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REPORT

OF THE

WEIGHTS AND MEASURES COMMITTEE.

1913-14.

SIMLA

GOVERNMENT CENTRAL PRESS

1914.

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EXPLANATIONS AND ABBREVIATIONS.

In referring to the summaries of evidence in Chapters IV and V the following abbreviations are employed :—

U. P.	...	United Provinces
B.	...	Bengal.
M.	...	Madras.
B. O.	...	Bihar and Orissa.
P.	...	Punjab.
Bo.	...	Bombay.
C. P.	...	Central Provinces.
Bu.	...	Burma.
As.	...	Assam.
N. W. F.	...	North-West Frontier Province.
Aj.	...	Ajmer-Merwara.
Ba.	...	Baluchistan.
D.	...	Delhi.
C.	...	Coorg.
Ba.	...	Bangalore.
N. S.	...	Native States.
O.	...	Oral Evidence.

The paragraphs in Chapters IV and V are numbered provincially, and references are given showing both the province and paragraph, thus Chapter V, U. P., 7 means paragraph 7 of the digest of the evidence regarding opinions expressed in the United Provinces in Chapter V.

No. 939, dated Simla, the 10th July 1914.

From—C. A. SILBERRAD, Esq., I.C.S., President, Weights and Measures Committee,

To—The Secretary to the Government of India, Department of Commerce and Industry, Simla.

In submitting the report of the Weights and Measures Committee I have the honour to say that I regret we are not able to submit a unanimous report. Mr. Rustomji Faridoonji and myself are in substantial agreement save in respect to one or two points of comparatively minor importance. Mr. Campbell has put in a note of dissent in which he recommends the metric system.

2. To make it more possible for a correct estimate of the opinions expressed to be arrived at, I think it should be noted that Mr. Campbell's service has been mainly that of an Under Secretary or Private Secretary, that of Mr. Rustomji Faridoonji and myself almost entirely that of a District Officer.

3. It is possibly also of interest to place on record the manner in which the work was distributed among the members of the Committee. The selection and editing of the evidence, the preparation of the summaries thereof and of the statements showing the weights and measures at present in use was divided amongst us, and though of course the work was co-ordinated as far as possible, the member concerned is primarily responsible for what he did. Accordingly Mr. Rustomji Faridoonji dealt with Bombay, the Central Provinces and Baluchistan; Mr. Campbell with Bengal, Madras, Bihar and Orissa, Assam, Coorg and Bangalore; while I myself took the United Provinces, the Punjab, Burma, North-West Frontier Province, Ajmer and Delhi.

4. Chapters I, II and III were almost entirely drafted by Mr. G. Findlay Shirras, Director of Statistics, to whose ungrudging assistance we are deeply indebted, an assistance without which it would have been quite impossible for us to have completed the work within the time prescribed.

5. Lastly, I wish to mention the good work of the head clerk, Babu Hari Narayan Ghosh, who did not spare himself in any way.

CHAPTER I.—INTRODUCTORY.

The diversity of weights and measures in India.

1. It is well known that the weights and measures of India have never been settled upon an organized system for the country as a whole, or for provinces. In India, as in other countries, the increase of communications and of commerce and industry has resulted in a widespread demand for greater uniformity in marketing, and therefore in a demand for a more uniform system of weights and measures applicable to larger areas, if not to the country as a whole. In the United Provinces, for example, the maund of sugar weighs 48½ seers in Cawnpore, 40 in Muttra, 72½ in Gorakhpur, 40 in Agra, 50 in Moradabad, 43¼ in Saharanpur, 50 in Bareilly, 46 in Fyzabad, and 48⅓ in Shahjahanpur. The maund varies throughout India from the Bengal or railway maund of 82⅔ lbs. to the Madras maund of 24 or 25 lbs., the Bombay maund being 28 lbs. and the factory maund a little over 72 lbs. 10 oz. In the United Kingdom also, weights and measures, although uniform, are yet far from perfect, and recently attention has been called in the "Times" to the difficulties of marketing, especially in the case of food-grains. The English stone usually known as the equivalent of 14 lbs. is only 8 lbs. for meat, 6lbs. for cheese, and 5 lbs. for weighing glass.

The great diversity in weights and measures in different districts, even in different parts of the same town and of the same district, tends to create an element of uncertainty in trade, and renders fraud on the part of retailers as easy as it is profitable, and it exposes the poorer and silent classes to the constant liability of being cheated. Gover in his "Indian Weights and Measures, their Condition and Remedy" quotes with approval the remarks of one of the chief traders in Madras. He said "I can never tell what I am buying, nor how I am selling. My agents inform me that rice is at so much the seer, while in another quarter it is double that price I take advantage of the opportunity, invest largely, and expect great profits. When the transaction is closed I find I have lost greatly. The seer in the first place was perhaps less than half the size of that in the other. No two villages hardly have the same measures, and to ensure success, I should need an agent in every place, each with infinite opportunity for deception. The expense and risk of employing these agents more than neutralizes the enormous advantages that might otherwise be gained, while the attendant labour and anxiety are more than you can imagine." This was written as long ago as 1865, and it applies with emphasis at the present time especially in the Madras Presidency, where uniformity, except in homogeneous areas, may be said to be almost non-existent.

Act XXXI of 1871, and events immediately preceding appointment of the Committee.

2. During the last 10 years the Government of India and the Provincial Governments have attempted to solve the problem of weights and measures. By Section 8 of the Indian Weights and Measures of Capacity Act (XXXI of 1871), the Governor General in Council was empowered to introduce a system of weights and measures of capacity consistent with a statutory unit prescribed by Section 3. Section 8 reads as follows:—"Whenever the Governor General in Council considers that proper standard weights and measures of capacity have been made available for the verification of the weights and measures of capacity to be used by any Government office or Municipal body or Railway Company, the Governor General in Council may, by notification in the Gazette of India, direct that, after a date to be fixed therein, all or any of the weights and measures of capacity authorized as aforesaid shall be used in dealings and contracts by such office, body, or company; and may, in like manner, from time to time, alter or revoke, such direction."

Section 2 is as follows:—"The primary standard of weight shall be called a Seer, and shall be a weight of metal in the possession of the Government of India, equal, when weighed in a vacuum, to the weight known in France as the Kilogramme des Archives".

Terms of reference.

4. No specific terms of reference were given to the Committee beyond the opening sentence of paragraph 3 of the Resolution dated Simla, the 10th October 1913 (printed as Appendix A), appointing the Committee in which it was laid down that it was decided "to re-open the question of the feasibility of securing the use of uniform weights and measures in India, and to appoint a Committee to inquire into the whole subject." The Committee decided that this reference involved three distinct questions :—

(1) how far was a uniform system of weights and measures possible for India as a whole or for provinces ;

(2) if unification were possible, what would be the best system of weights and measures, *e.g.*, the metric, British or some Indian system ;

(3) the system having been decided on, what would be the best means of introducing it, *e.g.*, by legislation, with special reference to time after which only the prescribed weights and measures would be used, the penalty for the use of any but the authorized weights and measures, the provision for inspection and stamping of weights and measures, the supply of standards in all important market towns, and the facilities to be given to traders for the purchase of new weights and measures within the time limit.

Method of inquiry.

5. The Committee met in Bombay on November 10th, 1913, and proceeded to frame two sets of questions, which are printed in Appendix B, the longer (*a*) was issued to the more highly educated witnesses, while the shorter (*b*) was for others. The Committee felt, however, that it was most necessary that they should get into touch with the agricultural and petty trader class, and equally that they were as a rule unable to do so themselves. They, therefore, addressed Collectors through Local Governments or directly, sending them copies of the shorter set of questions in the vernacular, the translations being either carried out directly by the Committee or by the Local Government,* and requested them to make inquiries of persons of these classes, who, it must be remembered, form the bulk of the population of the country. The letters issued are printed in Appendix B. The results of these inquiries were valuable.

Local Governments were requested to intimate the places in the various provinces which they considered the Committee should visit, and a tour programme was framed accordingly. The District Officers and Local Governments selected witnesses among whom were included the leading citizens, merchants, etc. With rare exceptions all witnesses received copies of the questions before being examined. The Committee also requested District Officers to arrange for groups of petty traders, agriculturists, and the lower professional classes to be ready to meet them and discuss the questions before them. They found that they frequently got more useful information by examining a group of persons together than by examining them singly. One member of a group would advance some statement and another would disagree with the result that points were discussed and considered from various sides. The Committee consider the evidence of these groups of witnesses among the most valuable they received. As far as possible witnesses were examined directly without the intervention of an interpreter. This was usually the case when witnesses spoke Urdu, Hindi, Marathi or Gujarati ; in the case of all other languages an interpreter was employed, an inevitably less satisfactory method of examination.

* The questions were translated into Assamese, Bengali, Burmese, Chinese, Gujarati, Hindi, Canarese, Malayalam, Marathi, Tamil, Telugu, Urdu and Uriya.

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* The questions were translated into Assamese, Bengali, Burmese, Chinese, Gujarati, Hindi, Canarese, Malayalam, Marathi, Tamil, Telugu, Urdu and Uriya.

The number of places visited, witnesses examined, etc., in each province is as follows :—

Province.	Population in thousands	No. of places visited.	Written replies received.	Number of witnesses examined.	
				Individually.	In groups.
United Provinces ...	47,182	10	113	7	250 in 25 groups.
Bengal	45,483	7	109	15	297 „ 12 „
Madras	41,405	13	248	31	244 „ 34 „
Bihar and Orissa ...	34,490	6	143	19	130 „ 13 „
Punjab	19,975	7	81	6	210 „ 16 „
Bombay	19,673	8	238	44	111 „ 12 „
Central Provinces ...	13,916	7	82	26	88 „ 9 „
Burma	12,115	10	284	20	227 „ 24 „
Assam	6,714	3	18	2	48 „ 7 „
North-West Frontier Province	2,197	2	33	..	49 „ 5 „
Ajmer-Merwara ...	501	1	21	...	25 „ 5 „
Baluchistan ...	414	2	5	...	41 „ 4 „
Delhi	225	1	26	3	27 „ 3 „
Coorg	175	1	4	...	...
Bangalore	101	1	8	1	11 „ 2 „
Total ...	2,44,566	79	1,413	174	1758 „ 178 „

It was not possible for the whole Committee to visit every place in the time at their disposal and they accordingly divided up, all of them visiting the more important places as far as was possible, and one or two members the smaller ones. They were on tour, with but short intervals, from November 19th, 1913 until April 28th, 1914.

The tour was an invaluable means of obtaining information regarding the subject of the Committee's inquiries, more especially in respect of local opinion as to the desirability and feasibility of introducing some uniform system, and of the difficulty or opposition likely to be encountered as a result of various lines of action. As a rule the Committee met with every assistance from the local authorities, but in some cases these did not appear to take any great amount of interest therein.

The amount of interest displayed in the various provinces varies considerably, being greatest in the United Provinces, Madras, the Central Provinces, Burma and Baluchistan. The apathy of not a few of the European merchants was noteworthy ; on the whole the middle class trading class was probably most interested.

CHAPTER II.—ACTION TAKEN TOWARDS SECURING UNIFORMITY UP TO 1900.

Early attempts; Akbar.

As early as the reign of Akbar attempts were made to unify measures, and it would appear, also weights. The gaz was, for example, so infinitely varied as regards length that reform was decided on, and after considerable inquiry and deliberation Akbar introduced the Iláhi gaz, which we know to have been between 33 and 34 inches. The Ain-i-Akbari informs us that this official gaz was taken as the mean of the three chief gaz then existing, and around which most of the existing measures may be grouped. The Iláhi gaz we know to have been between 33 and 34 inches. For some time the result of this unification was inestimable. At the present time, it may be said that there are 4 main gaz measures in the greater part of India—Akbar's and those he endeavoured to supersede—all with their own variations and no acknowledged standard. Jonathan Duncan employed a gaz of 33⅓ inches when he introduced the permanent settlement into part of the North-West Provinces. In the coast districts of the west, the most common gaz is that of about 28 inches. In other parts there is a group whose average is about 39 inches. It is necessary to note that frequently in one locality merchants will buy by the gaz of 34 inches and sell by that of 30 or they will measure cloth by one measure and silk by another, while carpenters and bricklayers will each use a different measure. Akbar's attempts at unification were not successful owing to the decline of the central power, and the internal confusion and anarchy that followed.

Attempts in Madras.

In March 1801, a Government proclamation was issued in Madras directing the introduction of what appears to be a revised system of weights and measures. In 1801, Mr. Ellis, Sub-Secretary of the Board of Revenue, drew up a plan for re-modelling the measures of capacity so that when heaped, they should correspond with the old 'struck' measures, and this was approved by the Government of Madras in 1802. "The accuracy of Mr. Ellis's calculation," said the Government in their letter of the 17th April 1802, "and the simplicity of the means to be employed in the organization of a general uniformity in weights and measures have satisfied His Lordship in Council, not only of the practicability of the plan, but that the public and individual interests will experience advantages not easily to be estimated from the establishment of a standard of weights and measures on the principles recommended by Mr. Ellis. His Lordship in Council has, therefore, resolved that these principles shall be practically applied to the construction of all weights and measures to be henceforward in use in the districts under the Presidency of Fort St. George." Mr. Ellis's plan does not seem to have ever been carried out owing to the fact that the supply of weights and measures required was so great. In the first quarter of the 19th century a careful perusal of proceedings of Madras, Bombay and Bengal will show that a few futile attempts were made to rectify the prevailing confusion of weights and measures, especially in landlocked areas.

Prinsep's proposal.

2. The first attempt to adopt a unified system of weights was in 1833 when Mr. James Prinsep, the Assay Master of Calcutta, addressed a letter to the Mint Committee proposing that the Furruckabad rupee for the North-West Provinces should be 180 grains instead of the 180·234; and he suggested the adoption of 180 grains as the standard for the tola weight, and the making of seer weights of 80 of these tolas. He pointed out that the Madras and Bombay rupees were already of a weight of 180 grains, the Sicca rupee only remaining 191·916 grains. He also pointed out the fact that with a tola of 180 grains the seer of 80 tolas would be exactly 2½ lbs. troy, and 40 seers or a maund, 100 lbs troy. Mr. Prinsep had outlined this scheme in the Journal of the Asiatic Society for October 1832. The Government of India in May 1833 passed Regulation VII of 1833, which altered the weight of the Furruckabad rupee to that of the Bombay and Madras rupee (180 grains English weight), and fixed 192 grains for the Sicca rupee. The Regulation declared in the preamble "that it is convenient to introduce the weight of the Furruckabad rupee (180 grains) as the unit of a general system of weights for Government transactions through-

India, under the native and well-known denomination of tola." By Act VII of 1835, the Sicca rupee was abolished, and since that date the only rupee coin has been the rupee of a 180 grains in order that the above standard of weight introduced into Bengal might be general throughout British India. This standard was adopted by the Customs authorities, and also by the merchants and traders of Calcutta in a meeting held in 1836, when it was resolved that the new maund should be of 82⅔ lbs. avoirdupois. In 1840, the standard was extended to Bombay, but throughout the Madras Presidency little was done for its introduction for at least 20 years after Act VII had been passed.

3. Between 1825 and 1853, the question of weights and measures was frequently discussed although no result seems to have been achieved. In Bombay Regulation XII of 1827 (Chapter II, Section XX), it was laid down that "the Magistrate shall keep weights of such standards and measures as are used in retail dealings throughout the district under his charge, and they shall be open to inspection by anyone who may desire to examine them." In 1839, the Madras Government appointed a Committee to adjust the value of the ordinary weights and measures in use in the Presidency to the Imperial standard. In their report they observed that "the weights and measures sent to them by the Ordnance are the English ones, but those sent to them by the Commissariat are the country ones made of all materials and very discordant; so much so that it was impossible to determine from the weights themselves the actual weight they are designed to represent". They refer to the discrepancy between the *pagoda* and *pollum* observing that if a pollum is 10 pagodas it should weigh 1 oz. 88 grains avoirdupois, and the maund 24 lbs. 192 grains, for the mint weight of the pagoda is 52·56 grains, whereas the pollum is always reckoned as 1¼ oz. and the maund 25 lbs. The Committee had no hesitation in recommending at once the introduction of British Imperial measures. In May, 1840, the Madras Government referred the question to the Government of India, and a reply, dated August 1840, stated that "the Governor General in Council considered the pollum a less perfect unit of weight than the tola, and it was desirable to adhere to one system." In September, 1840, in consequence of the Imperial Government's refusing to sanction any but the tola unit another Committee was appointed, and this Committee consulted the Madras Chamber of Commerce regarding the feasibility of making the pollum either 2½ or 3 tolas. By the first plan the pollum would be half the Bengal chatak, and by the second it would approach the existing commercial pollum of the town of Madras. The Chamber replied that "they consider no system can be perfect that does not reduce the weights and measures at the three Presidencies to the same standard; and any change, if to be made, might as well be a change that would ensure unification with the Bengal scale. If this standard be adopted so as to make the tola the unit, the second scale should be introduced." The Committee sent in their report in February 1841 recommending the tola unit and the pollum of 3 tolas by which the viss became 3 lbs. 1 oz. 5·24 drs. and the maund 24 lbs. 10 oz. 15·54 drs. The Committee also expressed themselves in favour of a decimal scale. In March, 1841, the Government of India approved of the second Committee's proposal as an adjustment promising local convenience, and the Madras Government asked the Committee for suggestions as to the carrying out of the proposals. The Committee replied that it would be useless to attempt to reconcile the discrepancies existing in the ordinary Indian weights and measures, and they agreed with the former Committee that it is in the power of Government, leaving untouched the provincial systems, to declare the value which they think proper to attach to the country weights and measures, and to recognize in the public accounts no weight or measure except those which correspond with the revised tables. They also proposed that every Department, Civil and Military, should be supplied with 'counterparts,' as soon as they were prepared, that Government should issue a proclamation prescribing the date from which the new tables should be introduced in the Public Departments. In June, 1841, the Government of Madras approved the report of the second Committee. In 1846, the following proclamation

Act VII of 1835.

was issued by the Government of Madras:—"The Governor in Council hereby notifies that on and after the first January 1847, the weights and measures herein particularized shall alone be used in the Revenue, Commissariat, and other Public Departments throughout the Presidency of Fort St. George, Madras, and that all the public accounts shall be kept therein, duly authenticated standards having been furnished to the several Heads of Departments throughout the Presidency for that purpose."

The following are the tables given:—

Weights.

	Equivalents in avoirdupois weights.	Equivalents in tolas.
	Lbs. oz. drs.	
180 grains = 1 tola	0 0 6·58	1
8 tolas = 1 pollum	0 1 3·75	3
40 pollums= 1 viss	3 1 5·94	120
8 viss = 1 maund	24 10 15·54	960

Measures.

	Cylindrical		Cubic inches.	Weight (avoir.) of water at 80° Fahr.
	Diameter in inches.	Depth in inches.		lbs. oz. dr. gr.
1 olluck	2·6	2·4	12½	0 7 3 6
8 ollucks=1 measure ...	5·0	5·1	100	3 9 9 20
8 measures=1 mercal ...	10·5	9·6	800	28 12 13 22
Half measure	4·0	4·0	50	1 12 12 23
Half mercal	8·2	7·6	400	14 6 6 24

This proclamation, however, was entirely a dead letter with the exception of a limited application in Public Departments. The Commissariat, for example, used the old measure for 6 years after. The case of Madras clearly shows the difficulties that existed and the futile efforts made by Local Governments in this period.

Bengal maund adopted on railways.

4. The Director General of Post Office in India had called the attention of Government in October 1854 to the inconvenience which had arisen in consequence of the railways having adopted English standards of weight instead of the standard of the Indian maund. In November 1854 the Government of India resolved that the railway weights should be the Indian maund for the same reasons that railway payments were in Rupee currency.

Mr. Bayley's proposals in 1857.

5. In 1857 the Court of Directors forwarded to the Government of India for its consideration a proposed reform of the weights and measures by Mr. W. H. Bayley of the Madras Civil Service, whose scheme was shortly as follows:—

"Taking the Bengal seer as the most generally used of the existing Indian weights, he adopted it as the unit, and proposed that it should be fixed at 2 lbs. avoirdupois. The existing unit—the tola of 180 grains—being incompatible with the avoirdupois scale, he abandoned it; but the natives of India being in the habit of testing weights by rupees, he suggested at first that 77¾ rupees or very approximately 2 lbs., should be taken as the equivalent of the seer. In a later paper, drawn up in 1864, he modified this suggestion, and stating as a fact that rupees in use lose weight, which on an average may be set down at half a grain on each rupee, he considered that as an approximation and a practical test for the people, 78 worn rupees would represent with sufficient accuracy the new 2 lbs. unit. For the unit of capacity Mr. Bayley recommended the imperial quart. Both the units of weight and capacity were to have decimal multiples and binary subdivisions. For linear and superficial measure he recommended the adoption of the English scales taking the yard and mile for length, and the acre, decimally divided, for area.*"

Proposals of 1863.

6. Until May 1863 no action seems to have been taken on Mr. Bayley's proposals when the Government of Madras drew the attention of the Government of India to the importance of steps being taken to reform the various systems of weights and measures in use in British India. The Madras Government also suggested that a Committee should be appointed consisting of properly qualified persons from each Presidency to report on a system which it would be desirable to adopt for all India. In July of the same year the Calcutta Trades Association also addressed the Government of India, and proposed that a mixed commission should be appointed to inquire into the existing system of weights and measures and to suggest one uniform system which should be enforced by legislation.

The Committees of 1864.

7. In a Resolution, therefore, dated 20th June 1864, the Government of India ordered a separate Committee for each Presidency and Province which should meet and deliberate on the subject of weights and measures, and report the result to the Local Governments for submission to the Government of India. "His Excellency" said the Resolution, "observed that a uniform system of weights and measures for all India would, doubtless, be of great advantage, but that the difficulties in the way of attaining so useful an object were grave and numerous. There was much to be done before a practical scheme for general adoption could be discovered, and it was anticipated that, when discovered, it would be better introduced by indirect means than by penal legislation."

The mode of dealing with the subject, which most recommended itself to His Excellency in Council, was to constitute a separate Committee of well selected persons for each Presidency and Province, each Committee to consist of three or five members (for preference three, *viz.*, a civil servant, a merchant, and an Engineer Officer), who should meet together in the chief city of such Presidency or Province, and deliberate on the subject, reporting the result of their labours to the Local Government or Administration, for submission to the Government of India, with any further remarks which the local authorities might deem necessary. For a Central Committee for all India, as proposed by the Madras Government, there was not at that time sufficient information available, and His Excellency in Council, therefore, believed that, as a preliminary measure at any rate, Local Committees would be more useful besides being far less expensive.

A copy of the Resolution was also sent to the Secretary of State, who suggested caution so as not to interfere unduly with a question so closely connected with the interests and habits of the people of India.

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* *Vide* Minchin's Report, 1868.

8. It is interesting to give in this connection a summary of the Local Governments' opinion.* The Bengal Committee opposed Mr. Bayley's scheme. They considered it a fallacy to seek for approximation with English weights and measures when those were on the brink of a tremendous change. When the rest of the world has adopted, or is about to adopt, the metre as its unit of length, they considered that it would be a retrograde step to adopt the English foot. In their opinion the days of the foot, acre, and pound were in all probability numbered. They objected to Mr. Bayley's measure of capacity being based on his weight as in a natural system it would be based on the linear measure. Lastly they objected to his weight as being neither true to the pound, the tola, or practical usage, though it ingeniously combined an approximation to all the three. They opposed, therefore, all previous propositions, as involving considerable change without simplifying calculations, as tending only to approximate Indian to the British scales which are in an unsettled state, and as being unscientific and possessing no clear connection between weights and measures. They, therefore, proposed the gradual, but finally complete, adoption of the French metric system, and that recommendation received the support of the Bengal Government.

Views of Bengal.

9. The Madras Committee adopted Mr. Bayley's scheme, modified in one point only. They would lower the weight of the tola from 180 to 175 grains, in order that a seer of 80 tolas should exactly equal 2 lbs. They would thus have the tola weight different from the rupee weight, any alteration in which they did not contemplate. Sir T. Pycroft, late of the Madras Council, objected to this proposal, urging that it invented a new weight to form a submultiple of one already known. He preferred to have the seer of 2 lbs. the unit of weight, and to divide it into 16 or 32 parts.

Views of Madras.

10. The Bombay Committee recommended a decimal system of multiples and submultiples of the pound avoirdupois and gallon; for linear measure, the inch, foot, yard and mile; and for area, the acre decimally divided. The Government recommended the adoption of the English pound and foot or yard as unit of weight and length; square foot or yard for area; and cubic foot or yard for capacity. They did not object to decimal multiples but recommended division into sixteenths.

Views of Bombay.

11. The Committee and Government of the North-West Provinces supported the units of length, weight, measure, and capacity recommended by Mr. Bayley, confining the use of the acre, decimally subdivided, to Government records. They suggested that the copper coinage should be taken as the standard of weight in lieu of the rupee, and that, the copper pice being fixed by Government to weigh 100 grains, 140 such pice should be declared equivalent to the seer. It would seem, however, that this assimilation to the weights of the copper coinage was recommended only as a popular test for weights and no particular coin was taken to serve as the unit of weight, as the rupee does under the present system.

Views of North-West Provinces.

12. The Punjab Committee supported Mr. Bayley's scheme, except for the unit of weight. For this they would preserve the present tola, and adopting troy weight, would make the seer the equivalent of 2 lbs. troy. The Punjab Government disapproved of the suggestion to adopt troy weight for the Indian standard when this scale had been abandoned in commerce. They advocated as the unit of weight the tola of 175 grains; and if the rupee could not be reduced to this weight, they would abandon an imaginary connection with the coinage, and like the Madras Committee, would advocate the introduction of a new tola differing from the rupee as a unit of weight.

Views of the Punjab.

13. The Committee and Chief Commissioner of British Burma deprecated any alteration of existing weights, but recommended that the basket or native measure should be assimilated with the English bushel.

Views of Burma.

* *Vide* Minchin's Report, 1868.

14. With the exception of the Report of the Bengal and Oudh Committees, none of the other papers forwarded to the present Committee contained any suggestion of importance.

The Resolution of 1867.

15. In a Resolution of 25th January 1867 when all the replies of Local Governments had been received the Governor General in Council decided that, since the proposals of Local Governments differed so greatly, a well selected Central Committee should meet in Calcutta to decide the best method of dealing with the question. The Committee was to consist of the Master of the Calcutta Mint, the Comptroller-General of Accounts, two members of the Bengal Chamber of Commerce, three Indian members appointed by the Government of Bengal and two Civilians representing Bengal, Bombay and Madras and any Indian gentlemen recommended by the Governments of Madras and Bombay. The Committee was to meet in Calcutta in February 1867 and the terms of reference were:—" It will be sufficient instruction to the Committee to accept generally the views of the Government of Madras expressed in their letter of the 13th May 1863, and already quoted above. Although the Governor in Council does not wish entirely to preclude the Committee from examining what may be theoretically the best system of weights and measures, His Excellency desires that they may be guided in their selection of a system rather by considerations of its practical convenience for adoption in India generally and its capability of being placed in easy relation with that now existing in England. Nor does the Governor in Council consider it expedient that the Committee should narrow their inquiries by the arbitrary adoption of any particular standard unit from any existing system of measurement or weight." The Resolution was communicated to the Secretary of State who in approving of it forwarded a report on the representations made by a deputation from the Metric Committee of the British Association on the subject of the introduction into India of the metric system. The Secretary of State did not believe it to be advisable to introduce the present English system, but that it would be more expedient to establish a system on the best theoretical model, although extreme caution should be used not to sacrifice practical convenience to theoretical symmetry.

Colonel Strachey's proposals of 1867.

16. Between July and December 1867 the Bombay and Madras Governments forwarded to the Government of India copies of communications from the Agents of Railways, recommending the adoption of English weights, and were informed that until the receipt of the report of Colonel Strachey's Committee no action could be taken in the matter. On the 1st of October 1867 Colonel Strachey issued a pamphlet containing proposals relating to the introduction of new standards of weights and measures in India in which he pointed out that weights and measures were as diverse as was well-nigh possible, but that India differed in no respect from other countries in which uniformity had not been prescribed by authority. He showed that throughout India the old standard of weight was based upon the current coin of the locality, and that weights and measures varied from town to town and even within the same town or rural area for various commodities. In Northern India the usual unit of weight was the tola, which was the weight of the current rupee coin, while the seer varied from 70 to 100 tolas. The maund was usually 40 seers, and 5 seers was called the *panseri* and the seer was divided into 16 chatáks. In Southern India, however, the original unit of weight was the pagoda and the common kachha seer was 80 pagodas equivalent to 24 current rupees. The maund of Southern India containing 40 such seers was divided into 8 viss (5 seers) weights and 40 pollums, and in Bombay the old seer was reckoned as equal to 30 pice or about 10 or 12 oz. avoirdupois. The Bombay maund was 40 such seers or nearly 28 lbs. Measures of capacity were hardly known in Northern India. In Bengal and Southern India they were more frequently used, and in Burma grain was universally sold by measure. The usual length measures were the cubit or háth and gaz, and measures of area based on the háth or gaz varied so exceedingly from one district to another that no general account could be given of them. In view of this condition of things he suggested firstly that it would be necessary to set aside the whole of the existing weights and measures

of all sorts in order to establish uniformity, and secondly that the introduction of the metric system would have to follow as a corollary.

Report of the Committee of 1868.

17. In March 1868 the report of the Committee was issued signed by the majority of members, in which a draft Bill was submitted adopting the English standard of weights and measures and length, on the ground that such weights and measures would best afford facilities of English trade. This report pointed out that the English system had to some extent been introduced into India and was more likely to meet with approval from English officials who would therefore be more willing to further its introduction. There was no probability, the Committee believed, of the English system giving way to the metric system in England. Colonel Strachey recorded a strong minute of dissent with which Colonel Hyde and Mr. Harrison agreed. He held that the Committee's arguments for the English system were not based on facts; that the English standard had not been introduced into India to any considerable extent; that the English system must give way to the metric system before very long; that the Committee's proposals do not even attempt the adoption of the English system, nor do they bring Indian weights into line with the English.

The Government of India's views on the Report.

18. In November 1868 the report was forwarded to the Secretary of State. The Governor General in Council pointed out that a reform of Indian weights and measures was urgently required and that for the present time attention should be given to weights only. The Governor General in Council did not believe the adoption of the English weights to be desirable since it would reduce the seer average of $2\frac{1}{4}$ lbs. to 2 lbs., while the kilogramme of 2·205 lbs. would more readily be accepted by the people. The metric system was therefore proposed so that (1) the standard of weight should be the kilogramme or seer of 2·205 lbs. avoirdupois, (2) the system of decimal subdivision should be adopted as far as possible, and (3) the Public Departments, municipalities and railways should use the system as soon as possible.

Indian Weights and Measures Act (XI of 1870).

In June 1869 the Secretary of State sanctioned the proposal and the Indian Weights and Measures Act of 1870 (XI of 1870) was passed in March, and forwarded to the Secretary of State for sanction with the request to allow Colonel Strachey means of obtaining the required standards in England.

In November 1870 the Secretary of State refused sanction to the Bill, because in his opinion it went further than had been intended in treating of other standards besides those of weights and because the compulsory clauses of the Act were too severe, and too extensive as they applied to all persons engaged in trade. He was dissatisfied with the explanation given by Colonel Strachey, and revision of the Act was ordered.

Indian Weights and Measures of Capacity Act, (XXXI of 1871).

