

EAST INDIA (METRIC SYSTEM).

RETURN to an Address of the Honourable The House of Commons,
dated 2 May 1870;—for,

“RETURN of certain CORRESPONDENCE on the Subject of the Application
to *India* of the METRIC SYSTEM of WEIGHTS and MEASURES (in
continuation of Parliamentary Paper, No. 16, of Session 1867-8).”

India Office, }
11 May 1870. }

H. L. ANDERSON,
Secretary in the Public Department.

(*Mr. John Benjamin Smith.*)

Ordered, by The House of Commons, to be Printed,
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CORRESPONDENCE on the Subject of the Application to *India* of the
METRIC SYSTEM of WEIGHTS and MEASURES (in continuation of
Parliamentary Paper, No. 16, of Session 1867-8).

—No. 1.—

(Public, No. 32.)

To His Excellency the Right Honourable the Governor General of
India in Council.

Sir, India Office, London, 15 February 1868.

Para. 1. THE Despatches of your Excellency in Council, dated 11th July, Nos. 126 and 127, of 1867, on the subject of weights and measures, have been considered by me in Council.

2. I approve of the proceedings reported in these Despatches, and I forward for your consideration, and for communication to Colonel Strachey, a report of the representations made to me by a deputation from the Metric Committee of the British Association on the subject of the introduction into India of the metric system.

3. You will observe that the deputation urged that the present English system of weights and measures was open to much objection, and was likely ere long to be changed, and that it would, therefore, be unwise to revise the Indian systems so as to bring them into harmony with it. I so far agree with the deputation as to think that it would be unnecessary for the committee to set the present English system before them as a model, and that they would do better to endeavour to establish a system more nearly approaching the best theoretical model. But you will not fail to bear in mind that any changes in a matter so closely affecting the daily relations of social life are sure to be viewed with great jealousy, and you will be cautious not unduly to sacrifice practical convenience to theoretical symmetry.

I have &c.
(signed) *Stafford H. Northcote.*

Enclosure in No. 1.

DEPUTATION to the Secretary of State for India.

A DEPUTATION from the Metric Committee of the British Association for the advancement of science, and the Council of the British Branch of the International Decimal Association, consisting of the Right Honourable Earl Fortescue, William Ewart, M.P., J. B. Smith, M.P., James Yates, F.R.S., Manockjee Cursetjee, David Mocatta, Samuel Brown, F.S.S., Capel H. Berger, Tito Pagliardini, William Smith, Dr. Leone Levi, F.S.A., L. T. D'Eyncourt, Frank P. Fellows, Frederick Hendricks, &c. &c., had the honour of an interview with the Right Honourable Sir Stafford Northcote, Her Majesty's Secretary of State for India, on the 22nd November 1867, on the subject of the introduction of the metric system into India.

Earl Fortescue, having introduced the deputation, stated that in 1866 the Metric Committee and the Council of the International Decimal Association had sent a memorial to the Secretary of the Government of India, showing that, having regard to the progress of the metric system in all countries and the legalisation of the same in the United Kingdom, it was highly desirable that steps should be taken for introducing the same into India; that no answer had been received on the subject from the Government of India, but that an official paper had been obtained, being a supplement to the "Fort St. George's Gazette," indicating that the said memorial, with other documents on the subject, had been remitted to a committee for consideration, with instructions to accept, generally, the views of the Government of Madras,

which especially recommended to make the Indian system universal throughout British India, and place it in a simple relation with that now existing in England. With reference to this recommendation, Earl Fortescue called the attention of the Secretary of State for India to the fact, that the weights and measures now in use in this country are by no means in a satisfactory condition; that they will, in all probability, be entirely superseded by the metric system, which has already been rendered permissive by the Act of 1864; that such system was making constant advance, public opinion being satisfied of its superior merits, especially in its international aspects, and that it would be highly desirable that, in undertaking so great a reform, India should place herself at once on a level with other countries, in adopting what will speedily become the universal system in the western world. Earl Fortescue further urged, as especially important, that the real position of the question should be communicated to the Indian Government, for the purpose of arresting any hasty movement, which might have to be rescinded or altered in a very few years.

Mr. Ewart, M.P., gave a sketch of the steps taken in this country in relation to the introduction of the metric system, the appointment of the Committee of the House of Commons in 1862 after the International Exhibition, their unanimous report in favour of the system, the introduction of the Bill in the House of Commons, which was read a second time by a very large majority, though as a compulsory measure, and the ultimate passing of a Permissive Act with the co-operation of Her Majesty's Government.

