, when it was composed of two large composite spots. Although a new and apparently independent centre of activity, this group was not far distant from that of the naked eye group of November 8–20, which has not outlived the rotation.

The second group grew from some spots seen close to the sun's west limb on November 24 and 25, which, when brought again into view on the eastern limb on December 9, had become a long stream stretching 15° in longitude. The axis of the stream was inclined about 17° to the solar equator, the latitude of the leading spot being $21^\circ N$. and that of the follower $25^\circ N$. At the present phase of the sunspot cycle, spots in this latitude are usual, but groups so large as this present one are more commonly found between latitudes 10° and 15° . These are, of course, the zones most active near the maximum phase of the cycle. A very large group of spots appeared, however, in latitude $32^\circ S$. in February 1894, and one exactly on

the sun's equator in May 1921 (see NATURE, vol. 107, p. 399).

Particulars of the recent spots are given in the table below. No considerable magnetic disturbances have been recorded as yet this month at Greenwich.

Date on Disc, 1925.	Central Meridian Passage (G.M.T.).	Latitude.	Maximum Area.
Dec. 4–16	Dec. 10.3	$20^\circ S$.	1/900
Dec. 9–(22)	Dec. 16.0	$23^\circ N$.	1/500

(Areas are corrected for foreshortening and express the proportion of the sun's hemisphere.)

TOTAL SOLAR ECLIPSE OF JUNE 29, 1927.—It is not too early to commence plans for the eclipse of June 29, 1927, total in Wales, England, and Norway. A large scale map of the track in Great Britain (10 miles to the inch) has been constructed by Mr. B. F. Bawtree (late of the Nautical Almanac Office), and is published in the B.A.A. Handbook for 1926. The central line runs from Criccieth (Carnarvonshire) to Hartlepool, passing through Colwyn Bay, Southport, Settle, and Richmond (Yorkshire). The north limit of totality runs just north of Beaumaris, Bangor, Lancaster, Durham, and just south of Sunderland. The south limit runs a little south of Denbigh, Liverpool, Accrington, Saltburn-on-Sea, and through Burnley.

It must be counted a fortunate circumstance that three of the observatories in the Nautical Almanac list (those of Bidston (Birkenhead), Stonyhurst College, and Durham) lie within the totality track. Stonyhurst specialises both in solar study and spectroscopy, and preparations for the eclipse are already in progress. The altitude of the sun is 13° on the east coast, and the duration of totality increases from 21.6 sec. on the west coast to 24.5 sec. at Hartlepool.

The conditions in Norway are far more favourable both as regards height of sun and length of totality, and those who propose to undertake important researches should certainly go there.