

who contributed to the founding of the Dutch school of physical chemistry; and Lothar Meyer (1830–1895), best known for the share he had in the periodic classification of the elements, and whose memorial lecture before the Chemical Society was delivered by Prof. Bedson in 1896.

The year 1830 also witnessed the death of Major James Rennel (1742–1830), the eminent geographer, who is buried in Westminster Abbey; of Richard Chenevix (1774–1830), the Irish chemist and mineralogist, whose name, like that of Rennel, is in the list of Copley medallists; and of Henry Bell (1767–1830), the steadfast but unfortunate promoter of steam navigation, whose *Comet* was

the forerunner of the *Mauretania*; and it also saw the birth of David Edward Hughes (1830–1900), inventor and physicist, founder of famous scientific prizes and benefactor of the London hospitals; of Sir Edward Reed (1830–1906), the most prominent naval architect of his time; and of Gerhard von Rath (1830–1888), the Bonn mineralogist. It also was marked by the founding of the Royal Geographical Society, while in January 1830, Lyell, then thirty-two years of age, published the first part of his "Principles of Geology", that classic which Geikie said "must form an early part of the reading of every man who would wish to make himself an accomplished geologist".

News and Views.

SUPPLEMENTING our article entitled "Pleistocene Man in China" in NATURE of Dec. 28, 1929, p. 973, we are informed that Prof. Davidson Black has cabled from Peking (or, as the Chinese Government now calls the city, Peiping) on Dec. 28 as follows: "Recovered Chou Kou Tien uncrushed adult *Sinanthropus* skull entire except face letter follows". This presumably is a correction of the unofficial cablegrams that appeared in the newspapers on Dec. 15 and 16 mentioning "a complete skull with both the cranial and facial bones perfectly preserved". Prof. Davidson Black's promised statement was made at a meeting of the Geological Society of China held on Dec. 28. According to a message in the *Times* of Dec. 30 from its Peking correspondent, the credit for the actual discovery lies with a young Chinese geologist, Mr. W. C. Pei, who is in charge of the field work of the Geological Survey at Chou Kou Tien. Some four tons of fossils have been excavated, including parts of two lower jaws, several teeth, and cranial fragments of man. Among the mammalian remains is included the sabre-toothed tiger, which is contemporary with Peking Man. The evidence would appear to point to a very high antiquity indeed. Dr. Grabau, of the Chinese Geological Survey, is said to assign the skull to the beginning of the Quaternary Age, while that well-known authority on Chinese geology and archaeology, Père Teilhard de Chardin, gives it an estimated antiquity of 400,000 to 500,000 years. If either of these estimates is confirmed, it would place this relic at comparatively little later than *Pithecanthropus* of Java. The skull is at present embedded in hard travertine, but the right side and vault have been freed by the removal of a relatively softer part of the matrix. It would appear that while the whole of the facial region is lacking, the brain case is almost complete and massive jaw sockets have been exposed. The brow ridges are also said to be massive. As compared with the Java skull, the length is approximately the same, but relatively there appears to be greater brain capacity.

WE propose to publish week by week throughout this year a calendar of historic natural events; and the first set of notes in this series appears on pp. 32, 33. It is intended to include in the weekly record as wide a range as possible of remarkable natural occurrences

and phenomena observed in past times. Great storms, floods, frosts, and similar meteorological phenomena will naturally make up a large part of the collected events, and notable earthquakes, volcanic eruptions, and like terrestrial disturbances will also frequently come into the calendar. Whatever has commanded scientific attention on the earth or in the heavens—including of course the appearances of new stars, bright comets, and meteor showers—will, it is hoped, be brought back to memory under their appropriate dates during the year. Events in the natural history or biological field are more difficult to assign to particular dates, and we shall be grateful to any readers of NATURE who will assist us with references or notes upon remarkable occurrences of this kind. Without such aid it will be difficult to make the historic records so comprehensive as we should like them to be.

THE material for the calendar will be derived from a great variety of sources, too numerous to mention individually. Special reference should be made, however, to the *Quarterly Journal of the Royal Meteorological Society*, the *Meteorological Magazine*, Dr. C. Easton's work, "Les hivers dans l'Europe occidentale" (Leyden, 1928), W. Andrew's "Famous Frosts and Frost Fairs in Great Britain" (London, 1887), and a manuscript collection of extracts from the Saxon Chronicle and Holinshed's Chronicles, compiled by the late Miss Eleanor A. Ormerod and now in the possession of the Royal Meteorological Society. In compiling the records, the dates employed have been those of the actual calendar in use at the time. It will be recalled that, in 1752, eleven days were added to the date in the British Isles, Sept. 2 being directly followed by Sept. 14, in order to bring the calendar into conformity with that introduced by Pope Gregory XIII.

