

cost of living should be the dominant factor in the determination of the level of the minimum wage. Such a mode of assessment would also form an equitable basis for the determination of the wage of the skilled worker, in so far that the increment to be added in payment of (1) skill, (2) compensation for work carried out under unpleasant or unhygienic conditions, or (3) extra-heavy work, would be simply an addition to the minimum wage.

It is unquestionably true that there ought to be a statutory minimum wage. It is the unskilled worker who suffers most. No matter what the trade or occupation, it can be confidently asserted that, as a general rule, it will be found that the unskilled labourer is expending most energy and receiving least pay.

The assumption has been made that the purchase of food and the production of external muscular work are terms which are strictly interchangeable, and within the limits of the minimum-wage-earning class this is true. Objection to the proposal to use food consumption as the basis of wage fixation might legitimately be raised on the ground that, with the great majority of wage-earners, the purchase of food is not confined to the purchase for their own needs, but also for those of a family or other dependents. There is the further difficulty as to whether the minimum wage for men and women should be identical. There is absolutely no question about the fact that the average woman worker does not expend the same amount of energy as the average man, but this may be offset by another factor of wide application, that the majority of working women

carry on at the same time housework in their own homes, where the expenditure in energy may easily compete in severity with the work done outside.

Science may seem at times to be cold and unsympathetic, even harsh, but, nevertheless, it is only when the facts are observed in a clear and unimpassioned manner that the truth can be found. Far from viewing man as a mere machine for the conversion of the latent energy of food into the potential energy of work, science is fully alive to the fact that this is only one aspect of vital activity, that there is a psychic side of life—everything that makes up the environment—which plays an equally important part in the life-history.

The purely energy side of the subject cannot be the sole criterion for the determining of wages. Food alone will not suffice to keep men going; it must be consumed under conditions which are satisfactory—conditions, it is true, which vary, at present, with the social status of the individual. There must be a sufficiency of money for a reasonable expenditure on various small luxuries, for entertainment, and for the various amenities of life, the absence of which makes life for the majority of people scarcely worth living. There is no question, then, as many Labour leaders seem to imagine, that an attempt is being made to reduce the manual worker to the level of serfdom.²

E. P. C.

² The Editor has very kindly directed the writer's attention to a footnote in Mr. H. G. Wells's "Outline of History" (p. 519; Cassell and Co., 1920) with reference to an experiment of the Oneida Silver Co. In the assessment of the weekly wage reference is made to the cost of staple commodities and common necessities, and the worker receives his wages *plus* a percentage representing the advance of the cost of food, etc., from a standard value.

Obituary.

DR. MAX MARGULES.

THE news of the death of Dr. Max Margules on October 4, which reached this country a fortnight ago, is rendered particularly sad by the announcement in Tuesday's *Times* that "his death was due to starvation. He had been living on a pension of 400 crowns a month (which is equivalent to 8s.), and he was too proud to beg for assistance." Dr. Margules was born in 1856 at Brody, in Galicia. After studying at Vienna and Berlin, he entered the Austrian Meteorological Service in 1880, and became secretary of the Institute at Vienna in 1890.

In 1882 Lord Kelvin suggested that the explanation of the regular semi-diurnal variation of the barometer, which has a range of more than two millibars in equatorial regions, might be found in the coincidence of a free period of oscillation of the atmosphere with the period of the solar gravitational tide. Lord Rayleigh in 1890 showed that *if the rotation of the earth were neglected*, a rough computation of the free periods led to values of 23.8 and 13.7 hours, so that Kelvin's hypothesis became at any rate a possi-

bility, although the actual values obtained by Rayleigh would have indicated a bigger diurnal and a smaller semi-diurnal barometer variation. Margules, in the same year, attacked the problem of computing the pressure oscillations of the atmosphere on a *rotating* globe, and found that for an atmosphere with a temperature of 268° absolute (-5° C.) the free period was exactly twelve hours.

In 1892 and 1893 Margules contributed to the *Sitzungsberichte* of the Vienna Academy a series of masterly papers on the motion of the air on a rotating spheroid. These papers are little known to English meteorologists, as they were not included in the collection of papers and translations issued by the Smithsonian Institution in the volumes of "Mechanics of the Earth's Atmosphere."