Mr. Manockjee Cursetjee called the attention of the Secretary of State to the extreme inconvenience, and great practical injury resulting from the many weights and measures in use in India, and urged that, since Her Majesty's Government was sufficiently strong in India to be able to carry any measure which was for the benefit of the people, if the metric system was preferable to the British system and likely to become general, it would be better to make a substantial good change at once, and in a final manner, than to incur the danger of having soon after again to disturb the habits of the people for another change.

Mr. J. B. Smith, M.P., asked the Secretary of State to lay before Parliament a report of a commission in favour of the metric system, and expressed the great advantage that would result from an international system of weights, measures, and coins, which was making so much progress in Europe.

Mr. Yates, F.R.S., stated that several efforts were being made in India to remove the present anomalous condition of the weights and measures, laid before the Secretary of State a pamphlet of Mr. Gover, showing in a most lucid manner the need of reform, and quoted other works recently published on the same subject, some of which advocated the metric system. He referred to the high intelligence and early civilisation of India, as giving the greatest security that the Hindoos were capable of appreciating a reform founded on high scientific principles.

Professor Leone Levi gave an account of the recent conferences held in Paris, at which the greatest unanimity prevailed in favour of the metric system, France, Belgium, the Netherlands, Italy, the Papal States, Spain, Portugal, Greece, Mexico, Chili, Brazil, New Grenada, and the South American Republics having already adopted it compulsorily, England and the United States of America permissively, and several States, such as Switzerland, Sweden, Bavaria, Wurtemberg, Austria, and Denmark, having largely borrowed from it.

Mr. Samuel Brown alluded to the official character of such conferences, which imparted so much weight to their deliberations.

And Mr. Fellows suggested that India should be placed in the same position as this country, as to legalising the use of the metric system. He also said that, since the guz varies from 36 to 42 inches, it might be easily declared by law to be of a measure perfectly uniform with the metre.

— No. 2. —

(No. 163.)

From the Governor General of India in Council to the Secretary of State for India.

Sir,

Simla, 6 November 1868.

REFERRING to the Despatches noted on the margin*, we have now the honour to transmit to you the report† of the committee appointed to revise the system of weights and measures for British India.

* From Secretary of State, No. 29, dated 9th March 1864.

To Secretary of State, No. 46, dated 29th July 1864.

From Secretary of State, No. 1, dated 7th January 1865.

To Secretary of State, No. 126, dated 11th July 1867.

From Secretary of State, No. 32, dated 15th February 1868.

2. Attached to the report, will be found the minutes of evidence recorded by the committee, and the correspondence referred to in their report.

A copy of Colonel R. Strachey's Memorandum, dated 1st October 1867, to which

† Letter from J. Minchin, Esq., President of the Committee, dated 1st April 1868, and the report therein enclosed.

which allusion is made in the 21st paragraph of the report, will also be found among the enclosures of this Despatch, together with a further Memorandum by that officer, dated the 25th March 1868, in which he records his dissent from the report of the committee, and a Memorandum by Mr. Minchin, dated 11th April 1868, in reply to Colonel Strachey's remarks.

3. We also enclose copies of the reports, noted on the margin, relating to the proposals made by Colonel Strachey in his Memorandum of the 1st October 1867. These documents were received by him after the committee's report had been made, and his dissent recorded.

1. From Government of Punjab to Colonel Strachey, No. 1256, dated 4th May 1868, and enclosures.

2. From Officiating Commissioner of Patna to Colonel Strachey, No. 292, dated 13th June 1868, and enclosures.

3. From Judicial Commissioner of Chota, Nagpore (in charge of Commissioner's Office), to Colonel Strachey, No. 1630, dated 26th June 1868.

4. The perusal of the voluminous papers which are now before us, has satisfied us that an immediate reform of Indian weights and measures is urgently required. On this point, there is no difference of opinion among all the authorities that have been consulted.

5. The existing diversity of weights and measures in this country, is a most serious evil, and reform is needed, as observed by our honourable colleague his Excellency the Commander in Chief; not only to facilitate and simplify commercial operations, but also as an essential preliminary towards the suppression of the fraudulent practices which are now so common among retail dealers.