IN the second week of this month the centenary of the discovery of the Murray River by Captain Charles Sturt will be commemorated by representatives of South Australia, New South Wales, and Victoria, who will meet at Wentworth on Jan. 7. The next day the delegates will witness the opening of No. 6 Lock, near the Victorian border, and during the following week they will proceed down the river, unveiling memorials at historic spots, arriving at Hindmarsh Island on

Jan. 19. Here the Deputy Governor of South Australia will unveil a granite column 40 feet high, with a bronze tablet, to commemorate Capt. Sturt's landing place after his journey in a whaleboat down the river a hundred years ago. Sturt, who was born in 1795 and was educated at Harrow, served in the Peninsula and in France, and in 1827 became military secretary to Sir Ralph Darling, the Governor of New South Wales. He made several hazardous journeys into the interior, and in 1829 descended the River Murrumbidgee to its confluence with the Murray, and by the latter travelled to the coast. His discoveries led to the founding of South Australia, of which Captain (afterwards Rear-Admiral Sir John) Hindmarsh became the first Governor in 1836. Sturt afterwards became the assistant-commissioner of lands and colonial secretary of the new colony, and one of the counties bordered by the Murray River bears his name. He published accounts of his journeys and received the founder's gold medal of the Royal Geographical Society. Sturt returned to England in 1853 and died at Cheltenham on June 16, 1869.

THE Report on the Administration of the Meteorological Department of the Government of India in 1928-29 has recently been issued. It covers the period during which the head office was reorganised and moved from Simla to commodious new buildings at Poona. The opening ceremony, which took place on July 20, 1928, is described in this report, and the speeches made on that occasion give a good conspectus of the present position and future prospects of the department. The men who occupy the superintendships of the various branches at headquarters are all Indians. It is to them and their younger colleagues that we must chiefly look for new contributions to our meteorological knowledge of India during the next decade or so, and it is perhaps a good augury that the dislocation caused by the move has not prevented research work from being carried out during the period under review. Some of these researches have already been reviewed in our columns.

SIMLA was badly placed for three very important pieces of work. Mr. J. H. Field, the late Director-General of the Department, had to conduct his pioneer work in the exploration of the upper atmosphere, by means of sounding balloons carrying self-recording instruments, far from the central office, for balloons liberated at Simla are generally lost outright in remote parts of the Himalayas or in Tibet, carried eastwards in the circumpolar westerly circulation that is in evidence at high levels in northern India throughout a large part of the year. An equally important line of investigation—the study of the tropical cyclones of the Arabian Sea—is also more readily conducted with Poona as a base. Lastly, there is the forecasting of the monsoon, upon which the economic life of India is so dependent. The rain-bearing south-westerlies from the far side of the equator reach Poona early, and in full strength, while Simla not only experiences them long after the greater part of India, but also as a 'wave' that has nearly spent its poleward impulse.

THE Safety in Mines Research Board has come to the conclusion that its technical papers are somewhat

too difficult for the ordinary miner to understand, and it has, therefore, commenced to issue a series of pamphlets headed "What Every Mining Man Should Know". The first two of these have now been published, and are priced at a very low sum (6d. and 3d. respectively) in order to make them generally available. The first deals with research problems that have already been more or less completely solved and those that are now undergoing investigation, the object apparently being to bring before the ordinary coal miner the large volume of data which are as yet unknown and will have to be found out before coal mining can be made as safe as is humanly possible. The second pamphlet is on gas and flame, and attempts to make clear to the unscientifically trained mind the rationale of gas ignition and gas explosion. The authors have attempted to attain this object by photographs of a number of experiments; no doubt if the experiments could actually be seen, they would make the matter quite clear to the uninitiated, but it cannot be said that the photographs alone are equally conclusive. Upon the whole, the effort, and especially the objects underlying it, are praiseworthy; unfortunately, it may be gravely doubted whether the great body of coal miners will be sufficiently interested even to read these pamphlets.