Margules contributed to the Year Book of the Meteorological Institute of Vienna for 1903 a comprehensive discussion of the energy of storms. He showed that the atmospheric phenomena associated with storms would arise if two masses of air of different temperatures were in

juxtaposition. The situation would be unstable, and in passing from this unstable situation to a stable one the potential energy would be reduced, part of it being converted into the kinetic energy of the ensuing "storm." This paper contains the germ of the theory of line squalls, of the development of cyclones, of polar fronts, and so forth. It includes computations of the horizontal velocities which would result from various distributions of pressure and temperature, and shows that actual distributions would lead to velocities of 50 miles an hour. Margules summed up his conclusions in the sentence: "So far as I can see, the source of storms is to be sought only in the potential energy of position."

Margules retired from active participation in the work of the Austrian Meteorological Service during the directorship of the late Prof. Pernter, and applied himself to the study of chemistry. He fitted up a small laboratory in his own house, where he lived in comparative retirement. The present writer was saddened to see him there in 1909 entirely divorced from the subject of which he had made himself a master. Meteorology lost him some fifteen years ago, and is for ever the poorer for a loss which one feels might and ought to have been prevented. E. GOLD.

THE *Engineer* for October 22 records the death of MR. C. J. BOWEN COOKE on October 18 in his sixty-second year. Mr. Bowen Cooke was educated at King's College School, London, and on the Continent, and thereafter spent the whole of his life in the service of the London and North-Western Railway. After serving a pupilage under the late Mr. F. W. Webb, he was appointed assistant in the running department, and rose to be its superintendent. In 1909 he was appointed chief mechanical engineer, and thereafter was responsible for the design of several important types of locomotive engines. The chief of these was a non-compound superheater engine weighing 116 tons and having four cylinders; this engine was fitted with Walschaert's valve gear. Mr. Bowen Cooke took a very active part in the development of the manufacture of munitions of war in railway workshops, and was made C.B.E. in 1918. He was a member of both the Institutions of Civil and Mechanical Engineers, a Justice of the Peace and County Councillor for Cheshire, and a major in the Engineer and Railway Staff Corps. He was the author of two books on locomotives, and also of a paper on the mechanical handling of coal for British locomotives, read at the Institution of Civil Engineers in 1912.

PROF. HANS PEDR. STEENSBY, whose death at the early age of forty-five is announced by the *Times*, was professor of geography in the University of Copenhagen. He was chiefly known for his researches on the Eskimo in relation to their environment, most of which appeared in

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Meddelelser om Grønland, and included "Contributions to the Ethnology and Anthropogeography of the Polar Eskimos" (1910) and "An Anthropogeographical Study of the Origin of Eskimo Culture" (1917). Prof. Steensby came to the conclusion that the Eskimo were originally an inland people dwelling in the tundra, probably in the vicinity of the Great Slave Land and Coronation Gulf, and that their culture was originally an Indian hunting culture adapted later to the conditions of the Arctic shores. He also wrote on the early voyages of the Norsemen, and was returning from America, where he had been in connection with his investigations into this subject, when his sudden death at sea occurred.

Science announces that PROF. SAMUEL MILLS TRACY, agronomist of the United States Department of Agriculture, died at Laurel, Miss., on September 5, aged seventy-three years. Prof. Tracy was born at Hartford, Vermont, and graduated from Michigan State Agricultural College in 1868. From 1877 to 1887 he was professor of botany and agriculture at the University of Missouri, and from 1887 to 1897 director of the Mississippi Agricultural Experiment Station. Since that time he had been attached to the United States Department of Agriculture. He was a fellow of the American Association for the Advancement of Science, in the work of which he took an active part, and a member of the New Orleans Academy of Science and of the Botanical Society of America. Among Prof. Tracy's works are "The Flora of Missouri," "The Flora of Southern United States," and numerous bulletins issued by the Mississippi Experiment Station and the United States Department of Agriculture.

SIR CORNELIUS NEALE DALTON, whose death occurred on October 19 at seventy-eight years of age, was Comptroller-General of Patents from 1897 to 1909. When, in 1901, the Committee appointed by the Board of Trade to inquire into the working of the Patent Acts reported in favour of an examination for novelty, within certain limits, being undertaken by the office, Sir C. N. Dalton laid down the lines on which the examination has since been conducted, and recommended and carried out the necessary scheme of reorganisation. His strength lay in his tact, energy, and power of organisation, and these enabled him to carry out alterations in the law and practice of patents, though it may be doubted whether the changes were to the advantage of the inventor. He was hon. D.C.L. of Oxford, was created K.C.M.G. in 1908, and was chairman of the council of the East London College.

THE death of DR. ANTON WEICHELBAUM, professor of pathological anatomy at Vienna University, at the age of seventy-five years, occurred on Friday, October 22.