19. In August 1871 a new Act was introduced—Act XXXI of 1871—in conformity with the suggestions of the Secretary of State. (Sections 2, 3 and 8 of this Act have already been referred to in Chapter I, pages 7 and 8.) In January 1872 this Act was submitted to the Secretary of State, with the suggestion that Colonel Tennant should be deputed to England to procure the necessary standards, and it was stated that Indian Railways were prepared to introduce the new system if it were introduced simultaneously; the new standards, however, were required before it could be so introduced. In March 1872 the Secretary of State ordered all steps for introducing the Act to be suspended until the arrival of the new Viceroy (Lord Northbrook),

Orders of 1872.

who, in the following September recommended that the compulsory clauses of the Act be not put in force so far as concerned the railway companies, but that the Directors should be consulted at Home and if they agreed the new seer

Opinions of Railway Companies on the Act.

should be adopted for all railways, but that otherwise the new Act must become a dead letter. Meantime negotiations for procuring standards of weight were in progress.* The Boards of Directors of the various Indian Railways were ac-

* *Vide* despatch from the Secretary of State, dated 30th March 1873; and despatch from the Government of India to the Secretary of State, dated 9th June 1873.

cordingly consulted. Three Railways—the Madras, the Carnatic, and the Great Southern of India—were favourable to the simultaneous introduction of the Act. The East Indian, Bombay, Baroda and Central India, and the Great Indian Peninsula Railways opposed the proposals. The Eastern Bengal Company also dissented, but as they were not connected with any other Railway their dissent was unimportant. The Oudh and Rohilkhand Railway objected on the ground that it was inexpedient for such a change to be imposed upon the people. In November 1873 a despatch was sent to the Secretary of State to the effect that the Railways were unwilling for the most part to introduce the new weights on their lines, that it was inexpedient to introduce their use on State Railways, and that therefore no steps would be taken to bring the Act into operation. One Member of Council (The Hon'ble Mr. Ellis) objected on the ground that no inconvenience would be caused by Government altering the seer by 7 per cent—the new seer of Act XXXI of 1871. In 1874 the Government of Bombay forwarded to the Government of India representations from the Bombay, Baroda and Central India Railway for the cost of altering their weighing machines to suit the system in anticipation of the introduction of Act XXXI of 1871. These representations were referred to the Secretary of State in June 1874, whose reply was to the effect that (1) no decision had been passed by the Secretary of State adversely to the introduction of the metric system and (2) that the matter was still under consideration.

Despatch of November 1873.

Despatch of Secretary of State of July 1874.

No further action seems to have been taken regarding the introduction of the Act until February 1877 when the Bengal Chamber of Commerce requested the Government of India to enforce the Act at the earliest possible date, and the Chamber stated that the Lieutenant-Governor of Bengal had informed them that a corrected set of standards of weight was expected from England.

Action of Bengal Chamber in 1877.

20. At this time the difficulty experienced in obtaining correct agricultural, railway and trade statistics owing to the diversity of weights throughout India reopened the question of weights. In October 1875 the Government of India decided * that the Indian maund of 40 seers (of 80 tolas) should be the standard in use on Guaranteed and State Railways.

Orders of 1875.

In December 1877 it was decided that the half-yearly abstract of traffic should be prepared in tons and pounds and that the standard maund should be equal to 82⅔ lbs.

21. On the 15th February 1889 an Act was passed, known as the Measures of Length Act (II of 1889)†, and by Act XIII of 1898, section 4, it was extended to Upper Burma, except the Shan States. By sections 2 and 4 of this Act the primary unit is the imperial standard yard, which is subdivided into feet and inches, and these are the only legal standard measures of length. It will be noted that nothing has been done as regards square or cubic measures.

Measures of Length Act (Act II of 1889).

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* Resolution No. 21-R., dated 9th October 1875.

† Gazette of India, 1889, Part I, page 305.

Act II of 1889 :—(1) This Act may be called the Measures of Length Act, 1889.

(2) It extends to the whole of British India ; and

(3) It shall come into force on such day as the Governor General in Council may appoint in this behalf.

The imperial standard yard for the United Kingdom shall be the legal standard measure of length in British India, and be called the standard yard.

A copy, approved by the Governor General in Council, of the imperial standard for determining the length of the imperial standard yard for the United Kingdom shall be kept in such place within the limits of the Town of Calcutta as the Governor General in Council may prescribe, and shall be the standard for determining the length of the standard yard.

One-third part of the standard yard shall be called a standard foot, and one thirty-sixth part of such a yard shall be called a standard inch.

Attempts at assimilation in 1889. New inquiry ordered.

22. In 1889 the Government of Bombay addressed the Government of India recommending that uniform weights and measures of capacity should be adopted in the various districts of that Presidency. They pointed out that in 1887 Mr. W. P. Symonds, then acting as Director of Land Records and Agriculture, had made a similar recommendation, and that all Taluq and Mahal offices should be supplied with measures from the Mint, and that District Magistrates should be directed to issue a proclamation calling attention to the fact that all persons using, making or selling measures that did not correspond in capacity and aperture with the standard measures, would be liable to prosecution under Chapter XIII of the Penal Code. The weights and measures recommended for universal adoption were :—

Weights.

180 grains (English) make	...	...	...	...	1 tola.
80 tolas ... „	...	...	...	...	1 seer.
40 seers ... „	...	...	...	...	1 khandi.

Liquid Measure.

Measure containing 1 seer of water is 1 liquid seer.

Its capacity is 57·7392 cubic inches.

Dry Measure.

Measure containing 1 seer of grain is 1 dry seer.

4 seers make...	...	...	...	...	1 paili.
10 pailis „ ...	...	...	...	...	1 dry maund.
20 maunds „ ...	...	...	...	...	1 dry khandi.

Mr. Symonds' proposals were circulated throughout the Presidency and forwarded to the Government of India, with the request that the subject be dealt with on the same principle already followed in respect of measures of length. The Government of India thereupon consulted other Local Governments,* the specific points on which information was asked for being :—

(1) The nature of the different measures of capacity in use and the extent to which they are respectively used.

(2) The best system of weights and measures capable of being generally adopted.

(3) The steps, if any, besides those indicated in Section 8 of Act XXXI of 1871, which may be taken to promote its general application.

In this connection it was suggested that the system which promised the best solution of the question was that of the tola of 180 grains, the seer of 80 tolas and the maund of 40 seers which had already been adopted on the railways in India.

(4) The opinion of the principal trading associations and communities (both European and Indian).

At the same time a proposal by Colonel Ardagh to assimilate Indian and British weights by reducing the weight of the rupee to 175 grains was circulated.

Replies.

23. The replies from all Local Governments and Administrations indicate a very great diversity of weights and measures in actual use, especially in regard to measures of capacity which varied not infrequently from district to district but even from village to village. It was deemed impossible to select any measure which could be made to apply generally.

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* Letter No. 3-127-35, dated 23rd January 1890.

The weights of the seers most generally in use in the several provinces are :—

Madras	24 tolas.
Bombay	80 „
Bengal	80 „
North-Western Provinces and Oudh...	80 „
Punjab (in mercantile places)	80 „
Central Provinces	80 „
Assam	80 „
Ajmer	80 „
Coorg	27½ „
Berar	80 „

The chief weight of Burma was the viss of 3·65 lbs. avoirdupois. A careful perusal of the evidence collected at this period in reply to the Government's letter reveals the fact that with the exception of Burma, uniformity of weights in India was possible only when based on the unit of the tola, and that perhaps the best solution was to adopt as the one system of weights the tola of 180 grains equal to one rupee, the seer of 80 such, and the maund of 40 seers. Bombay, Bengal, the Punjab, the North-Western Provinces and Oudh, Assam, the Central Provinces, Coorg and Berar supported the introduction of the weights suggested by the Government of India. Madras, however, proposed to introduce generally a maund of 40 seers of 24 tolas. The scale suggested by the Government of India for general adoption did not seem suitable to Burma.

To sum up, as regards weights, if a system were to be laid down, there can be, from an examination of the papers on the opinions collected at this time, no doubt that except in Burma, Coorg, and Madras, the railway system was considered the best—a system which entails not only the use of the tola, but also of the seer of 80 tolas and the maund of 40 seers. It was clear also that small tentative measures on the part of Local Governments led to very little result.

Measures of capacity.

24. Measures of capacity cannot be classified under any one common standard on an examination of the papers regarding the inquiry of 1889-1893. Madras proposed to reduce all grain measures to two types of seers of 80 and 120 tolas, or to such as can be referred to these two as multiples or submultiples and to leave liquid measures alone. Bombay recommended for a liquid measure, a measure containing 1 seer of water, which is equivalent to 57·0392 cubic inches ; and for dry measure the following :—

Measure containing 1 seer of grain is 1 dry seer.

4 seers make 1 paili.

10 pailis „ 1 dry maund.

20 maunds „ 1 dry khandi.

Bengal, the North-Western Provinces and Oudh, the Punjab, Berar and Ajmer made no proposals, and Burma preferred to retain its own scale for the time being. Assam did not feel sufficiently advanced to require a compulsory scale, and Coorg advocated the English quart as the legal measure. Bombay and the Central Provinces advocated uniformity with compulsion. Assam did not anticipate any difficulty in securing uniformity provided everything was based on the rupee on the general lines of the custom then in vogue. Coorg favoured uniformity, but did not say whether it should be compulsory or not. Bengal, the North-Western Provinces and Oudh, with Burma, were against any change.

It is interesting to note that commercial opinion was not at this time unanimous or very decided. Commercial opinion in Bengal, Bombay, Madras, the Central Provinces, Assam and Coorg was in favour of uniformity of weights and measures for India as a whole. In Berar opinion on this point was indifferent, and the Punjab gave no commercial testimony.

Replies regarding Colonel Ardagh's scheme.

25. The replies received to Colonel Ardagh's scheme were adverse, the objection being based on the danger of the depreciated rupee.

In the discussion which followed receipt of these replies opinions were divided. The possibility of altering the weight of the rupee was negatived. Sir David Barbour (then Finance Member) believed that "the objections to altering the weight of the rupee are, for the present, even greater than before, especially to any change in the direction of diminishing the weight." It may be noted that the Member for Revenue and Agriculture was of opinion that a great deal could be and ought to be done towards the establishment of a uniform standard. No orders, however, were passed by the Governor General in Council.

Introduction of a uniform system of measures of capacity in the Central Provinces, 1892.

26. In September 1892 the Chief Commissioner of the Central Provinces proposed the introduction of a uniform system of measures, especially in connection with the trade in grain to be carried out as far as possible without material dislocation of trade arrangements. The proposed uniform measures were the *kangan* or seer of 80 tolas and the *katha* or 5 seers, of 400 tolas. It was pointed out that the introduction of this system would be in general accordance with the seer of 80 tolas and the maund of 40 seers favoured by the Government of India. In order to hasten its general adoption it was deemed desirable to prohibit the use of other measures of capacity after a certain period of time fixed at two years, and to effect this by means of legislation. Sir A. Macdonnel, however, proposed to postpone legislation until the system proposed had been introduced for some time. The Government of India, in reply, had "no objection to the introduction of a uniform system of measures of capacity, so long as no compulsory procedure was put in force."

CHAPTER III.—ACTION TAKEN TOWARDS SECURING UNIFORMITY SINCE 1900.

Proposed adoption of the metric system of weights and measures and the decimal system of coinage in India.

In January 1901 the Secretary of State for India forwarded to the Government of India copies of a paper presented to Parliament regarding the adoption of the metric system of weights and measures in European countries. He pointed out that in nearly all European countries, except Turkey, the metric system had been introduced without much opposition from or disturbance to the people, and that it had proved a great benefit to the countries which adopted it. No country which had adopted it was willing to go back to the old system. The Secretary of State, in pointing out that most Governments intending to adopt the metric system did so in their own establishments for a few years before the general adoption was enacted by law, suggested that the first step in India would be to accustom the public to the new weights by adopting them on railways, at customs houses, and in post offices. Little need be said here (these papers are again referred to in Chapter VI, paragraph 4) on the contents of the reports on the metric system beyond referring to the reports of its working in Egypt. Viscount Cromer pointed out that in 1873 a decree was issued by the Khedive Ismail introducing the metric system throughout Egypt, but that it was not enforced. In 1886 a Commission was appointed to inquire into the relative values of weights and measures under the metric system, and those of the units of weights and measures then in use in that country. As a result the adoption of the metric system was decreed on the 1st January 1892, but the decree was made binding only on Government Departments, in their transactions with the public, while agricultural measures and the tonnage of ships were left unaffected. From that time the metric system came into general use in all Government Departments, and has been introduced without difficulty in public works, post offices and railways, has been used for levying customs duties and octroi and been taught in Government schools. Most of the wholesale and retail trade in the country, however, was still found to be carried on by means of the old Egyptian weights and measures.

2. To this despatch the Government of India replied that:—

"While recognizing the advantages of the decimal system as shown by the experience of other countries, we are of opinion that the difficulties in the way of its introduction into India would be very great. For the currency there might perhaps be no great difficulty in introducing the decimal subdivision of the rupee as in force in Ceylon; but in the case of weights and linear, superficial and cubic measures, the obstacles would be very serious. On the whole, we are averse from taking any action in the matter at the present time, and we prefer to wait before proposing a change in the Indian practice, until the United Kingdom has decided to adopt the decimal system."

Standardization of weights and measures in the Bombay Presidency and proposed amendment of Act XXXI of 1871 (1902).

3. The Government of Bombay in July 1902 asked the Government of India that Local Governments might be empowered, subject to the sanction of the Government of India, to prescribe standards for limited areas. The Government of Bombay was of opinion that it was incumbent on Government to take steps to remove the confusion, at present prevailing, which touched the interests of all classes of consumers. The specified amendment of Act XXXI of 1871 to which the greatest importance was attached was the omission of the proviso to section 4, which required that all weights and measures of capacity should be integral multiples or submultiples of the kilogramme and the litre. "His Excellency," said the Secretary to the Government of Bombay in his letter, "does not desire to discuss the question whether it will ever be possible to introduce the metric system into India. He would merely point to the fact that no notifications have yet been issued under any section of the Act as showing that it has not hitherto been possible to do anything in this direction. No standard can at present be introduced into India that is not based on the tola of 180 grains, which is now in universal use through the circulation of Government rupees. His Excellency the Governor

in Council proposes, in the event of the suggested amendment being made, to institute careful local inquiries into the standards at present in use before submitting for sanction his proposals as to the precise standards that should be adopted in particular districts or groups of districts." The Government of India in May 1903 replied that "the Governor General in Council has considered very carefully the proposed amendment of the Weights and Measures Act, and is advised that it is not necessary for the purpose which the Government of Bombay have in view; a purpose, * * * with which he is in the fullest sympathy. It is true that any weights and measures prescribed under the Act must be multiples or submultiples of the primary standard of weight prescribed by section 2. But it does not follow that any weights and measures prescribed otherwise than under the Act must necessarily conform with that standard, and in fact the Government standard maund, which is authoritatively prescribed for use on all Guaranteed and State Railways, and in the Government returns, weighs 82⅔ lbs and the Excise Act (No. XII of 1896), section 3(*m*), makes use of a seer of 80 tolas, while the Municipal Acts of Burma and the Central Provinces empower Municipal Committees to prescribe the standard weights and measures to be used within the Municipality. In the case of the Burma Act it is true that the power is expressly conferred 'notwithstanding the provisions of Act XXXI of 1871.' But it does not appear that the existence on the Statute Book of the proviso to section 4 of the Indian Weights and Measures of Capacity Act forms any real obstacle to the introduction of any measure of the nature contemplated which the Bombay Government may eventually decide to be desirable. As yet no notification has been issued under any section of the Act, which therefore is at present and will in all probability remain a dead letter; and as in these circumstances its amendment would be inadvisable and might be embarrassing, the Government of India would prefer that the Government of Bombay should consider the question independently of the provisions of that Act. If it should eventually be proposed to legislate in contravention of the provisions of the Act, this can always be done with the sanction of the Governor General, under section 5 of the Indian Councils Act, 1892 (55 and 56 Vict., cap. xiv)."

Views of the Government of India on these proposals

4. We have seen (Chapter II, paragraph 26) that at this time the Government of India were not prepared to consider compulsion with a view to securing a uniform system of weights and measures. The provisions of the Municipal Acts, referred to in paragraph 3, gave municipal bodies power to prescribe weights and measures for the use of the people whom they represented, and this was "as far as the Governor General in Council was prepared to go." It was suggested that the Government of Bombay might consider the desirability of making provision for this in their Municipal Acts, but was not thought desirable to confer a similar power upon the District Boards, since "the residents of rural areas were as a rule less intelligent and more suspicious than the people of the towns." The letter from the Government of India concluded, "it would probably be possible in all cases to adopt the tola as the basis of the standard, and even this would be one step towards that uniformity which is so eminently desirable. The Government of India are, therefore, of opinion that in all action of the nature under consideration the standard tola of 180 grains should form the basis of the proposals."

Views of the Government of the United Provinces in 1903.

5. A copy of this letter was sent to all Local Governments. The United Provnices accepted the opinion of their Board of Revenue, with regard to this letter, that, however desirable uniformity may be in the matter of weights and measures, no steps should be taken until popular support is assured. The Director of Land Records and Agriculture was of opinion* that for assimilation of weights standardization machinery must be created in order to provide that unauthorized weights are not used and without such machinery standardization would merely have the effect of increasing the existing diversity, as the people would go on using their own weights and there would be, in addition to those already used, the standard weights. The Director also pointed out that if the work of inspection was left to the existing staff, either the police, the patwaris

* No. 1635-183, dated the 25th May 1903.

or the municipal and town officials, there would be danger of shop-keepers and others being harried by the subordinate staff, but that there was no doubt that the railway system was working steadily in the direction of unification, and that the time for general prescription was coming in these Provinces.

Proposed introduction of a uniform system of weights and measures in the Madras Presidency.

6. The Chamber of Commerce of Madras in December 1905 addressed the Government of India on the question of the feasibilty of reopening the question of prescribing a uniform system of weights and measures throughout India. The Chamber enclosed a copy of a letter which had been addressed to the Government of Madras by the United Planters' Association of Southern India The Chamber recommended that another attempt should be made to establish a more or less uniform system, and thus tend to remove the disabilities of which the planters and the mercantile community complained. The Government of India in January 1906 informed the Chamber that the question of prescribing a uniform system of weights and measures throughout India would not be reopened for the present, and that their policy in this matter was explained to the Government of Bombay in their letter of 25th May 1903 quoted above.

The standardization of the viss in Burma (1907)

7. In August 1907 a proposal was submitted by the Government of Burma for the standardization of the viss, which is the weight in universal use in Burma. The proposal was to alter the equivalent of 140 tolas instead of $141\frac{7}{8}$ tolas. The viss of 3·65 lbs. had been usual in commercial practice, and was incorporated in official manuals as the standard of weight for taxation and kindred purposes. This prescription had been recognized in the by-laws of six municipalities, including Rangoon, Moulmein and Bassein, prescribing weights and measures under section 142(*o*) of the Burma Municipal Act, 1898. No official declaration, however, of the standardization was issued. The Lieutenant-Governor in suggesting a viss of 3·60 lbs. did not think it desirable to enforce the standard throughout the country, but merely to notify that in all Government transactions the weight of the viss should be taken as 3·60 lbs. or 140 tolas. Municipal Committees would alter the viss required by their by-laws to 3·60 lbs. and the Local Government would exercise its power to veto by-laws which do not conform to this invitation. In September 1907 the Government of India, while recognizing that the suggestion was made with a view to obtaining a more satisfactory multiple of the tola weight than the present viss, noted the hostile view expressed by the Rangoon Chamber of Commerce and the Rangoon Port Commissioners and refused sanction to the proposal doubting whether the change would be generally accepted and carried into effect without difficulty and whether the advantage to be gained was commensurate with the inconvenience likely to arise from the disturbance of the existing standard of weight.

In September 1908 the Local Government again addressed the Government of India urging a reconsideration of the above order. The Lieutenant-Governor believed that the proposal to standardize the viss at 3·60 lbs. or 140 tolas would in the long run be of great convenience to trade in the province. "The proposal has the approval, so far as His Honour is aware, of the Rangoon Municipal Committee, the Port Commissioners of Rangoon, the Burma Chamber of Commerce, and the Rangoon Trades Association, representing every section of the commercial community, and of such firms as Messrs. Finlay Fleming and Company, the Agents of the Burma Oil Company. The Agent of the Burma Railways has expressed his willingness to adopt the new standard on receipt of twelve months' notice. The feeling of the general public on the subject may be gauged by the enclosed extract from the 'Rangoon Times' of the 9th May 1908. These expressions of opinion show clearly that though the proposed change may produce some inconvenience at first, the inconvenience is in no way commensurate with the advantages which will eventually result from its adoption and that those advantages will constitute more than a merely nominal gain." Accordingly in January 1909 the Government of India sanctioned the proposal, pointing out that it was desirable that the alteration should not be introduced suddenly, and that for this purpose 12 months' notice of the intention of Government should be given.

8. In 1909, the Upper India Chamber of Commerce, Cawnpore, proposed that the use of marked weights and measures of distinctive design should be made compulsory in buying and selling precious stones and metals and articles made thereof, in order to check fraudulent practices prevailing among native goldsmiths and silversmiths. "The large extent," said the Chamber, "to which investment of savings in the form of jewellery and ornaments is resorted to by the people of this country, and particularly the poorer and more ignorant classes, renders it peculiarly necessary that the public should be given statutory protection, if this can be accomplished without imposing any vexatious restrictions upon trade". The Government of India were unable to agree to the proposal observing that a full statement of the cases of fraud had not been furnished, and that the proposal had been opposed by some of the other Chambers of Commerce which had been consulted by the Upper India Chamber. The policy stated in the letter of the 25th May 1903 was again referred to as applying with equal force to the proposal suggested by the latter Chamber. In November 1911, the Upper India Chamber of Commerce suggested that steps should be taken for the amelioration of the present unsatisfactory condition of the Indian weights and measures. The Chamber believed that in probably no other part of the Empire was trade and commerce so hampered by lack of uniformity in weights and measures, and while no longer advocating the adoption of the decimal system in this country (which it had done for the preceding 20 years) it asked that the Government of India should consider the feasibility of requiring all Railway Administrations in India to adopt, in substitution of the "cumbersome" maund, a unit of 100 lbs. avoirdupois, with convenient multiples and subdivisions based on the decimal system. On the 8th November 1911, the following reply was sent:—"The policy of the Government of India in regard to the standardization of weights and measures is explained in their letter to the Government of Bombay (No. 1653-133-7, dated the 25th May 1903). It will be observed from paragraph 5 of this letter that they were of opinion that, whenever it was possible to do so, the tola of 180 grains should be adopted as the primary standard of Indian weights and measures. They are still of opinion that this standard should be adhered to, and they are not, therefore, prepared to consider favourably a departure from this primary standard, such as would be involved in the suggestion now put forward by your Chamber. * * * The question of adopting a decimal system based on the standard tola as the unit has also been already considered by the Government of India, but the idea was abandoned on account of the serious difficulties it would raise."

The proposal of the Upper India Chamber of Commerce regarding compulsory marked weights and measures in buying and selling precious stones and metals and articles made thereof (1909).

Proposals of the Upper India Chamber of Commerce (1911).

9. Events immediately previous to the appointment of the present Committee have already been referred to in Chapter I of this Report. It is, however, necessary to refer at greater length to the inquiry undertaken by the Bombay Government in pursuance of their Resolution No. 1756, dated 23rd March 1911. After pointing out the disadvantages of diversity in weights and measures not only in different districts of the Presidency, but in different towns and even in different parts of the same town, and in reciting the various steps taken with regard to the standardization of weights and measures, the Government of Bombay showed that by Act IV of 1904 Municipalities were given the power to make by-laws for defining standard weights and measures to be used within their limits, though it was considered premature to empower Municipalities to prescribe the weights and measures which alone it would be lawful to use within their districts, or to permit Local Boards to maintain standards of the local weights and measures conformity with which would be compulsory. The question having been pressed upon the Government from time to time during recent years it was decided to appoint a Committee to reopen the question. This Committee was presided over by the Hon'ble Mr. J. P, Orr, I.C.S., and consisted in all of 10 members. The terms of reference have already been referred to in paragraph 2 of Chapter I. The final report was published in May 1913 together with a draft Bill for fixing

The appointment of a Committee to make proposals for the standardization of weights and measures in Bombay (1911).

standard weights and measures for the Bombay Presidency, and Resolution No. 3899 expressing concurrence in the recommendations of the Committee. Further inquiry was ordered to ascertain whether any modifications of the Bill or of the schedule appended to it are required by local conditions.

10. The final report may be summed up briefly as follows :—The Committee had no hesitation in saying that over the greater part of the Bombay Presidency, the standardization of weights and measures would be heartily welcomed by the people.

The Final Report, May 1913.

(2) Standard weights and measures based on the rules in Eastern Khandesh should be prescribed by Government for the whole Presidency. From Mr. Simcox's report it will be seen that in the course of three years the people of East Khandesh were gradually induced to adopt throughout the district uniform weights and measures of capacity.

(3) Mr. Orr's Committee found that his action was so highly appreciated by the people of East Khandesh that Mr. Simcox had no difficulty in enforcing the use of his standard weights and measures to the exclusion of all others, by his own personal influence without the aid of legislation.

(4) The introduction of weights and measures should not be left to local option. It was pointed out that if it were open to particular taluqs to stand out against uniformity, or if new weights and measures were adopted in neighbouring areas at different times there would certainly be the disturbing element of uncertainty and confusion. Traders in several places were prepared to consent to the standardization of weights and measures on the understanding that the same weights and measures were introduced simultaneously over the whole Presidency.

(5) The weights to be prescribed for the whole Presidency should be those of East Khandesh which were based upon the tola of 180 grains. The maund was the railway maund of 40 seers or $82\frac{2}{7}$ lbs.

(6) With regard to measures of capacity the Committee reported that in East Khandesh the standard dry measure is connected with the standard weights by the prescription that the 'seer' measure must be a vessel of such capacity as to exactly contain 2 seers weight of water and that it would probably be found that in most other districts there was originally some such connection between the local weights and measures, for a similar principle is prescribed in Bengal Regulation VII of 1833 for the relation of dry measures of capacity to weights. "We find that in 1848 the Bombay Government adopted the standards prescribed in that Regulation. We think that this connection should be maintained wherever any trace of it is found. One great advantage about it is the facility it affords for testing measures, whatever their shape, wherever custom is in favour of struck measures. Where the custom is to measure by heaped measures, there must be additional prescription as to the shape and area of the mouth of each standard measure. The East Khandesh standard measures are cylinders with diameters of 7 inches for the adholi (2 seers) measures, 5 inches for the seer, 4 inches for the $\frac{1}{2}$ seer and 3 inches for the $\frac{1}{4}$ seer. We approve the prescription of a diameter containing an integral number of inches as more easily ascertainable than such lengths as $4\frac{3}{8}$ inches, which appears * to be the diameter of the seer measure in use in Gadag Betgeri. There is, however, no need to insist on the universal adoption of cylinders throughout the Presidency. In some districts traders prefer measures of the hour-glass shape as more easy to handle, and, since the water test is as easily applicable to these as to cylinders, there is no objection to them, provided that, if they are prescribed as standard measures, the diameter of their mouths is fixed in accordance with the commonest custom, where heaped measure is the rule."

(7) The system of weights and measures in any area should be as nearly as possible similar to the best of the prevailing systems in that area. Undue diversity of standardization will be sufficiently guarded against if Government include in their schedule of prescribed weights and measures not only those in

* Resolution (General Department) No. 2511, of 26th April 1911.

use in East Khandesh, but also those which bear an easily ascertainable relation to the East Khandesh standards. In Gujarat, the seer is half the Government seer, *i.e.*, 40 tolas, and this 40-tola seer is that prescribed by the Baroda Government.

(8) Although Mr. Simcox's system has been introduced without legislation the Committee felt that it was *want of legislation* for the maintenance of those standards already prescribed that led in the course of time to the gradual divergence therefrom in actual practice. Government should, therefore, confirm by legislation what has been done so far by executive action only. Government accordingly should undertake legislation to secure for themselves the power to prescribe the weights and measures which alone should, after 6 months' public notice, be used in specified areas in retail and wholesale trade in all commodities, not specially exempted by Government. After that date any Government, Local Board or Municipal Officer should be empowered to impound and send to the nearest Magistrate or Police Sub-Inspector for destruction any weight or measure other than those specified. The new Act should also definitely prescribe a penalty for use of any but the prescribed weights and measures in order to cover cases to which Chapter XIII, Indian Penal Code, does not exactly apply and in which prosecution may be necessary in addition to destruction of false weights and measures.

(9) The duty of providing for inspection and stamping of weights and measures or of supplying standards in the several market towns, and of giving facilities to traders for the purchase of new weights and measures during the six months' notice period should be left to Local Boards and Municipalities. Power to make rules and by-laws in respect of these matters, and as regards the shape, size and material of measuring vessels and weights, may perhaps be given to them, provided that draft of such rules and by-laws shall have been brought to the notice of traders, etc., at least 3 months with a view to their bringing any objection to such weights or measures to the notice of the sanctioning authority before sanction is given.

Attempts at assimilation of weights and measures in the Central Provinces (1905-19.8).

11. It may be interesting to note that from 1905 to 1907 the question of the standardization of measures was again under the consideration of the Chief Commissioner of the Central Provinces. In October, 1905, a letter was addressed to all Commissioners in which a scheme was sketched for standardizing local measures asking for reports on the following points :—

(1) Whether the attempt to prescribe the use of the *katha*, and *kangan paili* (see Chapter II, paragraph 26) has succeeded or failed to such an extent as to justify a change of policy in the direction of standardizing the measures in use in each local area or district.

(2) If a change on the lines suggested is desirable a list of the different measures in use in each local area of their Divisions should be drawn up specifying the approximate weights of the staple grain which they are supposed to contain and their corresponding cubic capacity in ounces or tolas of water.

(3) Whether it would be advisable to legislate for the purpose of giving District Councils the same powers as are already possessed by Municipal Committees or at least the more limited power of standardization such as is indicated in the proposed scheme.

After an elaborate inquiry it was proposed that uniform weights and measures should be made and distributed locally. The orders, however, of the Chief Commissioner (Sir Benjamin Robertson) were that a decision should await the result of the inquiry undertaken by the Government of India.

Action taken in Bombay.

12. It may be convenient here to summarize briefly the legislation undertaken by Municipalities at various times. We have already referred to Regulation XII of 1827 in the case of Bombay. By section 20 it is laid down that " the

District Magistrate shall keep standards of such weights and measures as are used in retail dealings throughout the district under his charge and they shall be open to inspection by anyone who may desire to examine them." This section applies throughout the whole of the Bombay Presidency including Sind except scheduled districts. In section 418 (1) of Act III of 1888 it is prescribed that "the Commissioner (the Municipal Commissioner of the City of Bombay) shall from time to time provide such local standards of weights and measures as he deems requisite for the purpose of verification of weights and measures in use in the city, and shall make such arrangement as he shall think fit for the safe keeping of the said standards." In Act IV of 1901, as we have seen, Municipalities were given the power to define and to prescribe the standard weights and measures used within their limits. Ahmedabad, however, appears to be almost the only Municipality (besides Bombay) that has any definite by-laws on this subject. (See Chapter IV, Bo., paragraph 26).

Action taken in Bengal.

13. In Bengal, according to Act IV of 1886, section 55, "the Commissioner of Police shall keep in his office standard weights and measures; and weights and measures shall be held to be false when they do not agree with such standards". In 1905, Mr. L. P. Shirres, Secretary to the Government of Bengal, addressed* the Government of India proposing certain draft amendments in the Bengal Municipal Act, 1884, regulating the standardization of weights and measures in Municipalities. (The origin of this was a copy of the letter forwarded to the Government of Bombay already referred to.) The opinions of local officers in Bengal with regard to the action to be taken were that the mere standardization of the existing weights and measures, where these differed from the Government standards, would be a retrograde step tending to stereotype the variations which at present exist and which would render the attainment of uniformity in the future impossible. It was decided, however, to amend the Municipal Act so as to give Municipalities power (1) to prescribe the use of Government standard weights, *i.e.*, the maund of 40 seers each of 80 tolas of 180 grains, to enforce these standards and to prohibit the use of other weights within the Municipality; and (2) to prescribe 18 inches as the length of a háth or cubit for measuring commodities other than land.

A considerable body of opinion was in favour of another proposal, namely, that Government should be empowered by legislation to introduce a fixed standard of weights into the Municipalities of the province; the standard to be introduced being the Government standards of 180 grains to the tola, 80 tolas to the seer, and 40 seers to the maund. The Lieutenant-Governor believed that the rapid growth of railway communication in Bengal made it a matter of urgency that at least a first step should be taken in the path leading to uniformity. The Government of Bengal, while sympathizing with the proposal prescribing standard weights and measures for municipalities, merely asked for permission to amend the Municipal Act as follows:—

After Section 253 of the Bengal Municipal Act, 1884, to insert the following clauses:—

253A. The Commissioners at a meeting expressly convened for the purpose and of which due notice has been given may, by an order published in the manner prescribed in section 354, direct the use within the Municipality, on and from a date to be specified in the order not less than six weeks from the date of such order,

(*a*) of Government standard weights, that is to say, of a seer consisting of 80 tolas and of a tola consisting of 180 grains; or

(*c*) of both the weights and the measure of length mentioned in clauses (*a*) and (*b*), respectively,

and may at the same time by such order prohibit the use within the Municipality of weights or of a measure of length other than those mentioned in the order.

* Letter No. 2887-M., dated 16th December 1905.

