

fundamentals of a new science of applied mechanics. The application of these relations to long-distance transmissions by liquid columns and to acoustics has enabled him to duplicate practically every manifestation of electric transmissions, and led to the invention of the "wave transmission" method of transmitting energy and also to the synchronising of machine guns on aeroplanes so as to enable them to fire through the propeller.

Electric transmissions are at present in want of higher peak efficiencies in order to come up to the level of their mechanical equivalents. No doubt progress is still possible provided electrical engineers will not develop the habit of mechanical engineers of ignoring the fact that there is still plenty of work to do, both theoretical and practical, on old neglected avenues. Fluid transmissions have a fairly uphill task to overtake either electric or direct mechanical transmissions. Mechanical transmission at present seems to offer the most promising field for obtaining immediate and substantial results.

Mr. Constantinesco's paper is long, and full of speculations which cannot fail to be of interest to engineers who are concerned with the many problems of power transmission.

Food and Fattening of Oysters.¹

THE material eaten by an oyster consists of minute organisms and other matter floating freely in the water, and present in the surface soil on which oysters occur. Mr. R. E. Savage has studied qualitatively and quantitatively the contents of the stomachs of oysters in relation only to the organisms and material found floating near the bottom of the sea in two localities, namely, the Main Channels of the River Ore in Suffolk and the adjacent Butley Creek. These situations were chosen because there was reason to believe that oysters fattened much more readily in the Creek than in the Channels. Data were obtained by exhausting the alimentary canals of usually six oysters once a month and taking one ten-minute sample of plankton from each bed once a month for a period of 13 months. From his restricted material, the author has extracted highly interesting facts and results, but the value of the latter is diminished by the absence of continuous contributory—and not necessarily quantitative—observations on the beds. In any estuarine problem the influence of tide and time should not be ignored. The author found that the material ingested by the oysters in the localities examined consisted of 90 per cent. or more inanimate matter ("organic detritus"), and a searching volumetric and numerical analysis of the animate food is given. He also finds that the feeding period extended from July to October or November, with a short season of brisk feeding during August and September, and that in the remainder of the year little food was found. The suggestion adopted that the absence of feeding in winter may be due to the effect of low temperatures on the ciliary and muscular feeding mechanisms is well worth definite examination. There was a definite difference in the quality and quantity of the animate food in the situations chosen.

In analysing the results for these two regions, the author finds (1) that the total food consumed is approximately equal in volume, but that (2) the percentage volume (quantity) of animate food is four times as large in the Creek (where fattening occurs) as in the Channels (where fattening is less

satisfactory; the italics are ours), and that (3) the proportion of diatoms in the food of oysters from the Creek is greatly in excess of animals, while the proportion of animals in the food of Channel oysters is greater than that of diatoms. No proof is produced of better results in fattening in the Creek, where the food was mostly diatoms, and proof is unfortunately required since "fattening" is, in our present knowledge, highly capricious. The author concludes "that there is an apparent relation between consumption of diatoms and fattening," and "suggests that fattening is due to diatoms and growth to inanimate food."

The suggestion that fattening is due to diatoms (in this case mainly *Nitschiella*) is probably true for the particular locality studied, but on the author's data the difference in quantity of animate food might equally well account for a difference between "fattening" and "less satisfactory fattening." The reviewer holds the view that the problem of fattening will not be solved by a mere consideration of food. Fattening is chiefly a storing up of the surplus products of metabolism—mainly as glycogen—presumably for general purposes, but is also in part due to proliferation of the sex-organ. Hence the whole activities of the living animal, namely, growth, breeding, environmental conditions, as well as feeding, must be considered. A simple illustration will prove this: oysters which have recently grown a great deal of shell (and have been actively breeding) have mostly poor "fishes," *i.e.* are not fattened, whereas poorly grown dumpy or semi-dumpy oysters, taken in nearly equal proportions in the same hauls of the dredges as the well-grown ones, have large plump fishes, that is, are very well fattened, as the following figures,² which have been confirmed in larger numbers, will show:

Thirty-one oysters of average size 66 mm. × 67 mm. and average new growth 20 mm. had an average "fish" weight of 5.3 grams, whereas dumpy oysters ranging to a maximum size of 53 mm. × 68 mm. and with an average growth of 6 mm. had an average fish weight of 7.5 grams. Larger oysters 83 mm. × 81 mm. with average new growth 29 mm. had average fish weight 9.7 grams, but a typical large dumpy oyster 68 mm. × 75 mm. with 5 mm. new growth had a fish-weight of 13.5 grams.

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² Taken from Report on a Survey of the Oyster Beds in the Estuary of the Fal with Notes on the Biology of the Oyster, p. 97, January 1925. See also NATURE September 26, p. 486, where a review of the Summary published for the Falmouth and Truro Corporations was noticed.

Voltaire and Medicine.

IN the first part of a paper on "Voltaire and Medicine" read before the section of the History of Medicine of the Royal Society of Medicine on October 21, the president, Dr. J. D. Rolleston, quoted the words of the celebrated Berlin physiologist Prof. Emil Du Bois-Reymond, who in an address on Voltaire in his relation to natural science, attributed the neglect of this philosopher in the nineteenth century to the apparently paradoxical fact that we were all in a sense Voltairians without knowing it. "The ideals of tolerance, mental freedom, dignity and justice for which Voltaire had fought . . . had become a natural element of life like the air we breathe, which we only notice when we are deprived of it." Dr. Rolleston's paper dealt with Voltaire's relations to individual doctors and the medical profession as a whole, including some account of Voltaire's various illnesses. He contracted a severe attack of small-pox at the age of twenty-nine years, but apart from influenza and pneumonia he does not appear to have had any other

¹ Ministry of Agriculture and Fisheries. Fishery Investigations. Series 2, Vol. 8, No. 1, 1925. The Food of the Oyster. By R. E. Savage. Pp. 50 + 3 plates. (London: H.M. Stationery Office, 1925.) 8s. net.