

coinciding more nearly with the ecliptic than with the equator, and therefore not explicable merely by the rotation of the outer atmosphere with the rest of the earth.

In the discussion of this part of his subject the author's speculations range rather widely, but the atmosphere presents us with so many inescapable riddles that the addition of one more, relating to its most inaccessible regions, is only in keeping with its character. The terrestrial origin of the zodiacal light is rendered more probable by the existence of a zodiacal light associated with the moon.

*The Problem of Motor Transport: an Economic Analysis.* By Christopher T. Brunner. Pp. 187. (London: Ernest Benn, Ltd., 1928.) 12s. 6d. net.

EVERY return of motor traffic in every country shows an ever-increasing number of cars and lorries in use, and though it was only in 1907, as we are reminded by Mr. Brunner, that Mr. Asquith referred to motor-cars as "a luxury which is apt to degenerate into a nuisance", the petrol-driven vehicle is bringing about a change in our modes of travel comparable only to the revolution effected by the railway. Mass production places the motor-car at the service of the man of modest means, and if he cannot afford a car himself, he is a customer of the bus and charabanc owner.

Motor transport problems are therefore always with us, and to those who want a general review of them a better book than Mr. Brunner's would be hard to find. It does not tell the reader how to choose or run a car, but it tells him something about the questions of taxation, traffic, rail and road competition, the economics of special motor roads, why railway companies retain horses, and how roads are maintained. Incidentally, on p. 120 the author tells us that the idea of tarring roads originated with a workman of Hythe, who tarred the road in front of his own house at his own expense. Hythe boasts of being the birthplace of one great pioneer, Sir Francis Pettit Smith—"Screw" Smith—the chief promotor of screw propulsion, and there is a tablet in the High Street to his memory. If Mr. Brunner is correct, Hythe should certainly tell us the name of this workman who has been a benefactor to millions of motorists, and to still more millions of pedestrians.

*Das Prinzip der kleinsten Wirkung von Leibniz bis zur Gegenwart.* Von Adolf Kneser. (Wissenschaftliche Grundfragen: Philosophische Abhandlungen, herausgegeben von R. Höningwald, Band 9.) Pp. ii+70. (Leipzig und Berlin: B. G. Teubner, 1928.) 4 gold marks.

THIS pamphlet deals with the principle of least action, chiefly from a philosophical and historical point of view. A few pages are given to the mathematical aspect, which the author, who has written on the calculus of variations, is exceptionally well qualified to discuss. It is often asserted that the principle was due to Maupertuis, but it is here shown that the idea was enunciated

much earlier by Leibniz. His arguments were of a theological nature, and might not appeal to present-day scientific workers, but it is remarkable how much of the work of Einstein and others is in the form that Leibniz asserted could be given to every physical law.

Strangely enough, Prof. Kneser, while discussing the use of the principle of least action in the theory of relativity, says nothing of the important part that it has played in establishing the new science of wave mechanics. It was the analogy between the principle of least action and Fermat's principle of least time that suggested an analogy between mechanics and optics, and led de Broglie and Schrödinger to such important results.

H. T. H. P.

*The Tragedy of the Italia: With the Rescuers to the Red Tent.* By Davide Giudici. Pp. viii+216+34 plates. (London: Ernest Benn, Ltd., 1928.) 12s. 6d. net.

THE author of this book is an Italian newspaper correspondent who was the only journalist on board the *Krassin*, the Russian ice-breaker that took a prominent part in the rescue of the crew of the *Italia* airship off Spitsbergen in the spring of last year. His story is supplemented by accounts of several of the survivors. The *Italia* was wrecked off North East Land on a return flight from the North Pole. The cause of the disaster is not clear, but the result of it was the loss of seventeen lives, including that of Capt. R. Amundsen, who gallantly flew to the rescue, and the expenditure of large sums of money on search expeditions. In these operations the *Krassin* took a notable part. The ship was well handled, but her consumption of fuel, as much as 150 tons a day in open water, limited her sphere of work, and she was unable to force a passage in ice more than about six feet in thickness. In her second voyage, in September, the *Krassin* crossed the unexplored seas north of Giel's Land on the way to Franz Josef Land. No new land was found.

*Typical Flies: a Photographic Atlas of Diptera.* By E. K. Pearce. Series 3. Pp. xv+64. (Cambridge: At the University Press, 1928.) 10s. net.

THIS atlas is intended to help the beginner and attract attention to an order of insects the study of which is hampered by the lack of elementary treatises. Like its predecessors, it is essentially a picture book and its object is to illustrate typical British flies by means of annotated half-tone figures. The venation and general appearance of many Diptera are well portrayed by this method, and comparisons with the illustrations should enable the beginner to sort out a considerable proportion of his specimens into their major groups. In the case of the more striking examples, generic or, here and there, specific identifications are also possible. The atlas is uniform with its predecessors, and the standard of execution of the attractive plates is well maintained.