253B. Where an order has been published under the preceding section the Commissioners may provide standards of the weights and measures therein mentioned for the purpose of verification of weights and measures of length in use in the Municipality, and may make such arrangements as they may think fit for the safe keeping of the said standards.

The Commissioners may also provide from time to time proper means for verifying weights and measures.

The Government of India approved generally of these clauses but considered that the last part of clause 253A was "framed in such indefinite terms that it might be thought to give power to prohibit the use not only of maunds, seers, tolas and cubits which do not conform to standard, but also of any measures of weight or length other than the particular measure specified in the first part of the clause." They requested that this should be corrected. On the whole, however, nothing practical has so far been effected as regards the standardization of weights and measures in Bengal.

Action taken in Madras.

14. In Madras city, there are similar provisions to those in section 55 of the Calcutta Police Act, the false weights and measures being destroyed. [See Act I of 1884, Madras City Municipal Act, section 354 (*b*)]; Act III of 1888, Madras City Police Act, section 32). Elsewhere in the Municipalities of the Presidency with the exception of Coonoor there are no by-laws or other regulations regarding weights and measures. In Coonoor, a by-law to the effect that "weights and measures bearing the Government stamp alone shall be used in all markets" is still in force, though the similar by-laws which were in force in certain other Municipalities were repealed in 1906. It is, however, under consideration to empower Municipalities to undertake the regulation of weights and measures.

The regulation of weights and measures is, however, undertaken to a very large extent in Madras by the Board of Revenue under executive order. In 1871, the question of testing and stamping measures was first taken up. At first, there was very great confusion and the orders on the subject were somewhat obscure and much misunderstood. Apparently, very diverse measures were stamped in different districts, and even in different parts of the same district, and the method of testing was not clearly defined. This latter appears to have been sometimes carried out by means of rice, at others by water and at others again by horse-gram, and uniformity was not secured for many years in spite of repeated orders of the Board. At present, certain weights and measures of length and of dry and liquid capacity are stamped in almost every district in the Presidency. These vary to some extent from district to district, the object having been to have in each district a series of stamped weights and measures bearing definite proportions to well-known standards and yet not differing so much from those in previous use as to make their introduction the cause of any violent change from the weights and measures in prior use. The variations are, however, not very great, the most usual weights stamped are the viss, seer and palam of 120, 24 and 3 tolas, respectively, with occasionally a seer of 21 tolas (Bellary), a *rathal* of 40 tolas (South Canara), and the British weights (Godavari). For measures of length the British yard is stamped and for dry measures the most usual unit is the Madras measure supposed to hold 120 tolas of second-sort rice when filled 'struck', but in some districts it is the seer measure holding 80 tolas. For liquid capacity (usually only for Excise purposes) the gallon is the usual unit, but in South Canara there are certain local measures based on a *kutti* holding 108 tolas. In addition to the above units various multiples and sub-multiples are also stamped. The actual work is done by various stamping parties under the control of the Collector. In Ganjam and Malabar no action of this sort is taken. There is no legal sanction requiring the use of stamped weights or measures, but efforts are made to induce people to get their weights and measures stamped, and if it is a question of an under-weight or under-sized measure the case is viewed less favourably if such weight or measure

is unstamped; still the proportion of weights and measures that are stamped is perhaps not very large save in some of the towns. Further details will be found in the digest of evidence (Chapter IV, paras. 9 to 15).

Action taken in the Central Provinces.

15. In the Central Provinces, Act XVIII of 1889, section 84, lays down that "a (Municipal) Committee may from time to time at a special meeting make rule after previous publication consistent with this Act for prescribing the standard weights and measures to be used within the Municipality." Accordingly in March 1896 the Chief Commissioner of the Central Provinces sanctioned the substitution by the Municipal Committees of Ramtek, Umrer, Khapa, Sanoner and Mowar, in the Nagpur district, of the standard measures of *kangans* and *kathas*, for those then in use in these Municipalities, and the adoption of rules whereby no measures should be used by any measurer licensed by the Municipal Committee or by any person in any bazaar or shop, or public place within the Municipal limits, except pailis, ½ pailis, ¼ pailis, ⅛ pailis, kurohs or kathas issued by or under the orders of the Municipal Committee. Besides, the President, Vice-President, and Secretary, any Member of the Municipal Committee and such official or officials of the Committee as were authorized in this behalf can inspect or examine the measures used by licensed measurers or by traders in the public bazaars and other public places within the municipal limits. Every licensed measurer and trader was bound to produce the measures used before such officers, and all measures differing in capacity from the standard measures were to be confiscated. Besides confiscation of the false measures, any breach of the above rules was punishable, on conviction before a Magistrate, with a fine extending to Rs. 50.

(i) English standard weight; or			
(ii) Maund	...	...	40 seers.
Half maund	...	...	20 „
Quarter maund	...	...	10 „
Panseri	...	...	5 „
Half panseri	...	...	2½ „
One-fourth panseri	...	...	1¼ „
One-eighth panseri	...	...	¼ „
Chatak	...	...	5 tolas.
Half chatak	...	..	2½ „

In 1903, by-laws were made by the Municipal Committee of Jubbulpore for regulating the use of standard weights. The weights noted in the margin were prescribed.

A tola was equal to 180 grains or the full weight of a rupee. As regards inspection and punishment of users of false weights the notification was similar to that of the Municipalities of Nagpur referred to above.

Maund	...	...	40 seers.
Half maund	...	...	20 „
Quarter maund	...	...	10 „
Seer	...	...	16 chataks.
Half seer	...	...	8 „
Quarter seer	...	...	4 „
One-eighth seer	...	...	2 „
Chatak	...	...	5 tolas.
Half chatak	...	...	2½ „

In 1908, by-laws made by the Municipal Committee of Chanda were confirmed. Under these the standard weights were as in the margin. A tola should be the equivalent of 180 grains or the full weight of a rupee. The rules regarding the inspection and punishment of users of improper weights are the same as those in force in the Nagpur Municipalities.

In 1911, the Chief Commissioner confirmed the by-laws made by the Municipal Committee of Umrer regarding the paili Measure. By these the paili was to contain 100 tolas (of what is not stated). The Municipal officers were empowered to inspect the measures used by licensed measurers, brokers or traders and the use of false measures was made liable to punishment by a fine extending to Rs. 50.

Burma.

16. In Burma, also action has been taken on more or less similar lines under section 142 of the Burma Municipal Act of 1898 and the weights and measures notified for use in a few typical Municipalities of Burma are given as examples:—

(1) In 1909, by-laws were sanctioned prescribing the pound as the original standard of weight in the Akyab Municipality. The viss, whether used for weighing liquids or solids was to be a weight equal to 3·60 standard pounds or 140 tolas, and the standard of length the yard. The viss and the pound weight were to be tested in the month of January in every year by

persons appointed by the Municipal Committee of Akyab, who were to certify that they accurately corresponded with the weights marked thereon, and they were then to be considered as standard weights. An officer was to be appointed by the Municipal Committee at Akyab from time to time in order to test and verify weights brought to him. The pound weight and the standard measure of one yard were to be certified by the Board of Trade in England.

(2) In Yamethin, the standard weight of the viss was prescribed to be 3·60 lbs. or 140 tolas and the use of weights conforming to this standard was to be compulsory in Government transactions under by-laws framed by the Municipal Committee.

(3) In Ngathainggyaung-Daunggyi, the standard of weight is the viss equal to 3·60 lbs. or 140 standard tolas. In the office of the Municipal Committee were to be kept a standard viss and a standard tola weight certified by Government, made of brass and stamped with the weight thereof.

(4) In Sandoway, the standards prescribed were similar to those prescribed for use in Akyab.

(5) In Myingyan, the standard of weight was to be the viss equal to the above mentioned standard. The Secretary of the Municipal Committee was empowered to test and verify the weights brought to him by any person, and he was entitled to issue a certificate of their reliability, on receipt of a fee of one anna in every case. The standard of length was to be the yard and of capacity the quart. These measures of length aud capacity were tested whenever necessary by a comparison with the Mandalay Municipality standard yard and quart measures These rules were to be adopted from the 1st April 1910.

(6) In 1909, it was notified by the Moulmein Municipal Committee under section 201, sub-section (1) of the Burma Municipal Act, 1898, that "no person shall use any weight or measure of a denomination ordinarily applicable to any of the weights and measures referred to in these by laws or any subdivision or multiple of any such weight or measure in the same system of weights or of measures (as the case may be), unless it is in conformity with the standard prescribed by these by-laws in respect of such weight or measure". In 1910, a revised by-law was framed under which the viss was to be made 3·60 of the standard pound avoirdupois.

(7) The standard of weight for use within the Pegu Municipality was to be the pound, and the weight of the viss equal to 3·60 standard pounds or 140 tolas. A set of weights was to be kept in the Pegu Municipality for verification. The standard of length was to be the yard and the standard measure of capacity the quart, both of which were to be certified by the Board of Trade in England. It was ordered to keep in the Office of the Pegu Municipality a set of measures equal to 4, 3, 2, 1, and $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$ of such quart (each of which was to be stamped with the capacity thereof).

(8) With effect from 1st April 1910 the standard weight of the viss was to be 3·60 lbs. or 140 tolas in the following Municipalities also:—Mergui, Henzada, Yandoon Minbu, Allanmyo-Ywataung, Taungdwingyi, Salin, Pakokku, Thonze, Ma-ubin, Letpadan, Gyobingauk, Shwegyin, Kyaikto Tavoy Bassein and Paungde.

Very little done elsewhere.

17. Elsewhere very little has been done in this connection, and what has been done has been mostly by executive order. [See Chapter IV, U. (P., 14.)]

CHAPTER IV.—EXISTING STATE OF WEIGHTS AND MEASURES, BEING A DIGEST OF THE EVIDENCE RECEIVED ON THESE MATTERS.

UNITED PROVINCES.

Sources of information.

The weights and measures referred to in this Chapter were for the most part reported by Collectors of districts; in addition to the information so obtained which in some cases was very decidedly meagre, use has been made of information obtained from the various witnesses examined, and also from the District Gazetteers which, in this province, contain a very large amount of information on this subject.

Measures of weight.

2. *Measures of weight.*—For all ordinary commodities there is practically only one table which runs:— 5 tolas= 1 chatak; 16 chataks = 1 seer, and 40 seers = 1 maund. In a few places there is a kachha maund of 16 seers. For gold, drugs and valuable articles the table runs 8 khaskhas (poppy seeds) = 1 chawal (grain of rice); 8 chawals = 1 ratti, usually represented by a *ghunchi*, (the seed of the *Abrus Precatorius*); 8 rattis = 1 másha, and 12 máshas=1 tola. In a few places the ratti is divided into 20 bisas, and a tánk of 24 rattis is used.

The variations of the larger weights are usually based on the seer which is of a varying number of tolas (of 180 grains); it is very rare to find a seer based on a tola not of this value, Ghazipur reporting the only instance where a seer based on a tola of 216 grains is said to be used. Even where the seer is based on the weight of a number of coins other than the Government rupee its equivalent in such rupees is usually known. On the other hand, the tola for weighing gold and Indian drugs is a very variable thing. It is, however, usually expressed as so many rattis in excess of the weight of the rupee. As a rule, the excess is of from 1 to 6 rattis, though occasionally larger tolas (up to one of 1¼ rupee-weights or 216 grains) are found, and in a few instances gold tolas of less than a rupee's weight.

Distribution of various weights.

3. No regularity of local distribution can be traced as regards the gold tolas, and the distribution of weights by locality must depend solely on the larger weights. Based on these the provinces may be divided into six tracts:—

(1) Districts in which the 80-tola seer is used to the almost complete exclusion of any other weight:—Agra, Aligarh, Almora, Banda, Bulandshahr, Dehra Dun, Etah, Etawah, Jalaun, Jhansi, Meerut, Muttra and Muzaffarnagar. With the exception of Almora, which is isolated from the main area and in respect of measures other than those of weight falls rather into group (3) where it will be considered, this tract forms the western and northern part of the province.

(2) Districts in which the 80-tola seer is considerably used, but side by side with numerous local seers and in the case of the large commercial centre of Cawnpore a very large number of maunds for special commodities:—Allahabad, Benares, Cawnpore, Fatehpur, Hamirpur, Mirzapur, Sultanpur and Unao. This tract forms the south-west of the province.

(3) Districts in which the 80-tola seer is comparatively little used, save for official transactions, and in the larger towns to some extent, being replaced by some other seer dependent on the tola, usually larger than the 80-tola seer, and as a rule somewhere in the neighbourhood of 100 tolas:—Almora, Bareilly, Bijnor, Budaon, Garhwal, Kheri, Moradabad, Naini Tal, Pilibhit, Saharanpur and Shajahanpur, *i.e.*, Rohilkhand with some adjoining districts. Almora will for reasons given above under group (1), be placed in this group.

(4) A small group of districts intermediate between (2) and (3):—Farrukhabad, Hardoi and Mainpuri.

(5) Districts in which the 80-tola seer is little used save in official and railway transactions, though as a rule known as the 'Sirkari' or Government

weight, but in which the local seers are based on the weight of a varying number of gandas or sets of four of various local coins, and not on the tola of 180 grains though their equivalent in rupee weights is usually known :—Azamgarh, Bahraich, Ballia, Basti, Ghazipur, Gorakhpur and Jaunpur. This tract forms the extreme east of the province, and the weights thereof extend into the adjoining parts of Bihar.

(6) Districts in which the local weights were apparently based on a system similar to that of the weights of group (5) but in which the use of the 80-tola seer has spread considerably, and the local weights have almost entirely come to be deemed as based on a definite number of tolas, though often still called after the coin from which they originated :—Bara Banki, Fyzabad, Gonda, Lucknow, Partabgarh, Rai Bareli and Sitapur; thus including the greater part of Oudh.

It is of course very difficult to lay down precise boundaries between the various groups, certain districts being almost as fit for one as the other. Thus, Bahraich and Sultanpur might possibly almost go into group (6), and Benares probably would have gone there some 20 years ago, but the origin of the local seers seems now to have been forgotten.

Origin of various weights.

4. There is little necessity to go into further detail here as regards the weights in use in groups (1) to (4). Group (5) may, however, be dealt with in somewhat greater detail, as the diversity there is very much greater and the difficulty of effecting any change proportionately greater also. The typical district of this group is Gorakhpur, where matters are further complicated by a system of measures depending originally on a local seer of some particular kind of grain. The basis of the weights here is the ganda (set of four) of Gorakhpuri pice. These pice are shapeless lumps of copper made at Butwal in Nepal. A varying number (whole or fractional) of gandas was taken to form the local seer (which is more often than not different for different commodities also). Apart from the fact that when new the weight of these pice is by no means constant, as they have ceased to be coined, the supply of full weight ones is very short and short weight pice are used ; this is apparently sometimes remedied by adding more pice to make the weight up to that of the original seer, then that increased number is used as the basis of a new seer and so on. On top of this system the 180-grain rupee has come, and as a result seers of various numbers of gandas of rupees have come into use, the rupee being by some regarded as equal to the pice in weight and by others not so, the usual ratio being apparently 7 pice equal to 5 rupees. The result is the utmost confusion. Expressed in gandas the seers are almost innumerable, while when converted into terms of standard tolas each seer developes into several more according to the ratio assumed as existing between the gandas of pice and rupees.

Weights based on the Gorakhpuri pice are prevalent also in Azamgarh, Ballia, Basti and Jaunpur. In Azamgarh, this pice is known as the *bhar*, a word more often elsewhere used to denote the weight of the Government rupee.

In other districts—especially Bahraich, Bara Banki, Fyzabad, Gonda, Lucknow, Partabgarh, Rai Bareli and Sitapur—the basis of the local weights is traceable to the ganda of Maddusahi pice, which is reckoned as weighing 270 grains or $1\frac{1}{2}$ tolas. This relation has introduced a fresh element of confusion, as the ganda, which ordinarily means a set of four, being found equal to the weight of a set of six standard rupees has in some places come to mean a set of six. Elsewhere (*e.g.*, Benares and Gonda) local weights are traceable to the weight of a ganda of Farrukhabadi rupees, weighing 173 grains each. But save as regards the Gorakhpuri pice in Gorakhpur and its immediately adjoining districts the local weights are coming to be regarded as of so many standard tolas, and even in Gorakhpur this method of reckoning is coming into fashion. It may, therefore, be safely said that for very nearly the whole province the weight of the 180-grain tola is the one common unit whence local weights are derived by multiplication or by division.

Jewellers' weights.

5. As already mentioned jewellers' weights are usually based on a special and variable tola. Two frequently used and one rarer tables are reported.

These are:—(1) 8 khaskhas (or poppy seeds) = 1 cháwal (or grain of rice) 2 cháwals=1 jau (barley corn); 4 jaus=1 ratti; 8 rattis=1 másha; 12 máshas = 1 tola. (2) 20 bissas or biswas = 1 ratti; 24 rattis = 1 tánk or tankia, and 4 tánks = 1 tola; and (3) (more rare) 1½ máshas =1 damri; 2 damris = 1 chadám; 2 chadáms = 1 dhela and 2 dhelas = 1 tola. A generalized table is therefore—

	8	khaskhas	... = 1 cháwal.
5 bissas or	2	cháwals ...	... = 1 jau.
	4	jaus	... = 1 ratti.
	8	rattis	... = 1 másha.
	1½	máshas ...	... = 1 damri.
3 máshas or	2	damris ...	... = 1 tánk or chadám.
	4	tánks	... = 1 tola.

The ratti, of which 64 go to the tola, has not been reported in this province. From Agra a peculiar method of weighing pearls by the *cháva* is reported. This weight appears to become smaller as the size of the pearl increases so that the value of the pearl is always in a fixed ratio to the number of *chávas* contained therein.

Other weights of this class reported are the lal equal to 1½ rattis reported from Ballia, and the diram and miskal given as 3½ and 4½ máshas, respectively, from Shahjahanpur. Gorakhpur reports a peculiar series of weights as used for drugs only.

The ratti is frequently regarded as represented by the seed of the *Abrus Precatorius* usually known as the *ghunchi*.

Weights in actual use

6. The weights actually in use are as a rule:—Of the 80-tola series—¼, ½, 1, 2, 4 and 8 chatáks, 1, 2½, 5, 10 and 20 seers and 1 maund; of the 100 tola series—¼, ½, 1, 2, 4 and 8 chatáks, 1, 2, 5, 16, 20 and 32 seers; of jewellers' weights—2 and 4 rattis, 1, 2, 4 and 6 máshas, and 1, 2, 5, 10, 20 and 50 tolas. The larger weights of the 80-tola series in the larger bazaars are almost invariably fairly well-made cast iron weights usually circular. They are manufactured at Agra or Calcutta. The 100-tola series weights are as a rule locally made, and of rough workmanship. In rural areas and for cheap and bulky articles even in towns, weights of stone are frequently used. For jewellers' weights a few have well-made weights of brass, etc., but most have a miscellaneous collection of coins or portions thereof (two-anna pieces cut into halves as quarters, foreign coins, etc.), buttons, pieces of china, etc., and seeds.

Extent of inaccuracy of weights.

7. A few opinions have been expressed as to the amount of substantial inaccuracy among weights, thus some witnesses in Agra put the proportion at 2 to 15 per cent, others in Banda said 5 to 25 per cent. From Benares specimens of three seers of 72, 78 and 80 tolas with nothing whatever to indicate that they were not all of the same weight were received.

Some examples of different weights for buying and selling were given:—An Agra witness reported the simultaneous use of yards of 36" and 38¼"; from Etah it is reported that an extra ½ seer is added to the maund on occasions; in Mirzapur the seer for the purchase of milk is to that for sale as seven to four; and the use of different weights by the same trades for purchase and sale is also reported from Gorakhpur.

Measures of length.

8. *Measures of length.*—The full table appears to be:—3 or 4 jaus (barley-corns) or 8 chawals (rice-grains)=1 angul (digit); 3, 4 or 5 anguls=1 girah; 4 girahs=1 balisht (span); 2 balishts=1 hath (cubit); 2 haths=1 gaz (yard). The original base of this would appear to be the hath which is reckoned to be the distance from the elbow to the tip of the middle finger. It accordingly varied considerably. Now, however, the gaz is becoming more and more assimilated to the British yard of 36", and the other measures are either becoming fixed in

accordance with this sized yard or are dying out, being in some places replaced by the British inch and foot, though not to anything like the extent that the British yard has replaced all other yards. Of these other yards there are a great number as will appear from the statement. The smallest measure called a gaz is the yard of 24″ in Garhwal, and the largest that of 45″ in Banda and Fyzabad, while in between these two yards can be found at almost quarter inch intervals.

Another table of length measures which is fairly widely current is as follows:—4 pains=1 sut; 4 suts=1 pan; 4 pans=1 tasu; 24 tasus=1 gaz. This table appears to be mainly used for masonry and carpenters' work, and the yard should apparently be the Imarati or Mi'mari gaz of 33″ or thereabouts. The districts which report it practically all lie in the Agra, Meerut or Rohilkhand divisions, and the variations are only from 32½″ to 34″, 33″ being the most usual length. It appears further to be identical with the Shajahani gaz.

Another fairly definite yard is that known as the Ilahi or Akbari gaz. It is reported in the District Gazetteer of Benares that this yard was invented by the Emperor Akbar for measuring land, and should apparently be about 33½″. It seems, however, to have partly become confused with the Imarati gaz, and partly to have become mixed up with other local units of land measurement, and is now variously reported as from 31½″ to 40″.

Other special yards are the Sikandari gaz of Bahraich; the Katai gaz of Bahraich and Bara Banki; the Korian-ka-gaz of Cawnpore and the Dankani gaz of Benares, but none of these are of any importance.

9. The larger measures of length are of two kinds, (*a*) those connected with land surveying and measurement of area; and (*b*) those used for measuring distances. In the former class fall all the various gathas (or lattas) and jaribs. Many of the indigenous units of land measurement appear to be connected with the pace, which was fixed by Akbar as equal to the Ilahi gaz already referred to. Three of these went to the latta or gatha. On the other hand, however, the latha was often regarded as equal to 5½ hath. This was especially the case in the eastern districts and still more so in the adjoining districts of Bihar. Local lattas and gathas accordingly varied enormously and there have been innumerable disputes and not a few riots over the length of the latta. Settlement officers naturally fixed them at various lengths, and we thus have the Dankani latta in Benares, Ghazipur and one or two neighbouring districts fixed by Mr. Jonathan Duncan, the framer of the permanent settlement in those parts; another is Mr. Lushington's latta of 1,316 yards fixed by Mr. Lushington as Settlement Officer in Ghazipur in 1832. There are numerous others, but the only one of much importance is the gatha of 99″, 20 of which make the jarib or chain of 55 yards the square of which is the pakka bigha of 3,025 square yards. Even this is rapidly becoming of little importance, for as each district is resettled areas are being expressed in acres and hundredths thereof, and the necessity for lattas or gathas of any kind is disappearing.

Measures of distance are very uncertain, distances being frequently measured by such terms as (the length of) a well rope, a gunshot, etc. The chief indigenous measure is the 'kos' which varies from about 1⅓ to 2 miles. For all practical purposes these measures have been totally displaced by the British measures, the knowledge of which has spread widely through the distances being marked along roads and canals.

For our present purposes, however, the important thing to note is that the use of the British yard is more or less prevalent in every district in the province, though that of the foot is very much less extensive.

10. *Measures of area.*—Some information regarding these measures has already been given under measures of length. The chief indigenous measure is the bigha which is sometimes said to have been the area which a pair of oxen can plough in a day. It is a very variable unit, and the number of kachha bighas is almost innumerable. Such are generally based, as already noted, on a square each side of which is a certain number of paces, or else of haths (cubits). For survey and land record purposes the bigha has been invariably standardized and such standard bigha is always known as the pakka bigha. In all but 18

Measures of area.

districts the pakka bigha has been fixed at 3,025 square yards or a square each side of which is the chain of 55 yards. This bigha is also used by the opium and canal departments. In Gorakhpur, it is only one of nine bighas used in the land records for various parts of the district. In the districts of Agra, Aligarh, Etah, Etawah, Farrukhabad and Mainpuri the pakka bigha is 2,756¼ square yards. A bigha of 2,740¼ square yards is used in Allahabad and Azamgarh, one of 2,450¼ in Cawnpore and Saharanpur, and one of 4,356 square yards in Banda. The only exception to the rule that the bigha is the standard of area is in the hill portions of the districts of Almora, Dehra Dun, Garhwal and Naini Tal where the indigenous unit was the nali or area which could be sown with one nali or approximately two seers of wheat. This area has been standardized at 240 square yards, or a strip of land 60′ × 4′ which is well suited to the narrow terraced fields of the hills.

All these measures are, however, apparently destined to fall into disuse, for, as a district is resettled it is usual to replace the standard bigha as the accepted unit for Government purposes by the acre which is divided into a hundred equal parts which are rapidly becoming widely known as 'decimals', though sometimes (as in Bahraich) the decimal means the thousandth of an acre. To begin with, areas are shown in parallel columns in both standard bighas and acres and 'decimals'. This method is now current in the districts of Allahabad, Bara Banki, Bareilly, Basti, Benares, Etawah, Farrukhabad, Gorakhpur, Hamirpur, Jalaun, Jhansi (Lalitpur subdivision only), Kheri, Meerut, Muttra, Pilibhit and Saharanpur.

Measures of capacity (dry).

11. *Measures of capacity (dry).*—Dry measures are but little used in the province, 28 districts have reported none, while those reported from Agra, Bareilly, Bijnor, Kheri, Mainpuri and Rai Bareli are obviously scarcely worthy of the title of measures, being more of the nature of a bundle or headload of bhusa or some such article.

The largest use of measures is made in Gorakhpur and the neighbouring districts of Azamgarh and Basti. Here they are as complicated as the weights in force in those districts, and are in fact based directly thereon; the sei or sayee being supposed to be a measure that would contain a local seer of grain, usually rice. The variations of the local seer are manifold and so also are those of the sei. In addition, there is a measure known as rajia, which appears to be sometimes merely an alternative name for the sei, and at others a separate measure equal to 1½ seis. In Gorakhpur, these measures are considerably used in commercial transactions throughout the rural portions of the district, in Basti in a similar way but to less extent, while in Azamgarh they appear to be obsolescent.

The next set of measures may be termed the Bundelkhand group; they are specially current in the Bundelkhand districts of Banda, Hamirpur, Jalaun and Jhansi, while traces are found in Allahabad and perhaps Mirzapur, and the measures current in part of Sultanpur are probably derived from these. The basis is the paili, pahli, or paya, a measure containing from 4 to 12 seers of grain, the more usual content being from 4 to 6 seers. (It is doubtful, therefore, if the Mirzapur paila which contains a seer or less is connected with this measure, it seems possible that the name may have been taken therefrom while the actual measure is connected with the Gorakhpur sei). The use of these measures is confined to rural areas, and even here as a rule to transactions between villagers such as measuring grain for division of crops, loans for sowing, and such like matters. In some parts, however, more especially in Hamirpur and Jhansi they are used to some extent commercially.

The third and last tract where measures are used consists of the hill districts of Almora, Dehra Dun, Garhwal and Naini Tal, excluding the plains portions thereof. Here the basis is a measure termed nali in all the districts except in Jaunsar-Bawar in Dehra Dun where it is known as patha, and which is regarded as containing about two seers of grain, usually wheat. The nali varies somewhat but a standard nali of two seers was fixed by Mr. Beckett, when Settlement Officer of Kumaon, who at the same time fixed the nali of land

(the area which a *nali* of grain would sow) at 240 square yards as already noted. The *nali* itself and the measures based thereon are used to a very considerable extent in the hills for all purposes, though practically not at all in the towns unless it be at the special request of a rural purchaser.

It will thus be seen that there is a very close relation between the measures of capacity and of weight, practically every measure being defined as one to contain some weight of grain.

Measures of capacity (liquid).

12. *Measures of capacity (liquid).*—There are practically no liquid capacity measures in the province. The nearest approach to such occurs in Almora and Garhwal where the dry measures are also to some extent used as liquid measures, and in Basti and Gorakhpur where the case is similar. Elsewhere there are one or two local measures for special articles, such as milk, sugarcane juice or oil, but in almost every case it appears that the contents are really determined by weight. For the sale of liquids such as milk, oil, and ghi the almost invariable practice is to prepare a series of measures of such sizes as to contain the most convenient amounts expressed in the local weight of the place, the vessels so used bearing the names of the weights they contain. There is of course a separate series for milk from that for oil. If a purchaser has any doubts as to the correctness of the measure he demands that it be weighed, and this is recognized as the proper way of checking.

The only true series of liquid measures are British; liquor is measured by the British Imperial liquid measure, the measures being supplied to the licensees through the Excise department. European liquid medicines are dealt in by British apothecaries' weight. Kerosene oil is almost invariably sold by the reputed quart and pint bottle when quantities smaller than a whole tin of 4 gallons are required.

Measures of cubic content.

13. *Measures of cubic content.*—Of these there are practically none save British cubic measure which is used by the Public Works Department and to some extent by others, chiefly by contractors Nearly all the measures that possess local names are based on this measure. Thus the chatta in several of the northern districts denotes as a rule 500 or sometimes 600 cubic feet of wood while the paimana is from 1 to 25 cubic feet and is generally used for lime. The only indigenous cubic measures reported are the cubic Imarati gaz (33″ cube) used in Agra for masonry, the kamri or cubic hath used in Banda for earthwork, and the cubic balisht (span) and hath reported from Gorakhpur.

Action taken towards standardization.

14 Very little action has been taken in the United Provinces in the way of testing or stamping weights or measures, and such as there has been has been by executive order; there are no regulations or by-laws on the subject. In Azamgarh "a firm was authorized by the District Officer to stamp and sell weights. This is done but the use of such weights is purely voluntary". In Lakhimpur (Kheri) "there is a contractor to whom weights have to be brought annually for examination and correction". In Gorakhpur specimens of the seers of 23, 32 and 36 gandas of Gorakhpuri pice are kept in the Kotwali but do not appear to be used. In Moradabad an ironmonger is said to receive permission from the District Officer to "manufacture and stamp", and to certify and correct weights, the charge for correcting an old weight being about half that for a new one. A set of standard weights is kept at each tahsil.

BENGAL.

Measures of weight.

Measures of weight.—The ordinary table of weights in Bengal is 4 kachhas =1 chatak; 4 chataks=1 pao; 4 paos=1 seer; 5 seers=1 panseri; 8 panseris =1 maund and the most common seer in use in connection with ordinary commodities is the seer of 80 tolas. The kachha seer of 60 tolas is commonly used for ordinary commodities in retail trade in Bakarganj, Birbhum, Bogra in

Faridpur, Jalpaiguri, Midnapur, Khulna, Murshidabad, Mymensingh, Pabna, Rajshahi, and 24-Parganas and in portions of Bankura, Jessore and Rangpur in the principal marts in Burdwan, in outlying villages in Dacca. The same seer of 60 tolas is also used for agricultural produce in Burdwan, in retail trade in dry fish and milk in Chittagong, for medicines in Dacca, for various commodities in different parts of Dinajpur, and for molasses and tobacco in Nadia. Various other seers are also used in retail trade; 52, 55, 58, 58 $\frac{5}{8}$, 62, 64, 70, 72, 75, 78, 81, 82 $\frac{5}{8}$, 85 $\frac{5}{8}$, 90, 96. In wholesale purchase, special weights are frequently used, for instance a seer of 82 $\frac{5}{8}$ tolas for cotton in Chittagong, for rice, sugar, etc. in Dacca, for paddy, rice and mustard in Dinajpur, for country produce in Midnapur, for paddy, rice, betel-nut, etc. in Mymensingh, and for rice in Bakarganj, Tippera and 24-Parganas; the seer of 120 tolas for sugar in Bakarganj; the seer of 84 $\frac{5}{8}$ tolas for jute in Dacca, Pabna and 24-Parganas and for paddy, jute, rice, mustard, and other grains in Mymensingh. Other seers are used in wholesale trade, such as of 81, 82, 76$\frac{5}{8}$, 83, 84, 85, 86, 96 100, 90, 84 $\frac{21}{32}$, 88, 75, 58. Various seers are used in the same district for different purposes, *e.g.*, in Chittagong, there are seers of 16, 52, 60, 64, 70, 75, 80, 82, 82 $\frac{5}{8}$, 83, 84, 85, 86, 90, 96 and 100 tolas, while in Chittagong Hill tracts, trade in cotton is carried on in different parts by seers of 84, 85 and 120 tolas. In some cases, the number of seers to the maund in wholesale trade varies. For instance, in Chittagong it is reported that 30 seers make a maund for purchase of jute from Manikganj. In Jalpaiguri, there are maunds of 30, 42 and 43 seers of 80 tolas each. There are, therefore, several seers in use in Bengal, many being used at the same place for the same or different commodities. In Birbhum district a weight called a pai which is equal to 75, 80 or 110 tolas is used in certain parts of the district. Jute and tobacco in parts of Jalpaiguri is sold by the table 10 seers=1 pati; 4 patis=1 maund; 3 maunds = 1 tangi, the seer being 60 or 62 tolas, and in other parts of the same district, jute and tobacco are sold by 10 seers=1 pati; 6 patis=1 maund; and 2 maunds=1 tangi, the seer being 90 or 93 tolas. In the same district, cotton is sold by a khan of 189 tolas, and also by seers of 168 and 189 tolas, 18 seers being equal to 1 bhar. In 24-Parganas the factory maund is $\frac{3}{4}$cwt.