6. On the question how the needful reform might best be carried out, opinion has differed. On this subject, we would first observe that to deal with the weights of the country is of far greater practical importance than to deal with the measures of length, area, or capacity. We consider it advisable that reform should proceed gradually, and that our earliest efforts should be devoted to the correction of the evil of the greatest practical importance. We therefore think that it will be best to limit our present action to the reform of the system of weights, leaving the question of measures, which does not press for such early decision, for future consideration.

7. This point being settled, it remains to decide on the precise new system of weights to be established.

8. We have carefully considered the arguments advanced by the committee, and by the other authorities who take the same view, in favour of the adoption of the English pound as the new Indian unit; and also the arguments adduced by other authorities in favour of the introduction into India of the metric system. In deciding between these proposals, it appears to us essential that our conclusion should be based exclusively on a consideration of the convenience of the people of India, and that we are bound to select a system which shall be in all respects thoroughly and permanently convenient to them.

9. As regards the committee's proposal, we entirely concur with our honourable colleague Mr. Strachey, in the remarks recorded in paragraphs 8 to 14 of his Minute. For the reasons there assigned, we are of opinion that the adoption of the English system of weights is not advisable. Neither the English pound, nor any multiple of it, can be a convenient unit or weight for India. It has been almost universally admitted that the new unit should approximate to the existing Indian seer, the average weight of which is about $2\frac{1}{2}$ lbs.; to reduce the seer to 2 lbs., would be extremely unpopular and objectionable.

10. On the other hand, the kilogramme of the metric system, which weighs 2.205 lbs., at once provides a seer, which would certainly be as acceptable to the people as any that could be chosen. Further, we consider that on account of its simplicity and its symmetrical form, the metric system of weight, in its integrity, will be more convenient for India than any other. While it will be perfectly suitable for the internal wants of India, it will be in harmony with the system which has been already adopted in the greater part of the civilised world, and which may be ultimately adopted by England herself. In any case it will be more convenient for commercial transactions between England and India than any other system not really commensurable with that of England.

11. We therefore consider that the new unit of weight should be a seer equal to the kilogramme of 2·205 lbs. avoirdupois, and that a system of decimal multiples and subdivisions of the unit of weight should be accepted as a fundamental part of the new scale to be recognised by law. We are, however, of opinion, for the reasons stated by Mr. Strachey in his Minute, that other multiples and subdivisions should not be prohibited wherever their continued use appears to be demanded on considerations of present convenience and expediency, and that while it is desirable that the new system of weights should be brought into general use as speedily as possible, it should not be forced on any class of the community until such class is to some extent prepared to accept it. The best preparation for the general adoption of the new weights will undoubtedly be their introduction and authoritative use in the public departments of the Government, which are so widely scattered over the whole of the country. We therefore propose that the new unit of weight, with a system of decimal multiples and subdivisions, should be authoritatively adopted in all departments of Government, by all municipal bodies, and on the railways, as soon as practical convenience will admit.

12. To these propositions we now request your assent, and on obtaining it, we shall proceed to carry them out. If you should so desire, we shall be ready to submit for your approval the draft of the legislative enactment which will be necessary for establishing the new system of weights.

13. We trust that we are justified by the terms of your Despatch, No. 32, of the 15th February 1868, in hoping that these conclusions will meet your approval.

14. The Minutes* recorded by the Members of our Government on this subject are annexed.

We have, &c.
 (signed) *John Lawrence.*
W. R. Mansfield.
G. N. Taylor.
H. S. Maine.
John Strachey.
R. Temple.
H. W. Norman.

— No. 3. —

MINUTE by Mr. *H. T. Prinsep*, dated 31st of December 1868, on the Question of Reform of the Weights and Measures of *India*.

I HAVE now carefully read the Report of the Committee appointed by the Government of India to consider this question, also the Minutes of Colonel and Mr. Strachey, and the other papers connected with the subject. The discussions have resulted in two propositions; one submitted by the majority of the committee, recommending the adoption of the pound avoirdupois as a new unit of weight, to be enforced penally, and carried out by furnishing to every shopman and dealer in India weights bearing a Government stamp. The pound or seer of two pounds being subdivided, as at present, by the binary and duodecimal system, but for weights above the seer a new decimal multiple is proposed, and we are asked to perceive that the Government and people of England shall adopt this multiple, instead of the hundred weight and ton now in use in England, and in all countries and colonies peopled by the Anglo-Saxon race.