DURING recent years there has grown up a general recognition of the value of international conferences. This is especially evident in connexion with illumination, a subject which is in a state of constant development. International co-operation has been greatly fostered by the reconstitution of the original International Photometric Commission, on a wider basis, as the International Illumination Commission, to which are linked national committees in all the chief countries of the world. Since the War, meetings held in Paris (1921), Geneva (1924), Bellagio (1927), and New York (1928) have revealed continuous progress. The conference held in the United States last year, which was attended by five hundred delegates from eleven different countries, was perhaps the most important ever held in connexion with illumination. The next International Illumination Congress will be held in Great Britain on Sept. 3-13, 1931, and will be combined with excursions to places of interest in England and Scotland. Papers dealing with varied aspects of lighting will be presented, and topics of local interest will be dealt with at each centre. The congress will be followed by the technical meetings of the International Commission on Illumination, which will be held in Cambridge on Sept. 13-19. In Great Britain the machinery for the study of illumination is perhaps more perfectly organised than elsewhere, and the aid of all the leading scientific and technical bodies interested, and of organisations concerned with gas and electric lighting, is being secured. The honorary general secretary of the Congress is Col. C. H. Silvester Evans (c/o The Illuminating Engineering Society, 32 Victoria Street, London, S.W.1), to whom all communications should be addressed.

MR. T. G. N. HALDANE read a remarkable paper to the Institution of Electrical Engineers on Dec. 19. He described a new method of producing low grade

heat from electricity by means of a device which he calls a heat pump. In 1824, Carnot imagined a perfect reversible heat engine and proved that its efficiency is the ratio of the difference of temperature between the high and low temperatures of the working substance to the high temperature when the temperatures are expressed in the absolute scale. If we imagine the Carnot engine reversed, that is, if it be supplied with mechanical energy, then a small amount of mechanical energy will allow a very much larger amount of heat to be pumped from the low source to the high source. The general principle of this process was first pointed out by Kelvin in 1852. Little practical application has been made of it hitherto, possibly because it appears at first sight to contradict ordinary engineering principles. Mr. Haldane points out that the process of producing cold is simply that of pumping heat from a relatively cold to a relatively hot source. Hence the refrigerator is the most familiar type of heat pump. It is shown both from theoretical considerations and from practical tests on refrigerating plant that where heat at a comparatively low temperature is required, an 'efficiency' of the order of from 300 to 500 per cent can be obtained. The heating efficiency is the ratio of the heat produced by the heat pump to the heat equivalent of the electrical energy expended. The principle can be applied to the heating of large buildings and very usefully to the heating of public baths. A description is given of experiments which demonstrate the soundness of the principles used. Engineering estimates are given. It appears that the heating of swimming baths is the most suitable field for the immediate application of the system.

USERS of the telephone will find a paper, on interruptions on telephone conversations, by Mr. K. W. Waterson, published in the *Bell Telephone Quarterly* (vol. 7, p. 166), both interesting and useful. Everyone has felt annoyance when a telephone conversation is suddenly interrupted by what is technically called a 'cutoff'. It is small consolation to know that this only occurs about six times in a thousand. Half of these are due to failure in human effort by the operators or to a fault in the extensive network connecting the two subscribers. The other half are in private switchboards which are outside the company's control. 'Cutoffs' on conversations from dial telephones occur less frequently than on connexions completed manually, as there is less opportunity for human error. All long-distance calls are subject to a greater risk of a cutoff. In a long distance cable connexion from New York to Chicago there are 1500 relay or movable contacts and 9000 other fixed contacts of various kinds. In addition, there are 40,000 soldered connexions in the toll line itself. Considering the complication of handling the calls on a switchboard, the operator does well to keep his mistakes down to 1 in 1500, which is less than one in a day's work.

THE errors due to the telephone subscriber generally arise when he trusts too much to his memory when calling a number, when he speaks indistinctly, or when, in the case of a dial telephone, he dials before hearing the dial tone. During the last ten years the percentage of wrong numbers asked for by the sub-

scribers has remained practically constant. On the other hand, the wrong numbers attributable to the telephone company have diminished to half their former value. At present it is difficult to see how the causes of 'bell rang' complaints can ever be eliminated. However good the maintenance of the apparatus, it will occasionally get out of order, and however excellent the training and supervision, operators will sometimes err. It is not always convenient for a subscriber to carry on a conversation the moment he is called, and the caller is often not able to wait until he gets a reply. All efforts should be made to effect improvements in this direction.