Avoirdupois weights.

The English avoirdupois weights are used in Bakarganj for articles manufactured in England, for coal in Burdwan, for iron, coal, etc., in Chittagong, for various articles of European and American manufacture in Darjeeling, for hides in Midnapur, for corrugated iron, etc. in Noakhali and for English and Continental metals and goods and the export of rice to American ports in 24-Parganas and also for tea in some districts; but there are several districts from which the use of the avoirdupois weights is not reported. Troy weights are said to be used in Darjeeling and 24-Parganas, and apothecaries' weights in retail trade in European drugs in several districts.

Jewellers' and kabirajes' weights.

The usual table for jewellery, etc. is 4 dhans= 1 ratti; 6 rattis = 1 anna; 8 rattis= 1 masha; 12 mashas or 16 annas =1 tola, the tola being 180 grains. For medicines, the usual table is 4 dhans = 1 ratti; 10 rattis=1 masha; 8 mashas= 1 tola; but in Howrah, the equation 10 rattis = 1 masha is said to be obsolete now and to have been replaced by the equation 12 rattis = 1 masha, 8 mashas being one tola. In 24-Parganas, the seer for Indian medicines is generally 64 tolas and the table for Indian medicines is 4 dhans = 1 ratti; 10 rattis = 1 masha; 12 mashas = 1 tola. In some districts, the anna and the bhari are also used for medicines. In Mymensingh, this table is used for medicines but the tola is 192 grains. In Jessore, the tola is in some places 80 grains and in others 160 grains, in others again 180 grains. In Mymensingh, the following tables are used for English medicines:— 5 rattis = 1 masha; 8 mashas = 1 tola and also 10 ratis = 1 masha; 8 mashas = 1 tola, the tola being 160 grains. In Murshidabad, the masha for Indian medicines= 2 annas or 12 rattis, and 8 mashas = 1 tola. A long table used in native medicines is reported from Bakarganj district except as already noted. The weights used for jewellery and native medicines are all based on the tola of 180 grains but the values of the ratti and masha vary.

2. *Measures of length.*—The usual table of measures appears to be 3 jabs =1 anguli 3 angulis=1 girah; 4 angulis=1 mushti; 4 girahs= 1 bighat; 2 bighats =1 hath; 2 haths = 1 gaj; 2 gajs= 1 dhan or danda; 20 dandas = 1 rashi; 100 rashis = 1 kros; 4 kroses = 1 jojan. Portions of this table are reported from different districts but probably this represents the original native measure. The gaj is usually 36 inches. These measures are used for cloth and in all ordinary purposes except measuring land. English linear measures are reported as in use in most districts.

Measures of length.

Land is measured by the hath, gaj, nal, katha, rashi, or bigha; 20 kathas always make 1 bigha. The lengths of the hath and the gaj, nal, katha and rashi vary in different districts and in different parts of the same district. For instance, in Mymensingh, a hath varies from 18 to 28½ inches and nal from 7½ to 17½ haths and from 135 to 350 inches; the gaj is sometimes 24, 25½ or 31½ inches and in other places varies from 6¼ to 100 haths or 117 to 1,800 inches. A *rashi* varies from 480 to 3,150 inches while therefore measures of length for all purposes have been generally standardized on the basis of the English linear measures, the measures used in ascertaining the area of lands are still extremely varied.

Land measures.

3. *Measures of area.*—In Government survey and settlement records, the acre and decimals of an acre are used in Bakarganj, Faridpur and Howrah. The acre, rood and pole, etc., in a few other districts and both the acre, rood and pole and the bigha and katha in Nadia and Bankura. In other districts the bigha and katha appear to be used generally, the bigha being sometimes a local bigha and sometimes the standard bigha of 1,600 square yards. The values of local measures of area are extremely various as they depend on the length of the lagga or nal. The number of haths in the nal and the size of the hath vary even in different parts of the same district. A fairly common table of measures is 20 gandas=1 chatak; 16 chataks= 1 katha; 20 kathas= 1 bigha. This appears to be the standard table. Other expressions for areas are krant, kar, kuni, kani, and done, but the relations between them vary in different districts. The kara is 4 krantis in Bakarganj and 3 krantis in Chittagong, Mymensingh and Tippera; 4 karas=1 ganda; 5 gandas=1 kani in Bakarganj, but in Chittagong, Tippera and Noakhali 5 gandas=1 kuni; 4 kunis=1 kani; 4 kanis=1 done in Bakarganj, 16 kanis=1 done in Chittagong, Noakhali and Tippera. In Dacca, 7½ gandas=1 pakhi; 4 pakhis=1 kani; 4 kanis =1 khada or katha. In part of Jessore, the pakhi is 1½ bighas; in another portion it is half a bigha. The same measures are found also in Faridpur and Mymensingh except that the kani is not mentioned in Mymensingh; in Mymensingh the pakhi is ·448 or ·498 or ·525 acre. In Pabna, 16 pakhis=1 khada is the usual table of areas. There are a few other measures which are used in different districts. It appears that the local measures of area vary very considerably both in nomenclature and value throughout the Presidency and even in the different parts of the same district.

Measures of area.

4. *Measures of capacity (dry)*—Measures of capacity appear to be generally used throughout the Presidency in trade in rice, pulses, grains etc. The dry measures of capacity in Bengal are the sera, ari, done, katha and paila but, the capacity of each of these measures varies considerably. There are different kathas for different commodities and the weights of the commodities which a paila will hold vary. For instance, there is the katha holding 3 seers of rice in one part of Pabna district, the seer being 60 tolas weight and in another part it contains 2 seers 14 chataks or 3 seers 12 chataks of rice. In the same district, there are several different seers which are used for different commodities and also several khadis, but there seems to be no relation between the katha, khadi and seer. In Chittagong, there are various seer measures holding different weights of rice, paddy or pulses and the *ari* contains a certain number of seers varying from 9½ to 20. The basket by which paddy is purchased by European firms in Chittagong is a wooden measure which is supposed to hold

Measures of capacity (dry).

26 lbs. of paddy. In a similar way, there are several dones in Jalpaiguri and several kathas, pailas and khuttas which appear to have no relation with each other. In some districts, however, there seem to be defined tables of measures but although the same names are used to some extent in these tables, the relations between different measures of the same names vary even in the same district. There is no table of measures which appears to be in common use in more than one district, and all that can be said is that there are measures with various names and that measures of the same name have various capacities even in the same district.

Measures of capacity (liquid).

5. *Measures of capacity (liquid).*—In Bengal, liquids appear to be generally sold practically by weight with the exception of intoxicating liquors and varnish, foreign oils, etc., which are sold by the English measures but vessels are used in every district in retail transactions, the capacity of the vessel being determined so as to hold a particular weight of the commodity sold. These measures are usually made of bamboo or are earthenware pots or in some cases cocoanut-shells. In Bankura, 4 mantis=1 chanthi ; 4 chanthis=1 pao ; 4 paos =1 pai ; 20 pais=1 sali ; 8 salis=1 map. The measures are cups or bowls made of wood or metal. These are used for all trade in liquids. No definition has been given to them but apparently the same measures are used for all commodities. The pai varies in different parts of the district. In Noakhali, oil and milk are sold in cocoanut shells and bamboo chungas and their capacity is said to be defined by weight of water and not of the commodity sold. These two districts appear to be the only exceptions to the rule that liquids of capacity are sold by weight. The seer on which the measures of capacity are based varies in different places according to the seer in ordinary use in retail trade.

6. *Cubic contents.*—The British cubic measures appear to be in force throughout the Bengal Presidency. The term *jera* is used in a few districts for measuring lime-building materials, etc., but its contents vary in different districts, being sometimes 1, $2\frac{1}{2}$, 5, 10, or 25 cubic feet. In Burdwan, a maund of lime or sand is $1\frac{1}{2}$ cubic feet. In Jalpaiguri, a *chowka* of earth-work is 100 cubic feet. But in 24-Parganas, a *chowka* of building meterials, sand, lime, etc. represents 27 cubic yards. The term *kua* is used in a few districts for measuring earth-work, but it has different meanings in different places. Probably the use of British cubic measures is gradually driving out or standardizing local measures.

MADRAS.

Measures of weight.

Measures of weight.—In different parts of the Madras Presidency, the ordinary weights in use vary. Variations are partly due to the fact that in some places they are based upon the old Madras coins such as the pagoda, or on the British and, in one or two small areas, the Dutch or French pounds ; and the variations have been increased by the efforts of the Madras Government and municipalities to make the principal weights an exact multiple of the present rupee-weight. In Madras the old palam was slightly more than three tolas but the standard palam the use of which the Madras Government encourages are based upon the palam of 3 tolas, the table of weights being 8 palams = 1 seer ; 5 seers = 1 viss ; 8 visses=1 maund. This table of weights is now reported as in use to some extent in almost every district in the Presidency except in Malabar but it is not clear how far its use has extended beyond the principal towns. In almost the whole of Kurnool and a large part of Cuddapah, the seer in ordinary use appears to be 20 tolas ; but in Kurnool 6 seers=1 viss, while in Cuddapah 5 seers = 1 viss ; in Anantapur, Bellary and parts of Kurnool, the most common seer appears to be 21 tolas with a viss of 6 seers and a maund of 8 visses. In rural areas of Ganjam, and in part of Vizagapatam, the ordinary seer seems 22 tolas ; but from the evidence received, it appears that the English avoirdupois weights are widely used in the Northern Circars for purposes of weighment and it is even stated that in Vizagapatam district, stones made to correspond to

pound-weights are used in villages. In Vizagapatam, the seer used for ordinary commodities in different parts of the district is reported to be 22, 22½, 24 tolas (Bimlipatam only) and 24⅖ tolas (Vizagapatam town). In Godavari and Kistna, the seer does not seem to be commonly used but binary subdivisions of a viss of 120 tolas are in common use. The seer of 80 tolas is used for opium throughout the Presidency, for salt in factories only and for meat in Ganjam, Godavari and Kistna, but is not used otherwise. The seer of 24·9 tolas used by butchers in the Madras City is described by the Collector as the old standard. Various other seers are reported from different parts of the Presidency as in use in special localities or for particular purposes, *e. g.*, a seer of 25 tolas is in common use in one taluq of North Arcot and in part of Ramand district, a seer of 27 tolas for firewood, vegetables, locally manufactured articles, dry fish etc., in Kistna ; a seer of 36 tolas for vegetables in Ganjam and so forth. Seers of the following numbers of tolas are reported in different parts: 20, 21, 22, 22·5, 23·4, 23·6, 24, 24·4, 24·9, 25, 27, 32, 36, 71·5, 72, 75, 80, 82·5, 84 and 105. A palam is generally 3 tolas except in Madura and Ramnad where the old palam of 6 tolas has been retained in combination with the Madras seer of 24 tolas. In Madras City, the palam used by butchers is $3\frac{3}{80}$ tolas. In Malabar, Tinnevelly and in certain taluqs in Kistna, the palam is $3\frac{3}{8}$ tolas; in Malabar the ordinary palam is either ¼ lb. or ⅓ lb. avoirdupois ; but the Collector reports that the pound is 40 tolas. In some parts of the district, a palam is 10, 12½, 14, and 15 tolas. In Tinnevelly, the palam is exactly ⅐ pound avoirdupois (1,000 grains). The ordinary table of weights in use is 144 palams=1 tulam=800 tolas. In Tinnevelly town, however, there is a tulam of 100 of the same palams. A viss is generally 120 tolas, but occasionally varies. In Ganjam, there are visses of 118 and 180 tolas, in Kurnool, Bellary and Anantapur, the viss is six seers of 21 tolas, *i. e.*, 126 tolas ; there are visses of 125 tolas and 2¾ lbs. in Vizagapatam. The maund is generally 8 visses but there are special maunds in use in certain places, such as, 1,000, 1,024, 1,050 tolas, 22, 24, 26, 28 lbs. avoirdupois. A candy is usually 20 maunds but in Tinnevelly, a candy of cotton is 500 lbs., onions 900 lbs., and oil-cakes 1,200 lbs. In South Arcot, a candy of groundnut or oil-cakes, etc , is 480 French pounds. The tulam of 800 tolas has already been mentioned and that is the most common tulam. In Madura, there is a tulam of 810 tolas ; and in Malabar there are tulams of 1,400 and 1,500 tolas and 30 Dutch pounds and 25, 32, 33⅓ and 34 pound avoirdupois. A weight called thukku is used for vegetables, its value being 100 and 180 tolas in parts of Coimbatore, 150 tolas in Salem and 250 tolas in Trichinopoly; and a thukku of 156¼ tolas is used for ordinary commodities in portions of South Arcot. English avoirdupois weights appear to be used more or less widely for some purpose or other throughout the Presidency especially for firewood, coal, gun-powder, iron, bread, and in wholesale trade and in export trade and occasionally for such local articles as meat, Indian sweetmeats, groceries, confectionery, rice, chillies, etc. In the Nilgiris, all trade is stated to be done in English weights. The extensive use of English weights for making weighments in the Northern Circars has already been mentioned. In South Canara, the ordinary table of weights is 7 rathals or pounds=1 dade, 28 rathals=1 maund and 20 maunds=1 candy, but the rathal or pound is now regarded as 40 tolas. The Dutch pound is used to a limited extent in Malabar ; the kilogramme is used for trade in groundnuts, oil, oil-cakes, etc. in South Arcot.

In Malabar, the tables of weights depend mainly on the English avoirdupois pound, the palam, the tulam and candy being generally defined with reference to it, but they vary in different parts of the district.

2. *Special weights for special trades.*—The most common table of jewellers' weights is 32 gundumanis or guruginjas=1 varaha or pagoda and 3⅓ pagodas=1 tola of 180 grains. The seed of the *Abricus Precatorius* is generally used as gundumani or guruginja. In some places a large seed is used which is $\frac{1}{16}$ of a pagoda. The fanam is also used as a weight for gold and is regarded as ⅙ pagoda in North Arcot, Coimbatore, Nilgiris, Malabar and in most parts of the Coimbatore district, and as $\frac{1}{10}$ pagoda in Tanjore. In Trichinoply the fanam is $\frac{1}{8\frac{1}{2}}$ tola. In South Canara, 123 fanams=4 tolas and in Cuddapah 11

Jewellers' weights.

fanams=1 sovereign and 16 fanams=1 tola. In part of Coimbatore district, 9½ fanams=1 varaha which is $\frac{8}{81}$ tola. In some districts, the weight of varaha differs. In part of Cuddapah district it is $\frac{7}{24}$ tola, in Coimbatore it is $\frac{8}{81}$ tola; in Ramnad and a portion of Salem district $\frac{6}{1}$ tola, in another portion of Salem district $\frac{6}{50}$ tola; in Tanjore $\frac{99}{820}$ tola and in other portions of the district $\frac{11}{36}$ tola; and in Vizagapatam, it is half a sovereign or $\frac{41}{120}$ tola. The terms ratti and manjadi are also used in jewellers' tables. In North Arcot $2\frac{2}{15}$ gundumanis=1 ratti; $1\frac{4}{1}$ rattis=1 manjadi; 11 manjadis=1 pagoda. In South Arcot, 9 rattis=8 carats and 64 carats=1 tola, the table used for diamonds, rubies and emaralds. In South Canara, a ratti is defined as 16 grains. In Chittoor, a ratti of $\frac{1}{50}$ tola is used for emeralds and a manjadi of $\frac{8}{100}$ tola for diamonds. In Coimbatore, a manjadi of $\frac{8}{81}$ tola is used for diamonds. Sapphires are weighed by a ratti of $\frac{1}{53}$ tola and diamonds by a carat of $\frac{1}{56}$ tola and a manjadi of $\frac{2}{77}$ tola. For silver in Madras, $1\frac{3}{8}$ rattis=1 manjadi, the ratti being connected with the tola by the equation 3,399 rattis=64 tolas. In Tanjore, a ratti of 4½ tolas and a manjadi of $\frac{3}{100}$ tola are used for diamonds. In Vizagapatam, diamonds and rubies are sold by a ratti which is $\frac{1}{64}$ of a tola. Pearls are weighed by the table 26 manjadis=1 ratti, the manjadi being $\frac{1}{32}$ tola. For corals, in the same district, 12 manjadis=1 kalanji, and for diamonds, 10 manjadis=1 tola. The following table or part of it is used in the districts of Ganjam, Godavari and Guntur: 2 visams (paddy grains)=1 paraka; 2 parakas=1 padika (red-seed); 2 padikas=1 addiga; 2 addigas=1 chinnam; 9 chinnams=1 varaha; 30 chinnams=1 tola. In Godavari, the addiga is also called the ratti and the chinnam is also called the manjadi. Similar tables are used in the Malabar district but different names are given to the weights. In some districts a sovereign is used as a weight and other weights are connected with it; *e. g.*, in Cudappah, Guntur, Godavari, Nellore, Nilgiris and Vizagapatam, the sovereign is generally regarded as $\frac{11}{16}$ tola. In a portion of Vizagapatam it is taken to be $\frac{41}{60}$ tola and the Nilgiris $\frac{41}{81}$ tola. The term kalanji has already been mentioned as used in Ramnad. It is also used in Salem for corals and for diamonds in Tanjore. Pearls are weighed in Madras by a weight called chow which is equal to $\frac{3171}{10000}$ tola and a masha of $\frac{1}{12}$ tola is used in Kurnool district. In Anantapur district, there is no table of jewellers' weights, current coins being used instead. In Bellary, pearls and sapphires are weighed by rathals and taks, 24 rattals being equal to 1 tak, and the rattal being $\frac{1}{64}$ tola. Diamonds and rubies are weighed by carats in Bellary, 58 carats being regarded as equal to one tola. A carat of $\frac{17}{5}$ tola is used for imitation rubies in Ramnad district. The carat is also used in Trichinopoly district for precious stones.

In this somewhat lengthy summary it has not been possible to mention all the weights which are in use in various parts of the Madras Presidency, but what has been said above is sufficient to show that they vary considerably both in nomenclature and in value. It is also noticeable that the weights used for valuable metals and precious stones have no direct relation as a rule with the weight of the rupee.

3. *Measures of length.*—The British linear measure is used in most districts in the Presidency but there are a few districts from which it has not been reported, *e. g.*, Anantapur, South Canara, Chingleput, Chittoor, Ramnad, Nilgiris and Trichinopoly. In these districts the table of length, 2 cubits or muras, mulams or muzams=1 yard or gaz, is used and a cubit is divided into 2 spans or janas. The cubit has generally been standardized as 18 inches but it is 20 inches in Anantapur, and 19 or 20 inches in rural tracts of Vizagapatam. In some districts, the span is again subdivided into two jittas or three bettas and occasionally into nine angulams or inches. A bara or mattu or maru is usually 2 yards. In South Arcot, an architectural inch which is 1¼ English inches is used for stone-work, 24 English inches being equal to an architectural yard. In South Canara, the unit angul is considered to be the diameter of a rupee and is taken to be $1\frac{1}{6}$ inches; 24 angulis=1 malayal kolu and 26½ anguls make one ikkari kolu. In Kistna, the yard is used by traders, etc., and is divided into 16 visams and in Vizagapatam it is divided into 16 girhas. In Madura, Ramnad and Tinnevelly, a measure called tachumulam which is generally 33 inches, except in Melur taluq where it is

Measures of length.

32 inches, is used. In Ramnad a few other special measures are used. In measuring distances, a kros is regarded as equal to 2 miles and 4 kroses=amadá. It appears, therefore, that the measures of length in use are mainly either the English measures of length or based upon the English yard.

Measures of area.

4. *Measures of area.* —The ordinary measures of area used by Government in the Survey and Settlement Departments and adopted in documents are the acre and its $\frac{1}{100}$ part which is usually called a cent. For purposes of measurement, a Gunter's chain of 66 feet divided into 100 links is used, so that 1,000 square links=1 cent. In the old paimas survey records in some districts, *e. g.*, in Anantapur, South Canara, Cuddapah, and Kurnool, the acre is divided into 40 guntas or 16 visams or annas each and the anna into 16 ganusus. In Salem 16 annas=1 kuli and 40 kulis=1 acre in certain unsurveyed villages. The term cawnie—about 1·32 to $1\frac{1}{3}$ acres—is still used in Madras city as well as in several districts. In Madras city the table of areas used by Government is 2,400 square feet=1 manai or ground; 20 grounds =1 cawnie. The Tamil word *manai* signifies a plot of land sufficient for a small native house. The Madras cawnie is therefore $1\frac{39}{121}$ acres. In Madura a cawnie is also divided into 24 manais. In South Arcot, it is divided into 16 annas of 4 pies and also into 100 kulis. In Chingleput, it is divided into 100 kulis. In Trichinopoly and in some parts of Chingleput in proprietary estates 4 chulangs=1 visam; 16 visams=1 cawnie. In Chittoor, 20 pedda guntas or 100 picha guntas make a cawnie. The term goru is used in Guntur, Bellary, Kurnool and Nellore. The goru means a plough and is defined as the area which a pair of bullocks can plough in one day. It is regarded as $3\frac{1}{3}$ acres in Guntur and 4 acres elsewhere. In Guntur, it is divided into 50 kuntas and in Nellore the table runs 13 kuntas=1 goru; 8 gorus=1 kunchelus, but the Collector reports that these measures of area are fast disappearing from use. The areas are expressed in terms of dry measures of capacity in some districts, such as Anantapur, South Canara, Ganjam, Godavari and Vizagapatam. This statement would specially apply to zamindari and inam villages which have not been cadastrally surveyed, the rent being frequently paid in kind, *e. g.*, by a share of crop. Special local measures are in use for agricultural purposes for calculating wages, rent, etc. in South Canara, Coimbatore, Malabar, Ramnad and Tinnevelly.

Measures of capacity (dry).

5. *Measures of capacity dry.*—The two measures which are apparently in most widespread use are those based upon the Madras type measure or padi which holds 132 tolas of second sort rice when fully heaped, 120 tolas struck or 62·5 ounces of water and the type seer which holds 80 tolas of rice struck, 88 tolas of rice heaped and 41·7 ounces of water. The Madras type measure and its binary subdivisions are reported to be in use in North Arcot, South Arcot, a portion of Chittoor district, a portion of Cuddapah district, Kurnool, Madras, Madura, Ramnad, Salem, Tanjore, Tinnevelly and Trichinopoly. The Madras type seer is used in Anantapur, Bellary, South Canara, Coimbatore Ganjam, Godavari, Nellore and Vizagapatam (Bimlipatam only). In Madras and North Arcot 8 ollocks=1 padi or measure; 8 padis=1 marakkal. In Chingleput, Ramnad, Trichinopoly and Tinnevelly, the marakkal is four measures. In Ramnad, a marakkal of 6 Madras type measures is also reported and in Tinnevelly a marakkal of 8 seers is used, the seer holding 40 to $41\frac{2}{3}$ ounces of water. In some districts, the padi is about $\frac{1}{2}$ the Madras type measure, *e.g.*, in parts of Chittoor. The seer also varies considerably in different places where the Madras type seer has not been adopted. In North Arcot, the term 'measure' is used for vessels holding 75, 86, 132, 160 tolas of rice in different parts of the district, while in one taluk of Malabar it holds 125 tolas struck. In Chittoor district, a padi or measure may hold 80, $81\frac{1}{3}$, 66, 82, or 75 tolas of second sort rice. In Cuddapah there are measures holding 120 or 133 tolas of second sort rice. Other measures with various names such as kunêham, vallam, manika, etc., are used in various districts and the capacities vary not only from district to district but from place to place in the same district. For instance in Kistna the capacity of the kuncham varies

from 330 to 462½ tolas of second sort rice fully heaped and manika from 108 to 175 tolas. There appears to be very little uniformity among the measures in use in the Madras Presidency except in so far as the Madras type measure and type seer have been adopted. It is not possible to group areas according to measures of capacity or tables of measures used in them.

Sale of liquids by weight.

6. Liquids are generally sold by measure in the Madras Presidency. But in a few cases, they are sold by weight. Ghi is sold both by weight and by measure, in South Canara, Chingleput, Godavari, Guntur, Madura, Nellore, Nilgiris, Ramnad, Salem, Tinnevelly and Trichinopoly. In Madras city, ghi is sold wholesale by weight and retail by measure. In Anantapur, ghi is sold by measures in bazaars and by weights elsewhere. Local oils are sold both by weight and by measure in Godavari and North Arcot. In Guntur and Nellore, local oils are sold by weight only and in some places in Bellary, pots containing known quantities by weight of certain liquids are used so that the sale is practically by weight. In Madras city, gingelly oil is sold wholesale by weight and retail by measure. In South Arcot, oils and other liquids are sold by measure as well as by weight. The practice here mentioned does not always exist throughout the whole of a district. It may vary in different parts of the district.

Measures of capacity (dry).

7. In all districts, the dry measures in use are used to some extent as liquid measures and in some districts no special liquid measures are reported. The English measures, gallon, quart, etc. are only used for intoxicating liquors and kerosene oil except in the Nilgiris, where the quart bottle is reported as used for other oils, milk, ghi and honey. The names of special liquid measures vary in different districts and those of the same name vary in capacity from place to place. The adam is used for oils in South Arcot, Madura, Ramnad, Trichinopoly and Tanjore, but three different adams varying in capacity from 704 ounces to 754 ounces of water are reported from Tanjore district, two, between 720 ounces and 768 ounces, from Trichinopoly, while the adam in Madura holds 1,375 ounces of water. The vallam is used for various liquids such as oils and milk in North Arcot, Coimbatore, Madura, Salem and Trichinopoly. Here again, the definition of the vallam varies from district to district; for instance, in Coimbatore it should hold 288 tolas of second sort rice heaped in one taluq and 320 tolas in another taluq. In Salem it should contain 351 tolas of second sort rice heaped, while in Madura it is defined as 2¼ to 3 Madras measures. A kudam or kodam is used for oils in Coimbatore, Nilgiris, Salem and Trichinopoly; but its capacity varies from 445⅗ ounces to 573 ounces. In South Canara, special measures called kudta, kutti, kuladu shedda, hadu, and maund are used; but the evidence regarding the relationship between measures to each other is in some respects discrepant. This may be accounted for by the fact that the table of measures varies in different districts. In Malabar different measures are used. A few other special measures are used in other districts, such as a thukku-chembu and *manam* in North Arcot. It is apparent from the above that the liquid measures of capacity are very varied in the Madras Presidency.

Measures of cubic contents.

8. *Measures of cubic contents.*—The British cubic measures seem to be in general use throughout the Presidency although it has not been reported in a few districts. In some districts special measures of capacity exist. In Anantapur, for measuring irrigation wells and earthwork, the height of a man cubed is called a kunta or bhavi (well); a measure called para is used in South Arcot, Kistna, Madura, Nellore, Nilgiris, Tinnevelly, Vizagapatam for measuring lime. It is generally 4,000 cubic inches. In Nellore, 20 paras=1 putty; in Vizagapatam 60 paras=1 garce. In South Canara, special measures gula, kuli, and gunta are used in selling timber. Chakka which is a cube of six feet is used for purchasing firewood. In Malabar, the kole and gunta are also used for measuring timber but the quantity varies, the kunta being sometimes about 8 cubic feet in some places and in other places about 12 or 12½ cubic feet. In Ramnad, carpenters and masons use the tachumolam of 3¾ cubic feet, and in Tinnevelly they use a molam of 1,125 cubic inches.

9. *Stamping operations.*—Stamping operations are now carried on in all districts in the Madras Presidency except Ganjam, Vizagapatam and Malabar. In Ganjam, the stamping establishment was abolished in June 1903 for want of work, as the type seer had not been brought into force in the district and the stamping of wooden measures in general was absolutely prohibited. Stamping operations ceased in Vizagapatam in June 1908. The reason in the case of Vizagapatam cannot be ascertained from the annual reports before the Committee.

10. *Constitution of stamping parties.*—A stamping party generally consists of one gumastah, clerk or tester and one blacksmith, stamper, artizan or golla, the former on pay varying from Rs. 10 to Rs. 15 and the latter from Rs. 8 to Rs. 12. Some stamping parties consist of a single individual only, while in Bellary, a peon on Rs. 10 is attached to the party. In Madras, a special establishment is employed consisting of a head tester on Rs. 35, an assistant tester on Rs. 15, an iron-smith on Rs. 12 and two peons on Rs. 7 each. It is expected that the cost of the establishment and contingencies in each district should be covered by the fees received. In 1911-12, the total charges incurred amounted to Rs. 17,880, while the fees collected amounted to Rs. 20,563. The number of stamping parties in each district varies. In some districts there is a stamping party for each taluq while in others there is only one for the whole district.

11. *Fees.*—A single rate of fee is charged whether a weight or a measure is to be stamped; but the rate varies in different districts from 4 pies in Chingleput, South Arcot, and 5 pies in Tanjore to Re. 0-1-6 in South Canara. In conducting the actual operation of testing, the stamping establishment is expected to carry out free of extra charge any slight adjustment that may be found necessary to make the weights and measures perfectly accurate.

12. *Impression stamped.*—Weights and measures are stamped with the following set of impressions:—(1) the crown; (2) the denomination of the weight or measure in an abbreviated form in the local vernacular; (3) the initial letter or letters of the district where the number of the stamping parties does not exceed one, and, where the number of parties is more than one, the number of the party; and (4) the year of stamping.

13. *Weights and measures stamped.*—In most districts, the Madras Government weights (palam=3 tolas; seer=8 palams; viss=5 seers; maund=8 visses with their binary submultiples) and the Madras type measure with binary submultiples and the yard and $\frac{1}{2}$ yard are stamped. The Madras type measure contains 120 tolas of second sort rice struck, 132 tolas of second sort rice heaped or 62·5 oz. of water. English avoirdupois weights are also stamped in Madras city and Godavari. In South Canara, a rathal or pound of 40 tolas and a maund of 25 rathals with subdivisions are stamped. In Bellary, the stamped weights are based on a seer of 21 tolas, and in South Arcot a thukku of 50 palams is stamped in addition to the Madras weights. In Godavari, the Collector reports that the seer stamped is 80 tolas with the Madras viss and maund, but the seer of 80 tolas is only reported as used for opium and mutton in Godavari. In Bellary the measure of capacity which is stamped is the Madras type seer which contains 88 tolas of second sort rice heaped, 80 tolas of rice struck or 41·7 oz. of water. In South Canara, the seer measure contains 80 tolas and a kalsige of 14 seers is also stamped as a grain measure; the *kudta* (12 tolas), *kutti* ($9\frac{1}{3}$ kudtas), a maund (10 kuttis) and their binary submultiples are stamped as liquid measures. In Godavari, the seer measure which is stamped is the Madras type-seer; its binary multiples (adda and kuncham) and submultiples (tawa, sola, arasola and gidda) are also stamped. In Trichinopoly, the *adam* with its submultiples down to $\frac{1}{5\,1\,2}$ are stamped for use in the sale of oil. The English measures of capacity (gallon, bushel, etc.) are stamped at Madras and in several districts for abkari purposes. The Committee has not complete information before it regarding the weights and measures stamped in several districts but what has been said above is sufficient to show that the weights and measures which are recognized and stamped by Government still vary in different districts.

14. Apparently it is not expected that weights and measures should be stamped at regular intervals and, except where the stamped weights or measures have

become worn out or reduced in capacity, it is not necessary to submit them to the inspection of the Government stamping establishments [Bo.P.(Rev. Sett, L.R. & Ag.) 31st July 1888, No. 375, paragraph 9]. The total number of dry measures stamped has generally exceeded 300,000 in recent years; liquid measures, 20,000; weights 250,000 and measuring rods, 2,000. In 1912-13, the figures were 327,283; 21,118; 295,194; and 2,779, respectively. The amount of work done in districts varies very much. In 1912-13, the total number of weights and measures stamped was only 15 in the Nilgiris, 1,404 in Bellary, 1,966 in Anantapur, 2,914 in South Canara, 4,904 in Godavari, 11,280 in Cuddapah and 11,797 in Kurnool, while it amounted to 83,004 in Tanjore, 70,607 in Ramnad, 66,384 in Chingleput, 55,902 in South Arcot, 52,363 in Madura and 48,897 in Tinnevelly. As regards the district of Tinnevelly, the Collector does not consider the extent to which the standard maund and its submultiples are stamped to be satisfactory because the local traders have not sufficiently recognized their utility and standardization and the old two kinds of tulam weights of 800 and 556 tolas weight, respectively, and their submultiples are still in use. The number of parties working in a district varies with the amount of work done. The amount of work done appears to vary roughly inversely as the rate of fee. This is to be expected from the condition that the establishment shall be self-supporting.

