150° C. by traces of carbon monoxide. In an ordinary bats-wing burner, the amounts of carbon monoxide found were so small as to be possibly due to experimental error, and in any case negligible. The ordinary incandescent burner gives off traces of this gas, and in fact whenever a gas flame strikes an obstacle within a certain distance of the orifice through which the gas is issuing, small quantities of carbon monoxide are evolved, and on this account special attention to the upward draught in all gas stoves is essential. No lighting burner in ordinary use appears to give off sufficient carbon monoxide to render any special precautions necessary, the author pointing out that more of this gas will be introduced into a room through slightly defective gas fittings than is given out by any pattern of burner in ordinary use.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. W. White; two Great Bats (*Vespertilio noctula*), British, presented by Mr. E. Hilton; a Common Seal (*Phoca vitulina*) from the River Spay, Scotland, presented by his Grace the Duke of Richmond and Gordon, K.G.; a Common Hare (*Lepus europaeus*), British, presented by Miss Henrietta Holland; an Egyptian Jerboa (*Dipus aegyptius*) from North Africa, presented by Mr. F. Tomlin; a West African Love Bird (*Agapornis pullaria*) from West Africa, presented by Mr. C. W. Gameys; a Kiang (*Equus hemionus*) from Tibet, a Rose-crested Cockatoo (*Cacatua moluccensus*) from Moluccas, an Echidna (*Echidna hystrix*) from New South Wales, deposited; a Cabot's Tragopan (*Ceriornis caboti*) from China, five Crested Colins (*Eupsychortyx cristata*) from Mexico, purchased.

OUR ASTRONOMICAL COLUMN.

COMET 1899 *a* (SWIFT).—The number of observations of this comet has been sufficient to allow of the orbit being computed, and for this the following elements are found:—

T = 1899, April 13·26, G.M.T.

$$\left.\begin{array}{l} \omega = 4^\circ\ 54' \\ \Omega = 23\ \ 9 \\ i = 146\ \ 4 \\ q = 0{\cdot}3447 \end{array}\right\} 1899$$

Ephemeris for 12h. G.M.T.

1899.	R.A. h. m.	Decl. ° ′	Br.
Mar. 16	2 56	11 53	1·00
17	2 52	−10 47	1·13
19	2 46	8 47	
20	2 43	7 55	
21	2 40	6 54	1·23
23	2 34	5 7	

The comet is brightening as it approaches the sun, and its rapidly decreasing southerly declination will render its observation more likely in these latitudes. It is said to be round, with a diameter of about 7′ of arc, having a central condensation and a short tail. It should be looked for immediately after sunset near η Eridani, and will move from that position towards the variable star *o* Ceti (Mira).

TUTTLE'S COMET 1896 *b*.—In *Ast. Nach.*, 3552, Mr. J. Rahts gives an improved ephemeris of this comet, together with the elements.

1899.	R.A. h. m.	Decl. ° ′
March 17	2 2	+28 49
21	2 18	27 42
25	2 33	26 30
29	2 48	+25 13

The comet is increasing in brightness.

NEW STAR IN AQUILA.—A circular from the Centralstelle at Kiel informs us of the present state of the new star discovered by Mrs. Fleming in March 1898, during the examination of the Harvard plates. The position of the star for epoch 1900 is R.A. = 18h. 56m. 13s.; Decl. = −13° 18′; this place is in the south-western border of Aquila, or on some charts in the north-west of Sagittarius. At the time of discovery the Nova was of the fifth magnitude, while now (March 10) Prof. Pickering gives it the magnitude ten, as determined from the photometric measurement of eight plates.

PHOTOGRAPHY OF CORONA.—For the past four or five years several astrophysicists have been attempting to obtain photographs of the Solar Corona without the aid of a total eclipse, but so far, however, without success. Sig. A. Ricco, director of the Catania Observatory, gives the history of the investigation as well as the results of his own attempts on the problem. [*Bulletin de la Soc.-Belgé d'Astronomie*, vol. iii. No. 4.] The first attempts described are those of Dr. Huggins, who employed a reflector having an extended cap provided with numerous diaphragms to minimise the amount of scattered light. A similar apparatus has also been used by A. Mascari at the observatory on Mount Etna. Certain corona-like forms do appear on the photographs thus obtained, but there seems to be no probability of their being real.