THE lure of spectroscopic investigation as applied to industry fascinates many a chemist until he reads a treatise, studies the subject in detail, and concludes that the goal is beyond his reach owing to high cost of equipment and the need for long training in the technique. However far from or near to the truth this may be in the ordinary way, the reader will find his fears greatly reduced or even dispelled in a new publication entitled "Spectroscopic Outfits for Metallurgical Analysis" (4to., pp. 40), published by Messrs. Adam Hilger, Ltd. Equipments of various types are so clearly described with regard to both their construction and the purposes to which they are adaptable, that the reader can scarcely fail to make a wise selection and to be assured that the cost will not greatly exceed the sum estimated, since accessories are listed together with the main equipment. Part 2 opens up three new methods of quantitative spectrographic analysis; Barratt's twin spark photometric method, in which the unknown intensity of the given lines is adjusted to equality with that of known lines; Scheibe and Neuhausser's method employing a 'rotating logarithmic wedge sector', which expresses in the length of the photographed line a function of its intensity; and Occhialini's method, also depending on measurements of the lengths of lines.

SINCE the Arctic Islands of Canada were incorporated in the North-West Territories of the Dominion, a great deal of exploration and survey work have been done annually, both in respect of routine patrols and in definitive pieces of investigation. A small chart, published by the National Resources Intelligence Branch of the Department of the Interior, shows the routes of officers carrying out patrols, inspection, and investigation during the present year, by land and by sea. Nearly the whole of the north-west passage was visited, and extensive explorations were made in the little known Foxe peninsula, the eastern side of Foxe basin, and the northern coasts of Hudson Strait. Most of the coasts of Baffin Island were visited, and in the far north patrols touched Melville Island, Bathurst Island, and Alex Heiberg Island, besides Ellesmere Island, where there is a police post. The Department keeps in active touch with all the areas inhabited by Eskimo, and has made Canadian jurisdiction much more than nominal in these arctic territories.

ON Dec. 23, according to the *Times*, a memorial to Sir Stamford Raffles was unveiled in Batavia. Born at sea, off Jamaica, in July 1781, Raffles at the age of

fourteen entered the East India house and in 1805 was sent to the Far East as assistant-secretary of Penang. Rising rapidly to more responsible positions, from 1811 until 1816 he was Lieutenant-Governor of Java, where he abolished slavery, instituted schools, and in other ways ameliorated the lot of the natives. His work, it was said, "will make his memory adored on the island of Java for ages to come". Afterwards Governor of Bencoolen in Sumatra, in 1819 he hoisted the British flag in Singapore. He returned to England in 1824, where he founded the Zoological Society, of which he was the first president. His death occurred on July 5, 1826, and his statue was afterwards placed in the north aisle of the choir of Westminster Abbey.

In his address at the twelfth anniversary meeting of the Bose Institute, Sir J. C. Bose said that the advance of plant physiology had been obstructed by narrow specialisation. His new type of 'growth balance' not only visualises imperceptible growth but makes an immediate measurement of the rate. The establishment of the laws of growth, on which the advance of scientific agriculture depends, has been rendered possible by this new method. Experiments carried out side by side on plant and animal tissue have established identical life mechanism in the two kingdoms. The leg of the frog and the leaf of *Mimosa* produce similar motile response under nervous impulse caused by cathodic excitation of an electric current. The characteristic effects of drugs are shown in automatic pulsations of both plant and animal. Indian plants are being found having medicinal properties which were not previously suspected, and the efficacy of which in reviving the failing heart appears to be exceptionally high. Further steps necessitate the isolation of the active principles from plant extracts, as well as prolonged investigation for standardisation of dose on human subjects.

In the November *Scientific Monthly*, Prof. M. F. Guyer describes the marine biological stations of Japan. So much good work has come out of these institutions that it is interesting to have some general account of them, and the attractive photographs inspire one with a desire to work in these laboratories. Two are described, the Marine Biological Station at Asamushi on the north-eastern coast of the main Island of Japan, and the Misaki Marine Biological Station, which lies on the southern extremity of a peninsula which separates the Bay of Tokyo from Sagami Sea. Both offer hospitality to foreign workers and both have much to offer in interesting plants and animals and ideal collecting grounds. The Asamushi Station has a staff of fourteen, with Prof. Hatai as director. There is a well-equipped laboratory and aquarium and an under-sea laboratory which is half submerged. The Misaki Station was founded by the Japanese Government in 1887 at the suggestion of Prof. Mitsukuri. It is now under the direction of Prof. Yatsu of the Tokyo Imperial University. The wonderful fauna and flora of this part of the world is well known for its richness, and regular courses are given for teachers in fisheries, planktology, and oceanography. Here also the laboratory is well equipped,

and there is a library and aquarium, besides research rooms for investigators. Both of these stations are of the greatest possible value.