15. *Conduct of stamping establishment.*—The parties work under the supervision of the ordinary revenue establishment of the district, but it is not very clear what amount of supervision is actually given to the stamping establishments. In recent annual reports, however, information is included of a few complaints regarding the conduct of the stamping establishments. The principal complaints are levy of unauthorized and excess fees; illegal charges; receipt of illegal gratifications; fraud; exaction of charges for adjusting measures in addition to the authorized fee; and the misappropriation of fees.

16. *Sale of weights and measures by Government.*—In recent years, the Government have pushed the sale of type measures and standard weights. In 1912-13, type measures were sold departmentally in every district except Kistna, Madras and Ramnad. The total number sold was 14,725, the amount realized by their sale being Rs. 3,098. The number of type measures sold in each district varies from 7 in Cuddapah, 11 in Vizagapatam, 31 in the Nilgiris and 50 in Anantapur to 2,540 in Bellary, 2,486 in Godavari, 1,998 in South Arcot and 1,237 in Madura. In five districts, standard weights are also sold departmentally. In one district 577 weights were sold in 1912-13 but information was not received from the other districts regarding the number sold. The total amount realized by the sale of standard weights was Rs. 962. The price at which the Government sell weights and measures vary from district to district. For instance, in South Arcot a set of Madras type measures consisting of 1, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{32}$ measure is sold for ten annas and a similar set is sold in Madura for Re. 0-7-1. In Ganjam a set of type seer-measures is sold for Re. 0-14-6. A set of weights (1, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$ viss, 2, 1, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$ seer) is sold in South Arcot for Re. 1-0-4. Where the standard weights and measures are locally available at a reasonable price, it appears that the Government do not interfere with private trade by undertaking the sale of weights or measures.

BIHAR AND ORISSA.

Measures of weight.—The ordinary weights in use are based on the seer of 80 tolas in Bihar and Orissa except in Angul and Khondmals, portion of Bhagalpur district, most parts of Gaya district, Monghyr, certain portions in Midnapur, Palamau, most of Sonthal Parganas, and parts of Singbhum. In Angul subdivision and in Cuttack, a seer of 105 tolas is commonly used but in Khondmals subdivision, the seer of 80 tolas is used for imported article, and in certain markets it is used in general trade. In Bhagalpur, Champaran, Hazaribagh, Monghyr, Muzaffarpur and Patna, Saran and Shahabad various seers depending on gandas of Gorakhpuri pice and Nepalese pice are used. The seers depending on them vary very much from place to place

Measures of weight.

e.g., in Bhagalpur from 48 to 105 tolas, in Champaran from 33 to 95 tolas, in Hazaribagh from 28 to 120 tolas, the seer of 48 tolas being the most common; in Monghyr from 48 to 88 tolas, in Muzaffarpur 40 to 88 tolas Lohia pice, in Patna from 33 to 84 tolas, in Saran from 35 to 116 tolas and in Shahabad from 72 to 92 tolas. There are also various seers in Gaya from 44 to 84 tolas, in Purnea from 82⅝ to 132 tolas, in Sonthal Parganas from 58⅜ to 106 tolas and in Singbhum from 60 to 105 tolas; in Darbhanga seers of 50, 52 and 88 tolas are used in ordinary trade in different parts of the district. In Palamau, a kachha seer of 45 tolas is generally used. In Ranchi, a kachha seer of 40 tolas is used by banias when purchasing from aboriginals, and in part of Saran district a seer of 48 tolas is used in all trades except oil and milk. The seer is usually divided into 16 chataks or kanwas. The panseri is generally five seers but in the case of other seers, it is sometimes 5½, 6, 6½, 7, 8, 8½, 9 seers. The maund is generally 8 panseris but in part of Champaran district, the maund is 64 seers of 60 tolas each where the panseri is 7 such seers. In some districts, the terms karisa, pal and bisa are used in connection with the sale of articles in retail trade. The bisa is generally 20 tolas but occasionally varies in value from 24, 27 and 30 tolas in portion of Puri district. A pal is generally 4 karisas. It may be equal to 2, 4 and 6 tolas. Special weights are sometimes used in purchasing from cultivators, etc. in the interior, *e. g.*, in Manbhum, seers of 100, 105 and 110 tolas are used for purchasing raw shellac. British avoirdupois weights appear to be commonly in use in retail trade in hides in Angul and Khondmals. The most ordinary weights used by jewellers and apothecaries are 4 dhans=1 ratti; 4 rattis=1 china ; 6 rattis = 1 anna; 8 rattis = 1 masha ; 52 annas=1 tola or bhar; 16 annas = 1 tola. The whole of this table is not reported as used in each district, but parts of it are generally in use. In Angul and Khondmals, Balasore, Cuttack and Puri, 10 mashas = 1 bhar; while in Gaya, 10 rattis = 1 masha; 12 mashas = 1 tola. In Palamau and Shahabad 5 rattis = 1 anna. In Muzaffarpur, Patna and Purnea, the tola is not the same as a rupee but 10½ mashas make one bhar or rupee weight and 12 mashas make one tola. In Sambhalpur, the following tables are also used :— 7 rattis = 1 masha; 13½ mashas = 1 bhar for gold and silver and 10 rattis = 1 masha; 3 mashas = 1 mash; 4 mashes = 1 tola for drugs; in some places the masha is ½ tola, *e. g.*, Angul and Khondmals, Cuttack. A few special weights are used in some places for jewellery or drugs but those already mentioned are the most common. The British apothecaries' weights are reported to be in use in one or two districts for weighing medicines and drugs.

2. *Measures of length.*—The ordinary table of measures in Bihar and Orissa appears to be 3 jams = 1 angul or finger; 4 fingers = 1 muthi or mushi (fist); 3 muthis = 1 chakband, bitta or span; 3 anguls = 1 girah; 2 chakbands = 1 hath or cubit; 2 cubits = 1 gaj or yard; 2 gajes = 1 dau; 2,000 daus = 1 kos; 4 koses = 1 jojan. The whole of this table is not reported in many districts but portions of it are reported as in use in every district. It appears probable that it represents the original table. The most common gaj throughout the province is now 36 inches; but other gajes are found in different districts, the lengths being 33, 36½, 37, 38, 39, 40, 40½, 41, 42 and 44 inches The gaj of 36 inches is commonly known as the Nambri gaj and a gaj of 39 to 42 inches is sometimes called the Sikandari gaj.

Measures of length.

3. *Land measures.*—Land is usually measured by a lagga, bans, padika or nal. It is generally between 6 and 12 feet long. In Balasore, the table for measuring land is 4 padikas = 1 guntha; 25 gunthas = 1 mau. In Bhagalpur, 20 kathas=1 bigha, the standard of katha being four cubits. In Muzaffarpur, 20 laggas = 1 rashi; 30 rashis = 1 mile. In Palamau, 20 bans = 1 kata and 20 katas = 1 bigha, the ban being 6 cubits. In Patna, 20 bans or laggas = 1 rashi. In Singbhum, it is reported, that 20 kathas = 1 bigha and 4 bighas = 1 rashi.

For ordinary measurements, therefore, except generally cloths, the local measures have been standardized on a gaj of 36 inches. Different kathas are

also used for different localities, but the standards of measures for land vary considerably.

Measures of Area.

4. *Measures of area.*—In Government survey records, areas are apparently given both in terms of local measures and of the acre and decimals of an acre; but it does not appear that the acre is commonly used by the people. The local measures of area depend upon the length of the rod which is generally known as a lagga, bans, padika or nal. The most common table appears to be 20 phurkis = 1 dhurki; 20 dhurkis = 1 dhur; 20 dhurs = 1 katha; 20 kathas = 1 bigha, the dhur being a square lagga. The actual value of these measures varies, of course, with the length of the lagga. Another table in use in Angul and Khondmals, Balasore, Cuttack and Puri, is 4 kanis = 1 biswa, 16 biswas = 1 guntha, 25 gunthas = 1 pati, the biswa being a square padika or nal. In Manbhum, Ranchi and Singbhum, the katha is divided into 16 chataks and in Manbhum a chatak is divided into 20 gandas, in Singbhum into 20 square haths. In Singbhum, another table is 20 gandas = 1 katha, 20 kathas = 1 bigha, and a ganda being a square katha of $4\frac{1}{2}$ cubits. In the Khondmals subdivision, a measure called mova is reported. The method of estimating the area of land by the amount of seed required to sow is still in use in Sambhalpur and Singbhum. This system is known as "paran" system of measurement.

Measures of capacity (dry).

5. *Measures of capacity (dry).*—Measures of capacity (dry) are used in Darbhanga, Gaya, Patna and Shahabad. The measure called paila is used in Champaran, Manbhum, Monghyr, Muzaffarpur, Palamau, Ranchi and Singbhum. In Champaran, Manbhum and Singbhum, the paila is supposed to contain one seer (80 tolas) of rice, in Muzaffarpur, $1\frac{1}{4}$ kachha seers of grains, in Palamau 45 tolas' weight of grain, and in Ranchi from 6 chataks to 1 seer of grain. In Monghyr, the paila is not used in trade. In Champaran, 20 pailas = 1 maund. In Palamau, 20 pailas = 1 kata. In Ranchi, 20 pailas = 1 gunta, and 2 guntas = 1 kat. The term gouni is used for measures in Angul and Khondmals, Balasore, Cuttack, and Puri, but its capacity seems to be very variable; for instance, in Balasore, it contains from 10 to $14\frac{1}{2}$ katas, a kata holding 70 or 80 tolas weight of rice. In Cuttack, it is supposed to contain 2 Cuttack seers (105 tolas) weight of *birji*, but its capacity is said to range from $1\frac{3}{4}$ to 7 seers. In Purnea, there are various kattas used in different parts of the district, having a capacity of from $1\frac{1}{4}$ seers (80 tolas) and $2\frac{1}{2}$ seers (64 tolas) to 20 seers of 105 tolas. Many of these are apparently not used in trade. There are various other names for measures; thus the man, khandi or gandu, pudugo, pudichhlla, bharan, tambi, bhoga, pital, dinla, sola, pouti, arha, pahili, nowti, pai, etc. Many of these are replaced by authorized tables but no table of measures seems to be common to two districts. Different tables are used in different parts of the same district. Where, therefore, measures of capacity are used, it appears that they vary very much from place to place both in name and in capacity.

Measures of capacity (liquid).

6. *Measures of capacity (liquid).*—In Balasore, Champaran, Cuttack, Darbhanga, Gaya, Hazaribagh, Muzaffarpur, Monghyr, Patna, Puri, Purnea, Ranchi, Sonthal Parganas, Saran, Shahabad and Singbhum, liquids appear to be really sold by weight though in selling small quantities vessels are used for purposes of convenience, the capacity of the vessel in each case being so determined as to hold a particular weight of the commodity sold. The seers on which weights are based vary in different parts of the same district and the measures vary according to the weights in ordinary use in the locality. These remarks do not apply generally to intoxicating liquors and kerosene oil which are sold by the gallon and bottle. In Angul and Khondmals, Manbhum, Sambhalpur, the measures used for dry commodities are also used for liquids. In Bhagalpur, the following table is used for curds and milk :—4 choollos = 1 kain; 4 kains = 1 patha or seer; 4 pathas = 1 chukka; 5 chukkas = 1 bhara; 2 bharas = 1 maund or kunda. The choollo is supposed to contain a handful, but the Collector reports that this table is being fast displaced by weights. Other measures in this district appear to be based upon the weights

of the commodities sold. In Palamau, the terms kanwa, pai, sera, paseri and maund are applied to liquid measures, and in wholesale transactions, oils are sold by weight but the seer is defined as containing the weight of 50 or 64 Gorakhpuri pice of mustard-oil. Curds and milk are sold in Palamau district by ahirs by measures and by halwais by weight.

7. *Measures of cubic content.*—In Sambhalpur, no cubic measure is used. In all districts except Balasore, Champaran and Sambhalpur the English cubic measures are used, while in one or two districts, the expressions cubic gaj, cubic hath, cubic bigha or cubic muthi are said to be used. A chauk is said to be 10 cubic feet in Purnea and Hazaribagh. In Purnea, a tank of firewood is a cube, a side of which is $1\frac{3}{4}$ haths; and a *nal* of earthwork is $56\frac{1}{4}$ cubic feet in Purnea town. A cubic gaj in Champaran is called a seer. In Sonthal Parganas, a kerosene oil tin is used for measuring lime, etc., and is called ad-mania. In Hazaribagh, various measures are reported as representing the cubic contents of logs of wood, etc. Firewood is measured by cart-loads and lime, road-metal, etc., by the pawana, barka pawana, gaddu and barka gaddu, the contents of which are said to be 5, 25, 100, 200 cubic feet. Generally speaking, it may be said that the English cubic measures are used for measures with Indian names based upon the English measures.

Measures of cubic content.

PUNJAB.

Weights.—The measures of weight of the Punjab are decidedly simple. The 80-tola seer and connected weights are well-known throughout almost the whole province, the only part in which it does not appear to be at least moderately well-known being most of Dera Ghazi Khan and the trans-Indus portion of Mianwali. In 12 districts (Gujranwala, Gujrat, Gurgaon, Hissar, Jhang, Karnal, Montgomery, Multan, Rawalpindi, Rohtak, Shahpur and Simla) it is reported to be used to the practical exclusion of any other system.

Measures of weights.

2. In Ambala, Amritsar, Ferozepore, Hoshiarpur, Jullundhur, Gurdaspur, Kangra, Lahore, Ludhiana and Lyallpur it is accompanied in rural areas by several kachha seers of from 32 to 36 tolas, though in Lyallpur the use of these is confined to settlers from districts in which these were used, and is said to be on the decrease. In Amritsar and Ludhiana the origin of these kachha seers is traced to the Mansuri pice, 36 of which were reckoned to go to the kachha seer, which was regarded as equal to $33\frac{1}{3}$ rupees in weight. These pice are made in the Maler Kotla State and vary considerably in weight. This together with the variations due to the pice used to make up the seer being more or less worn accounts for the variety of kachha seers in use; their use is, however, very largely confined to the rural portions of the district mentioned. In many of these districts the 80-tola seer is often known as the Angrezi or British seer.

Distribution of various weights.

In Attock, Dera Ghazi Khan, Jhelum, Mianwali and Muzaffargarh, the 80-tola seer is accompanied by one or more seers larger than itself, usually about 100 tolas; while in Sialkot both these larger seers and the smaller (kachha) seers of the second group are current in the rural areas.

3. The only weight that appears to be in any way really peculiar to the Punjab is the sirsai which in Ambala, Amritsar, Ferozepore, Gurdaspur and Jullundhur is reported to be one-sixteenth of the kachha seer, or from 2 to $2\frac{1}{4}$ tolas. In Attock, Mianwali, Multan and Shahpur this name means a weight of $1\frac{1}{4}$ tolas, and in Jhelum and Montgomery it is said to be of $1\frac{1}{3}$ tolas. In several of the western districts the chatak is known as the sharak.

4. Jewellers' weights are quite similar to those in force in the United Provinces, the gold tola being as a rule from one to eight rattis in excess of the 180-grain tola. The large ratti of $2\frac{3}{16}$ grains or approximately $1\frac{1}{8}$ ordinary rattis is

Jewellers' weights.

reported from Amritsar, Gujranwala and Lahore, and is subdivided there as usual into 20 biswas, while 24 make the *tánk* (in Gujranwala the number is said to be 36). Gujranwala reports a series of weights used in medicine including the *misqal*, *diram* and *dam*; these appear to be mainly used in prescriptions in old works on medicine.

Use of standard tola, seer and maund widespread.

5. The important point for present purposes is the widespread use of the standard tola, seer and maund, which appears to be more widespread than in the United Provinces.

Weights in actual use.

6. The weights actually in use in the larger towns are more or less well made iron weights frequently from Agra or Delhi, but weights are now being cast in some cities, *e.g.*, Sialkot. In rural areas in Ambala and Ludhiana stone weights are considerably used.

Measures of length.

7. *Measures of length.*—There appear to be three more or less general tables of these measures used (*a*) for ordinary purposes such as measuring cloth and ordinary small lengths; (*b*) by carpenters and masons; and (*c*) for land measurement. They are :—

(*a*) 3 jobs = 1 ungal or ungli.
3 ungals = 1 girah.
4 ungals = 1 chappa.
8 girahs = 1 bálisht (span), or girth.
2 bálishts = 1 háth (cubit).
2 háths = 1 gaz (yard).

With this table are connected certain special measures :—

3 gazes = 1 gandhára (Gurdaspur).
12 gazes = 1 pachosi (Hissar) or jaul (Jhelum).
2 jauls = 1 parkala (Jhelum).
8 pachosis = 1 adha (Hissar).

(*b*) 2 solas = 1 sút.
2 súts = 1 pain (some say 4).
4 pains = 1 tasu (some say 6; others give 10 súts = 1 tasu).
24 tasus = 1 Imárati gaz; or (in Muzaffargarh) háth pakka.

(*c*) 16 chappas = 1 karam (or kadam, pace).
3 karams = 1 kán.
10 or 12 karams = 1 jarib.

These tables are not reported complete from any one district, but portions occur in each. Table (*b*) seems specially variable.

8. The British yard has spread over the greater part of the province and is reported as fairly well-known in every district except Multan, and even there it seems to be known to a considerable extent. As a rule it has been taken as equivalent to the gaz of two haths. But in several of the western districts the hath in common use is the *murwan* or *morni* (*i.e.*, curved) hath of approximately 24", really the distance from the elbow round the tip of the middle finger and back to the knuckle. This gives rise to a gaz of 40" to 48", and the British yard is then taken as 1½ haths (Dera Ghazi Khan). In Multan a gaz of this series (45") is divided into 16 sharaks or 20 girah, and in Muzaffargarh into 16 tasus. The other measures in table (*a*) would seem to be gradually becoming determined by the ratios they bear to the yard of 36", though of course there are numerous special yards for special articles, and progress in this direction is much greater in the towns and larger bazaars than in the rural areas; still it

would seem that the knowledge of the 36″ yard is very widespread. In this connection it is interesting to note that in Amritsar and Sialkot several special yards are reported and all are defined as of so many girahs, the girah being—$\frac{1}{16}$ of the 36″ yard.

As regards table (*b*) the original basis was the Imarati gaz of about 33″ which would make the tasu 1⅜″. But a connection has been made apparently with the *morni* or *morwan* hath by taking this as equivalent to 16 tasus. On the other hand, the Imarati gaz of 33″ is apparently in some districts (*e.g.*, Ludhiana) being assimilated with the 36″ yard, the tasu thus becoming 1½″. The use of the British inch and foot is, however, spreading among carpenters and it seems probable that the tasu and its subdivisions will die out.

Land measures.

9. As regards measures of length used for land the karam seems to be of double origin as was noted in regard to the United Provinces measures, *i.e.*, as the double pace, or the treble cubit. Whatever its origin it has now been practically fixed in accordance with the exigencies of land survey work. The most usual length is 5½′, so that 10 go to the jarib (chain) of 55′, or 12 to that of 56′. A karam of 57·151″ with corresponding jarib of 10 such karams is reported from Ferozepore, Hissar, and Ludhiana, of 57½″ from Hoshiarpur, Jullundhur and the Kulu subdivision of Kangra, and one of 5′ from Ferozepore, Gurdaspur and Lahore, while Kangra proper has a special karam of 56″. In the eastern districts of Gurgaon, Hissar and Rohtak the 99″ gatha so common in the United Provinces appears and is not infrequently termed a karam.

Measures of distance.

10. The kos is as usual a variable measure from 1 to 2 miles, and is rapidly disappearing in favour of the more exact mile. In the Canal Colonies there is an interesting instance of the introduction of a new measure. The land is parcelled out into *killas* each of 220′ square and *marabbas* (or ' squares ') each of 1,100′ square (*i e.*, 25 killas). In both Jhang and Lyallpur districts the lengths of the sides of the killa and marabba are becoming recognized as measures of length under the names of killa and marabba respectively.

The Canal Department has also introduced new measures of length. The canal mile is of 5,000′ only, and these miles are subdivided into five equal parts, each of which is marked along the canal by a *burji* (small ' tower '). Accordingly the term *burji* has come to be used to denote a length of 1,000′.

Measures of area; the ghumaon.

11. *Measures of area.*—The predominant measure of area is the ghumaon, which is reported from Muzaffargarh to be the area that can be ploughed by a pair of oxen in 8 hours in the riverain portion of the district (Kachar), or in 16 hours in the uplands (Thal). It has, however, been standardized and adopted for survey work in accordance with the following table :—9 sarsahis = 1 marla; 20 marlas = 1 kanal ; 4 kanals=1 bigha ; and 2 bighas=1 ghumaon. The most usual size for the ghumaon is one British acre which makes the marla exactly equal to the pole or one square karam of 5½′. This is the unit of area adopted to a greater or less extent in 17 districts :—Ambala, (since 1887), Attock, Dera Ghazi Khan, Ferozepore (part), Gujranwala, Gujrat, Gurdaspur (part), Jhang (part), Jhelum, Lyallpur (part), Mianwali, Montgomery, Multan, Muzaffargarh (except Leiah tahsil), Rawalpindi, Shahpur and Sialkot. A ghumaon of 4,000 square yards is used in Amritsar, Lahore and part of Gurdaspur ; one of 3,674 square yards (accurately 3,673⅛) in Hoshiarpur, Jullundhur, Kangra proper, and the hill portions of Gurdaspur. Ghumaons of 4,033 and 6,050 square yards are reported from Ludhiana and Multan city, respectively.

The bigha.

12. The bigha of the United Provinces is used in several of the eastern districts, the pakka bigha of 3,025 square yards being current in Ambala (until the Settlement of 1887), Ferozepore (part), Gurgaon, Hissar, Karnal (part), Ludhiana and Rohtak, often side by side with the kachha bigha of 1,008⅓ square yards, which is found in Ambala, Ferozepore, Hissar, Karnal (part), Ludhiana and

Rohtak, where it is usually the popular measure only, though used in Government records in one tahsil of Hissar, one of Karnal and in Ludhiana. A bigha of 900 square yards is used in Simla and one of 968 square yards ($\frac{1}{5}$ acre) in the Kulu subdivision of Kangra. And elsewhere there are one or two other bighas. In the Canal Colonies (in Gujranwala, Jhang, Lyallpur and Shahpur districts) new units of area have been adopted. These are the killa of 220 feet square or $1\frac{1}{9}$ acres, and the marabba or square equal to 25 killas or $27\frac{7}{9}$ acres.

13. It will thus be seen that the acre is the basis of area measure over by far the greater part of the province, but an acre divided more or less on the English system and not into hundredths.

Measures of capacity.

14. *Measures of capacity* (*dry*).—No measures of capacity are reported from Gurgaon, Hissar, Jullundhur, Karnal and Rohtak; and from Ambala, Amritsar, Hoshiarpur and Ludhiana only a very few and very indefinite measures are reported, of no interest whatever. In the other districts dry measures are more or less widely used. There appear to be two chief systems, though there is considerable confusion between them. The first and most widely used is based on a *topa* which holds somewhere about 2 seers of wheat; the variations reported from Gujranwala, Gujrat, Gurdaspur, Hoshiarpur, Montgomery, Shahpur and Sialkot all lie between $1\frac{1}{2}$ and $3\frac{1}{4}$ seers. A similar *topa* is the basis of what measures are used in Lahore, Lyallpur and Multan where, however, the use of measures is distinctly on the decline. The second chief system is based on a large *topa* averaging about 5 or 6 seers, but varying widely between 4 and 12 seers. This *topa* is current in Attock, Dera Ghazi Khan, Jhelum and Muzaffargarh, while in Ferozpore an intermediate *topa* of 3 to 4 seers is reported. In Attock and Jhelum this large *topa* is subdivided into four *chohas*, which appear to be very much the same as the small *topa*. In Jhelum this *choha* and the small *topa* are both found and are of much the same size. From Rawalpindi the *choha* only is reported. In Attock and Muzaffargarh the *odi* or *oza* of 2 to 4 seers occasionally take the place of both *topa* and *choha*. This is the usual Frontier Province measure of capacity and will be discussed there.

Measures are also used in the two hill districts of Kangra and Simla. Here the basis is the *patha* which is also found in Jaunsar-Bawar in Dehra Dun (U. P.), a measure reported as holding 2 kachha (32 tola) seers in Kangra and 3 (80 tola) seers in Simla.

These measures are widely used for practically all transactions in grain in the rural areas of all the districts above noted except in Gurdaspur, where their use is confined to a portion of one tahsil, the Murree tahsil of Rawalpindi and, as above noted, Lahore, Lyallpur (confined to those settlers who came from districts using measures) and Multan, where they are going out of fashion.

The multiples and submultiples of the *topa* and *choha* are very numerous and nearly every district uses several different tables for which the statement must be consulted. The important point to note here is that these measures are thus widely used in commercial transactions as well as in mere customary village payments, division of crops, etc., and that all are based on certain weights of the prevalent grain which is usually wheat.

Measures are invariably reported as used heaped.

Measures of capacity (liquid).

15. *Measures of capacity* (*liquid*).—None are reported from Gujranwala, Hissar, Kangra, Lyallpur, Mianwali, Rawalpindi, Rohtak and Sialkot. All the other districts except only Jullundhur and Simla report the use of the *garwi* as a measure containing one seer of milk and used solely for that purpose. The seer may be either the 80-tola one or one of the local seers, *e.g.*, the 100-tola seer is of fairly frequent occurrence. In Lahore a *garwi* based on the 80-tola seer is used for retail sale, and one on the 100-tola seer for purchase from milk producers. The *garwi* is divided into four equal parts usually known as *garwa*

although occasionally merely called *pao* (quarter). In Jullundur *garwi* is given as a general name for measures for milk holding ¼, ½ or 1 seer thereof. In Muzaffargarh one of the dry measures (the *paropi*) is used and Shahpur reports the nearest approach to a table of liquid measures that there seems to be.

For oil a variable measure called a *pali* (holding from 5 to 10 chataks) is reported from Attock, Gujranwala and Ludhiana ; and there are a few other more or less indefinite measures reported. For liquor the British Imperial system has been prescribed by Government and measures in accord therewith are provided through the Excise Department. The British apothecaries' weights are used for European liquid medicines, and kerosene when sold in quantities less the tin is practically always sold by the reputed pint or quart bottle.

There is, in short, scarcely anything that can be dignified by the name of liquid measures, as what there are are made so as to hold some definite weight of some specific article, and are, therefore, only available for use in respect of that article.

16. *Measures of cubic content.*—Practically the only measures used are the British and the use of these is almost entirely confined to the Public Works and Forest Departments, and contractors working for them. Only seven districts report any measures of any sort save such as the cubic foot, etc. And of these only Ludhiana reports anything not immediately dependent on the cubic foot; in that district the cubic *sola, sut* and *pain* are said to be used for measuring wood.

Measures of cubic content.

17. *Stamping and Inspection.*—Nothing in the way of general action has been done in the Punjab, a few individual attempts have been reported. In Ambala weights are inspected in the bazaars by the bazaar chaudharis ; in Amritsar measures of weight and length were stamped by Government or the Municipality; in Ferozepore the Deputy Commissioner reports the use of stamped weights, but no stamping appears to be done by Government or the Municipality ; in Lahore some stamping is reported to have been done occasionally in past times by the tahsil staff, but none is done now. In Multan stamping and correcting of weights was done under the supervision of the District Board by means of the bazaar chaudharis, but was discontinued in March 1913, and in Sialkot weights are brought for testing and stamping to certain families of lohars, and something was formerly done by a previous Deputy Commissioner (Col. Jenkins) in the way of standardizing the *topa*.

Stamping and Inspection.

BOMBAY.

Measures of weight.—The Bombay city excluded, there are three principal systems of weight in the Presidency which are to some extent conterminous with the boundaries of the Divisions :—

Measures of weight—Distribution.

(1) The Railway weights are, excepting the British weights for special commodities or for export in Karachi Town, exclusively used in the seven districts of Sind, in the Ahmednagar, East Khandesh, West Khandesh, Nasik, Satara and the Sholapur districts, *i.e.*, the whole of the Central Division except the Poona district where a seer of 76 tolas as well as the Railway seer are prevalent

(2) A seer of 40 tolas is current practically, to the exclusion of others, in four out of the six districts of the Northern Division, *viz.*, Ahmedabad, Broach, Kaira and Panch Mahals, while a seer of 37 tolas obtains in the Surat district and one of 80 tolas in the Thana district except in the tract near Bombay where the 28-tola seer of that city is used.

(3) In the Belgaum, Bijapur, Dharwar and Canara districts of the Southern Division the seer is one of 20 tolas, a 15-tola seer being also used in a part of Belgaum. In the remaining two districts of that Division there are various seers, *viz.*, 80, 78 and 76 tolas in Kolaba, and 27⅛, 27½, 28, 29⅜, 30 and 32 tolas in Ratnagiri. Thus the Railway seer is either the exclusive or the principal unit of weight in 13 out of 26 districts, while in four districts the seer is exactly one-half and in four more districts exactly a quarter. In the Bombay city the most common unit is a seer of 28 tolas which has penetrated a part of the neighbouring district of Thana, and the multifarious seers of the Ratnagiri district are evidently connected with the same unit.

Weights below the seer.

2. All the seers have their usual binary subdivisions down to one-sixteenth, except apparently the Bombay city seer, the 20-tola seer in four districts of the Southern Division and the multifarious seers of Ratnagiri in the same Division which stop short at one-eighth. In Sind, the chatak is called the *anna* (corresponding to the subdivisions of the rupee), and in the Larkana district of that Division the *anna* is divided into four *dukos*. In the Northern Division, the chatak ($\frac{1}{16}$ seer) is called the *adhol* and the 2-chatak or one-eighth seer weight, *navtak*. The term *navtak* is also used in the Southern Division except in Kolaba and in East Khandesh (Central Division).

Besides the above, there are several kachha or special seers used either for certain commodities or in certain tracts. But the whole of Sind is remarkably free from these complications. This remark also applies to a great extent to the Northern Division and to the East and West Khandesh districts.

Weights larger than the seer.

3. As regards weights above the seer, the maund of 40 seers and the *khandi* (or *candy* in and about Bombay) of 20 maunds based on the local seers are generally used. A part or whole of the following table is generally applicable to the Southern Division except the Kolaba district, and the Satara and Sholapur districts in the Central Division :—

2 sawasers (1¼ seers)=1 adichser.

2 adichsers or adisers (2½ seers)=1 paseri or panseri.

2 paseris (5 seers)=1 dhada.

4 dhadas=1 maund.

But the first three weights do not, as their names imply, always mean 1¼, 2½ and 5 seers. For instance, in Dharwar an *adichser* weight is equal to 3⅛ current seers, and in Bijapur a *panseri* is 6 seers. Such weights are apparently the survivals of weights based on a different seer which is extinct. A *dhari* which is equal to 5 seers, used in a part of Sind (Larkana and Sukkur), is quite a different weight from the *dhada* or *dhadi* which is used in the Bombay Presidency proper, and which ranges from 30 to 50 seers. The other larger weights are :—

(1) *Kalsi* (16 local maunds) ; *bhar* (16 maunds in Ahmedabad and 24 maunds in Surat) ; *bat* (55 seers) ; *palla* (¼ khandi) ; *mani* (12 maunds) and *galli* (30 maunds) in parts of the Northern Division.

(2) *Palla* varying from 3 to 10 maunds, in Ahmednagar, Nasik Sholapur and Poona.

(3) *Haru* (8 maunds) in Dharwar (Southern Division).

(4) *Naga* or *nug* (8 to 48 maunds) in Bijapur and Dharwar districts.

The *khandi* varies from 8 to 32 maunds.

Variations of the maund.

4. As in other parts of India, the greatest variations are in respect of the maund. It varies of course from place to place, but varies more according to the classes of commodities dealt with. The greatest number of variations is notice-

able in Belgaum, Dharwar and East Khandesh (13), Bombay city (11, besides 12 kinds of *khandis*) and Thar and Parkar (5). There are 2 to 4 kinds of maunds in Karachi, West Khandesh, Kolaba, Ratnagiri, Satara and Sholapur, and scarcely any in the remaining districts.

