

from Annelids. Hence if the Apodidæ (and all other Crustacea) arose from Trilobites possessing biramous limbs, their own foliaceous appendages must be presumed to be derived from the biramous type, notwithstanding the similarity of their structure to the foliaceous uniramous parapodia of some Annelids. It is possible that the bilobed type of parapodium possessed by many Annelids may have given rise to the biramous Crustacean limb. On the other hand there is the objection felt by a few that the descent of the Apodidæ and other Crustacea from an ancestral group of Trilobites does not necessarily follow from the fact that Trilobites are the earliest known Crustacea. The Apodidæ themselves have many structural affinities with Annelids. Thus it is conceivable that the Crustacean-Annelid may have produced divergent branches of which the Trilobites (biramous-limbed) represent one, and the Apodidæ (foliaceous-limbed) the other. This view, however, is not regarded with favour by the chief authorities.

At the sitting of the French Academy of Sciences held on October 23, 1922, a note was presented by MM. Constantin, Joessel, and Daloz "concerning a boat which travels against the wind while using the wind itself for motive power." An article on the same topic, entitled "Un bateau paradoxal," appears in *La Nature* of November 11. An ordinary sailing-boat cannot use the wind for directions which are too near that directly opposite to the wind, and it was long ago suggested that if an arrange-

ment like the sails of a windmill were substituted for ordinary sails, the boat could travel even against the wind. Napoleon was urged to use this as a means of surprising the British fleet. Scientific work on the idea was initiated in 1901 by Constantin, who constructed a model car on wheels which advanced against a current of air blown on it. The publication of Drzwiecki's theory of propellers in 1909 encouraged Constantin to proceed further. He attracted the attention and approval of many French men of science, and a syndicate was formed for the development of the method, but the war interrupted the work. In 1917 work was resumed, and since then the idea has been applied successfully. Joessel (son of the well-known investigator in aerodynamics) put an air-screw—like the sails of a windmill—of 5 metres diameter into a 2-ton sloop, *La Drésinette*, connected with a marine propeller of 60 cm. diameter, and successful journeys were made on the Erdre, near Nantes, and on the Loire. This was in 1918. Later on a 9-metre air-screw was installed in the 5-ton boat *Bois Rosé*, connected with a marine propeller of 105 cm. diameter, and on September 15, 1922, this boat sailed successfully on the Seine, between Saint Cloud and Sèvres, in all winds and against the wind, without causing any derangement in the ordinary traffic. It was estimated that the speed was 2 metres per second against a wind of 7 metres per second. The investigations were conducted with the help of the French *Direction des recherches scientifiques et industrielles et des inventions*.

Our Astronomical Column.

THE PLANET MERCURY.—This planet reaches its easterly elongation on January 13 and will be favourably placed for naked-eye observation at about that date.

The best time to obtain a glimpse of the planet will be at about an hour after sunset, when it may be seen at a low altitude over the west-south-west horizon. The planet may be expected to be about as bright as a first magnitude star would appear in a similar position and involved in twilight. Mercury does not shine with the same steady light as some of the larger planets, but often exhibits a sparkling fitful lustre.

Being rarely visible owing to its proximity to the sun, it is necessary for intending observers to look for the planet at special periods like the present, when its apparent elongations from the sun enable it to be perceived with the unaided eye.

THE JANUARY METEORS.—A brilliant full moon and passing clouds somewhat interfered with observation of this event. The maximum display was expected on January 3, and Mr. W. F. Denning writes that at Bristol fine meteors were visible occasionally, and indications were that had the conditions been favourable, the shower would have been fairly conspicuous and plentiful.

At Stowmarket, Miss A. Grace Cook and Mr. J. P. M. Prentice obtained independent observations on the night mentioned, and remarked some fine meteors from the usual point of radiation at $232^{\circ} + 52^{\circ}$.

The sky was not watched after midnight and the maximum seemed to have been attained in the earlier part of the evening. Miss Cook recorded bright meteors from the special shower of Quadrantids

at $6^{\text{h}} 58^{\text{m}}$, $8^{\text{h}} 10^{\text{m}}$, $8^{\text{h}} 43^{\text{m}}$ and $10^{\text{h}} 18^{\text{m}}$, and there were others of about mag. 1. At $9^{\text{h}} 36^{\text{m}}$ there was a fireball from the direction of Aquarius.

On the night of January 4, the shower of Quadrantids seemed to have become nearly extinct. At $8^{\text{h}} 48^{\text{m}}$, however, Miss Cook witnessed the appearance of a remarkable stationary meteor. It was as bright as Venus, and shone for about $1\frac{1}{2}$ seconds with a motionless aspect at the position $222^{\circ} + 77^{\circ}$. There is a known shower at this point in Ursa Minor and it corresponds with the point of radiation of Mechain-Tuttle's Comet on December 20.

COMING SOLAR ECLIPSES.—The eclipse of September 10, 1923, will be total in California and Mexico. The sun's altitude will be more than 60° , and the duration of totality $3\frac{1}{2}$ minutes. The weather prospects are very hopeful. There is little doubt that the Einstein problem will again be studied. Mr. F. Slocum (*Astr. Journ.* No. 809) gives a list of the stars within $2\frac{1}{2}^{\circ}$ of the sun's centre down to mag. 9.0. They are mostly faint, especially those nearer the sun, and it will need skilled photography to record them. It is proposed to photograph a check field, some 5° distant, on the same plates during totality, thus giving an independent determination of scale value, and enabling the whole Einstein displacement to be utilised. Otherwise much of it is lost, only the differential shift being available.

The succeeding totality, on January 24, 1925, crosses the north-eastern states. Four observatories—Vassar, Yale, Van Vlack, and Nantucket—enjoy total eclipse; its duration is $1\frac{1}{2}$ minutes, but the sun's altitude is less than 20° . The star field is better than that of 1923 but not so good as 1919.