THE question of growing crops subsidiary to the staple products of a country is discussed in a recent issue of the *Bulletin of the Imperial Institute*, vol. 27, p. 307, with particular reference to the tropical colonies. The danger of depending solely on one crop has recently been emphasised by the occurrence of a slump in the tobacco industry in Rhodesia, Nyasaland, and elsewhere, but many factors, notably transport, need to be considered before a suitable subsidiary export crop is selected. The industry suggested is the manufacture of essential oils, of which peppermint, geranium, and lavender appear the most promising. The oil is prepared from the plants by steam distillation, the process being carried out by the grower on the spot. A full account of the different varieties, the methods of cultivation, harvesting, and preparation of the oil, is given for each plant, together with the average yields to be expected and the present market conditions. Co-operation with the Royal Botanic Gardens at Kew is being arranged, plants for trial cultivation being sent to certain areas and the resulting oil being returned to the Imperial Institute for analysis and valuation. For those desiring further information a list of useful references is appended; the Imperial Institute is prepared to advise planters with regard to the type of still required and to put them into touch with makers of the necessary apparatus and merchants through whom the oils may be marketed. Intending planters are, however, also recommended to consult the agricultural officers of the country concerned so that they may obtain advice based on a thorough knowledge of local conditions.

THE growing appreciation of the value of trade associations for protecting the interests of their members is exemplified by the formation of the British Disinfectant Manufacturers' Association, the inaugural meeting of which was held on Dec. 16 last. About fifty firms, representative of all the branches of the disinfectant trade, have signified their intention of joining the new Association. One of the main objects of the Association is to protect and further the mutual trade interests of its members, to foster the manufacture of British disinfectants and promote closer co-operation between British disinfectant manufacturers. The Association will also serve as a medium for placing before government departments or other public bodies, at home and abroad, the views of British disinfectant manufacturers on matters affecting their industry. Mr. N. F. Kingzett, of the Sanitas Co., Ltd., was elected chairman, Mr. W. H. Hivey, of Taylor's Automatic Disinfectant, Ltd., vice-chairman, and Mr. R. A. Blair, of Burt, Boulton, and Haywood, Ltd., honorary treasurer of the new Association, which will be affiliated to the Association of British Chemical Manufacturers, 166 Piccadilly, W.1. The Association has already taken steps to investigate certain questions of tests which have arisen in connexion with the standardisation of disinfectant specifications by a government committee.

WE much regret to announce the death, on Dec. 25, of Major P. A. MacMahon, F.R.S., president in 1917-19 of the Royal Astronomical Society, who was formerly Deputy Warden of Standards, Board of Trade, at the age of seventy-five years; also of Major P. H. Hepburn, president in 1920-22 of the British Astronomical Association and treasurer in 1927-28 of the Royal Astronomical Society, on Dec. 25, aged fifty-six years.

THE fourteenth series of "Methods and Problems of Medical Education" has been issued by the Rockefeller Foundation, New York. Methods of keeping records are dealt with in this series, and as models specimens of the following are given: (1) the complete case sheets of a case of fracture, Massachusetts General Hospital, (2) the blank forms used

in a sanitary survey, Peking Union Medical College, and (3) a summary of the records and record system of the Children's Hospital, Cincinnati, Ohio.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—A principal of the County Technical College and School of Art, and organiser of evening school work in the Borough of Newark—The Clerk to the Governors, Education Offices, Old Magnus Buildings, Newark (Jan. 14). A principal of the County Technical Institute, Worksop—The Director of Education, Shire Hall, Nottingham (Jan. 25). A lecturer in physical and stratigraphical geology in the Egyptian University, Faculty of Science, Cairo—The Dean of the Faculty of Science, Egyptian University, Cairo (Jan. 31).

Our Astronomical Column.

An Active Region on the Sun.—Although the maximum of the present cycle was reached in 1928, the sun has shown considerable activity during the past three months in the appearance of several large spots (see NATURE, Oct. 19, p. 631, Nov. 9, p. 737, Dec. 7, p. 888, Dec. 28, p. 998). During the latter part of December, another group of spots crossed the disc, covering with its attendant faculae a great extent of the sun's surface. The group (or possibly two separate but allied groups), which consisted of a long stream extending over 18° of longitude or 130,000 miles, occupied the place of the big naked-eye spot, No. 16 of the previous rotation, which also was the return of a complex stream beginning its development on Oct. 30. Notes relating to the early history of this active region are given in the *Observatory* for December last, p. 365.