In Bombay, some peculiar maunds, called the *surti ektala* (38·26 lbs.), *surti betala* (29·4 and 39·2 lbs) and *surti chumala* (41·06 lbs), based evidently on the Surat seer, are used for certain articles.

Use of British weights.

5. The British avoirdupois weights are used for certain imported articles, for coal, firewood, cotton and in some cases for grain and groceries sold in small quantities in Bombay City, and in the Ahmedabad, Broach, Kaira, Karachi, Panch Mahals and Ratnagiri districts. For exports out of the country the British weights are used in port towns and many other trade centres. The pound weight is generally considered to be equal to 39 or 40 tolas, more often the latter, and in many places British weights are used as local weights with the object of cheating. The pound weights are also used to make up a maund, *e.g*, in Ratnagiri, 28 lbs.=1 maund; in Thana 20 and 36 lbs. = 1 maund for certain articles. On the other hand, 28 maunds are considered as equal to one ton.

The apothecaries' weights are used in hospitals and dispensaries and by chemists and medical practitioners.

Use of metric weights.

6. The metric weights are used to some extent in Bombay city by a few men of the medical profession, etc.

180 grain tola a common unit—use of other tolas.

7. The one invariable factor in the variety of indigenous weights summarized above is the tola of 180 grains or the rupee-weight. With a few exceptions, the same tola is used for precious metals, Indian drugs, etc. As elsewhere in India, rupees are freely used for checking weights and for weighing valuable articles besides gold and silver, small silver being also used but not to the same extent, for this purpose. So far as the tradesmen are concerned, one reason for this custom is necessity, as the smaller weights are expensive and not easily procurable. As regards the ordinary, illiterate customer, he naturally trusts the Government rupee more than the smaller weights of which he has no definite idea.

The weights of the special tola for gold, etc., used in certain tracts are :—

(1) In Ahmedabad, 195·25 grains for silver lace; (2) in a part of Broach 188·85 grains; (3) in a part of Kolaba, 172½ grains; (4) in Ratnagiri, 188 and 192 grains; (5) in Ahmednagar, for gold, 187½ grains generally, but in some places varying from 180 to 192 grains; (6) in Nasik, for gold, 185, 186, 188 and 192 grains; (7) in Satara, 188 and 192 grains; (8) in Hyderabad, 175 grains. But the special tolas are used in addition to the ordinary tola in these tracts. For weights below the tola, the table used in most districts is :—

8 gunjas (*abrus precatorius*)		=1 masha.
12 mashas	...	=1 tola.

But in Guzarat the following table is ordinarily used :—

6 chokhabhars (weight of rice grains)			=1 ratti or chanoti.
3 rattis	...	...	=1 val.
16 vals	...	...	=1 gadiana.
2 gadianas	...	...	=1 tola.

In Bombay city, 40 *vals* go to the tola. In Canara (North) 2 gunjis= 1 manjuti; 3 manjutis=1 anna; 16 annas=1 tola. In Karachi, in addition to the first table the *mung* grain is used as a weight, 12 being considered as equal to 1 ratti, while in the rest of Sind 4 mungs=1 ratti. There are similar variations in Surat, Poona, Sholapur and Sukkur.

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A seer of 24 tolas is used for gold, etc., in the Ahmednagar, Belgaum, Bijapur, Dharwar, Canara (North), Nasik, Ratnagiri and Satara districts.

Weights varying with commodities.

8. To revert to the question of the multifarious weights, especially the maund, apart from the stereotyped reason of old custom, the variations are accounted for by witnesses as follows :—

(1) Peculiarity of the commodity dealt with or the weights adapted to the weights of the tract from which certain articles were originally imported.

(2) In the past, commodities were measured and not weighed, and later, when such commodities came to be weighed, the weights were based on the original measures, *e.g.*, in Bombay, certain articles were sold by the *khandi* of 8 *fara* measures. If these articles were now measured by *faras*, a *khandi* for a particular commodity, so measured, would correspond with the number of maunds which make that *khandi*.

(3) Other weights were based on the old coins of different rulers of the tracts concerned.

(4) The variations due to different causes are still maintained by traders with the object of cheating.

(5) The variations have been introduced and maintained to encourage retail trade, the retail trader nominally selling commodities at cost price, *i.e.*, by using smaller weights under the same names.

(6) The variations cover wastage, etc.

(7) Before Railways and roads were made, trade was confined to small tracts which had their own system of weights, and these have outlived the cause of their origin.

All these reasons are substantially true.

Sale by weight and measures.

9. Grain is sold by weight as well as by measure in Sind, in Gujarat and in the Belgaum and Ratnagiri districts.

Weights used by Excise Department.

10. In the Excise Department the weights prescribed are as follows :—

(*a*) For opium : seers, pounds and grains, one seer being equal to 2 lbs., 1 lb. equal to 40 tolas and 1 tola equal to 180 grains.

(*b*) For hemp drugs : the Railway maund and seer and the tola of 180 grains.

(*c*) For cocaine : (*i*) Wholesale transactions—pounds, ounces, drams and grains, the pound being equal to 16 ounces, the ounce equal to 16 drams, and the dram equal to $27\frac{1}{2}\frac{1}{2}$ grains. (*ii*) Retail transactions—pounds, ounces, drams and grains, a pound being equal to 12 ounces, an ounce equal to 8 drams and a dram equal to 60 grains.

As regards (*a*), it would appear that even a Government Department cannot steer clear of the popular confusion in the matter of weights, as the pound is taken as equal to 40 tolas instead of its actual weight of $38\frac{8}{9}$ tolas. As a whole, the system of weights adopted by the Excise Department cannot be commended on the score of simplicity.

Measures of length.

11. *Measures of length.*—As in other parts of India, the Imperial yard is widely known and used throughout the Presidency, but its use has not yet, of course, come to be exclusive. It is clear that the yard is steadily and firmly establishing itself through Manchester piece-goods, and that with anything like

an organized effort the people will be glad to be rid of their old indefinite measures. The use of the foot and the inch is not as extensive as that of the yard, but the older subdivisions, such as the *girahs* or the *tasus* are generally applied to the yard or the half-yard measure.

12. Even a meteorologist would despair of evolving any system from the confusion of the indigeneous measures. There is at least a common table applicable to different weights of the same name in homogeneous tracts, but in the case of measures of length, there is a remarkable absence of symmetry in this respect. The only constant facts deducible from the statements are that, throughout the Presidency, the British yard is called the var or val, and gaj in some places, that the hath or the ancient measure of the forearm is generally fixed at half a yard, and that the yard with its adaptations is generally subdivided into *tasus* which range from $1\frac{1}{8}$ inches upwards each, and in some places into *girahs* of $2\frac{1}{4}$ inches each. The subdivisions of the ordinary indigenous measures, *viz.*, the hath or the gaj are also in terms of *girahs* or the varying *tasus*. The confusion as regards the *tasu* is not only due to the varying units of length to which it is applied but also to its varying number when applied to a definite measure of length in different localities.

The finger's breadth, the span and the breadth of the fist are used in many rural areas, and in some places these claim to represent some definite measures in terms of inches.

The gaj measure, as used by carpenters and tailors, is often different from that used for measuring cloth.

13. Subject to the above remarks, the principal indigenous measures are summarized below by Divisions.

Bombay city.—The yard, divided into 32 *tasus* and the gaj of 27 inches.

Northern Division.—The gaj, varying from $23\frac{1}{2}$″ to 37″. In a part of Broach a hybrid *var* or yard of 37″ is used. The *hath* varies from 18″ to 20″. In Ahmedabad, the gaj is divided into 20 *vasas*, 20 *visvasis* making 1 *vasa*. The hath and the gaj are divided into a certain number of *tasus* of $1\frac{1}{8}$″ or $1\frac{1}{4}$″ each. Land is measured in some places by a *kathi* or iron rod which is $3\frac{1}{4}$ feet in length in Ahmedabad and 5 haths (of 18 or 20 inches each) in Thana. The *girah* does not appear to be used in this Division.

Central Division.—Gaj, varying from $17\frac{1}{4}$″ to 36″. *Kamdi*=18″. The subdivisions are the *girah* (in Ahmednagar)=$2\frac{1}{4}$″ and the *tasu*=$1\frac{3}{7}$″, $1\frac{5}{13}$″, $1\frac{1}{2}$″ and 2″. The hath, varying from 18″ to 21″. *Purush*, for measuring depth, above $7\frac{1}{2}$′. *Kathi* for measuring land from $6\frac{3}{4}$′ upwards. Rough cloth in some places is sold by weight.

Southern Division.—The yard or *var* is also called gaj in Bijapur. The indigenous gaj varies from 18″ to 27″, that for measuring wood in a part of Ratnagiri being 48″. A special measure used for bodice lengths is equal to 20″ to 42″. The usual subdivisions are *girahs* or *geris* (*navtak* in Canara) of $2\frac{1}{4}$″ each. *Kol* or *kathi*, $8\frac{1}{4}$ feet in length, is a land measure in some places.

Sind.—*Gazi*, varying from 18″ to 29″ and gaz varying from $13\frac{3}{4}$″ to 36″ are common measures. The usual subdivisions are *girahs* or *annas* of $2\frac{1}{4}$″ each ($2\frac{1}{3}$″ in Sukkur), and *charki*=4 *annas*. In Nawabshah, the hath of 18 or 24 inches is divided into 16 *agars*. *Kano* is a land measure, $6\frac{3}{4}$ to 8 feet in length.

Measures for land.

14. In the Land Records Department, the chain of 33 feet is used, and the measures for the Public Works Department are prescribed in their Code.

Measures of distance.

15. For distances, the mile is fairly well-known throughout the Presidency. The *kos* is an elastic measure of distance as in other parts of India.

Measures of area.

16. *Measures of area.*—The British measures, *viz.*, square feet, square yards and acres are used in the towns generally, and the first two measures to

some extent in rural areas also. In the Land Records Department the acre which is divided into 40 gunthas (1 × 1 chain of 33 feet each) is used and the guntha is called *viswas* in the Upper Sind frontier district and *vaso* in Larkana. In Canara, the *guntha* is divided into 4 square poles or *majpettas*.

17. The principal indigenous measure for agricultural land is the bigha or vigha which varies from place to place, $\frac{2}{5}$th of an acre in Bijapur, $\frac{4}{5}$th of an acre in Bombay city, $\frac{7}{8}$th of an acre in Kolaba, $\frac{3}{4}$th of an acre in East Khandesh and so forth. In many districts (Ahmedabad, East and West Khandesh, Kolaba, Nasik, Satara, Thana, etc.,) the bigha is divided into 20 *pands*, and the *pand* in some places is subdivided into 20 *kathis*. The table for Bombay city is 20 *kathis*=1 *vasa* and 20 *vasas*=1 vigha; and in Surat 20 *viswasis*=1 *vasa* and 20 *vasas*=1 vigha. In Belgaum, Bijapur and Dharwar, the measure *kurgi* which is equal to 3 to 4 acres is used. In some parts of Sind the table is—20 *viswas*=1 *veso* or *guntha*, 20 *vesos*=1 *jarib* and 2 *jaribs* =1 acre. In Thar and Parkar districts in Sind, the measures are those in general use in the Western Punjab, *i.e.*—

9 square karans	...	...	...	...	= 1 marla.
20 marlas ...	...	...	...	...	= 1 kanal.
4 kanals ...	...	...	...	...	= 1 bigha.
2 bighas ...	...	...	...	...	= 1 khuma or acre.

In both the Khandesh districts, a measure called *partan* and equal to $1\frac{1}{2}$ to 3 acres is used. A rough estimate of areas is the *har* = 25 acres, *i.e.*, an area which a pair of bullocks can plough in the season. Another rough estimate of areas is the seed or yield capacity of land, *e.g.*, in Thana, a maund of rice land means area yielding that quantity and $\frac{3}{4}$ *fara* of land means an area taking that amount of seed; in Satara 8 *pailis* of wheat land = 1 acre, while in Sholapur land of the same seed capacity is $\frac{4}{5}$th or $\frac{3}{4}$th of an acre; in Kaira, area taking 5 to $7\frac{1}{2}$ seers of *juar* = $\frac{4}{7}$th of an acre; in Canara *bijwari* means an area (= 1 acre) with a seed capacity of 1 *khandi* of grain in low-lying land and $\frac{1}{2}$ khandi in *makki* land. Ordinarily the term *baras* is applied to 100 cubic feet of road material, etc., but in Thana this term is also used for a superficial measure of 100 square feet.

18. In many places, the bigha and other indigenous measures are important not so much as actual measures, as terms of reference to old records or as traditional areas used in conversation, etc.

19. *Measures of capacity (dry).*—There is a large variety of measures and many measures of the same name have different capacities in different areas while the capacity is defined by different kinds of grains. A lucid and comprehensive summary of these measures is, therefore, impossible.

Measures of capacity (dry).

20. In the Northern Division, all articles are sold by weight in the Ahmedabad, Broach and Kaira districts. In the Panch Mahals, seer, half-seer and quarter-seer measures are used only in household transactions, in lending grain to neighbours, etc. In Surat and Thana the measures in use are the seer and the *paili*, with their submultiples, there being a large variety in Thana which also uses the measures of the neighbouring city of Bombay. In Thana the seer measure holds 72 seers of rice and the *paili*, 160 tolas of pounded *nagli*.

In Bombay city, the measures are—

4 seers = 1 *paili* or *adholi*, 16 *pailis* = 1 *fara*, 8 *faras* = 1 *khandi*, 25 *faras* = 1 *muda*. The half-seer measure is called *tipri*. The *paili* is made to hold $236\frac{1}{4}$ tolas of *bajri*.

In the Central Division, measures bearing two separate sets of names are used:—

(1) In Ahmednagar, in East and West Khandesh, in Nasik and in a part of Poona, the table generally used is :—

2 chataks	...	...	...	=	1 adpao or navtak.
2 adpaos	...	...	...	=	1 paoser.
4 paosers	...	...	...	=	1 seer.
2 seers	...	...	...	=	1 adholi.
2 adholis	...	...	...	=	1 paili or choutha.

The measures bigger than a *paili* are the maund = 16 *pailis* and a *map* of 2 maunds in West Khandesh and Nasik, in East Khandesh a *map* of 48 ordinary *pailis* or 4 special *pailis* and in Ahmednagar a *pulla* of 30 *pailis*. The seer measure which varies holds from 82 to 160 tolas of water. In East Khandesh the seer measure is uniform and is made to hold 160 tolas of water. In Nasik the seer measure is made to hold 115 tolas of 8 kinds of grain, while in Poona, where the measure varies a great deal, it is made to hold a certain quantity of *bajri* (93 to 200 tolas).

(2) In the rest of the Division, *i.e.*, in Sholapur and Satara and in a part of Poona, the general table is :—2 *chilvas* = 1 *nilva*, 2 *nilvas* = 1 *kolva*, 2 *kolvas* = 1 *chipte*, 2 *chiptes* =1 *mapte*, 2 *maptes* =1 seer. Except in the part of Poona coming under this series of measures, the multiples of a seer are—2 seers = 1 *adholi* or *adiseri*, 2 *adholis*= 1 *paili*, 16 *pailis* = 1 maund, and 20 maunds = 1 *khandi*.

In the Southern Division, there is a great variety of names, some of which mean different measures in different localities. In Kolaba, Ratnagiri, Dharwar and Bijapur, the common table is — 2 *chivtaks* = 1 *navtak*, *chipte*, *kolawa*, *chatak* or *nilvi*; 2 *navtaks* = 1 *paoser*, *tipri* or *kolvi*; 2 *paosers* =1 *adser*, *nilwa*, *kalpao*, *gidna* or *mapte*; 2 *adsers* = 1 seer, *adholi*, *ara pao* or *adna*. The multiples of the seer are, *paili*, *fara*, *maund*, *khandi*, etc.

In Belgaum and parts of Canara the general table is :— 2 *nilvas* = 1 *kolwa*, *navtak*, *kolwi*, or *arasolga*; 2 *arasolgas*=1 *solagi* or *girpar*; 2 *solagis*= 1 *alla*, *arola*, *arala*, *kalpar* or *arpas*; 2 *allas* = 1 *siddi*, *seer* or *pao*.

In Belgaum the multiples of a seer are :—

2 seers	...	...	...	...	= 1 adiser or padi;
2 padis	...	...	...	...	= 1 solgi or paili;
24 or 32 solgis		...	...	...	= 1 her or kudav;
20 hers	...	...	...	...	= 1 khandi.

In Canara, however, the multiples of the seer are again different both as to capacity and nomenclature. The capacity of the seer is too varied to be enumerated and is determined by a certain amount of *bajri*, *juar*, unhusked rice or several kinds of grains mixed together.

In the Bombay Presidency proper the seer, which is the principal but varying measure, holds from 39½ to 200 tolas of water.

The principal measures of Sind are :—

4 chauthias	...	...	...	...	= 1 pati;
4 patis	...	...	...	...	= 1 toya or toyo.

The *toya* holds from 4 to 4⅝ seers of *mung* in the Hyderabad, Larkana and Upper Sind frontier districts, 4 to 6 seers of *bajri* in the Karachi and Thar and Parkar districts and 3⅓ to 4⅛ seers of wheat in Sukkur. The measures bigger than the *toya* are :—

4 *toyas* =1 *kasa* and 60 *kasas*= 1 *kharar* in the Hyderabad, Karachi and Larkana districts. The multiples of the *toya* in the other districts are different both in respect of nomenclature and capacity.

21. *Measures of capacity* (*liquid*).—As a general rule, a measure was originally intended to hold a definite quantity by weight of the commodity for which such measure was meant. But as a matter of convenience the same measures have come to be used for different liquids of varying density. The measures for milk, however, are distinct from the measures for oils.

Measures of capacity (liquid).

22. The general table, wholly or partly applicable to various commodities or places, is as follows :—

2 chataks or annas...		...	...	...	= 1 navtak.
2 navtaks	...	...	...	...	= 1 pavser.
4 pavsers	...	...	...	...	= 1 seer.

The measures may be briefly considered by Divisions—

Northern Division—In Ahmedabad, Broach and Kaira, the seer measures for different commodities are made to hold 40 tolas of those commodities. In Panch Mahals, Surat and Thana, the seer measure holds 32 to 92 tolas of water. In Broach a measure called *ghada*, holding 20 or 21 seers of oil, is used. In Surat the maund is equal to 40-seer measures.

Central Division and Bombay City.—In Poona, Satara and Sholapur measures above the seer are—2 *savasers*=1 *adiser*; 2 *adisers*=1 *paseri*; 4 *paseris*=1 *dhada*; 4 *dhadas*=1 maund. The seer holds 30 to 160 tolas of water. In Ahmednagar, a *ghada* of 10 seers is used for oil and ghi. In Poona, vessels to hold 95 and 1,040 to 1,045 tolas of oil are used.

Southern Division.—The capacity of the seer is from 20 to 96 tolas of water. In some parts of Canara the names of the measures are distinct from those obtaining in the rest of the Presidency. In Belgaum, Ratnagiri and Bijapur and in a part of Canara the large measures are—2 *panchers*=1 *dhada* and 4 *dhadas*=1 maund. *Pancher* means 5 seers in Ratnagiri and 6 in the other three districts.

Sind.—The capacity of the seer varies from 77 to 100 tolas of water. In Nawabshah, a *kupi* measure holding 20 to 26⅔ tolas of water is used instead of a seer, while in parts of Thar and Parkar the *tipri* measure holding over 6 tolas of water is used. In Karachi, Nawabshah and Thar and Parkar, ghi and oil are also sold by vessels of capacities varying from 1¼ to 10 seers.

23. As a general rule, in the whole Presidency ghi and oil are sold wholesale, and in some towns also retail, by weight. In a few places milk is also sold by weight.

Kerosene oil is imported in tins of 4 gallons each and is sold either by the tin or by the bottle which is of course not uniform in size. Other imported oils, including mineral oils, are generally sold by British measures or by the bottle.

24. For country spirit and *tari*, the measures prescribed by the Excise Department are the Imperial gallon and the dram, 48 drams going to the gallon.

25. *Measures of cubic content.*—British measures are generally used throughout the Presidency. The *baras* is a well-known measure for 100 cubic feet of road material, lime, etc., and a quarter of this measure is called the *fara* or *fari* in some places. The *khandi*, varying from 12 to 40 cubic feet, is used for measuring lime, timber, etc., and in Ahmednagar, Dharwar, Canara and Ratnagiri. In Bombay city and Karachi town and in a part of the Colaba district, timber is sold by the cubic ton which is equal to 50 cubic feet. In the port of Karachi, for cargo 40 cubic feet make the ton. In parts of the Northern Division the cubic gaj, the *topli* or basket and the cart-load (about 40 cubic feet) are also used as measures.

Measures of cubic content.

In Thana, the measure table for timber is 20 *viswasis*=1 gaj; and 3½ gajes =50 cubic feet. In Surat, the table used for big timber is 20 *viswasis*= 1 *vasa* and 20 *vasas*=1 gaj. The circumference of the log is first measured in the middle by a string, the length is then doubled and squared and the result multiplied by the length of the log gives the cubic contents. In the Central Division, the cubic hath is equal to 3·375 cubic feet and the *ota* is a 100 cubic feet measure. In Sind, the cubic gaj, equal to 14 or 64 cubic feet, is used for measuring timber and earth-work, the *kharar*, equal to 2¼ cubic feet, for lime and the *nazi*, equal to 1½ cubic feet, for measuring mud walls.

26. *Stamping and Inspection.*—A great deal appears to be done in the Presidency in the way of stamping weights and measures. In Bombay city, weights and measures are stamped, and under the Bombay Municipal Act, the use of stamped weights and measures is enforced in the Municipal markets, action

Stamping and Inspection.

being taken by the police outside the market areas. In Karachi and Larkana the stamping of weights and measures is optional. Both weights and measures or measures only are stamped in the Dharwar, East Khandesh, Nasik, Panch Mahals, Ratnagiri, Sholapur, Ahmedabad, Surat and Thana districts and vigorous inspections appear to be made in East Khandesh and Nasik. Except in Bombay city there is no law enforcing the use of stamped weights and measures, and a great deal must, therefore, depend upon the executive steps taken to ensure the use of such measures. Such action appears to have been most successful in the East Khandesh district. In Satara and Belgaum weights and measures are not stamped. The work of stamping is done under the supervision of the Municipal staff or the Mamlatdar and in the districts the fees recovered are paid to the blacksmith, etc., employed for the purpose. No special inspection staff appears to have been entertained anywhere. The above facts relate only to Bombay city and 13 districts from which written evidence has been received.

In the Excise Department arrangements are made to stamp the prescribed weights and measures used by contractors.

CENTRAL PROVINCES AND BERAR.

Measures of weight.

Measures of weight —The Railway seer of 80 tolas is practically *the* unit of weight throughout these provinces. With the exception of British weights, which will be dealt with in a further paragraph, this seer, as a unit, is exclusively used, for ordinary commodities, in all but the Amraoti, Akola and Buldana districts in Berar, and in parts of the Chanda and Hoshangabad districts in the Central Provinces. In Amraoti, the use of a kachha seer of 20 tolas is confined to the Morsi Taluq, but not to the exclusion of the Railway seer. In Akola, while commodities up to 80 tolas are sold by the Railway seer, the larger weights are based on a kachha seer of 21 tolas. The kachha seer, as a weight, does not exist. Similarly, in Buldana, the unit for ordinary commodities is the Railway seer, but the larger weights are based on a seer of 20 tolas, and in a few villages there is also a seer of 90 tolas. In parts of the Hoshangabad district, a seer of 95 tolas is used for weighing grain and ghi, but the Railway seer is predominant in the district. In Chanda, in the Sironcha tract adjoining the Madras Presidency and inhabited principally by Telugus, there is an entirely different system of weights beginning with a *tankam* of 15 tolas and ending with a *mangu* or maund of 240 tolas (3 seers).

2. The seer is divided into 16 chataks, half a chatak, called *navtak*, being also used in some places. The usual multiples of a seer are *sawaser* ($1\frac{1}{4}$ seers), *adichser* or *adhiser* ($=2\frac{1}{2}$ seers), *paseri* or *panseri* ($=5$ seers), *dhada* ($=2$ *panseris*) and maund ($=4$ *dhadas*). These multiples, wherever they are used, while they bear an exact relation to one another, are not always based on the current seer, and they represent different weights in different tracts and in respect of different commodities. In some tracts even the seer varies for certain commodities; *e.g.*, a seer of 35 or 40 tolas for butter in Chhindwara; a seer of 78 tolas (evidently a 2 lb. weight) for fruit and of 35 tolas for butter in Akola; a seer of 95 tolas for cardamoms in Jubbulpore and a seer of 100 tolas for lac in Bilaspur. But the greatest offender in the matter of variability is the maund, and these variations are governed not so much by any particular tracts as by particular commodities. The largest number of variations in the maund reported is in Amraoti and Nagpur (13 kinds each), Yeotmal (12 kinds), Wardha (11 kinds) and Akola (8 kinds). Judging from the evidence, the variations may be considered more as suggestive of types than exhaustive. The Railway maund of 40 seers is almost exclusively used by the public in Damoh, Mandla, Nimar, Saugor and Seoni, and scarcely used in the four Berar districts, but it is widely known throughout the provinces.

The weights above the maund used in some parts of the province are the *boja* which generally means a sack of cotton equal to 10 to 15 Railway maunds, the *palla* which is equal to 3 maunds, the *gaon* or *gon*, equal to about 3 maunds and the *khandi* which is invariably 20 Railway or other maunds.

The tola of 180 grains—the common unit.

3. The weights referred to above, except the *boja* which is peculiar to cotton, are based on a constant tola of 180 grains or the rupee-weight. Indeed throughout the province rupees are often used as weights for valuable articles and by Indians of all classes for checking weights. As in the rest of India, the tola is thus an important factor in the indigenous systems of weights in the province.

Use of British weights.

4. The British avoirdupois weights, as such, especially the pound-weights, are generally used in most districts for imported hardware, European stores and coal, and for cotton in the exporting markets. In many towns in the cotton districts, firewood is sold by the ton as well as by the maund. Large firms use British weights for export and in some cases also for buying commodities.

In all the cotton markets in Berar the weights prescribed and used are a *dhada* of 7 lbs., and a maund of 4 *dhadas* or 28 lbs. (*vide* Hyderabad Residency Orders, Notification No. 79-B, dated the 1st April 1898). British weights are used as stated above especially in all the towns of Berar and parts of the Nagpur and Wardha districts, in the Warora tahsil of the Chanda district, and in the towns of Jubbalpore, Saugor, Seoni, Balaghat and Raipur. In these areas and also in some other towns the pound weight is freely used as half a Railway seer, in some cases with the knowledge of the customers, and more often with the object of cheating. The maund, when used as an indigenous weight for ordinary commodities, is generally considered equal to 39 tolas roughly, and in some cases, for commodities sold in bulk, 80 lbs. are reckoned as the Railway maund.

5. The apothecaries' weights are used in all hospitals and dispensaries and by chemists, etc.

Jewellers' weights.

6. As already indicated, the whole structure of the Indian weights used in the province, rests on a constant tola, *i.e.*, the rupee-weight. Rupees or their equivalent tola-weights are generally used for weighing gold and silver, for other valuable articles, such as musk, saffron, scents, etc., for Indian drugs generally and for excise articles. The only variations in the weight of the tola, as used for all or some of these commodities, are — a tola = 184·812 and 194¼ grains in parts of the Hoshangabad district; 184·812 grains in the Narsingpur district; 188 grains in a portion of the Buldana district; 191¼ grains in a part of Chhindwara; 192 grains in Betul; 192 and 194½ grains in parts of Nimar; 196·3 grains in Seoni; and 200 grains in Nagpur. But in these areas also the rupee-weight is recognized and used as a tola. The evidence on record does not disclose any reasons for their variations, but the survival of the weights of some old coins is the most probable explanation.

The usual submultiples of the tola, irrespective of its weight, are comprised in the following table :—

2 gunjas or rattis (*Abrus Precatorius*)=1 val (*chitatra* or *caesalpinia sepiaria*); 4 vals = 1 masha; 12 mashas = 1 tola. But like the rules of English grammar, every rule of Indian weights has its exceptions. In Drug, 2½ rattis go to the val and 3⅕ vals or 8 rattis make a masha. In the Sironcha tract of Chanda, the *tulam* or tola of 180 grains is arrived at by a table of multiples commencing with the weight of a grain of wheat or *gurujethu*. The *gunj* or ratti is subdivided in many places and these smaller weights are generally represented by the weights of poppy seeds and rice, *juar* or wheat grains. In a part of Saugor, 6 rattis are equal to one *anni* or $\frac{1}{16}$th of the rupee-weight. Small silver is often used as weights to represent fractions of a tola. There are, again, some special weights for pearls and precious stones, *e.g.*, the *chav* and the *tank* in Akola, the latter being equal to 70 grains; in Amraoti, a special *gunj* equal to 1½ times the ordinary *gunj*; in Saugor, *biswa*, *chowni* and *tank*. A seer of 24 tolas is reported as a jeweller's weight from Akola, Amraoti and Buldana, and it is believed this weight is also recognized in some other places.

Weights varying according to commodities.

7. As regards the variations in weights according to commodities, especially in respect of the maund, several reasons have been suggested in the evidence :—

(i) The current weights are those of places from which articles were or are imported.

(ii) Different rulers introduced different systems in their respective territories.

(iii) Smaller weights have been adopted for the more expensive articles.

(iv) Allowance has been made in the systems of weights for dryage, leakage and wastage in other forms which certain commodities are liable to. This simplifies, for tradesmen, the adjustment of prices. The allowance for wastage was an important consideration in old times when communications were bad.

(v) A convenient unit was adopted for each class of commodity, with regard to its bulk, etc., and this unit was called the maund.

(vi) These multifarious maunds form a trade secret, and it is advantageous to the several trades to maintain the variations.

These reasons appear to be more or less correct.

Generally speaking, the system of weights is the simplest in the most unsophisticated parts of the province, *e g.*, in the Damoh, Mandla, Saugor and Seoni districts.

8. In some cases, different weights of the same name are used in the same place when buying and when selling the same commodity. For instance, in Akola petty grocers buy articles by the seer of 80 tolas and sell them by the 2 lb.-weight, which is called a seer. In Nagpur, salt is bought by traders by the maund of 40 seers and sold by a maund of 15 seers, and ghi is bought from *gaolis* by a maund of 41 seers and sold by the maund of 40 seers. According to two witnesses from Nagpur both parties to such transactions know and recognize the custom. The reason for the custom apparently is that the bulk of the petty trade is in the hands of illiterate men who have to depend on mental arithmetic for calculating their profits and making an allowance for wastage.

Sale by weight and measure.

9. As a rule grain is sold retail by measure of capacity, but in the Betul, Hoshangabad, Jubbalpore, Mandla, Narsingpur, Seoni, Drug and Yeotmal districts, it is sold both by weight and by measure, while in Burhanpur town (Nimar district) it is sold exclusively by weight.

Measures of length.

10. *Measures of length.*—Owing principally to the universal use of English piece-goods, the yard which is called *war*, gaj or gaz has become quite a common measure in towns, and to a considerable extent in rural areas. The foot and the inch are not so widely used outside towns. The yard is usually divided into 16 *girahs*, and the half-yard measure which roughly corresponds to the old measure of hath or length of the forearm is very popular. The table in common use runs thus :—

3 anguls or ungals (finger's breadth.)				= 1 girah.
4 girahs	...	...	...	= 1 balisht, bilas or vit (span).
2 balishts	...	...	...	= 1 hath.
2 haths	...	...	...	= 1 gaj or war.

In some places the half-yard measure is called gaj, and the local gaj measure varies in some rural areas of Nimar and Saugor. The hath is generally recognized as equal to 18 inches, but it is a rough measure and varies in some tracts from about 16½ to 22 inches. In some places the hath or gaj is divided into *tasus*, a *tasu* being generally equal to 1¼ inches.

As regards measures above the yard, in the Central Provinces the Department of Land Records uses the Gunter's chain of 66 feet and in Berar a chain of 33 feet. The illiterate agriculturists who have to deal more with areas than with lengths have only a vague idea of these measures. Some rough approximations as regards measures for distances are—a *wawar's* or field's length; *hank* or distance to which a man's voice can reach (about half a mile); *dhap* (1 to 1½ miles) and *kos* which is ordinarily 1½ to 2 miles, the proverbial Gondi *kos* being, as many a weary traveller has found by experience, very elastic and in the neighbourhood of 3 miles. The province is, however, well served with made roads and the people generally have a very fair idea of the mile.

