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The Metric System and World Trade.

A SHORT time ago (March 29) Dr. C. E. Guillaume contributed to the Paris Academy of Sciences a paper on the obligatory adoption of the metric system in Japan. The recent Japanese law making the metric system compulsory after a fixed period will no doubt have considerable effect towards rendering the system familiar in trade in the Far East, where its use is already facultative in some countries. Before arriving at this decision the Japanese Government dispatched a Commission of Inquiry to the principal trading centres of the world, so that the present law represents the outcome of prolonged and mature judgment, and as such supplies very satisfactory evidence in support of the international claims of the metric system. The values of the old units of Japan have for many years been defined in terms of the metre and the kilogram, and, owing to this fact and to the issue of regulations on the subject, the trading community has gradually become accustomed to metric weights and measures. Dr. Guillaume expects that in a few years the only weights and measures permissible in eastern Asia will be those of the metric system. The enormous strides made by this system in the Far East cannot be without effect in the United States, where in the past one of the principal arguments against it was that British weights and measures were tacitly recognised in China, Japan, and Siam. It appears probable, therefore, that before long advocates of

the metric system will be able to turn this line of reasoning against their opponents.

By its recent decision Japan has once more shown its readiness to change its customs in order to adapt itself to changing needs. Its statesmen have recognised that the metric system is the only system of service for international trade, and have, therefore, decided that their country shall not be handicapped by traditional use and human inertia from adopting new standards of measurement. We have no patience with any other policy. Whether a principle is sound or not may be discussed, and whether its adoption is expedient or not may also be a matter of opinion; but to suggest that a particular policy should not be followed merely because there are many difficulties in the way is to manifest a state of mind which we fail to understand. The first thing to decide in individual or national life is whether an action is right; and once having arrived at an affirmative conclusion, difficulties are nothing but obstacles to be surmounted boldly or swept aside ruthlessly from the path of progress.

This we conceive to be the true scientific spirit, and by the use of it Japan has won the high position which she now occupies among the nations of the world. We must confess, however, that in the matter of the adoption of the metric system there are few signs that like action will readily be taken in our own country. It is perhaps not surprising that Lord Balfour of Burleigh's Committee on Commercial and Industrial Policy after the War should have reported that it was not desirable to make a compulsory change in our system of weights and measures; but we expected something different from a committee appointed by the Conjoint Board of Scientific Societies. The report of this committee was dealt with in our issue of October 7 last, p. 169, and the only satisfactory thing about it from our point of view is that the Conjoint Board declined to adopt the report, which was, therefore, published on the authority of the committee alone.

In justice to the committee it must be said that the inquiry with which it was entrusted was solely that of the compulsory adoption or otherwise of the metric system in the United Kingdom, and not the advantages or disadvantages of the system in comparison with the British system of weights and measures, or its scientific aspects in general. Some of these subjects were, however, discussed—not altogether impartially—by the committee in its report; and the conclusion

reached was "that the British system of units of weights and measures be retained in general use in the United Kingdom." Interesting suggestions were made as to the decimalisation of our system and the abolition of several unnecessary units; but even if this were accomplished the result would still be that British manufacturers would have to continue to employ two systems—one for home trade, the other for trade with the increasing number of countries overseas in which the metric system is commonly used.

Neither Lord Balfour's Committee nor that of the Conjoint Board gave adequate attention to the value of official encouragement as a *via media* between legal permission and legal compulsion. The Act of 1897 made the use of the metric system permissive, and official adoption of the system now would pave the way to legal compulsion at a later date.

The many reports of our Consuls and representatives abroad have shown in the most convincing way that the practice of those British manufacturers who use only British weights and measures in their catalogues and price lists intended for other countries has a prejudicial effect on the extension of our foreign trade, particularly in countries where the metric system is used exclusively. In the textile trades British measures are no doubt widely recognised; but there is not the slightest reason for hope that their usage can be made international by common consent. The only possible international system is the metric system, and as a nation we cannot afford permanently to remain outside it. When the metric carat was legalised for use in trade in 1914, its adoption by dealers in diamonds and precious stones was practically complete in a few weeks, though they were previously opposed to the change. The weights and measures now given in the British Pharmacopœia are all in the metric system, and Imperial standards are entirely omitted. The dual system formerly used was found to be a constant source of trouble, and in 1914 it was abandoned in favour of the metric system alone. In mining statistics the metric ton is now a common standard, and in many engineering and ordnance machines and structures metric measures are now used almost as frequently as British. It cannot be said that our system of weights and measures is extending to other nations in the same way. Nothing that we could do would make the system international, so that what we have to do is to

choose between a system which has custom alone to commend it, and must be limited in its use and one which extends over the whole world and becomes more important industrially and commercially every year.

The adoption of the metric system by the United States and the United Kingdom is, indeed, inevitable, and adherence to the Imperial system is an obstacle to world commerce. We shall have to abandon the system sooner or later, and it would not be so difficult to adjust ourselves to the new standards now as it is to adapt ourselves to other conditions of reconstruction brought about by the war. The Colonies have frequently expressed their desire to adopt the system whenever the United Kingdom does so; all our European Allies, and practically half the population of the world, use it, and we cannot avoid doing so eventually. The only two important countries now outside the system are the United States and the United Kingdom, and when either of these enters it the other must follow.

