

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.

acute infectious disease. He was subject to chronic dyspepsia from an early age, and frequently suffered from catarrhal bronchitis, often associated with deafness and aphonia. He frequently complained of febrile attacks which may have been malarial in origin. His death at the age of eighty-four years was probably due to uræmia following cystitis secondary to enlargement of the prostate which was found on post-mortem examination.

Voltaire was brought into contact with medical men on numerous occasions, both professionally and socially. During his stay in London (1726-29) he appears to have been acquainted with several leading medical men of the time, especially Sir Hans Sloane, Mead and Freind, as well as with other medical fellows of the Royal Society, especially Arbuthnot and Pemberton. He was himself elected F.R.S. in 1743. Among the numerous doctors whom Voltaire consulted the best known are Silva, physician to Louis XIV.; Boerhaave, whose name frequently occurs in Voltaire's works, especially in connexion with chemistry; and Tronchin, whom he described as the greatest physician in Europe and the only one who understood Nature.

Voltaire's works, particularly his correspondence, the "Dictionnaire Philosophique," his tales, and to a less extent his historical works, miscellaneous essays and pamphlets, abound with references to the medical profession. Many allusions are to be found to the masters of medicine, such as Hippocrates, Rhazes, Servetus, Harvey and Sydenham, as well as to celebrated anatomists such as Vesalius, Ruysch, Bartholin and Vieussens, but the medical works with which Voltaire was most familiar was probably that of Astruc on the venereal disease. The passages in which he indulges his satirical humour at the expense of the profession are few and unimportant in comparison with those in which he expresses his admiration and gratitude, and apart from the tales are chiefly to be found in his correspondence, where they are probably not to be taken too seriously. On the other hand, Voltaire was scathing in his denunciation of quacks, and vented his ridicule on many superstitions and erroneous doctrines connected with normal and morbid processes, particularly spontaneous generation, which was upheld by Needham and combated by Spallanzani.

University and Educational Intelligence.

GLASGOW.—The University Court on Thursday, December 10, appointed to the chair of natural philosophy Dr. Edward Taylor Jones, professor of physics in the University College of North Wales, Bangor. In 1899 he succeeded Prof. Andrew Gray in the latter chair, and now succeeds him in Glasgow also. A distinguished pupil of Prof. Gray at Bangor, he graduated with the highest honours in the University of London. With the aid of an "1851 Exhibition" research scholarship, he proceeded to the University of Berlin, where he worked under Profs. Kundt, du Bois, Rubens, von Helmholtz, Planck, and Fuchs. His important memoir on "Electromagnetic Stress" procured him his doctorate. Returning to Bangor in 1896 he was appointed lecturer, and afterwards professor of physics. He has also held in succession the administrative posts of Dean and Chairman of the Faculty of Science, representative of the Senate on the Council, member of the University Court of the University of Wales, and Vice-Principal of the College. Prof. Taylor Jones has published some thirty papers on electrical subjects, in particular on electrical oscillations, coupled circuits, the singing electric arc, and the triode valve generator, all having

important bearings on wireless telegraphy and telephony. He is recognised as having placed the theory of the induction-coil on a sure basis, and his book on that subject is the standard treatise. He also cooperated with the Internal Combustion Engine Subcommittee of the Advisory Committee for Aeronautics. He will take up his duties in Glasgow at the beginning of next term. He is fifty-two years of age.

LIVERPOOL.—Miss Winifred E. Frost has been appointed to the Herdman Memorial Scholarship for 1925.

Dr. T. P. Hilditch has been appointed to the Campbell Brown chair of industrial chemistry. The appointment is in the first instance with special reference to research on oils, fats, and waxes. Prof. S. H. Gaiger, of the Veterinary College, Edinburgh, has been appointed to the William Prescott chair of the care of animals with special reference to the causation and prevention of disease.

In a lecture delivered on December 4, Prof. G. H. Henderson, of the University of Glasgow, advocated that chemists should endeavour to educate the public to the value of their profession to the community and its importance in national welfare. He would like to see a unified body controlling all chemists and speaking for the profession as a whole.

MANCHESTER.—Prof. A. H. Gibson has been elected Dean of the Faculty of Science. The following appointments have been made:—Dr. J. C. Smith to be assistant lecturer in chemistry; and Mr. J. C. Brierley to be assistant lecturer in engineering drawing (Faculty of Technology). Dr. E. N. Mottram has been awarded the Sir Clements Royd Memorial Scholarship in chemistry.

PROGRAMMES have now been issued of the annual meetings of the Science Masters' Association and of the Association of Women Science Teachers. The Science Masters' Association meets at King's College for Women, London, on January 5-7, under the presidency of the Right Rev. C. W. Barnes, Lord Bishop of Birmingham. The presidential address will be delivered on the first evening of the gathering, and the general programme includes lectures by Dr. T. Slater Price on "The Sensitivity of the Photographic Plate," and by Prof. Leonard Hill on "Sunshine, Open Air, and Health," and discussions on "Science and Citizenship," to be opened by Mr. W. D. Eggar and Mr. O. H. Latter, and on school science examinations, to be opened by Mr. D. J. Berridge, Mr. E. Nightingale and Mr. E. G. Laws. Invitations have been accepted for parties to visit the laboratories of the General Electric Company and also the National Physical Laboratory, while there will be the usual exhibition of apparatus and books by members of the Association and by publishers and instrument-makers. The annual general meeting of the Association of Women Science Teachers will be held on February 6 at St. Paul's Girls' School, London. The programme includes a demonstration by the Visual Education Society of educational films and an address by Miss Coward on the teaching of hygiene in schools. Miss Bond is to move a resolution "that in view of the fact that for the majority of pupils the General School Examination (School Certificate) terminates their study of Botany, it is desirable that the Syllabus in Botany be amended as follows: (1) The number of Families should be very much reduced, and the ability to use a Flora should take the place of most of this detailed knowledge. (2) The life histories of, at least, one Alga and a Fern should be included in the Syllabus. These should be simply treated so as to need only a small amount of microscopic work."