Measures of area; measures used by Government.

11. *Measures of area.*—The British measures up to the square yard are used in large towns for measuring building sites, etc. In the Akola, Amraoti, Buldana, Jubbalpore, Hoshangabad, Betul and Chhindwara districts, the measures known in rural areas are:—

20 kathis, or poles = 1 pand,

20 pands = 1 bigha,

the area of the *bigha* varying from 1,600 square yards to an acre. The Land Records are maintained in the Central Provinces and in the recently settled villages of the Melghat Taluq of Berar in terms of the acre and its fractions in decimals; in the rest of Berar in terms of the acre which is divided into 40 gunthas, each guntha being 1 × 1 chain of 33 feet. Practically, all documents relating to land are drawn up in those terms in the respective areas, and most agriculturists have become so familiar with those measures through the Land Records that they have scarcely anything beyond a vague idea of the older measures.

Popular measures of area.

12. In the rural tracts, however, estimates of an area are made by cultivators in terms of its seed capacity, the time taken to plough or harrow it or to weed the crop standing on it or to sow it, with one or more pairs of bullocks. The area so determined varies with the nature of the soil, the kind of crop sown, etc. Of these the most commonly used are the following:—

(1) *Tifan* of land-area which can be sown in a day with one drill; it varies from 3 to 5 acres. This measure is common in Berar and in the Nagpur district.

(2) A *nagar* (plough) *hal* or *kuthwa* of land, *i.e.*, an area which can be cultivated with one pair of bullocks; 12 to 20 acres. The districts in which this method of estimating area is employed are Amraoti Betul, Chhindwara, Damoh, Drug, Hoshangabad, Nagpur and Raipur.

(3) *Wakhar* of land = 1⅓ to 2 acres, used throughout Berar. It means an area that can be harrowed in a day with a pair of bullocks.

(4) *Khandi, mani* or *dhada* of land, *i.e*, an area which takes these measures of seeds of particular kinds. The area of course varies with the character of the soil, the kind of seed sown and so forth. Thus a khandi of *juar* = 20 acres in some places; a *khandi* of *dhan* (rice seed) = 2 to 2½ acres; a *khandi* of wheat =5 acres and a *dhada* of land = area taking one *dhada* of cotton seed.

(5) *Dhusa* or *daura* of land = 2 to 4 acres, used in the Nagpur and Buldana districts and means an area which can be weeded with one pair of bullocks in a day.

(6) *Mala, avad* or *manda* of land, *i.e.*, an area under crops which can be watched by a watcher from one platform. The mode of estimating an area obtains in the Amraoti, Chanda and Chhindwara districts. The area varies from 2 to 8 acres according to the character of the country and the importance of the crops.

13. *Measures of capacity (dry).*—These measures are much more variable than weights, principally because they are not based on any common factor, such as a measure to hold a definite weight of water, but are made with a view to hold a definite weight of the staple grain of any particular tract. Then the custom of using measures heaped adds to the uncertainty of a given bulk of grain of the same kind but belonging to different areas or seasons being the same weight. Another reason for such variations is that the majority of these measures are made locally by the town or village carpenters who have no idea of exactness, and the dimensions are determined more with regard to convenience in handling the measures than to their correctness. The only exceptions to the general lack of uniformity are :—

Measures of capacity (dry).

(1) The grain markets in municipalities in Berar which have been brought under the Berar Cotton and Grain Markets Law. The measures in these markets are prescribed and enforced.

(2) The Nagpur and Raipur Municipalities where measures are to some extent stamped and in the Balaghat Municipality. In these Municipalities the use of other than the prescribed measures is prohibited under by-laws framed under the Central Provinces Municipal Act.

14. The *paili* is a common measure in the districts of the Nagpur, Berar and Chhatisgarh Divisions and in the Betul, Chhindwara, Mandla and Damoh districts. In some of the Central Provinces districts, the measure corresponding to the *paili* is called *chowthia*. The *paili* is generally made to hold 100 tolas of rice in Nagpur, Balaghat and Bhandara, and 100 tolas of wheat in Wardha, Chanda, Damoh and Chhindwara. In Berar, the capacity of the *paili* measure varies from $1\frac{2}{5}$ seers of *juar* in Yeotmal to $4\frac{1}{2}$ seers of *juar* in Buldana. But this does not exhaust the variations in the *paili* which range from 40 tolas to 9 lbs. of wheat and $4\frac{1}{2}$ to 28 seers of *juar*. Half a *paili* is called *adholi*. The seer-measure, where used, is ordinarily $\frac{1}{4}$ of a *paili*, except in parts of Amraoti where it is equal to half a *paili*. The *kuro* measure is generally an adjunct to the *paili* and its capacity is 8 times the latter. Another common table is :—

4 paholis, pohais or chaholis	...	...	=1 chowthia or barhaiya ;
4 chowthias ...	...	...	...	=1 kuro or kuraya.

This is more or less common to Damoh, Drug, Jubbalpore, Mandla, Saugor and the capacity of the *chowthia* ranges from 60 to 111 tolas of wheat. The next general measure of any importance is the *katha* which is used in parts of the Nagpur Division and in the whole of Chhatisgarh. The capacity of the *katha* is 400 tolas of wheat or 365 tolas of rice. The *kangan* is one-fourth the capacity of the *katha*, but is very little used. The Nimar district and the Sironcha tract of Chanda have their own peculiar names for their measures, the unit in Nimar being a *chowki*, made to hold $4\frac{1}{2}$ seers of wheat. The common multiples used for the purpose of computations are the maund, *khandi*, *mani*, *manosha*, *kanesha*, etc., but there are no such actual measures.

15. Except in the Hatta tahsil in Damoh, in the town of Mandla, and in respect of the *katha* measure in some places in the Chhatisgarh Division, measures are used heaped, generally fully, throughout the province. The *katha* measure in Chhatisgarh, where it is used struck, is provided with an elaborate striker, called the *sig*-cutter.

16. While there is a far greater variety of measures than weights throughout the province, there is not the same amount of confusion in respect of different measures for different commodities as in the case of weights.

17. Grain and oil seeds are generally sold by measure, especially retail.

In some districts, as reported from Chanda, Drug, Jubbalpore and Raipur, there is a smaller set of measures for paying field labourers, etc.

Measures of capacity (liquid).

18. *Measures of capacity (liquid).*—The general unit for the whole province is the seer, with its subdivisions down to the chatak. The seer does not always, as its name implies, mean a seer of weight of any particular commodity. The basis of the liquid measures generally is a definite weight of the commodity for which it is intended, but in many cases the same measures are used for different kinds of liquids, and in the case of edible oils their various densities are ignored. Again, in many cases the measures of capacity for dry articles are used, *e g.*, the *paili* measure used in Chhanda, Chhindwara, Nagpur, and Wardha, which is made to hold 100 tolas of rice or 100 tolas of wheat and in Raipur, the *chabela*, the *pohai* and the *chowthia*, the *chabela* holding $\frac{3}{4}$th seer of rice. The *pohai* and *chowthia* are also used in Drug. The seer-measure is known as *lota*, *tomi*, *ainda* or *kama* in the Hoshangabad district, and in the Sironcha tract of Chanda the measures bear Telugu names, but the system is much the same as in the rest of the province. The name term is sometimes used in different tracts to denote different measures in relation to the seer-measure; for example, in Chhindwara the *adholi* means half a seer measure while in Wardha it means 2 seers.

For oils generally there are higher denominations than the seer, the *paili* etc., such as the *paseri*, the *dhadi* and the maund, and these vary according to the unit. Kerosene oil is sold by the tin of 4 gallons, or by the ordinary bottle of varying capacity. The same remark applies to oils imported from foreign countries, while oils manufactured by European processes in India are sold either by the gallon and the bottle or by local measures. Locally manufactured oils are sold by measure in most places and by weight in some, while ghi which is generally sold by weight is in some places sold by measure.

The Excise Department has prescribed for its warehouses and all liquor shops the gallon, the seer (or the reputed quart bottle) and the dram, 8 drams making one seer and 6 seers making a gallon.

Measures of cubic content.

19. *Measures of cubic content.*—The British measures used by the Public Works Department are familiar to people in large towns and some other advanced areas, and are employed for measuring timber, masonry or earthwork and the like.

The *baras*, *fanna* or *fadi*, *i.e.*, $10' \times 10' \times 1'$ or 100 cubic feet, is a common unit used by the Public Works Department for measuring building or road materials, such as stone metal, sand, murram, lime, etc., and this measure is fairly well-known in towns and large villages.

In rural areas and the smaller towns the hath is the general unit, and definite quantities, etc., are called by definite names, but they vary in different tracts according to the length of the hath or the factors employed :—

(1) *Dagon* or *dagni* in Mandla, Seoni, Bilaspur and Drug.

(2) *Pasori* in Nagpur, Bhandara, Chanda and a part of Seoni.

(3) *Rumal* (or the length of the ordinary headgear) the measurements being $3 \times 3 \times 1$ haths, in a part of Chanda.

(4) *Kamti* and *latha*, based on the hath, in a part of Saugor.

(5) A cart-load of certain materials, such as stone, coal, straw, etc., the quantity depending on the size of the cart, the bulk of the commodity, etc., and varying from 8 to 54 cubic feet.

In rural areas, in selling timbers the cubical contents are not actually worked out, but only the length, the diameter and the quality of the wood are considered.

Stamping and Inspection.

20. *Stamping and Inspection.*—No regular action has been taken in the province. As stated before, in Berar, uniform weights and measures are prescribed in the cotton and grain markets notified under the Berar Cotton and

Grain Markets Law, and in some of the grain markets the measures would appear to be stamped. In the Nagpur Municipality all weights and measures are supposed to be stamped, but this was not borne out at our inspection of the bazaar. The Deputy Commissioner, Nagpur, reports that the use of stamped weights and measures is in force to some extent in the other municipalities in the district. In the Raipur Municipality only the *katha* measures and in the Balaghat Municipality all weights and measures are reported to be stamped. In the cotton and grain markets in Berar inspections are systematically made by the committees in charge of those institutions. Elsewhere inspections by the Police and the Municipal agency seem to be made occasionally.

The Excise shops in the province are supplied with weights obtained from the Postal Workshop at Aligarh, and with stamped liquor measures made by a contractor at Nagpur. These weights and measures are systematically inspected by the Excise and the Revenue staffs.

BURMA.

Measures of weight.

Measures of weight.—With the exception of Akyab and Northern Arakan, where the Indian seer is to some extent used, and Victoria Point in Mergui where Chinese weights are prevalent, there is a remarkable uniformity in the weights in use throughout the country. The universal unit is the *peiktha*, usually known to the European under its Madras name of viss, a word not generally known to the ordinary Burman. This has been fixed by Government order (Municipal and Local Department Notification No. 137 of 5th July 1909) as 140 tolas, it having been previously recognized as 3·65 lbs. or 141$\frac{7}{18}$ tolas, though often supposed to be 142$\frac{1}{2}$ tolas. But this fixation does not appear to have extended to any appreciable extent beyond the municipalities which have mostly passed by-law to the effect that the viss is of this weight. But even in municipalities the fact does not seem to be widely known nor do any serious efforts seem to be made to enforce the orders. Thus in the Municipality of Sagaing the Deputy Commissioner tested several visses and found them to vary between 130 and 150 tolas; and in Mandalay itself a group of witnesses including an Honorary Magistrate and two Municipal Commissioners stated that 10 visses were checked by weighing against 1,425 tolas. In Myingyan, the alteration was actually carried out by the Municipality; traders made no change in prices in consequence of the reduction in weight. A certain but apparently not large amount has been done by some municipalities in the way of stamping weights; thus this is done to a greater or less extent in Bassein, Moulmein, Mandalay, Myingyan and Rangoon. The original value of the viss appears to have been about 142 $\frac{6}{7}$ tolas. The gold tikal (which is based on the original viss) is reported from the Ruby Mines district, a place where accuracy in weights is intrinsically probable, as equal to one rupee, three two-anna pieces and 4$\frac{1}{2}$ small ywés, which gives a tikal of 257$\frac{2}{11}$ grains, as against one of 257$\frac{1}{7}$ grains derived from a viss of 142$\frac{6}{7}$ tolas. These details are, however, of but little more than historical interest, as the viss has now been standardized at 140 tolas or 3·60 pounds avoirdupois. This viss is universally subdivided into 100 equal parts, known as *kyat* or *gyat* to the Burman or sometimes simply as *tha* (piece), and to the European and Indian as tikal.

2. The names of Burmese weights are often apparently different through the addition or prefixing of various particles, thus the word *lé* meaning 'weight' is often added, or *tha* meaning 'piece', or *ta* meaning 'one' or 'a single' is prefixed. Thus *ta-gyat-tha* is 'one-tikal piece', and *kyat-lè* is 'tikal weight' both meaning merely one tikal, or the number only is given with the termination *lè*, thus *nga-ze-lè* literally '50-weight' is used to denote 50 tikals or a half-viss.

Weights below the tikal.

3. When, however, we consider the weights below the tikal we find very considerable confusion. The original Burmese table would appear to have been 2 small ywés = 1 large ywé; 2 large ywés= 1 pè; 2 pès= 1 mú; 5 pès= 1 mat; 2 mats or 5 mús= 1 ngá-mú ('five-mú'); and 2 ngá-mús = 1 tikal.

Owing to intercourse with India and the introduction of the rupee with its division into 16 annas the tikal came to be also subdivided into 16 equal parts, which were called pè, just as the $\frac{1}{20}$th of the tikal was. Accordingly, the following table came into use side by side with the one just given :—4 large ywés= 1 large pè; 2 large pès=1 large mú ; 2 large mús = 1 mat ; 4 large mús or 2 mats = 1 ngá-mú, and 2 ngá-mús= 1 tikal. In this table the mat, ngá-mú and tikal are the same as in the one first given, the other weights are different. As the use of this table spread, the pè and mú in the first table became designated as the small pè and mú to differentiate them from the larger weights of the same name in the second table. (The words in Burmese used to mean small are variously *ngé* or *galé* after the name of the weight and *kyin* or *gyin* before it : large is designated by *gyi* after the name). An inspection of the two tables shows that in the former the pè is $\frac{1}{20}$th and the large ywé $\frac{1}{60}$th of the tikal, while in the latter they are $\frac{1}{16}$ and $\frac{1}{64}$, respectively. The ratio of the small to the large ywé thus arrived at is 64 : 120 or very near the usually recognized one of 1: 2. As, however, the small ywé is usually taken to be represented by the seed of the *Abrus Precatorius* and the large ywé by that of the *Adenanthera Pavenina*,* the ratio between them is somewhat uncertain and we find it reported as 2 : 3 in Pakokku, 3 : 4 in Pegu and 1 : 4 in Prome, but 1 : 2 is by far the most usual.

* One other seed is occasionally used as a weight ; this is the metlin or seed of the *Garcinia Pedunculata*, regarded as equal to 8 large ywés.

Between the above two tables there have been numerous permutations and combinations reported, sometimes the large pè is expressed in terms of the small ywé and *vice versa* ; when this is done it is most usual to take 4 large ywés as equal to the small pè and 7½ small ywés equal to the large pè, but there are numerous variants, Myaungmya and Thaton giving 3 large ywés to the small pè, and Myingyan and Rangoon 8 small ywés to the large pè.

4. This, however, does not by any means terminate the confusion, for with the introduction of the rupee the name kyat or gyat already used to denote the tikal, was applied to the rupee too and also to it as a weight, and the word pè was used to denote an anna or $\frac{1}{16}$th of the tola, and we thus have a third meaning for the word pè when used to denote a weight. We have already seen that in the second table the term ngá-mú literally meaning 5 mús is used to denote 4 mús or 8 large pès. Applied to the subdivision of the tola and rupee ngá-mú means a half tola or 8 annas, and at the same time the word mú is used to denote 2 pès or annas. As a result of the attempt to combine the two systems we get the following as the subdivisions of the rupee or tola :—one anna is one pè ; two, 1 mú ; three, 3 pès ; four, 1 mat ; five, 5 pès ; six, 3 mús ; seven, 5 mús less one pè ; eight, 5 mús ; nine, 5 mús and 1 pè, or 6 mús less 1 pè ; ten, 6 mús ; eleven, 6 mús and 1 pè, or 3 mats less 1 pè ; twelve, 3 mats ; thirteen, 3 mats and 1 pè ; fourteen, ' less 1 mú ' (*i.e.* one rupee less one mú); and fifteen annas is less 1 pè (*i.e.*, one rupee less one pè). In selling gold the mú usually means $\frac{1}{10}$th tikal, but sometimes $\frac{1}{8}$th tikal ; in selling opium it always means $\frac{1}{8}$th of a tola ; but in any case the pè is always half the mú.

Confusion between anna and pé.

Even now the meanings of the words mú, mat and nga-mú are not exhausted, for the Ruby Mines district reports them as subdivisions of the ratti and here 4 mús go to the ngá-mú and 2 to the mat. The ratti is invariably used for weighing precious stones throughout Burma, and is usually subdivided into 20 biswas, and regarded as itself $\frac{1}{64}$th of the tola, which in the Ruby Mines is termed *bali*, probably a corruption of the North Indian word *bhari* so frequently used to denote the rupee when used as a weight. In Rangoon, it is reported that the ratti is termed the kyat, and the biswa anna (though it is $\frac{1}{20}$th ratti). This ' anna' is subdivided into 6 ywés.

5. The other weights present few features of interest. The 80-tola seer and maund are used by Government for opium (hence probably the remark that ' Government prefers Indian weights and the tola for silver), but otherwise the Indian railway weights are practically unknown, save in Akyab and North Arakan where the 80-tola seer is found but accompanied by other seers, the only one

Other weights.

of interest being the shwé-lé or 'gold-weight' seer of approximately 56 tolas, said to have been introduced at the Burmese conquest. This is also reported from Amherst where it is used by the fishermen of Moulmein, and from Mandalay. Curiously it is exactly equal to the Chinese viss, which is $\frac{2}{5}$ of the ordinary Burmese viss, but subdivided like it into 100 tikals. The Chinese weights are scarcely used save by Chinamen in transactions *inter se*; and as a matter of fact weights are really but rarely used, weighing between Chinamen being generally done by the steelyard, *le-dan* or *taing tzu*. Wherever it is used objection is made to it by Burmese as leading to fraud. Goods for export to China *viâ* Bhamo are made up and invoiced according to Chinese weights. British avoirdupois weights are used to a small extent in some of the larger towns, *e.g.*, for ice in Bassein, a few articles in Pegu, and of course in the export trade. British apothecaries' weights are used for European drugs.

Weights in actual use.

6. The weights in actual use in the larger markets are, as a rule, fairly well made. The sizes employed almost invariably include weights of $\frac{1}{8}$, 1, 2, 5, 10, 50 tikals and of 1, 2, 5, 10, $12\frac{1}{2}$ and 25 visses. Weights of $6\frac{1}{4}$ and $12\frac{1}{2}$ tikals, and $7\frac{1}{2}$ visses are less common. In Burmese times weights were, at least in Mandalay, issued under royal authority, such weights were known as *sandawmi* and were in the shape of the *hentha* or Brahmini duck, and such are even now made at Amarapura. King Mindon is said to have fixed $12\frac{1}{2}$ visses as equal to 1,786 rupees (of his mintage), the $12\frac{1}{2}$ visses being doubtless selected because it was the weight of rice contained in the then standard viss. Weights that depended on this equation were known as *dinga-le*. These *hentha* or 'bird' weights are not infrequently to be found in actual use in the bazaars. In Pakokku weights of white marble are made covered with a design to prevent fraudulent chipping.

The smaller weights (below the tikal) are of less uniform shape. It is only jewellers in a large way who have good sets, such include weights of 1, 2, 3, 4, 8, 16, 32, 64, and 100 carats, of 1 and 3 biswas, of $\frac{1}{4}$, $\frac{1}{2}$, 1, 2, 3, 8, 16, 32 and 64 rattis, and of 1, 2, 3, 5, 10, 20, 30 and 50 tolas.

Inaccuracy of weights.

7. It must not, however, be concluded that the viss is by any means always what it purports to be. Many instances of it being under weight have been reported; visses 5 to 10 tikals short are reported in Moulmein, and in Myingyan the variation is said to be from 90 to 105 tikals.

Measures of length.

8. *Measures of length.*—The almost complete uniformity which at least in theory characterizes the measures of weight in Burma is a still more marked feature of those of length. There is practically only one table for the whole country, with a few separate measures unconnected with it. The chief unit is the *taung* or cubit, corresponding closely to the *hath* of India, only that it never seems to have been so variable a measure as that was. For all commercial purposes it has now been fixed at 18". It varies from that of course in rural areas, the variations being greater the greater the distance from any place of importance. But in cases of dispute it is always held to be 18 British inches. The only special taungs reported which are recognized as differing from the half yard are two specially used for measuring timber, and used in Pakokku and Shwebo; they are respectively $19\frac{1}{4}$" and $19\frac{5}{8}$", and are probably connected with the old Mandalay cubit of 19" reported to have been used in building the royal palace there. The half-yard cubit is frequently known as the *gaik-taung* to distinguish it from the old country taung of 17 to $17\frac{1}{2}$" which is known as the *mein-ma-taung*, *i. e.*, woman's cubit, but the necessity for this distinction is fast disappearing, with the spread of the knowledge of the British measures, of which the inch (*letma*), foot (*pe*), yard (*gaik*), furlong (*plang*) and mile (*maing*) are all becoming known; still for distances the indigenous '*daing*' about two miles is the most common measure; in Moulmein the use of British measures is obligatory.

Of special tables there are only two of any importance, these are—one based on the Indian cubit which, however, is divided into 4 girahs used in Akyab mainly by Chittagonians; and various Chinese measures used by Chinamen,

but practically only in transactions *inter se*. Such measures are reported from Bhamo and Rangoon. The Malay cubit or *herta*—also of 18"—is used at Victoria Point in Mergui.

Measures of area

9. *Measures of area.*—For the purposes of Land Records there is but one measure, and that is the acre divided into hundredths which are usually known as *dathama* (*i. e.*, 'decimal'). The acre is rapidly becoming known all over the province; thus in Amherst where it has now been in use for some 60 years, it is said that at least one or two men in every village know well what an acre is.

The only approach to a regular unit of area in Burmese times appears to be the pè. Of these there were two, the *pegadi* or public pè defined as 625 *palagwet*, the palagwet being one square ta (7 taungs or cubits, *i e.*, approximately $10\frac{1}{2}'$). Taking the cubit as exactly 18" this gives an area of $7{,}656\frac{1}{4}$ sq. yards for the public pè. The *min-pe* or official pè was supposed to be double the public pè, and was defined as an area 35 ta $2\frac{1}{2}$ taungs square, which is accurately 1,241·7 palagwet instead of 1,250. The public pè, now generally taken as $1\frac{3}{4}$ or occasionally 2 acres, survives in some of the Upper Burma districts being reported from Kyauksé, Lower Chindwin, Mandalay, Meiktila, Myingyan, Upper Chindwin and Yaméthin. In the last named district it is still used as a measure of area in some unsettled state lands. The pè of $306\frac{1}{4}$ square yards reported from Bhamo, and of 2,356 square yards from Hanthawaddy appear to be quite distinct measures.

An area of 40 lan square or about 6,400 square yards is known as *alan-la-se* and is used in several of the delta districts, mainly as a rough measure for paying paddy reapers. It is also reported from Mandalay. In the Arakan coast districts of Akyab and Kyaukpyu the *dun* of 6·4 acres appears to have doubtless come from Chittagong. It is usually termed *kyat* by the Arakanese. The *ta* is an apparently variable square measure, being reported as $10 \times 7\frac{1}{2}$ taungs or $18\frac{3}{4}$ square yards in Amherst, 1 sq. ta or $12\frac{1}{4}$ sq. yards in Bhamo and 75 taungs square or $1{,}406\frac{1}{4}$ sq. yards in Thaton. The *kan* appears in Minbu and Pakokku as $\frac{2}{7}$ and $\frac{1}{2}$ acre respectively while in Henzada it is 10 tas square or only $122\frac{1}{2}$ sq. yards.

Popular measures of area.

10. The usual way by which the Burman expresses an area is by the amount of seed required to sow it, the number of persons required to transplant paddy into it, the number of bundles of paddy plants required to transplant it, the amount of grain it produces or the number of oxen or buffaloes required to work it. Thus a very usual expression is the area sown with one basket of paddy. This is variously expressed according to the district reports as *tin-gye ta-din-gya*, *ta-din-kin*, *ta-gyaw-ga*, *ta-din-saik*, etc. A series of measures of area is arrived at by substituting for *din* (basket) in the above the names of other measures, *byi*, etc. The area varies of course with the grain and soil; paddy is, however, by far the most usual, and in this case the area is generally a little under an acre, though in Bassein it is stated as 4 or 5 acres according as the seed is broadcasted or transplanted, in the former case the area is known as *ta-din-gye*, in the latter as *pyo-ta-din-saik*. In Yamèthin the *ta-din-gye* has become sufficiently definite to be used in documents regarding land.

When the area depends on the number of persons required to transplant paddy into it, the expression contains the word saik, thus, *ta-yauk-saik* means the area that can be transplanted with paddy in one day by one person, and which appears to vary from $\frac{1}{5}$ to $\frac{1}{3}$ acre. This form of measure appears to be most common in Upper Burma and the most northern districts of Lower Burma.

Expressions for area containing the word *pyo*, usually depend on the number of bundles of paddy seedlings required to transplant it with. Lower Chhindwin gives the word *pyo* as used to indicate in this connection an area of

$\frac{1}{150}$ acre, while Mandalay reports the expression *pyo-win* as meaning the same. *Pyo-ta-ya-win* and *pyo-nga-se-win* denote the areas transplanted with 100 and 50 bundles respectively, which areas are stated as $1\frac{1}{2}$ acres (in Kathai) and $\frac{1}{4}$ acre (in Myingyan) respectively.

Tin-dwet means the area producing one basket of paddy, and is reckoned as $\frac{1}{40}$ acre in Bassein, *Ta-ya-dwet* means the area producing 100 baskets, and is 5 acres in the case of juar in Pakokku. In Yamèthin the expression is *ta-ya-gin* and the area 2 acres.

Lastly we have expressions dependent on the ploughing power of cattle, and here there appears to be confusion between the area that can be worked for the season by a pair of plough animals (*nwe* denotes bullocks and *kywé* buffaloes) and the area which such a pair can plough in one day; the same expression appears sometimes to denote the one and sometimes the other. Thus *nwe-ta-shin* in Bassein means an area of 8 acres and in Katha of only $1\frac{1}{2}$ or in Myingyan of 4. *Kywe-ta-shin* means 30 acres in Myaungmya and only 10 in Yamèthin and yet all appear to mean the area ploughed by a pair of oxen or buffaloes. Tharrawaddy gives the expression *tatondun* (literally the area that can be worked with one plough) as of the same meaning and implying an area of about 7 acres, while Pegu uses *ton dwin* as representing 10 acres.

The foregoing shows that there are no definite Burmese areas of land, and the ease with which the acre and dathma system is spreading shows that some definite measure was clearly wanted.

Measures of capacity (dry).

11. *Measures of capacity (dry).*—There is but one table of these measures throughout the whole of Burma with very trifling exceptions. These exceptions occur in Akyab, Kyaukpyu and the Shan States. In Akyab and the Cheduba Township of Kyaukpyu the basket used is approximately half that used elsewhere in Burma, and subdivisions appear to differ from those in force elsewhere. In the Southern Shan States (Taunggyi) the pyi is said to be the same as the seit, *i.e.*, to be one-fourth of the basket; instead of the usual $\frac{1}{16}$.

12. *Basket in Burmese times.*—Though the table of measures is thus uniform the capacity is very far from being so. The origin of the tin or basket appears to have been the largest measure that a man could conveniently carry and in this connection it is of interest to note that the objection to an 8-gallon basket in Akyab is that it would be too heavy for the Arakanese cooly to carry while in Bassein it is objected that if the present basket were reduced to this size there would be loss of labour as the men at present carry more. As a more definite origin it is said that the lamè represents two handfuls, or the pyi $1\frac{1}{2}$ visses, of white rice. The Burmese Government appears to have made attempts from time to time at standardizing the basket and also appears to have had an official basket one pyi ($\frac{1}{16}$) larger than the ordinary basket. The British Government has more or less recognized as the standard basket one of 9-gallons capacity, and this is used in Settlement Reports, and for calculations of outturn, other baskets being expressed in terms of this.

Rice-millers' basket.

13. The rice-millers of Rangoon, Bassein and Moulmein use a combination of measure and weight for purchasing paddy. The baskets actually used in Rangoon and Bassein are as a rule cylindrical, $24\frac{1}{2}$" to 15" in height and $14\frac{1}{2}$" to 15" in diameter. One or other of these baskets is taken to measure the paddy which usually comes in by boat, and every now and then a basket is weighed, the usual proportion being 5 or 6 per 10,000. The price is fixed per 100 baskets of 46 lbs. with the proviso that $2\frac{1}{2}$ per cent more shall be paid for every pound the average basket weighs in excess of 46; while if the average weight turn out less than 46 lbs. a deduction of that amount or of 2 per cent is made in the price for every pound short.

A good deal obviously depends on the size of the basket adopted, and that the method is far from being really satisfactory appears from the

experience of certain cultivators of Pakokku who, having previously weighed their paddy under the supervision of the local Co-operative Credit Society, sent it to Rangoon where it was measured in the usual way with the result that their 50 lbs. baskets were said to be of only 47 to 48 lbs. and paid for accordingly. It is interesting to note that a very similar system was formerly employed by the growers in rural areas near Delhi in disposing of grain to wholesale purchasers, but has "fallen into desuetude in the course of the past few decades on account of its roughness".

14. For all other articles of export, rice and 'offals', beans, peas, millet and maize, definite weights are fixed as the recognized basket and purchases for export are really by weight pure and simple, the consignment being weighed and converted into baskets at these rates.

Rural baskets.

15. The baskets in ordinary country use vary greatly; as a rule they are smaller than the 9-gallon basket, but occasionally even larger, and are not often smaller than 8 gallons. A larger basket tends to be used for lighter and more bulky produce, though this is not a certain rule, and baskets tend to grow as the place gets nearer a trade-centre. They vary according to the quality of the paddy and the freight from the place at which the paddy is purchased to the place of export, and on the state of the market. But these reasons do not explain all the variations which appear to be largely a matter of pure chance; every village has its own 'standard' basket used in dealing with brokers and occasionally two or three if it be a large one.

Of all places the basket appears to be most variable in Taungdwingyi in Magwe, where the basket for ground-nuts is said to vary from 20 to 40 lbs., while expressed in pyis based on an approximately standard basket, the baskets in use there and in the adjoining subdivision of the Yamèthin district (Pyinmana) vary from 8 to 20. Myingyan reports variations to the extent of 2 pyis each way. Such great variations appear, however, to be unusual, and in general they are comprised within the limits of one pyi each way, *i. e.*, 6¼ per cent more or less, with, as already noted, a tendency to being generally distinctly under the Government 9-gallon basket.

As a means of trade they are obviously a somewhat unsatisfactory measure, and the remark of Lim Shwe Lu, a Chinese broker of Rangoon, that "it is difficult for me to say whose measure is the correct one" is decidedly *a propos*. Frequently brokers take their own measures with them when purchasing paddy. It is in fact well called "a measure of agreement".

Variations of the pyi.

16 The variations of the *pyi* are also considerable. Thus in the bazaar at Pegu pyis were found in actual use such that of the largest 9 and of the smallest 16 went to the same sized basket. This is the usual measure used in retail trade. Of the other measures of the series the most used is the zalè. But the whole of the series from basket to lamè with the exception of the hkwet are in practical use to a greater or less extent, while a 1½-basket measure is occasionally found.

Other names of measures.

17. As regards terminology, the names are often at first sight to the person not acquainted with Burmese obscured by the prefixing of the particle *ta* meaning 'a single' thus *ta-pyi* which is corrupted into *tubby*. Also the word *taung* meaning basket in the sense of receptacle, is often added, thus we find *tin-taung* to denote the basket.

Attempts at standardizing the basket.

18. There do not appear to have been any particular efforts made to popularize the standard 9-gallon basket, the only one mentioned is in Amherst where it is said that it has been "standardized" 15 or 20 years ago, but not to much purpose. The pyi has received more attention and is

tested and stamped in some municipalities, *e.g.*, Moulmein, Myingyan, Pegu and Rangoon.

Other measures.