The present group was observed at Greenwich with the spectrohelioscope presented to the Royal Observatory by Dr. Hale, and it was seen to be associated with extensive bright hydrogen flocculi. Preceding the group, on Dec. 24-26 (the only days when observation was possible), there was a very long, slender, dark filament which represented a prominence of considerable size and activity. Measures taken with the velocity recorder or 'line-shifter' of the spectrohelioscope showed on Dec. 25 a difference of 95 km./sec. in radial velocity between the two ends of the filament, the southern end rising from the sun with a velocity of 25 km./sec. and the northern end falling back with a velocity of 70 km./sec. A detailed account of a similar observation of a dark filament but connected directly with a sunspot is given by Dr. Hale in NATURE of May 14, 1927, p. 711.

The following table completes the list of large sunspots seen during the year 1929.

| No. | Date on Disc. | Central Meridian Passage. | Latitude. | Maximum Area. |
|-----|----------------|---------------------------|---------------|---------------|
| 19 | Dec. 21-Jan. 2 | Dec. 27-5 | 16° N. | 2000 |

Comets.—A new comet, 1929*d*, was discovered on Dec. 20 by Mr. Wilk of Cracow Observatory, who will be remembered as one of the discoverers of comet 1925*XI* (Peltier-Wilk). The following positions, of which the first is only approximate, have been transmitted by telegram from the I.A.U. Bureau, Copenhagen:

| U.T. | R.A. 1929-0. | N. Decl. 1929-0. | Observer. | Place. |
|--|--|------------------|-----------|------------|
| Dec. 20 ^d 17 ^h 45 ^m | 18 ^h 8 ^m 35 ^s | 36° 19' | Wilk | Cracow |
| 21 17 32.1 | 18 20 15.67 | 35 23 30 | Wolf | Königstuhl |

No. 3140, VOL. 125]

The magnitude was noted as 7 on Dec. 20, 9 on Dec. 21. The deduced rate of daily motion is $+11^m 48^s, -56'$. This gives the rough position for the evening of Dec. 28, R.A. $19^h 43^m$, N. Decl. $28^\circ 52'$, which is some 5° east of β Cygni. This is the first comet readily visible with small instruments in European latitudes for nearly two years, and the first orbit likely to prove parabolic since the bright comet 1927*IX* (Skjellerup).

As the comet is approaching the sun, though receding from the earth, it is likely to become somewhat brighter: the following positions were secured by Dr. W. H. Steavenson at Norwood:

| | | R.A. 1929-0. | N. Decl. 1929-0. |
|----------|--------------|--------------------|---------------------|
| Dec. 25. | 18 37.3 U.T. | $19^h 5^m 36.64^s$ | $30^\circ 42' 14''$ |
| „ 26. | 18 21.0 „ | 19 15 47.91 | 29 24 37 |

Prof. Banachiewicz, Director of Cracow Observatory, has deduced the following orbit from observations on Dec. 21, 23, 25:

| | |
|----------|------------------|
| T | 1930 Jan. 22.257 |
| ω | $157^\circ 8'$ |
| Ω | $178 41$ |
| i | $124 31$ |
| log q | 9.82840 |

EPHEMERIS FOR 18^h U.T.

| | R.A. | N. Decl. | log r . | log Δ . |
|---------|-----------------|---------------|-----------|----------------|
| Jan. 1. | $20^h 9^m 50^s$ | $21^\circ 1'$ | 9.9006 | 9.9789 |
| „ 5. | 20 38 1 | 15 24 | 9.8783 | 0.0054 |
| „ 9. | 21 1 4 | 10 8 | 9.8586 | 0.0359 |
| „ 13. | 21 19 45 | 5 18 | 9.8430 | 0.0679 |
| „ 17. | 21 34 51 | 1 3 | 9.8328 | 0.0990 |

An observation by Dr. A. C. D. Crommelin on Dec. 29, not yet fully reduced, shows that the position was within $1'$ or $2'$ of the ephemeris place, so that the elements are probably near the truth: the comet must be looked for in the evening as soon as the sky is dark enough.

Prof. van Biesbroeck followed Forbes's Comet, 1929*c*, at Yerkes Observatory until Nov. 22: on Nov. 5 it was of mag. 15, with a diffused nucleus and a tail on the following side. On Nov. 22 the magnitude was 16.5. He is still following Stearns's Comet, 1927*IV*, with the 24-inch reflector. Its magnitude is 16. Carpenter's reported comet of Nov. 2 may be written off as unconfirmed.