

line, acts as a cement, and has both setting and binding properties. A greenish-blue pigment examined was composed of azurite, a hydrated carbonate of copper; whilst the green pigment was a mixture of malachite, azurite, and clay. The grey was limestone mixed with charcoal or carbon, and the black was a carbon black, composed of charred wood or burnt bones. It has been generally assumed that the Egyptians used white of egg as a binder for their pigments, but Mr. Toch could find no trace of any albuminous binder in the specimens submitted to him; they did, however, show evidence of the use of glue or gelatin. The pigment in two paint-pots, evidently thrown away by the workmen, was found to be hæmatite mixed with limestone and clay.

A REPORT of Prof. W. J. Pope's recent presidential address to the Chemical Society, which is comparable in importance with the late Prof. Meldola's address of eleven years ago, is printed in the April issue of the society's Journal. Prof. Pope commences his address—entitled "The Future of Pure and Applied Chemistry"—by pointing out that the last three years have dissipated for ever the fallacy that British chemists cannot excel in applied organic chemistry. In fact, Great Britain, which in 1914 had no resources for their manufacture, is now a larger producer of explosive, pharmaceutical, photographic, and other essential chemicals than Germany. The fact that science is unvocative has prevented the people from realising that the discoveries of Young, Davy, and Dalton at the beginning of the nineteenth century had more influence than the Napoleonic wars. The whole history of Europe for the last century was made within the laboratories of the Royal Institution. The greatest incentive to political change is the desire to increase the amenities of life, and research in pure science has for a hundred years been the greatest influence in this direction. Prof. Pope strongly urges that the various chemical societies should set up a joint council for the consideration of national questions in which chemical interests are concerned, and suggests for its consideration the correlation of the dye interests with the synthesis of pharmaceutical and photographic products, the development of natural colouring matters, and the study of patent law.

SOME interesting examples of the work accomplished by the Salvage Section of the Admiralty are given in *Engineering* for June 21. Since October, 1915, down to the present time about four hundred ships have been salvaged by this department. A large proportion of these ships, some of which are of high carrying capacity, has been repaired, refitted, and put in commission afresh. On account of the comparative shortage of shipping it is worth while at the present time to salvage practically every sunken ship, whereas before the war many would have been left to their fate on account of the cost of the operation exceeding the value of the ship. One of the great aids to salvage operations is the submersible electric-driven motor-pump, some types of which can deliver 500 tons of water per hour to a height of 75 ft. to 80 ft. One of the examples quoted is that of a vessel carrying a cargo of foodstuffs to the combined value of more than 3,000,000*l.* After being torpedoed, she was taken in tow by the Section's tugboats, but sank before she could be left high up on the beach. Electrically driven submersible pumps were put down in the stokeholds and divers established communication between the flooded holds and the stokeholds. After making the parts thus involved watertight on the outside the pumps were started, and the vessel, being thus lightened, could be drawn higher up on the beach, when similar operations were effected in the

lower submerged quarters. The vessel was ultimately floated off and repaired.

IN a recent issue of the *Zeitschrift für angewandte Chemie* is described a process (patented in Germany) for spraying metals on to any kind of surface, using metal melted in an electric arc and blown by means of gas-jets on to the surface to be covered. The metal to be sprayed forms one of the electrodes of the arc, and the gas-jets are directed so as to strike the sides of the metal electrodes without impinging on the arc and blowing it out. If the arc is produced between two electrodes, one being metallic, and a stream of non-oxidisable gas is directed on to the electrode, portions of the electrode that are melted will be carried away in the form of a fine spray, and may be deposited on any surface on which they impinge, thus forming a metallic skin on it. Suitable control apparatus is provided to allow for the wear of the electrodes.