Colonel Strachey, on the other hand, proposes that the metrical system of weights

By Mr. Strachey, dated 4th August 1868.
 By the Commander in Chief, dated 5th September 1868.
 By Mr Taylor, dated 6th September 1868.

By Mr. Maine, dated 22nd September 1868.
 By Sir R. Temple, 6th October 1868.
 By the Governor General, dated 16th October 1868.

weights established in France, and adopted by several other nations of Europe, shall be at once octroyed into India, because it has a more scientific basis, and its scale is framed on the decimal system. His brother, in the Council of India, has strongly supported the same view, and their influence has prevailed with the Governor General and his Council to recommend this scheme.

I cannot bring myself to accept either of these suggestions. It seems to me that Mr. Minchin, and those who oppose Colonel Strachey in committee, have given conclusive reasons against the attempt to introduce a new and unknown scheme, having no ready means of test and verification amongst a people such as we have to deal with in the various regions of India; that the only result would be to add another to the existing elements of confusion. On the other hand, the two Stracheys have given conclusively reasons for rejecting the scheme of the majority of the committee. Thus the two projects destroy each other, and I must remark at the outset that both of them aim at reconciling or assimilating the Indian ponduary system with that of Europe, for the convenience of general trade, but that is not what I conceive ought to be the first aim of measures to be adopted by the Government of India. Their object must be to rectify the system in use among the population at large; to remove as many as possible of the incongruities and dissimilarities found to prevail in the small dealings of the lower classes, with bunees in shops, and hâts, and bazaars. To them it must matter little whether the seer and maund can or cannot be brought to fall in with the systems of Europe, and to them it would surely be a great evil to be required to give up the modes of dealing they have in some instances used for ages and to adopt a new one, the basis and tests of which are wholly unknown to them. But the fault I especially find with both parties is that they lower and treat as of no account what has already been done towards furnishing the entire population of India with a unit of weight for the test and verification of any system that may locally prevail. The fact that the tola of 180 grains was so established by the Government regulation in 1833 is indeed stated; but the great measure adopted shortly after to carry out and give effect to this unit of the ponduary systems of India, viz., the coining of a rupee of that exact weight for the whole of India, of which rupee there have now been struck and put into circulation nearly 200 crore of 2,000,000,000 of pieces, so that by this time there is no part of India into which this coin has not penetrated, and where it is not promptly available for test and comparison with any weights or measures that may be anywhere in use, is not at all averted to; indeed the use of coin for the verification of weights, or as the basis of a ponduary system, is quite ignored and disregarded, notwithstanding that it is admitted that this has been hitherto the universal system of India.

It may be useful to state the manner in which the tola weight of 180 grains was established, and the reasons for its adoption. The sicca rupee of Moorshedabad, which was adopted as the coin of Bengal, weighed 179·666 grains, and that was the unit of the most common ponduary system. Eighty of these made a seer, and 40 of these seers the bazaar maund, by which grain and most of articles of country produce were bought and sold in wholesale dealings. But the officers of the East India Company had introduced a separate maund for their transactions called the factory maund, three of which were exactly equal to 200 pounds avoirdupois, and the seer therefore, or fortieth part, was one-tenth less than that of the common bazaar seer. Again, the Government delivered salt at its golales to purchasers at the auction sales of this article weighed with a maund composed of 40 seers, each weighing 82 siccas, so that, even in Government transactions, there was no conformity in the weights used, or in the meaning which attached to the term maund.

But another element of confusion had been introduced. This sicca rupee, which was the basis of the sicca weight, weighing close upon 180 grains, contained 175·923 grains of pure silver, and only about four grains of alloy. About the year 1816, however, the Court of Directors ordered a change in the standard to be introduced in all the British coinages, one-twelfth of alloy being substituted for the usually more pure coin. By this change the Calcutta rupee of the same intrinsic value became increased in weight from 179·666 grains to 191·916 grains. But there was no corresponding change made in the seer and manud based on the old rupee, the sicca weight remaining a separate thing disconnected with the coin, and requiring, if tested thereby, that care should be taken to see that the wrong rupee was not used.

