

paration is the fourth, in which the compound is formed by direct synthesis by the union of vapour of carbon with vapour of silicon. For, as has been previously described in these columns, M. Moissan is able to actually distil carbon at the high temperature of the arc which he is able to produce in his furnace. The experiment is conducted in a small crucible of pure carbon of elongated form, and enclosing a little block of silicon. The base of the crucible is arranged so as to occupy the position where the highest temperature of the arc is attained, and after the conclusion of the experiment the interior of the crucible is found to be covered with almost colourless prismatic needles of carbon silicide.

CRYSTALLISED carbon silicide is an extremely stable substance which resists the action of the most energetic reagents, even those which are capable of readily attacking its elementary constituents. The pure crystals are colourless and perfectly transparent, and present the appearance of regular hexagons. Their density is 3.12, and they are so hard that the ruby is readily scratched, and may be ground by means of the powdered compound. They are unalterable in air or sulphur vapour at 1000°. Chlorine attacks them very slowly at 600°, but more rapidly at 1200°. Fused nitre and potassium chlorate are entirely without action upon them, as are likewise boiling sulphuric, hydrochloric, and nitric acids, and even aqua regia and the silicon-dissolving mixture of nitric and hydrofluoric acids are incapable of attacking them. Fused caustic potash, however, after heating to redness for an hour in contact with them, reacts with formation of carbonate and silicate of potassium, and thus affords a means of estimating the content of silicon. The carbon may also be estimated by repeated combustion with chromate of lead, which gradually effects oxidation of the carbon. The analyses thus carried out agree in all cases with the simple formula CSi .

NOTES from the Marine Biological Station, Plymouth.—Last week's captures include various types of *Foraminifera*, colonies of the Hydroid *Coryne pusilla* (without gonophores), a colony of the *Scyphistoma* stage of *Aurelia*, and the Nudibranchs *Platydois planata*, *Candiella plebeia* and *Polycera quadrilineata*. In the floating fauna the Hydroid medusæ *Cyanea areolata* and *Eutima insignis* have been observed in addition to the forms mentioned last week.

THE additions to the Zoological Society's Gardens during the past week include a Sooty Mangabey (*Cercocebus fuliginosus*) from West Africa, presented by Mr. Swaniston Cyril Hopkins; a Serval (*Felis serval*), a Nilotic Crocodile (*Crocodilus vulgaris*) from Africa, presented by Mr. T. E. C. Remington; a Lesser White-nosed Monkey (*Cercopithecus petaurista*) from West Africa, presented by Mrs. Noakes; a Yellow-collared Parrakeet (*Platyercus semitorquatus*) from Australia, presented by Miss A. Fenwick; a Common Sheldrake (*Tadorna vulpanser*) European, presented by the Rev. H. G. Morse; an Oyster-catcher (*Hamatopus ostralegus*) European, presented by Mr. Edmund Elliot; a Goliath Beetle, from West Africa, presented by Mr. F. W. Marshall; two Great Eagle Owls (*Bubo maximus*) European, deposited; a Flocky Lemur (*Avahi laniger*) from Madagascar, a Raccoon-like Dog (*Canis procynides*) from North-east Asia, a Sanderling (*Calidris arenaria*), a Puffin (*Fratercula arctica*) European, purchased.

OUR ASTRONOMICAL COLUMN.

ASTRONOMY AT THE WORLD'S FAIR.—The astronomical exhibits at Chicago seem to be fairly representative of the state of astronomical science at the present day, but they are too much scattered about in the different buildings for a proper study of them to be made. Among many of the more interesting exhibits we may mention the following: Fine collection

NO. 1250, VOL. 48]

of astronomical photographs, made by the Harvard College Observatory, which included those of stellar spectra nebulae and clusters, and of a portion of the lunar surface enlarged over one thousand diameters. Dr. Chandler's four inch almcantar, the collections of Draper and Langley, and the diffraction gratings and photographs of spectra by Prof. Rowland, the last of which formed the Johns Hopkins University exhibit. Specimens of the famous Jena optical glass, Kirchhoff's original spectrocope, Brill's mathematical models, and the magnetic apparatus of Gauss and Weber form part of the German Educational exhibit. In the English exhibit are found many astronomical photographs by Roberts, Gill, and others; others from the Royal Observatory, Greenwich, Boeddicker's Milky Way drawings, and the fine five-foot glass speculum by Dr. Common. Among some of the exhibits of the American astronomical instrument makers, we are glad to note the mounting of the great forty-inch Yerkes telescope by Warner and Swasey, who exhibit also some minor instruments. J. A. Brashear exhibits the stellar spectrocope for the Yerkes telescope, eighteen-inch and fifteen-inch objectives, gratings, &c. Among G. N. Saegmuller's (of Washington) exhibits is a four-inch steel meridian circle. Two twenty-three-inch discs of the celebrated Jena glass are shown by Schott and Genossen, of Jena, in addition to other specimens of optical glass. In the Cape Colony exhibit Dr. Gill's interesting stellar photographs are prominent, while the Lick Observatory display is housed in the educational department of the California State building, and, as *Science* says, is "strangely enough mixed up with the Kindergarten exhibit there." The U.S. Government building contains interesting apparatus as used in the Coast Survey, while the Naval Observatory shows a small observatory with several instruments.

THE AURORA OF JULY 15, 1893.—The system of observation of the aurora as lately instituted, seems to be already at work, and the observations of the aurora of July 15, most of which have been made on this system, show that the results are of the highest interest. A brief account of this aurora, by M. A. Veeder, will be found in the *Bulletin of the New England Weather Service* for the month of August (No. 18), from which we gather the following few notes:—With regard to the places of visibility and invisibility, it may be mentioned that its absence was verified up to midnight in Nova Scotia. In New England it was observed at a few stations, of short duration, and not at all conspicuous. Towards New York it was a fine display, and lasted all night, and was seen as far south as Washington at this longitude, while it was defined as a fine red aurora at Salt Lake city, and was seen as far south as the Lick Observatory, at both of which places this phenomenon is very rare. A special feature of this aurora was the "formation of a narrow band having an east and west direction, and passing just south of the zenith." This was seen in New England, the neighbourhood of Lake Ontario, and occasionally in Michigan, Wisconsin, and Iowa. An unusual formation recorded was that of an auroral curtain with a clearly defined lower margin. The twenty-seventh day interval coinciding thus with a synodic revolution of the sun, shows, as M. Veeder says, that whatever it is in the sun that originates an aurora can have this effect only when it has reached a certain position relative to the earth, and, further, that "the effect must proceed from the eastern limb." That in certain cases of large sunspots auroral effects might proceed from the central meridian of the sun as seen from the earth, M. Veeder freely admits; but he adds that, until further study has been made, this question cannot as yet be said to be satisfactorily answered.

NEW VARIABLE STARS IN CYGNUS.—A communication to the *Astronomischen Nachrichten*, No. 3191, by Herr Fr. Deichmüller, informs us of two new variable stars in the constellation of Cygnus. Their positions are respectively

h.	m.	s.	o.	'	"	1855
19	8	27	+	49	24	2
20	6	24	+	47	23	0

The first of these stars has a range of one and a half magnitudes, while the second varies from $7\frac{1}{2}$ to the ninth magnitude.

ASTRONOMICAL WORKS (ANTIQ.).—We have received the catalogue of Herr Oswald Weigel's Antiquarium in Leipzig, which is devoted simply to works on astronomy (astronomical geography and geodesy). Included also is the library of Prof. C. Fearnley, of Christiania; so that our readers may be sure that there are now some important works for sale.