During the war we, and the United States also, were forced to use metric measures in order to secure effective co-ordination between us and our Allies in military maps, range finding, firing data, and ordnance generally, and in the uniform standardisation of motors, aeroplane parts, and other machines and accessories. The result is that millions of men are now familiar with metric units, and would experience little difficulty in adjusting themselves to the change which the introduction of the metric system would involve. Every pupil in every secondary school in this country is made acquainted with the system, and in scientific work its use is universal. "The present chaos of English weights and measures," reported Sir J. J. Thomson's Committee on the position of natural science in the educational system of Great Britain, "causes waste of time and confusion of thought, and these are strong educational reasons for the adoption of the metric system."

The truth is that we have not a uniform system of weights and measures, but a medley of units and standards which differ in different industries and often vary in a single industry. In agriculture a bushel of wheat is defined in official statistics as having a weight of 62 lb.; by the Corn Returns Act it weighs 60 lb., and by the Grain Prices Order 63 lb. Bushels of barley and oats show like variations in weight both officially and according to frequent practice. To secure

uniformity in the weights and measures used in the sale of corn and other crops, the Corn Sales Bill is now being considered by a Committee of the House of Commons; but as the standard proposed is one of 112 lb., while the whole of the futures market is based on the decimal system, the Bill can be nothing more than a makeshift measure. In the textile industries, from which comes the chief opposition to the use of metric measures, the standards of measurement vary greatly in different centres, and there is no common relationship between them. British and American measures with the same denomination, such as the pound, yard, gallon, and bushel, also differ in quantity in the two countries. The advantages of a uniform system—a common language—from the point of view of world service are obvious, and the jealous attitude of conservative corporations towards it represents, not the spirit of progress, but rather that of obscurantism.

The fact that local and trade usage sanctions such a variety of weights and measures as that now existing in this country and in the United States is in itself sufficient to justify a movement towards reasonable uniformity. There is an official British system of weights and measures, but when trade transactions are concerned its standards are often varied to suit industrial convenience or local custom. A proposal that the British standards should be made compulsory in all transactions, and that no departures from them should be recognised, would evoke quite as much opposition as is now offered by certain industries to the introduction of the metric system. No one supposes that by making the metric system compulsory after a period of years the people as a whole would think in terms of metric units. Local denominations of fractions and multiples of such units are commonly used in all countries where the metric system has been adopted, but they do not interfere in the slightest degree with the larger transactions of trade and commerce.

If the Government adopted the metric system as the sole legal system in all its Departments, and announced that after a particular date all specifications for its work would have to be expressed in terms of that system, a great step would be taken towards its general use. This course and the publication of all official trade statistics in metric terms would lead to similar action by municipalities, railways, and other corporations, and promote the voluntary adoption of metric standards by the trading community generally.

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Lamarckism Unashamed.

Initiative in Evolution. By Dr. W. Kidd. Pp. x+262. (London: H. F. and G. Witherby, 1920.) 15s. net.

FOR more than twenty years Dr. Walter Kidd has interested himself in the arrangement of the mammalian hair, and pondered over its significance, especially in relation to theories of evolution. He has shown that definite patterns due to the diverse lie of the hair are of common occurrence, that they are subject to change, and that they are hypothetically interpretable on Neo-Lamarckian lines. Whether one agrees with his interpretations or not, one must thank him for a very enjoyable book, written with whimsical humour and with a delightful urbanity in controversy. One admires also the candour with which Dr. Kidd states and seeks to dispose of some serious criticisms brought against his position as expressed in previous books.

A study of the lie of the hair on a cow shows great definiteness; thus it slopes first backwards and then forwards on the neck; behind a whorl over the shoulders it slopes backwards again; along the middle line of the upper part of the tail there is a streak of hairs at right angles.

"Arrangements of its hair so audacious as these need explanation, and it is found in the mode of life of the cow. So large a part of its daily life is spent in the business of grazing with her muzzle close to the ground, during which the neck of the animal is constantly stretched downwards from the back at the level of the shoulders, that the skin, which is very loose in this and most other portions of its body, is dragged upon to allow of the extreme flexion of its neck. This traction is for all this time acting against the normal or backward slope of the hairs, and has given rise to this victory of a new force through a thousand generations. It is equally clear that a mechanical explanation of the line of erect hairs on the first nine or twelve inches of the tail is forthcoming, for one has only to watch a cow standing on a hot day, undergoing her torment of flies, to see it writ large. . . . It is hardly necessary to point out how the underlying muscles would drag upon the skin of the tail over them and gradually reverse more or less the 'lie' of the hairs."

Similar interpretations, often very ingenious, abound in the pages of Dr. Kidd's book. There is an unusual pattern of hairs on man's back; it is to be correlated with his ancestors' habit of sitting with their backs against the side of the cave, or sleeping with their heads raised on some sort of pillow. From between the eyes of a cat the hair on the broad snout slopes downwards, but on a dog's snout it slopes upwards; this is put down to the fact that the dog rubs his head on the