The Court of Directors were early sensible of the confusion which existed in

the weights and measures of India, and, preparatory to the consideration of what steps should be taken to reform the system, they called for reports, with specimens of all the weights in use, to be furnished and sent home to them by all their district officers and commercial agents. They obtained, in consequence, a mass of materials, which were submitted to Dr. Kelly, who, with the aid of the officers of the Royal Mint, having accurately weighed and verified them, published in his *cambist* a full list and detail of them. This proved a most useful work for every one engaged in commerce with India, and is still of high authority. The Court of Directors, however, did not immediately follow this up by any authoritative measures for the correction of abuses and simplification of Indian weights and measures. They observed that most of the weights were based upon the coin current in the locality. They wisely judged, therefore, that the first step towards reform was to introduce a uniform currency, and to this end their efforts, and those of their several Governments, were therefore for some time directed. These efforts resulted in the establishment, in 1835, of the rupee of 180 grains, now universally current, in supersession of the Calcutta sicca rupee and of all other local coinages. This rupee has now been current 33 years, and all others are fast disappearing. We have thus the universal unit for weights which it was desired to supply. The question, as it appears to me, is, what further step shall be taken in the same direction. The suggestions offered in these papers recommend, as I have before noticed, the abandonment of all that has been done, and the arbitrary imposition of something new, and of European device and origin, not in any respect Indian.

There have been several investigations made and committees appointed to consider the subject since the rupee tola of 180 grains was established. The most complete inquiry and best report made was by Mr. William Bayley, of the Madras Civil Service. His suggestions were practical. He saw the value of the rupee tola unit, but wishing to combine with its use a weight that should correspond with that used in commercial transactions in England. The committee in their report, state that he proposed that the seer, instead of weighing 80 tolas, should weigh only 78, which allowing for a little wear of the rupee, would make it exactly equal to two pounds avoirdupois. He made also some other suggestions, but this was the most important. It was felt, however, that it could not well be adopted in supersession of what had already been done in Bengal for the introduction and extensive use of the seer of 80 tolas. To have attempted to substitute another, could only increase confusion, and with the difference proposed of one-fortieth less, the loss upon the change would fall wholly on the buying consumer, for the bunea, although he would readily give a smaller weight, would very seldom, if ever, deduct the one-fortieth from the price. The monetary system indeed would seldom allow such a deduction in small transactions. At Madras, however, I believe that since Mr. Bayley's report, a ponduary system based upon the tola has been very extensively, if not very generally, introduced. The original system of Southern India was like most of the systems in other provinces based upon the current coin, but that coin was their gold until between 50 and 60 years ago, when the gold currency was displaced by silver, in consequence of the increasing value of gold, and this change will naturally have prepared the population for a new ponduary system based on the coin of that metal.

We have then the tola unit for any ponduary system that may be introduced anywhere. I object entirely, and I do not think the Council would assent to the rejection of this unit, after it has been established for 33 years, in the hope of finding a better, either in the French metrical based on the kilogramme, or in the English rather clumsy hundred weight and ton, based on the pound avoirdupois.

Retaining this unit, is there anything better that we can adopt than the seer of 80 tolas, and the mun or maund of 40 of these seers? I very much doubt it. The maund based upon this tola, exactly equals 100 lbs. troy, and although neither it nor the seer can be brought exactly to correspond with the weights based on the pound avoirdupois, still the conversion can be effected by a simple arithmetical process, as shown in my brother James Prinsep's useful Tables, "without any fractional quantities to complicate the calculation."*

It

* Eight tola rupees weigh exactly 3 ounces troy. The seer of 80 tolas weigh therefore exactly 30 ounces troy, and on the other hand 2 seer or 60 ounces exactly equals 5 pounds troy.

