History of the Galway Fishery

MR. ARTHUR E. J. WENT (*Proc. Roy. Irish Acad.*, **48**, Sect. C, No. 5; August, 1942) has made a considerable research into the ownership of the Galway fishery, which he traces from the thirteenth century to the present day. The paper deals only with the fishery of the River Corrib, usually known as the Galway fishery. Galway was formerly also the seat of a very valuable sea fishery. The unique sight, during the runs of salmon, of multitudes of these fish, below the Gaol Bridge in the town of Galway, waiting to ascend the regulation weir some two hundred yards upstream, makes this fishery of special interest, but it is only in comparatively modern times that it has been observed. Alteration in the bed of the river and construction in connexion with the utilization of water-power in the town have produced just the conditions necessary to hold fish in this region until such times as there is a sufficiency of water flowing over the weir to entice fish to make the passage up the fish pass. The interesting fact that a certain type of stone implement has been found along the banks of the river shows that the fishery was important even in pre-history times. So far back as the reign of Edward I there is mention of the fishery in the records and the ownership has changed hands many times. It is mainly a salmon fishery, but there are also eels and other fish. A further paper will shortly be published, which will deal with the methods of fishing.

Sirius and its Companion

AN interesting paper by Robert G. Aitken appearing in *Sky and Telescope* of September recalls some interesting events of nearly half a century ago. From the time of the discovery of the companion to Sirius in 1862 by Alvan G. Clark, until 1892, the tiny companion was followed by double-star observers as it gradually approached its primary, until it was lost in the rays of Sirius in 1892. The arc observed over the thirty years was not sufficiently long to permit the computation of a good orbit, and it was necessary to *assume* the identity of Clark's companion with the one predicted by Bessel in 1840, and the consequent revolution period of fifty years. This assumption could only be proved to be correct when the companion reappeared in its predicted position. In 1896 Aitken was spending the summer vacation with Dr. Holden on Mt. Hamilton, and was offered the post of assistant astronomer, which he accepted. On October 23 in the same year he went to the 36-in. dome to see how Prof. J. M. Schaeberle was getting on with his search for the companion of Sirius, but found that he had gone home; and, as he discovered next morning, had not only been seized with a violent headache, but had also broken a micrometer thread at the beginning of his night's work. Aitken used the opportunity to look at Sirius with the 36-in. telescope, and the tiny companion stood out clearly defined and steady. He recorded a few sets of measures and went home very happy at the thought that he, too, had seen the companion on the first night of its emergence from the rays of its primary. Only next day did he discover that he was the first to see the companion since Burnham lost it in the rays of Sirius in 1892, Schaeberle having abandoned his search on the previous night. It is very doubtful if many English astronomers know this interesting part of the story of the rediscovery of the companion of Sirius.

The Basis of Stereochemistry

THE Pedler Lecture of the Chemical Society, given by the president, Dr. W. H. Mills, dealt with information supplied by wave mechanics about the valency configurations of atoms. The lecture as printed in the *Journal of the Chemical Society* (457; 1942) gives a clear and well-illustrated account of the subject in which the mathematical apparatus is reduced to a minimum. It is shown how the combination of wave functions for the electrons in an atom leads to very surprising detail of bond directions which gives a reason for many facts established experimentally by chemists working with the guidance of the classical views on stereochemistry, such as the tetrahedral arrangement of bonds associated with the carbon atom. These views are now shown to be in agreement with the theoretical deductions, and the latter are seen to be of considerable interest to chemists. Recent determinations of bond distances and angles by physical methods have provided quantitative data from which models of molecular configurations may be constructed.

A Theory of Muscle Mechanism

IN an article in the magazine *Cheap Steam*, which has been reprinted in pamphlet form, Walter Goldstern has put forward a theory as to the methods by which muscles operate. The muscle is described as an engine transforming the calorific energy of food into power and heat. Structurally, the muscle is formed of a large number of fibres about 2 in. long and 1/500 in. in diameter, each consisting of many fibrils bound together by an elastic covering, the sarcolemma. By the operation of a nerve, one or more bundles of fibrils, according to the power required, are caused to contract. The author sets himself to supply an answer to the question as to the mechanism by which the muscle fibre is caused to contract. This, he says, is effected by a small internal pressure. He compares the sarcolemma to a long, narrow tube closed at both ends into which liquid under pressure is pumped. As the pressure increases, the tube becomes enlarged centrally and adopts a barrel shape, and would tend ultimately to become spherical. It is suggested that this central distension is accompanied by diminution in length; but this rather doubtful point is not cleared up, and if it were admitted it would still require to be shown that it would occur against the pull which the muscle is understood to be exerting; and also the method by which the pressure is produced and where the added liquid necessary to produce it can come from. A more acceptable explanation is conveyed in the suggestion that this central expansion of the sarcolemma is made to aid the lengthwise contraction by what is called lever action, but which might more suitably be described as the bowstring effect of the muscle fibres being pulled apart at the centre and producing a considerably magnified endwise pull.

Although no confirmation of the author's theory has been obtained, three arguments are put forward to support it. He states that experiments have shown that a muscle is unable to exert any force if contracted to 60 per cent of its original length—a fact which would support the bowstring action. The fact that muscle becomes thicker and harder when contracted is in consonance with the increased pressure theory. He quotes Prof. A. V. Hill (*Proc. Roy. Soc.*, B, **127**) to the effect that there must be two different