Later Prof. G. E. Hale, using a spectroheliograph at Mount Etna, attempted to photograph the corona by isolating the violet calcium line (K) of the spectrum, and traversing the sun's image given by a lens across the slit of the instrument. This was also unsuccessful.

Prof. Ricco then tried using a portrait lens, but with no better result; and the last attempts he describes were made with pin-hole cameras of various dimensions, these also failing to record any true image. Reproductions of the photographs obtained with all four types of apparatus are given, and examination of these shows that the only appearance photographed is the graduated halation effect radiating equally in all directions from the solar disc.

HARVARD COLLEGE OBSERVATORY.—In the Harvard College Observatory *Circular*, No. 39, Prof. E. C. Pickering presents some remarks on the work done with the new Bruce photographic doublet in comparison with other instruments of different design. He advocates that in future new large telescopes should be made of widely-varying types, so that the most appropriate form for any particular department of astronomical work may be obtained. The Bruce telescope was a new departure from conventional lines, and its complete success encourages the extension of the inquiry. In this case the instrument has a very short focal length, and Prof. Pickering proposes, if funds be forthcoming, to design an instrument of unusually long focus, say from 130 to 160 feet, with an aperture of from 12 to 14 inches. This he would place horizontally, and feed with light from a mirror. The diurnal motion would be counteracted by moving the plate by clockwork, as in the horizontal photoheliograph now in use at Cambridge. With such an instrument he thinks much could be done in obtaining better photographs of the solar surface and the prominences; pictures of the moon could be got exceeding 12 inches in diameter without enlargement, and possibly photographs of the planets Jupiter, Saturn and Mars. It would also be useful in re-determining the solar parallax from the next approach of Eros in 1900, by observing the planet east and west of the meridian.

Circular No. 40 gives a description of the methods adopted at the observatory for photographing meteors. In the case of determining the radiant point of bright meteors the usual method of intersecting trails is scarcely applicable, their number being so small. If, however, the meteor is simultaneously observed from *two* stations, the radiant can be determined just as correctly. Provision for this has been made, cameras provided with automatic exposing shutters having been installed at Blue Hill and Cambridge. The lenses are of wide angle, and point to the zenith. If two photographs of the same meteor are superimposed, the height at the instant of exposure can be found by a simple proportion. As the distance of the meteor on the two photographs is to the focal length of the lenses, so is the distance apart of the two stations to the required altitude. The positions of the trails in space can be found if stars are also photographed on the plates, the intersection of the two trails giving the declination of the radiant point of the meteor. The right ascension is, however, indeterminate unless time of appearance is known, or, as may be later, the camera be mounted equatorially.

The value of placing a prism in front of the lens to obtain spectra is also mentioned, and it is recommended that the plate be kept in vibration at a known rate. Prof. Pickering thinks that using three plates each night it would be possible to determine the altitude, radiant point, velocity and spectrum of one-third of all the bright meteors visible in any locality.

FORTHCOMING BOOKS OF SCIENCE.

MR. FÉLIX ALCAN (Paris) promises:—(Bibliothèque Scientifique Internationale) "La géologie expérimentale," by Prof. Stanislas Meunier; "La Nature tropicale," by J. Constantin. Médicine.—"Chirurgie de la plèvre," by Prof. Terrier and Dr. Reymond, illustrated; "Chirurgie d'urgence," by Dr. Cornet, illustrated; "L'Instinct sexuel, evolution," by Dr. Ch. Féré, illustrated; "Traité d'histologie pathologique," by MM. Cornil, Brault and Letulle, 3 vols., illustrated; "La profession médicale (Devoirs et Droits), by Prof. Morache; "La mécanothérapie," by Dr. F. Lagrange; "Etudes de chirurgie médullaire," by A. Chipault, Tome i. and ii., illustrated.