It is quite true that this ponduary system has never met with general acceptance. The indigo planters, who were in the habit of selling their produce by the factory maund, and of making the chest of indigo to contain two of these, refused to accept the new maund upon its introduction, on the plea that it was inconvenient to their trade. The plea was accepted, and, I believe, the factory maund still prevails in this trade. Again, the Government itself did not introduce the new maund into the opium department. The chests there are of the pecul weight, of about 140 lbs., to suit the China market; each contains 40 balls of opium, the weight of each of which cannot be expressed in the scale of any system without a fraction. The continuance of these anomalies, and the continued disuse of the new seer and maund, in many lines of dealing, is no argument against the wisdom of propounding the scheme, and of giving facilities for its use, as has been done by the extensive circulation of certified weights, if we find that through these measures the adoption of this ponduary system has spread, and is spreading. The committee, in their report, admit that it is now the scheme most extensively known and used in India, but locally and in particular transactions it is opposed. Is that sufficient reason for abandoning it, and attempting to introduce another which will assuredly be similarly opposed? I think not; and therefore would suggest that the reply to this reference of the Government of India shall be drawn in the spirit of these observations, that is to say, that we should tell the Governor General in Council that we see no reason, in what is urged by either section of the committee appointed to consider the subject of weights and measures, sufficient to justify the abandonment of the rupee tola of 180 grains as the unit of any ponduary system that may be established in India; that there can be no objection, locally, to any multiple or subdivision of this unit being introduced and legalised, but that in Bengal and Hindostan, where it appears the 80 tola seer and 40 seer maund, based on this unit, are extensively known and used, it is not desirable to attempt to supersede it by a new scheme, which would only be an additional element of confusion.

I have said nothing of linear measures, but of the measures of capacity used extensively in different parts of India. There is no recommendation at present that we should make any change of these. They are, therefore, not necessarily before us.

31 December.

(signed) *H. T. Prinsep.*

P.S.—The pound avoirdupois weighs exactly 7,000 grains, and the ounce avoirdupois is one-sixteenth of this, or $437\frac{1}{2}$ grains, a weight not easily reconcileable with the Bengal of 80 tolas, and its subdivisions. The Government of India, in 1833, preferred seeking congruity with the lb. and oz. troy, because these weights were more easily reconcileable with the existing bazaar maund and seer, based on the tola of 180 grains. Eight of these tolas being exactly equal to 3 ozs. troy, and two seer to 5 lbs. troy. If it had been desired to seek congruity with the lb. avoirdupois, a much more simple means than that suggested by Mr. W. Bayley might have been found by reducing the weight of the rupee to 175 grains, leaving it of the same value, *i. e.*, containing 165 grains of pure silver as now, with 10 only of alloy instead of 16. Eighty tolas, of 175 grains each, give 14,000 tolas to the seer, which is exactly 2 lbs. avoirdupois. This change might easily have been adopted in 1835, when the rupee with the royal stamp was first struck; but we cannot make the change now, after coining 200 crores of pieces, weighing 180 grains, and after circulating these everywhere as the test and basis of all local weights in India.

(signed) *H. T. P.*

— No. 4. —

From the Under Secretary of State for India to the Secretary to the Board of Trade.

Sir,

India Office, 6 February 1869.

I AM directed by the Duke of Argyll to forward to you, for submission to the Board of Trade, the accompanying copy of a Despatch from the Government of India, with the inclosed correspondence on the subject of a proposed revision of the weights in India.

The Government of India propose to introduce the French kilogramme as the unit of weight, and to leave the revision of measures for future consideration. In forwarding the correspondence, together with copy of a Minute recorded by Mr. H. T. Prinsep, a Member of the Council of the Secretary of State for India, I am desired to state that the Duke of Argyll would wish to be favoured with the opinion of the Board of Trade as to the proposed reform, and whether any measure is under consideration for a change in the weights of this country.

I am, &c.
(signed) *Herman Merivale.*

— No. 5. —

From Mr. *Gray*, Assistant Secretary, Board of Trade, to the Under Secretary of State for India.

Sir,

27 March 1869.

I AM directed by the Lords of the Committee of Privy Council for Trade to acknowledge the receipt of your letter of the 6th ultimo, transmitting, by direction of the Duke of Argyll, for the opinion of this Board, copy of a Despatch from the Government of India, with the correspondence which has passed, respecting the proposed revision of the weights in use in India.

In reply, I am to request that you will state to his Grace that my Lords have consulted the Warden of the Standards on the subject, and I am to transmit herewith a copy of his reply (and enclosures), which contains the views of the Royal Standards Commission in the matter, and to state that my Lords entertain a favourable opinion of the course proposed by the Indian Government.

I have, &c.
(signed) *Thomas Gray.*

Enclosure in No. 5.

From the Warden of the Standards.

MY views upon the general question of the introduction of the metric system of weights and measures into the United Kingdom are fully set forth in the accompanying paper, No. XVI., laid by me before the Standards Commission, and particularly in the resolutions suggested at pp. 42-3, which have since been unanimously agreed to by the Commission, and will form the basis of their second report.