WE have received a Classified List of Publications of the Carnegie Institution of Washington, dated December, 1917. It is stated that copies of each publication, except the *Index Medicus*, are sent gratuitously to each of the greater libraries of the world, while the remainder of the edition is to be sold at prices sufficient only to cover the cost of publication and postage. Among the volumes published by the institution in 1916 and 1917 we notice:—In astronomy, a revision of Ulugh Beg's Persian Catalogue of Stars by E. B. Knobel; in mathematics, a Sylow Factor Table of the first twelve thousand numbers by H. W. Stager; in chemistry, "The Interferometry of Reversed and Non-reversed Spectra," by Carl Barus; in terrestrial magnetism, "Ocean Magnetic Observations, 1905-16," by L. A. Bauer; in palæontology, "American Fossil Cycads," by G. R. Wieland, and "The Coal Measures Amphibia of North America," by Roy L. Moodie; in embryology, two new volumes of the "Contributions to Embryology," by various authors; in evolution, "Studies of Inheritance in Guinea-pigs and Rats," by W. E. Castle and S. G. Wright, "Gonadectomy in Relation to the Secondary Sexual Characters of some Domestic Birds," by H. D. Goodale, and "Sex-linked Inheritance in *Drosophila*," by T. H. Morgan and C. B. Bridges; in botany, "Plant Succession," by F. E. Clements; and in zoology, a new volume of papers from the Department of Marine Biology of the Carnegie Institution. It will be seen that the works recently published by the institution belong, as in former years, to many different branches of science. The complete list contains about 264 volumes published since 1903, with short descriptive notes on most of these publications.

MESSRS. BLACKIE AND SON, LTD., will shortly publish "Medicinal Herbs and Poisonous Plants," by Prof. David Ellis, of the Royal Technical College, Glasgow.

#### OUR ASTRONOMICAL COLUMN.

A NEW ASTEROID OF THE TROJAN GROUP.—A fifth member of this group has been discovered by Wolf. It has at present only the provisional designation CQ. The following elements are given in *Ast. Nach.*, No. 4945:—Epoch 1917, September 24.5, G.M.T.,  $M 83^{\circ} 18' 55''$ ,  $\omega 329^{\circ} 32' 38''$ ,  $\Omega 300^{\circ} 41' 27''$ ,  $i 8^{\circ} 51' 26''$ ,  $\phi 6^{\circ} 46' 53''$ ,  $\mu 294.427''$ ,  $\log a 0.720686$ . CQ and Patroclus are about  $60^{\circ}$  behind Jupiter in longitude, while Achilles, Hector, and Nestor are  $60^{\circ}$  in front of Jupiter. The value of  $\mu$  for each of them oscillates about  $5''$  on each side of the value for Jupiter  $299''$ , the period of an oscillation being

150 years. CQ had its minimum value of  $\mu$  about 1911; it will reach the mean value in 1949 and the maximum value in 1986. Its phase in this libration appears to be nearly opposite to that of Patroclus, so that the two planets are on opposite sides of their librational ellipse.

**A FAINT STAR WITH LARGE PROPER MOTION.**—In the *Ast. Nach.*, No. 4944, Dr. Max Wolf announces the discovery that a 13th magnitude star, about  $2^\circ$  west of  $\chi$  Leonis, has the exceptionally large proper motion of nearly  $5''$  per annum. The star appears on plates taken with the Bruce telescope at an interval of 17.055 years, and the following co-ordinates for 1875.0 have been determined from neighbouring comparison stars:—

	R.A.		Decl.
	h.	m.	s.
1901.146	10 50	24.40	+7 45 21.8
1918.201	10 50	20.00	+7 44 36.7

These measures give the proper motion as  $4.66''$  in the direction  $235.4^\circ$ , in close agreement with  $4.84''$  in the direction  $232^\circ$  determined by the stereo-comparator. In the period covered by the observations the total motion of the star was  $1.4'$ .

**THE YOUNG MOON SEEN AS A CIRCLE.**—Miss E. A. Stevenson has directed attention to the interesting appearance which the moon occasionally presents when about two days old (*Journ. Brit. Ast. Assoc.*, vol. xxviii., p. 223). Besides the familiar earth-shine effect, the "dark" limb of the moon then appears as a ring of silver light, in continuation of the illuminated crescent. When observed by Miss Stevenson, the circle has always been complete, but never of uniform brilliance, and its whiteness was in striking contrast with the pink or ashy hue of the earth-shine. Mr. W. Goodacre points out that the ring is best seen when the earth-shine is most marked, and attributes the appearance to the greater brightness of the moon's surface near the eastern limb as compared with the adjacent regions. The presence or absence of a similar effect along the western limb just before new moon does not appear to have been noted.

**PARALLAX OF THE BARNARD STAR.**—A new determination of the parallax of this star has been made at the Dearborn Observatory (*Ast. Journ.*, No. 734). The value found is  $0.557'' \pm 0.016''$ , which is somewhat larger than the other photographic determinations.

