

illustrated, and Winkler's method for estimating the volume of dissolved air in water explained. The lecturer referred to the utility of this work in such diverse fields as public health and oceanography, and indicated the importance of dissolved air to sub-aqueous plant and animal life. The function of submerged green plants in absorbing carbon dioxide and liberating oxygen was explained, and it was stated that large quantities of oxygen in excess of saturation were found after a period of plant activity in bright light. One function of this dissolved oxygen is to maintain a healthy condition in water by oxidising submerged refuse—a process largely dependent upon the presence of living organisms. Reference was also made to geological changes due to dissolved carbon dioxide, to hardness produced by the same gas, and to the corrosive action of water containing dissolved air as exemplified by the oxidation of ironwork in hot-water radiators, and by the corrosion observed in all steam-raising systems owing to the oxygen dissolved in the feed-water. At the close of his lecture Mr. Coste referred in eloquent terms to the work done at Finsbury College during the past thirty-five years, and deplored the fact that the closing of the college was contemplated.

Engineering for October 8 gives some interesting particulars regarding fabricated ships constructed in the United States. It will be remembered that these ships were so arranged as to permit the separate parts to be manufactured by a large number of firms and then assembled at the shipyard. The fabricated freighter has now been afloat long enough to experience sufficiently varied conditions to reveal its seaworthiness. It is a known fact that steamers of this kind have been able to forge ahead in the teeth of storms that have driven larger boats of the usual build to leeward. Replacements in cases of breakdown or injury have been made very promptly. Two steamers, one of which was a fabricated vessel, collided, and each smashed a hawse-pipe; the fabricated vessel was repaired from stock in a few hours, whilst repairs to the other ship took six weeks. Reports made by masters and chief engineers reveal the soundness of the hulls and their unusual tightness and freedom from leakages in the cargo-bilges, etc. Up to April 1 of the current year 120 fabricated craft had been launched from the twenty-eight ways of the Newark Bay shipyard, the keel of the first having been laid in December, 1917—a feat which constitutes a record. It is proposed to carry on this yard, and the Submarine Boat Corporation has taken it over from the Government. The programme provides for extensive developments of both the yard and its neighbourhood, with the idea of making that point a highly equipped port of entry and departure, with dry docks and other repair conveniences.

We learn that the X-ray and electro-medical business of the High Tension Co. has been purchased by X Rays, Ltd. Arrangements have also been made whereby Mr. Mortimer A. Codd, the author of a well-known book on the subject of high-tension apparatus, becomes the director of research for X Rays, Ltd. The direct association of an X-ray research laboratory

with a manufacturing firm has yielded such astonishing results in America that one may look with confidence to the similar plan which has been initiated in this country.

We are informed that the head offices of Siemens Brothers and Co., Ltd., and of Siemens Brothers Dynamo Works, Ltd., will be removed shortly from Palace Place Mansions, Kensington, London, W.8, to Caxton House, Westminster, London, S.W.1.

Our Astronomical Column.

THE NOVA IN CYGNUS.—This object has continued to decline in brilliancy at a fairly steady rate. Mr. Denning writes that since the end of August the star has lost light at a rate equivalent to one-tenth of a magnitude daily. The nova has exhibited features differing in several respects from those of the bright novæ of 1901 (Perseid) and 1918 (Aquilid), which showed remarkable fluctuations in their declining stages and presented phenomena analogous to those of ordinary variable stars. It seems, in fact, as though the new stars of 1901 and 1918, after their great outburst and quick decline, were subject to a series of minor outbursts affecting them at short and fairly regular intervals.

No such disturbances have apparently been observed in the case of Nova Cygni. At Bristol, during the fifty-five nights from August 20 to October 13 inclusive, the star was observable on forty-seven nights, and it has now become a rather faint telescopic object, its magnitude on October 7 being only 8½.

It is remarkable that since 1848 twelve new stars have been discovered which were visible to the naked eye, although during the preceding 150 years not one nova was recorded.

CONNECTION OF PLANETARY NEBULÆ WITH HELIUM STARS.—*Astr. Nach.*, No. 5065, has an article by Herr H. Ludendorff on this subject. Herr Ludendorff alludes to the puzzling fact that the planetary nebulæ show a high average velocity in the line of sight, while the helium and Wolf-Rayet stars, with which they have spectroscopic affinity, have a conspicuously low one. It was at first thought that the number of nebulæ on Keeler's list, which was twelve, might be insufficient to deduce a trustworthy mean. But the publication of a much larger list of ninety-six nebulæ by Campbell and Moore has increased the mean radial velocity from 25 to 30 km./sec. It becomes very difficult to make any plausible scheme of cosmogony into which these nebulæ will fit. The low radial velocity of the helium stars is generally explained by their large mass on the assumption that the law of equipartition of energy applies to stellar velocities. There is, however, evidence of considerable mass in the case of the planetary nebulæ also. Campbell noted spectroscopic evidence of rotation in several cases. Combining these with van Maanen's parallaxes, Herr Ludendorff finds values for the masses of four planetaries as 14, 19, 162, and 28, that of the sun being unity. In view of this difficulty, he re-examines the evidence that spectroscopic binary systems give of the masses of the B stars, and states that it appears that those with the largest mass have also the largest radial velocity, and that the same rule appears to hold for the Wolf-Rayet stars.

While this result may help to bridge the gulf between the planetaries and kindred types of stars, it only removes one difficulty to create another. It remains to give a reasonable explanation of the increase of velocity with mass, which is quite opposed to preconceived ideas.