As to the question of the introduction of the metric system into India, whether of weights only, or of measures also, I can say little more than is stated at p. 14. Many of the arguments and facts which are applicable to the introduction of the metric system into the United Kingdom apply with equal strength to India, and should therefore be as conclusive in favour of the metric system. Indeed, the necessity for the change in the existing system is far greater in India, in regard to the extensive diversity of the fundamental units, as compared with their actual uniformity in the United Kingdom.

It must, however, remain for the Indian authorities, with their special knowledge of the feelings, habits, and customs of the natives, to decide how far it may be expedient, or even practicable, to introduce the metric system throughout India. My own view is that if practicable, the whole metric system should be introduced at once.

My

OF THE METRIC SYSTEM OF WEIGHTS AND MEASURES. 11

My paper, XVI., as well as papers VI. and VII., on the tenth of the metre, in relation to the Imperial yard, &c., and the more detailed paper, XV., on the metric system, as established in France, will be appended to the second report of the Commission, now being prepared. In the meantime, any reasonable number of copies of these papers that the Indian Department may require, can be at once furnished to them.

— No 6. —

MINUTE by Mr. *H. T. Prinsep*, dated 10 April 1869.

Weights and Measures of India.

THE papers submitted by the Warden of the Standard to the Board of Trade, and by the Board forwarded to us, are very valuable and important.

We ought by all means to ask for several copies of them (since they are in print) in order to send them out to India for the information of the public officers and others, who have given and are giving their attention to the subject.

These papers contain a very complete summary of what has recently been done in India, and what is proposed for the improvement of the weights there. They further show the precise condition of the question whether it is expedient to introduce the French metrical system of weights, and to make it compulsory in this United Kingdom, and give besides some important statistics regarding the condition of the weights in use in this country, all which information has important bearing upon the course proper to be adopted for improving the weights of India.

But though I attach great value to these reports of the Warden, I am not prepared to approve and accept his conclusions and recommendation. He is a partizan of the policy of adopting the French metrical system in England, and advocates the recommendation of the Government of India that it should be introduced, and eventually made compulsory in India, in order that its being so may be used as an additional argument for adopting the same policy in England. But wherefore should we anticipate the decision of this question, that will have to be come to by the authorities and by Parliament in this country? Why be less cautious and considerate in the steps we take than those who have dealt with the question here have been? The recommendation we have from India is not that of an unanimous Council. It was rejected by a large majority in the committee specially appointed by Government to consider the subject. They recommend the establishment of the pound avoirdupois of 7,000 grains as the unit upon which to base a new scheme of weights for India.

I have agreed in a previous paper that we have established in the tola of 180 grains, which is the weight of the Government rupee, of which 200 crores have been struck since 1835, an unit for testing and comparing all the various weights in use throughout India. That upon the basis of this tola a scheme of weights was established in 1833, corresponding with one then largely in use there, viz., 5 tolas = 1 chatak, 16 chataks or 80 tolas = 1 seer, and 40 seers of 3,200 tolas = 1 maund, which was then and is still the common bazaar maund of Calcutta. That this scheme of weights corresponded conveniently with the troy weights of England (though not with the avoirdupois), 2 seers being equal to 5 lbs. troy, and the maund of 40 seers being exactly 100 lbs. troy. It appears from the report of the committee that sat in Calcutta, that this scheme of weights, although its use has largely extended in Bengal and the Upper Provinces since 1833, is not even there generally adopted, notwithstanding that the Calcutta Mint has been casting and furnishing weights of the scheme to public officers, and to anyone who applied for them ever since 1833. At the other Presidencies the scheme of weights has not been adopted at all, but the tola is universally used for the test and comparison of the different weights in use. The committee want new weights to be introduced based on

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the pound avoirdupois, rejecting apparently the tola unit. The two Messrs. Strachey maintain that if a new scheme is to be adopted, the French metrical scheme is the best, because it is sure to be adopted in England for general conformity with the rest of Europe in supercession of the avoirdupois scheme. The Warden of the Standard who notices, and fairly enough reviews, my arguments, objects to the tola unit as too small, but he gives no reason why a small unit should not be as good as a large one. He objects also to the unit being based on the current silver coin, because that coin is liable to wear, and is not struck in the first instance with complete exactness. No doubt silver coin in India is a legal tender until by wear it has lost weight by more than 2 per cent. But the declared unit is a new unworn rupee, and who, knowing this, would allow his weights to be tested by old and worn rupees. For every practical purpose a new rupee is as perfect a tola as anyone could desire to apply as a test of weight. It would be a nonsensical absurdity to tell the people of India that the weight they are to use is the equivalent of a certain cube of distilled water of a given temperature, with the barometer at a certain point. Who but a most scientific experimentalist could ever apply such a test? If, therefore, the pound avoirdupois, or the French metrical unit, were to be adopted in India, the reference of either to the tola must be specified and declared to make it all intelligible to the population.