**A JAPANESE METEORITE.**—Mr. Kuni Niinomi, writing from the South Manchurian Middle School at Mukden, China, sends us particulars of a meteoric stone which was observed to fall on January 25 last, at 2.28 p.m., in Central Japan, the locality being near the village of Tané, in the prefecture of Shiga, on the east side of Lake Biwa, province Omi. There was an explosion and something was heard to fall, and through a hole in the snow the stone was found at a depth of a foot in the ground. It is irregularly wedge-shaped, and covered with a black crust with the usual "thumb-markings." The greatest dimension is 86 mm., and the weight 311.16 grams, specific gravity 3.55. On the fractured surface the stone is grey, with brown spots and minute spangles of metal. In character the new stone is very similar to those of the shower which fell on July 24, 1909, near the town of Gifu, in province Mino (adjoining province Omi). The latter consist of olivine and bronzite, with very little nickel-iron, and were classed as a "white chondrite." These two falls are to be added to the list of sixteen falls of meteorites, mostly stones, recognised by K. Jimbō in 1906 in his "General Notes on Japanese Meteorites."

NO. 2540, VOL. 101]

### THE NEW STAR IN AQUILA.

THE following estimates of magnitude of Nova Aquilæ have been communicated by Mr. Harold Thomson, who independently detected the star on June 8:—

Date	G.M.T.	Mag.	Date	G.M.T.	Mag.	
June 8	11.45	0.74	June 19	11.15	2.10*	
	13.30	0.74		20	11.0	2.35*
9	9.50	-0.42	22	9.59	3.01*	
	10.30	-0.26			10.47	2.87
	11.0	-0.50			11.30	2.84
10	9.40	0.07*	23	10.5	3.12	
	12.10	-0.25			10.21	3.21
	12.45	+0.07	24	10.0	3.1	
	11	10.8		0.30	25	9.25
11	10.50	0.55		11.0	3.09	
	11.45	0.43		11.20	3.10	
	14	13.30	1.04		12.15	3.24
15	9.38	1.55		12.35	2.99	
	10.56	1.60	26	10.10	3.4	
16	11.25	1.80*			11.20	3.3
18	11.10	1.90		12.30	3.4	

The magnitudes marked with an asterisk were not considered very satisfactory on account of clouds or twilight. Making due allowance for these, the decline of the star does not appear to have been accompanied by any marked fluctuations.

Several early observations of the new star, made on June 8 and 9, are reported in the ephemeris circular of the *Ast. Nach.*, 1918, No. 548. The first information received by the Centralstelle was from Prof. L. Courvoisier, who had observed the star at Babelsberg on June 8 at 12h. 38m. G.M.T.; the magnitude at 13h. 30m. was given as 1.1, and the spectrum was stated to show bright and dark lines. Prof. Schorr states that a photograph taken with the reflector at Bergedorf on June 10 showed no trace of nebulosity in the vicinity of the nova. According to a telegram from Dr. Gautier, *via* Copenhagen, the new star was observed by Prof. Laskovski at Geneva on the evening of June 7, but no mention is made of its magnitude.

The spectrum of the new star has undergone considerable changes as compared with the observations previously reported in NATURE. On June 29, when the star had diminished in brightness to about magnitude 4, Prof. Fowler observed that while the bright hydrogen lines were still the predominant feature, they had become very broad, and each appeared to have a central dark line, as if reversed or doubled. In the case of  $H_\alpha$ , there was no marked difference in the intensities of the two components, but the less refrangible component of  $H_\beta$  was distinctly the brighter. The total breadth of the bright  $H_\beta$  was estimated at not much less than 40 Å. The band about  $\lambda 464$  was broad and bright, but not so strong as  $H_\beta$ . Of the group of lines less refrangible than  $H_\beta$ , 492, 517, and 532 had considerably diminished in intensity, but 502 had not faded at the same rate, and was the brightest of the four. All these were very broad, and possibly double or reversed like  $H_\beta$ . The dark bands and the adjacent bright bands about 560 and D were still visible, and the bright D band was divided centrally by a dark line. There was also a broad, faint band about  $\lambda 600$ , and a narrower band about  $\lambda 631$ . The relative brightening of 502 may possibly indicate the incoming of the adjacent nebular line 5007.

Father Cortie informs us that further photographs of the spectrum were obtained at Stonyhurst on June 29 and 30. The chief features on these plates are the broad bright bands of hydrogen and the band about  $\lambda 464$ . Other bright bands are also present, but no