Mr. Edward Arnold announces:—"Dynamics for Engineering Students," by Prof. W. E. Dalby; "Elementary Natural Philosophy," by A. Earl; "An Elementary Chemistry," by W. A. Shenstone, F.R.S.; "Physical Chemistry," by Dr. Alexander Scott; "A Manual of Physiology," by Dr. Leonard Hill; "A Manual of Botany," by David Houston; "A Manual of Physiography," by Andrew J. Herbertson; "Wood: its Natural History and Industrial Applications," by Prof. G. S. Boulger.

Messrs. Baillière, Tindall, and Cox give notice of:—The Harben Lectures, 1898–99: "The Administrative Control of Tuberculosis," by Sir Richard Thorne Thorne, K.C.B.; "Arris and Gale Lecture, Royal College of Surgeons of England, 1899," by Dr. B. G. A. Moynihan; "The Analysis of Food and Drugs," by T. H. Pearmain and C. G. Moor, part ii., "The Chemical and Biological Examination of Water"; "The Pocket Pharmacopœia: including the Therapeutical Action of the Drugs with the Natural Order and Active Principle of those of Vegetable Origin," by F. Hudson-Cox and Dr. John Stokes; "Dictionary of Medical Terms," by H. de Méric, part ii., French-English; "Aids to Materia Medica," by Dr. W. Murrell, part ii.

Messrs. A. and C. Black's list contains:—"Human Geography," by A. J. Herbertson; "Physics," by A. T. Walden and J. J. Manley.

Messrs. Gebrüder Borntraeger (Berlin) give notice of:—"Symbolae Antillanae seu Fundamenta Florae Indiae Occidentalis," edited by Urban, vol. i., Fasc. i; "Werden und Vergehen," by Carus Sterne.

The list of Messrs. C. J. Clay and Sons (Cambridge University Press) includes:—"Collected Mathematical Papers," by Prof. P. G. Tait, vol. ii.; "The Scientific Papers of John Couch Adams," vol. ii., edited by Prof. W. G. Adams and R. A. Sampson; "Scientific Papers," by Lord Rayleigh, F.R.S.; "Scientific Papers," by the late Dr. Hopkinson, F.R.S.; "Scientific Papers," by Prof. Osborne Reynolds, F.R.S.; "The Strength of Materials," by Prof. J. A. Ewing, F.R.S.; "A Treatise on Spherical Astronomy," by Prof. Sir Robert S. Ball, F.R.S.; "A Treatise on Geometrical Optics," by R. A. Herman; "On the Kinetic Theory of Gases," by S. H. Burbury, F.R.S.; "Zoological Results based on material from New Britain, New Guinea, Loyalty Islands, and elsewhere, collected during the years 1895, 1896 and 1897," by Dr. Arthur Willey, part iii., illustrated; "Fauna Hawaiiensis," or the Zoology of the Sandwich Islands, being results of the explorations instituted by the Joint Committee appointed by the Royal Society of London for Promoting Natural Knowledge and the British Association for the Advancement of Science, and carried on with the assistance of those bodies and of the Trustees of the Bernice Pauahi Bishop Museum," edited by Dr. David Sharp, F.R.S., vol. i. part i.: *Hymenoptera Aculeata*, by R. C. L. Perkins; Cambridge Natural Science Manuals (Biological Series): "Fossil Plants," a manual for students of botany and geology, by A. C. Seward, F.R.S., vol. ii.; "The Soluble Ferments and Fermentation," by Prof. J. Reynolds Green, F.R.S; (Physical Series): "Electricity and Magnetism," by R. T. Glazebrook, F.R.S.; "Sound," by J. W. Capstick; (Geological Series), Crystallography, by Prof. W. J. Lewis; (Cambridge Geographical Series), "Man, Past and Present," by A. H. Keane; "Military Geography," by Dr. T. Miller Maguire.

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Mr. Henry Frowde announces:—"Annals of Botany," No. xlix.; Goebel's "Organographie der Pflanzen," translated by Prof. I. Bayley Balfour, F.R.S.; Pfeffer's "Pflanzenphysiologie," translated by Dr. A. G. Ewart.

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