But the method proposed of introducing these is, to my mind, fatal to the notion that the use of either can be made compulsory. The proposition is, that the Government shall furnish weights of the new scheme to everybody that wants them. Now, let anyone consider how many villages there are in India, and how many shopkeepers in each, all of whom would require to be furnished with the new set. Are they to be furnished gratis? Could the smaller dealers pay for them, if not so? At present in many hundred shops that I visited while in India, I found the seer and half seer weight to be boulder stones, picked up in the bed of a river. Very good weights these, if true, and thus anyone might test by weighing them against tola rupees. In England weights are cast by every founder of copper and zinc, and there are shops everywhere in which they are to be bought and sold, after first being tested and stamped by a Government Inspector. There are stated to be 1,300 official inspectors authorised to fix these stamps, and they stamp two millions and a half sets of stamps in a year. It is computed, says one of the reports submitted by the Warden, that there are thirty million sets of weights in use in the United Kingdom. Calculate from this the number that would be required by the population of India, which is at least 10 times as numerous, could the three Presidency Mints undertake to supply such a want in addition to the work of the coinage? How else are they to be cast and tested? A large machinery must be organised for this purpose before ever the idea can be entertained of forcing either the pound avoirdupois or the French metrical unit weight into general use.

This argument is, I think, conclusive against the adoption of either of the propositions submitted by the Government of India. But we may concede thus much to their recommendation, *i. e.*, to proceed in the matter as has been done in England, and to allow the permissive use either of the French weights, or of a scheme based on the avoirdupois pound; that so it may be seen how far they are approved, and likely to be preferred. The Mint may cast and furnish weights of either scheme to anyone that may apply for them, taking care to adopt the very useful suggestion contained in these papers, *viz.*, that the weights of each scheme shall have a different shape, so as to be easily distinguishable, and to this may be added the further precaution of stamping the number of tolas on each weight, so as to promulgate generally their relation to a test in general use.

I think the reply to the Government of India should, in forwarding these papers of the Warden of the Standard, explain the necessity of not departing too hastily from the tola test for any weights that may be introduced, which having now been upheld by Government for more than 30 years, ought not hastily to be given up.

(signed) *H. T. Prinsep.*

-- No. 7. --

(Public, No. 51.)

To His Excellency The Right Honourable the Governor General of
India in Council.

My Lord, India Office, London, 10 June 1869.

Para. 1. THE Despatch of your Excellency's predecessor in Council, dated the 6th of November, No. 163, of 1868, relative to the introduction in India of the metric system in connection with weights, has been considered by me in Council.

2. I forward herewith copy of a letter, dated 27th March 1869, from the Board of Trade, to which department a reference was made upon the subject, and also copy of a Memorandum by the Warden of the Standards, with six copies of each of the printed papers, noted on the margin,* issued by the Standards Commission.†

* Nos. 6 (with Post-script), 7, and 15, of 1867, and No. 16 of 1869.

3. I consider that your Lordship's predecessor in Council acted with due judgment in limiting the reform for the present to weights, and I approve of the adoption of the kilogramme as the new unit of weight, in preference to the English pound.

4. The propositions submitted in the 11th paragraph of the Despatch under reply have my approval, and I accord my assent to them.

5. I desire to be furnished with a report on the operation of the new system, after a fair period has been allowed for the experiment.

I have, &c.
(signed) *Argyll.*

† The second Report of the Standards Commission, with numerous appendices, will shortly be presented to Parliament. Copies of it will be forwarded to the Government of India.

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EAST INDIA (METRIC SYSTEM).

CORRESPONDENCE on the Subject of the
Application to *India* of the METRIC SYSTEM
of WEIGHTS and MEASURES (in continuation
of Parliamentary Paper, No. 16, of Session
1867-8).

(Mr. John Benjamin Smith.)

*Ordered, by The House of Commons, to be Printed,
12 May 1870.*