19. Among other measures may be mentioned the Akyab basket of 12 seers and the Kyaukpyu one of about 5 gallons. At Victoria Point in Mergui the kerosene oil tin (4 gallons) has become a recognized measure under the name of *catan*.

Measures of capacity (liquid).

20. *Measures of Capacity (liquid).*—There are practically no true measures of liquid capacity. The only instances of a liquid being sold otherwise than by weight are kerosene oil (by the bottle) and toddy (by the *myu-o*), details regarding which are given in the statement. A series of measures, which, however, are really little more than weights, is reported as used in Akyab, but mainly by Indians.

All liquids (save kerosene and toddy) are sold in Burma by weight, vessels made to hold a definite weight being used for convenience, it being always open to the purchaser to have the amount checked by actual weighment; or he is pacified by "having a little extra added". These measures are named according to their content; thus we have the *hsa-beittha-winde-o*, meaning the '10-viss-capacity-pot', contracted to *se-win-o* or '10-capacity-pot'. Similarly we have the *peiktha-win* or 'viss-capacity' the *hna*, *thon* and *nga-peiktha-win* or the 'two three or five viss capacity', and the *nga-se-tha*, literally 'fifty piece', meaning fifty tikals or half a viss, and the *aseitha* for the quarter viss and so on. Myingyan complains of false measures. Pakokku reports the names *hmok* and *chin-o* as general terms for measures of 1 to 100 tikals and 1 to 5 visses respectively. Toungoo mentions a measure the *bon*, *tabon* or *hna-bon* as containing about 10 visses of oil, but adds that it is not a measure in reality.

British imperial liquid measures are used to a small extent in a few of the larger places and for special articles, *e.g.*, for linseed oil, turpentine and varnish, and also to some extent for milk in Rangoon.

Measures of cubic content.

21. *Measures of cubic content.*—The Public Works Department uses British cubic measure, and the timber trade a ton of 50 cubic feet for timber, the Forest Department using also special tons of 120 and 216 (the cubic *lan* or fathom) cubic foot for firewood. The 50 cubic feet ton is almost universally used, even in exporting timber to metric countries. The usual measure for earthwork is *sadram* or *kyin* of 100 cubic feet.

The only indigenous method of measuring cubic capacity is that which gives the result in *athas*. In brief it is a rule of thumb measure which gives the content of logs approximately 12 cubits long which do not taper appreciably by measuring the half-girth at a distance of 3 cubits from the thick end, in a scale bearing a direct ratio to their value. The atha is more or less the content of a log of this length the half-girth of which is 8 sok. The sok is one-fourth of the cubit, which is usually the Mandalay cubit of $19\frac{1}{8}$ inches. There is a method also for correcting for longer or shorter logs.

Inspection of weights and measures.

22. *Inspection of weights and measures.*—A certain amount of supervision is exercised over weights and measures in some of the places visited. Akyab, Bhamo, Henzada and Sagaing, however, report no action of any kind. In Moulmein, the use of prescribed weights is required, and a system of checking and stamping of viss and tikal weights has recently been introduced, though stamping is not insisted on. In Bassein, the viss and tikal weights, the yard and pyi are tested by comparison with standards at a charge of half an anna each, but the use of stamped or tested weights is not insisted on. In Magwe and Myingyan, the use of prescribed weights is required, and standards are kept. The bazaar goungs do some testing, and prosecutions follow serious shortages. The same is done in Taungdwingyi. In Myingyan, some

stamping is said to be done by the Municipal staff but there is no insistence on stamping. In Mandalay, checking only is done in the Zegyo bazaar. There is no stamping and nothing is done elsewhere. In Pegu, the use of prescribed weights is required, and weights and measures are checked and stamped on application. Rangoon has a more complete set of by-laws and supervision is more complete.

ASSAM.

Measures of weight.—In Assam, trade in all ordinary commodities is generally done in the seer of 80 tolas. It is divided into 16 chataks and 40 seers make one maund. A chatak is also divided in some places into 4 kachas. In some districts, other tables of weights based upon different seers are also in use. For instance, in Cachar, a seer of 82 tolas is sometimes used for trade in ordinary commodities, and potatoes and onions are said to be purchased by traders by this seer and sold by the seer of 80 tolas. In Goalpara, a seer of 60 tolas used in some parts of the district in all trade in ordinary commodities. This is known as the kachha seer. In Kamrup district, a seer of 84 tolas is used by marwaris and petty traders in purchasing jute, lac, pulses and mustard. In Sylhet, various seers are in use of the following weights :—

Measures of weight.

76, 80, 82, 82$\frac{5}{8}$, 86, 90 to 105, 100, 110, 120 tolas ; a seer of 82 $\frac{5}{8}$ tolas appears to be widely used in wholesale trade in certain articles, the same articles being sold retail by the seer of 80 tolas, the other seers are used for particular commodities ; for instance, the seer of 90 to 105 tolas is used for purchasing ghi in the interior of the district. In Habiganj subdivision a panseri of 5 seers and a botha of 3 maunds are also in use. In Cachar district, special maunds are reported of 80 lbs. in tea gardens, 90 lbs. for lime and 102 lbs. for limestone. In Sylhet, there are special maunds of 90, 92, 102 and 112 lbs. for unslaked lime, laterite stones, limestone at chattah and limestone at the quarries, respectively. Avoirdupois weights are reported as used by European firms and for certain commodities in Cachar district, and for corrugated iron, machinery and iron building materials, tea, preserved butter, imported liquors in Sylhet, as well as in Railway and steamer offices and tea-gardens in the latter district. English apothecaries' weights appear to be used for English medicines, drugs, etc., throughout the province. Indian medicines are sold by a seer of 64 tolas in Cachar and Sylhet districts. In Sylhet kabirajis also use seers of 60 tolas and 102 tolas. In Sibsagar district Kabirajis use the following table :—

4 dhans	...	...	...	=1 ratti.
10 rattis	...	...	...	=1 masha.
8 mashas	...	...	...	=1 tola.

The kabirajis' weights in other districts have not been reported. The tola of 180 grains appears to be used throughout the province for weighing gold, silver and jewellery, and also for opium and ganja. The tola is generally divided for purposes of gold, silver and jewellery into 16 annas and the anna into 6 rattis. In Darrang and Kamrup, 4 annas make one masha. In Goalpara and Sylhet, 4 dhans make one ratti. In part of Sibsagar district, 5 new or 6 old rattis make one anna and 4 annas make one masha, 4 mashas make one tola or bhari. In other portions of the district, 8 rattis=1 masha, and 12 mashas =1 bhari.

2. *Measures of length.*—The ordinary table of measures of length in use in Assam except in the hills appears to be :—

Measures of length.

3 angulis	...	...	...	=1 girah ;
4 girahs	...	...	...	=1 bighat ;
2 bighats	...	...	...	=1 hath, and
2 haths	...	...	...	=1 gaj ;

the gaj being generally 36 inches. These measures are used for cloth, timber, etc. In Cachar, a special yard of 48 inches divided into 16 girahs is used by tailors. In Sylhet a hath of 15 inches is reported to be used for cloth and a hath of 16 inches for Jarul wood, etc. English linear measures are reported as in use for general purposes in several districts. In Darrang, a kros is 2 miles and jojan is 4 kroses. Special measures are used for wood and logs in certain districts, *e.g.*, in Goalpara a *dhon* of 4 or 5 cubits, a *ghuni* of 7 or 8 cubits, a *gorl* of 11 cubits, a *dhakal* of 12 cubits and a *dasti* of 14 cubits; in Sylhet, a *ber* of 18 inches in the Sadar subdivision and the following table in the Habiganj subdivision :—

16 chataks ...	...	...	...	=1 mut ;
12 rekhs ...	...	...	...	=1 mut ;
2 muts ...	...	...	...	=1 cubit ;

the cubit being about $17\frac{7}{8}$ inches. Various measures are reported as in use for surveying land. In Cachar, a *nal*, which is not defined, is used. In Kamrup, a *tar* or *nal* of 8 cubits or 4 yards ; in Sibsagar, the *bighat*, the cubit, and the *bes*, *tār* or *nal* of 8 cubits ; and in Sylhet, a *kahon*=2 *nals*, the *kahon* varying from 6 to 8 cubits in different parts of the district ; the *kahon* of 6 cubits (18 inches) is said to be used in tea-gardens while the ordinary *nal* is six cubits of $21\frac{5}{8}$ inches each. In the Garo Hills, the cubit and yard and English linear measures are used for all purposes. In the Khasi and Jaintia Hills—

8 girahs ...	...	...	...	=1 pruh ;
2 pruhs ...	...	...	...	=1 kot ;
3 khups ...	...	...	...	=1 ida. ;

the *pruh* being 18 inches and the *ida* 9 inches. These are used for cloth, timber, etc. For measuring land, the *dung* or rod of about 4 yards is used for wet fields. In the Lushai Hills the *tong* or cubit and *lam* ($3\frac{1}{2}$ cubits) are used for general purposes ; for distance, a *ting* of about $\frac{1}{5}$ of a mile is used while the height of animal is measured by the *shum* or fist, 5 or 6 being generally equal to a cubit.

3. *Measures of area.*—The principal measures of area throughout the province is the bigha or 1,600 square yards. This is usually combined with the following table : 20 lessas=1 katha, 5 kathas=1 bigha, except in Cachar and Sylhet where 4 karas=1 ganda ; 20 gandas=1 pan ; and 16 chataks=1 katha; 20 kathas=1 bigha. These measures are used in Government, Survey or Settlement records except the kara and ganda. English square measures are used in tea gardens in Cachar and also in Kamrup, Khasi and Jaintia Hills and Sylhet. In Cachar and Sylhet, the following table is also used :— 4 karas =1 ganda; 20 gandas=1 pan ; 4 pans=1 rak ; 4 raks=1 jaishtha ; 7 jaishthas=1 pao ; 4 paos=1 keyar ; 12 keyars=1 hal.

Measures of area.

In Cachar, 20 tils=1 kan ; 4 kans=1 kara ; and in Sylhet, 3 krantis=1 kara ; 3 keyars=1 chok. The rekh is a square nal. In Cachar the nal is $7\frac{1}{2}$ haths of 18 inches. In Sylhet, it is supposed to be 7 such rekhs, but it varies from 6 to 8 cubits, a cubit varying also from 18 to 22 inches. In sub-letting land on rent in Cachar, the keyar is taken to be $1\frac{1}{2}$ of the keyars as just defined. In tea-gardens in Cachar, land is measured by the square nal, a nal being 4 yards. In Kasi and Jaintia Hills a mong of 500 square yards is used in certain upland tracts in calculating the hire of labourers for ploughing, etc. No measures of area are used in the Lushai Hills and no information is available regarding the measures of area in Naga Hills.

4. *Measures of capacity (dry).*—Trade in rice, paddy, pulses, linseed, etc., is usually carried on by measures of capacity. These are generally baskets made of cane or bamboo. They are used heaped but the diameter of the same kind of measure is not constant. The measures vary from district to district

Measures of capacity (dry).

in name and also in capacity. The katti or katha holds 2⅛ seers (80 tolas each) weight of rice in Cachar; ⅛ a seer of paddy in Darrang; a ¼ seer of rice in Kamrup; about a lb. of rice in Nowgong; and 2½ seers of rice in Sibsagar. In Darrang, the done holds 2 seers of 80 tolas each weight of paddy; in Garo Hills, 440 tolas of water; in Goalpara 400 tolas of rice; in Kamrup 3½ to 8 seers of rice; in Lakhimpur 4 seers; in Nowgong about 10 lbs.; in Sibsagar, 5 seers of rice. In Darrang, a dhol=10 dones and holds 20 seers weight of paddy. In Garo Hills in retail trade in rice, pulses, wheat, etc., 40 tolas make a maund, but in retail trade in paddy, 80 tolas make a maund. The former tola holds 76 tolas of water and the latter 420 tolas of water. In Goalpara 40 tolas make a maund in trade in paddy, pulses, til and linseed and 24 tolas make a maund in trade in mustard-seed. In Sibsagar the following table is used:— 3 mutts=1 katha; 2 kathas=1 seer; 5 seers= 1 done; 3 dones=1 pura. In Sylhet, 4 seers=1 pura; 4 puras= 1 pali; 8 palis=1 katha; and in other parts of the district, 4 palis=1 bhota or bhar and 16 bhars=1 paila. In another portion of Sylhet district, 4 seers=1 pura, 4 puras=1 katha and 20 kathas=1 bish. In Kamrup, Goalpara, a dang containing 5 seers of cotton is used in certain places for trade in cotton. In Khasi and Jaintia Hills, the following measures are used:—ukhri, (originally made so as to contain a man's head) pyrha (said to hold 5 seers of water), and ushang (holding 50 seers of water), the latter being used for potatoes only. In Lushai Hills a dorun or am, holding about 20 to 30 seers of paddy, is used for rice and paddy trade.

5. *Measures of capacity (liquid).*—Retail trade in milk, oils, curds, ghi, etc., appears to be really carried on by weight in Assam, but for purposes of convenience vessels are used which hold specified weights of the commodity sold. These weights are usually based upon a seer of 80 tolas, the vessels consisting of pieces of bamboo called chunga or earthenware pots or tins. These measures are said to be used for kerosene oil also in Goalpara, Kamrup, Nowgong and Sylhet and Lushai Hills districts. In Sylhet, chungas holding 30 tolas of dahi (curds) and 45 tolas of milk are used in Habiganj. Lotas holding 40 or 45 tolas of milk are used in the same subdivision, milk being sold in that subdivision by the seer of 60 tolas. In other places in Sylhet district, ghi is sold by the seer of 96 tolas, in other places 82 tolas and in others again of 90 tolas. The English apothecaries' fluid measures are used for medicines in the various parts of the province.

Measures of capacity (liquid).

6. *Measures of cubic content.*—English cubic measures are generally used in Assam when measures of cubical contents are required. Sometimes the measures are given special names for special commodities, *e.g.*, for pruh of about 2¼ cubic yards for firewood; a ghup of about 15¾ cubic yards for cut stones; a khum (a bundle) for thatching grass and reeds and a khop (a conical basket) for cow-dung, etc., in Khasi and Jaintia Hills. A thak of 180 cubic feet for firewood in Lakhimpur and a fera for lime and surki and a koohas in Sylhet.

Measures of cubic content.

NORTH-WEST FRONTIER PROVINCE.

Measures of weight.—The use of the 80-tola seer, frequently known as the British seer, is practically confined to the Hazara district, the railway and the various Cantonments. In Hazara it is used to a considerable extent for ordinary purposes. The ordinary seer of the province is one of from 100 to 105 tolas, the seer in Peshawar being apparently slightly larger than that in the trans-Indus districts. This seer is subdivided into 16 chataks (sometimes known as sharak) as usual, but the chatak is divided into 4 sirsahis and not as a rule into 5 tolas, though the tola is known and as a rule deemed equal to the rupee in weight, but for gold a larger tola is as usual used. The original Peshawari seer appears to have been of 102 Doadzashahi or Nanakshahi rupees, the two coins were apparently of equal weight and are reckoned as equal to 12 mashas, while the ordinary rupee of 180 grains is regarded as 11½ mashas.

Measures of weight.

Whatever the origin, however, the equivalent of the seers now in use in Government rupee is well-known.

The weights in actual use are in the larger towns (Peshawar and Dera Ismail Khan) usually locally made of iron, being square, octagonal or polyhedrel, and usually bear nothing to indicate what they purport to be. Better weights are found with some goldsmiths. The usual sizes include 5, 4, $2\frac{1}{2}$, 2 and 1 seer, 8, 4, 2, 1 and $\frac{1}{2}$ chataks and the sarsai, all based on weights of 9, 6, 4, 3, $1\frac{1}{2}$ mashas and of 10, 5, 2, 1, $\frac{1}{2}$ and $\frac{1}{4}$ tolas; many of these are made of pieces of china or buttons rubbed down to the right size. For weighing bulks and cheap articles such as fireworks, palm leaves, etc., stone weights are often used. The Kabul seer is said to be about 157 tolas.

2. *Measures of length.*—The most widely used indigenous measure appears to be the Peshawari gaz of 38 to $38\frac{3}{4}$ inches. This is still common throughout the province except in Dera Ismail Khan, though it is being replaced gradually by the British yard, which in Peshawar is reckoned as equal to 15 girahs, *i. e.*, $\frac{15}{16}$ of the Peshawari yard. In Hazara the British yard has come into use to a larger extent than elsewhere, and it is fairly well-known in Bannu and Dera Ismail Khan. Hazara and Peshawar also report a smaller yard of about 34 inches known as the Mi'mari gaz, and used for carpentry and building. This is probably the Imarati gaz of elsewhere.

Measures of length.

The *morni* or crooked hath (described among the measures of length of the Punjab) is reported from Dera Ismail Khan. For purposes of land measurement a karam of 66 inches corresponding to the jarib (chain) of 55 feet is almost universally used.

3. *Measures of area.*—The ghumaon equal to one acre, and subdivided into merlas, kanals and sirsais as in the Punjab is the system of land measure used throughout the province. One or two local measures dependent on the quantity of seed sown are reported from Dera Ismail Khan and Peshawar, but the Government system seems to have displaced all such to a great extent.

Measures of area.

4. *Measures of capacity (dry).*—These are widely used throughout the province in all rural areas except the Peshawar district where their use is confined to the Swabi tahsil. In these areas they are used in practically all village transactions concerning grain though a preference for weights is shown in the larger towns and by Afghan traders in Dera Ismail Khan district. The units are practically always either the topa or the odhi or ozha, which are apparently much the same being used in different parts. The topa is found in Dera Ismail Khan and part of Bannu, its limits being from $3\frac{1}{2}$ to 15 seers of grain, usually wheat. The odhi or ozha is found elsewhere and varies between 3 and 16 seers. In Kohat it is known also by some tribes as the Kashra or Kasa, though it is alleged by others that these are different measures. The most usual limits of the contents of both measures seem to be between 4 and 6 seers of the prevalent grain, wheat, except in Hazara where it is maize. These measures are usually made of wood, circular round bottomed and with bulging sides. They are invariably used heaped (*makhruti* or *gandum*).

Measures of capacity (dry).

5. *Measures of capacity (liquid).*—The only district to report any liquid measures is Dera Ismail Khan where one of the dry measures (the *paropi* and its fourth part or *pan*) is used for measuring milk. Elsewhere liquids are sold by weight, measures known as palli in Peshawar constructed to contain certain definite weights (*e.g.*, in Peshawar 1, $\frac{1}{2}$, $\frac{1}{4}$ or $\frac{1}{5}$ seer) of milk being used. For country liquor and European liquid medicines British Imperial and Apothecaries' measures are respectively used. Kerosene oil is, as usual, sold in small quantities by the reputed quart and pint bottle.

Measures of capacity (liquid).

6. *Measures of cubic content.*—None have been reported save the British measures which are used by the Public and Military Works Departments.

Measures of cubic content.

7. Testing and correcting of weights and of measures of length and liquid capacity (for milk only) is done in Dera Ismail Khan under the executive orders of the Deputy Commissioner. The actual work is carried out by a blacksmith under the supervision of the Tahsildar; the fee usually charged is 2 annas for a set consisting generally of 1, 2, 4 and 8 chataks and 1, 2 and 5 seers; the British yard is also stamped. The district authorities at Peshawar considered but dropped the question of testing and stamping weights.

Testing and correcting of weights.

AJMER-MERWARA.

Weights and measures in force.—The weights and measures of this district are substantially similar to those of the United Provinces. The usual unit of weight is the 80-tola seer, and of length the British yard. The long hath of 21 inches to 24 inches is used occasionally but only in rural areas. Areas are measured by the bigha of 1,936 square yards (subdivided as in the United Provinces) which is the square of the jarib (chain) of 44 yards. Measures of capacity are little used only surviving in a few rural areas. The chief measure is the *manu* holding about $2\frac{1}{2}$ seers of grain. Of measures of liquid capacity and cubic content there are none indigenous. The remarks regarding these measures generally applying to the United Provinces (Chapter IV, U. P. 12 and 13) apply here.

Weights and measures in force.

2. *Actual weights used.*—The weights in actual use in the towns and larger villages are usually of iron, round for weights below 5 seers, and square in the case of larger weights; they are made locally. The poorer classes frequently use stone weights, especially for cheap and bulky articles, such as grass or wool.

Actual weights used.

3. *Stamping.*—Testing, correcting and stamping of weights is carried out under the executive orders of the Deputy Commissioner. A blacksmith is appointed who travels over the district under the ægis of the local authorities, testing, correcting and stamping weights at a charge which averages one anna per seer. This is done at varying intervals, about five years in Ajmer and annually in Beawar.

Stamping.

BALUCHISTAN.

Measures of weight.—The Railway weights are used throughout the province. A weight of 10 seers, called *dhadi*, is also used in the Bolan Pass and Sibi districts. In Fort Sandeman Bazaar (Zhob district) $2_1^1{}_6$ lbs. are reckoned as one seer.

Weights.

The variations in the maund are comparatively very few in this province. In Quetta town and in some villages in the neighbourhood, a maund of 100 lbs. is used for the purchase of commodities like coal, firewood, fodder, etc., by and for the Commissariat Department. A Kandahari *man* or maund of 45 Railway seers is used for ghi, oil, wool, dry fruit, etc., in the Chaman, Pishin and Killa Abdula Bazaars. In Quetta town which is less unsophisticated and where the population is more mixed than in the rest of the province, there are special maunds for various commodities, such as a maund of 45 railway seers for dry fruit.

British avoirdupois weights are generally used by the Commissariat Department for buying food stuffs, etc. Apothecaries' weights are used in all hospitals, dispensaries and by chemists.

For weighing gold and silver and for Indian drugs, the standard tola of 180 grains is used. Weights smaller than the tola for these articles are—

8 rice or *mung* grains	...	...	...	= 1 ratti.
8 rattis	...	...	...	= 1 másha.
12 máshas	...	...	...	= 1 tola.

It will thus be seen that the system of weights in the whole province is remarkably simple. Another noteworthy fact is the celerity with which a simple system like that of the Railway weights has been established in Quetta town. This system was introduced by executive order in 1891, before which period a variety of weights was in use, the principal one being a seer of 90 tolas. A primitive kind of steel yard is still used in the interior of the district. A man's load is called *bharota* and a bullock load *lad* or *gonda* in some places. In the Quetta-Pishin district a camel load is called a *langar*.

Measures of length.

2. *Measures of length.*—The British yard, divided into 16 girahs, is used throughout the province. The hath or forearm measure, varying from 18″ to 20¾,″ is also used. In the rural areas of Quetta-Pishin, Chagai and Zhob districts, the Kandahari gaz of 40½″ to 42″ is also used. This gaz is divided into two haths and a hath equals two *lwists*. The Kandahari gaz is generally used in dealing with tribesmen, who prefer using their forearm as a measure, *i.e.*, from the elbow to the tip of the middle finger and back to the second knuckle. These measurements are also used for measuring *karez* which is an underground tunnel with shafts at regular intervals, for irrigation purposes. A pace measure, which is called *danga* and considered equal to 40½″, is also used for measuring *karez*, and land under *karez* irrigation.

In Quetta town merchants from Meshed and Siestan use the Meshed gaz which is shorter than the Kandahari gaz by one-twentieth.

Measures of area.

3. *Measures of area.*—The acre is used by the Settlement Department throughout the province and is divided in the Bolan Pass and Chagai and in a part of the Sibi districts into 2 *jaribs* or 10 *gunthas*.

Irrigated land is measured by the amount of water supplied thereto, and the quantity of water is measured by the flow for a number of hours. Thus, the term *shabanaroz* means an area requiring flow of water for 24 hours.

In the Loralai district the area of unirrigated land is estimated by the time in which it can be ploughed. Thus, a *jora* means an area that can be ploughed in 12 hours, *yavgi* means an area under one plough. In and about Quetta town British measures are used. Area under one plough is called *jora* or *kolba*. In the Zhob district, *yavgi* represents an area that can be ploughed by a pair of bullocks in one day or that has a seed capacity of 10 or 12 seers of wheat.

Measures of capacity (dry).

4. *Measures of capacity* (*dry*).—The simplicity of the system of weights does not extend to measures of capacity for dry articles. These vary from district to district, and in different parts of the same district, and the greatest diversity obtains in the Loralai district. In the Quetta-Pishin and Zhob districts, the most common measures are —

2 pinkis	...	...	...	= 1 manga.
2 mangas	...	...	...	= 1 topa or chothra.

The measures above the *topa* in the Bolan Pass and Chagai districts are 1⅞ topas = 1 yakhman and 2 yakhmans = 1kasa. The measure most generally used in the province is the *kasa* the capacity of which varies from 3 to 7 seers of wheat. All measures are used heaped. *Lap* represents a fistful of grain in a part of the Loralai district, and a handful in the Zhob district, a handful in Loralai being called a *buk* or *mangul*.

Grain is sold by measure throughout the province except in the Quetta-Pishin district and in Fort Sandeman Bazaar and rural shops in the Zhob district.

5. *Measures of capacity (liquid).*—In the Quettta-Pishin, Chagai and Zhob districts the measures generally used are—

Measures of capacity (liquid).

2 kurwais, kuros or charyaks	...	= 1 nim-wuzhai or yakhmani.
2 nim-wuzhais	... ...	= 1 kasa or man.

In the Bolan Pass and Sibi districts the principal measures are—

2 salorams	...	...	...	= 1 manga.
2 mangas	...	...	...	= 1 path or chothra.
4 paths	...	...	...	= 1 kasa.

The *kasa* is made to hold 3 to 5½ seers of wheat. In Quetta town and Fort Sandeman Bazaar (Zhob district), a seer to hold 80 tolas of milk and 80 tolas of water, respectively, is used. In the Zhob district, any vessel is turned into a *kasa* for milk, the space occupied by a *kasa*-ful of wheat by the dry measure being marked.

6. *Measures of cubic content.*—British measures are used for measuring timber, etc., in Quetta-Pishin and Chagai districts and in Fort Sandeman Bazaar. There is evidently not much use for these measures in the rest of the country.

Measures of cubic content.

7. No weights and measures are stamped. The Excise Department has prescribed measures for liquor shops. Weights and measures are inspected by the Police and local Magistrates and in the markets where the Railway weights have been prescribed by executive orders the use of unauthorized weights is strictly prohibited.

Stamping and inspection.

DELHI.

Measures of weight.—The weights and measures of Delhi are quite similar to those in use in the neighbouring portions of the United Provinces and the Punjab. The basis of the weights in use is the 80-tola seer. Jewellers' weights as might be expected are elaborate and various. The gold tola is usually 181·9 grains or the weight of one rupee *plus* one ratti. A special tola of one rupee *plus* two rattis is used for gold and silver lace, while for precious stones a separate table based on a ratti of $2\frac{1}{16}\frac{3}{6}$ grains of 1½ times the ordinary ratti is used. Two old tables of medicine weights have also been reported.

Measures of weight.

2. *Other measures.*—For length the British yard is the usual basis, though the Imarati (katai or milmari) gaz of 32″ to 33″is used. Areas are measured by the usual 3,025 square yards bigha. Dry measures of capacity have almost disappeared but are still used to some extent in canal areas and there are no indigenous measures of liquid capacity or cubical content, the British measures being used where necessary in the way usual in the United Provinces and the Punjab. Liquids are really sold by weight, measures being made for convenience sake to hold certain definite weights of the article concerned. If a customer has any doubt of the correctness of the measure it is the recognized custom to check this by weighing.

Other measures.

3. There is no system of testing and checking weights in force though the Municipality have had under consideration the introduction of by-laws on this subject. Some witnesses estimate that about 5 per cent of the weights actually in use are seriously inaccurate.

Inspection.

COORG.

Measures of weight.—The principal table of weights in Coorg for ordinary commodities is 40 seers=1 maund. The Commissioner reports that the seer is 27½

Measures of weight.

tolas and the maund is 27½ lbs., the lb. being taken as equivalent to 40 rupees. Merchants of Mercara and the First Assistant Commissioner report the use of a maund of 28 lbs., *i.e.*, 1,088 $\frac{8}{9}$ tolas, the maund of 40 seers of 27½ tolas being 1,110 tolas In retail trade in metals such as gold, silver, copper, brass, etc., the seer is 24 tolas and in the sale of mutton it is 84 tolas. The First Assistant Commissioner reports that a new weight of 1¼ maunds regarded as equal to 50 seers has been recently introduced for use in connection with coffee, in order to agree with the weights in Kottayam taluq of the Malabar district in the Madras Presidency. Commodities are sold by the pound or rathal when customers desire it. Jewellers use the following table throughout the province :—

6 grains = 1 fanam; 9 fanams = 1 varaha; 3⅓ varahas = 1 tola; 80 varahas = 1 seer. Virajpet goldsmiths use the following table: 4 ganjis = 1 hana; 9 hanas = 1 varaha; 3⅓ varahas = 1 tola.

2. *Measures of length.*—English measures appear to be used in Coorg for measuring cloth, distance, etc., but the foot is called adi, the yard, gaj; the half yard, mola; and 2 yards = 1 maru; 3 miles = 1 haradari; 4 haradaris = 1 gavuda. A kole of 28 inches is used for measuring timber when dealing with Malayalis.

Measures of length.

3. *Measures of area.*—In Coorg, the area of land is expressed in acres and cents, the cent being $\frac{1}{100}$ of an acre. Formerly, the area which yielded 80 seers of paddy was called a *bhatti* but this measure is now obsolete, 100 *bhattis* of land being regarded as equivalent to 3 acres.

Measures of area.

4. *Measures of capacity (dry).*—Grains are sold by measure in Coorg. The table of measures of capacity is—16 chataks = 1 seer; 2 seers = 1 hani; 80 seers = 1 batti; 100 seers = 1 palla; 120 or 160 seers = 1 kandaga. There are two definitions of the seer; one that it holds 80 tolas of second sort rice heaped and the other that it contains 80 tolas of nine different kinds of grains mixed together in equal proportions; but the Commissioner reports that both these definitions are misleading and that on experiment the seer was found to hold 83⅓ tolas of second sort rice. In measuring paddy and cherry coffee, a Malabar measure called para of 8 to 12 seers is used.

Measures of capacity (dry.)

5. *Measures of capacity (liquid).*—Oils, ghi, toddy, honey and milk are dealt with in Coorg by the same seer that is used as a measure of capacity for grains, *i.e.*, a seer which nominally holds 80 tolas of second sort rice when heaped. Arrack is sold by English measure and kerosene oil by gallon and bottle.

Measures of capacity (liquid).

6. *Measures of cubic content.*—A cubic foot is used as a measure of cubical contents in Coorg.

Measures of cubic content.

BANGALORE (CIVIL AND MILITARY STATION).

Measures of weight.—In Bangalore, the local seer weight = 24 tolas. It is divided into 16 chataks and also into 8 palams; 5 seers = 1 viss; 2 visses = 1 dadiyam; 8 visses = 1 maund; 8 maunds = 1 pothi; 20 maunds = 1 candy.

Measures of weight.

These weights are used in retail sale of all commodities except meat, iron, flour, sugar, bread, etc., which are sold by the avoirdupois weight, and rice, grains, pulses, oil-seeds, etc., which are sold by measures. The Committee found that grocers in the Bangalore Bazaar kept both lb. and local seer weights and used either as desired by a customer. In wholesale trade in certain articles, the maund is 42½ seers. There are also other special maunds varying from 45 to 50 seers of 24 tolas each and others varying from 25 to 35 lbs. avoirdupois. Gold is sold by the varaha (which is regarded as $5\frac{26}{27}$ tola) and silver by the tola.

2. *Measures of length.*—English linear measures are used for all purposes in Bangalore.

Measures of length.

3. *Measures of area.*—The area of land is expressed in terms of acres and guntas, the gunta being 121 square yards.

Measures of area.

4. *Measures of capacity (dry).*—The seer measure in Bangalore holds 84 tolas of cleaned ragi when fully heaped. It has a constant diameter. It is divided into 16 chataks. 8 seers = 1 marakkal ; 20 marakkals = 1 putti ; 4 puttis = 1 cart-load.

Measures of capacity (dry).

This is the usual table of measures for trade in rice, grains, pulses and oil-seeds. One witness states, however, that in wholesale trade, it is customary to allow 4 marakkals extra for each cart-load. Other measures are mentioned by witnesses such as a marakkal and a kolaga of 10 seers each, a palla of 10 kolagas, a candy of 2 pallas and a balla of 4 seers and various cart-loads but it is not clear whether these measures are actually used in Bangalore or only in the vicinity.

5. *Measures of capacity (liquid).*—Oils are measured by a viss of 5 seers, eleven seers of oil being regarded as one maund. Country liquor and kerosene oil are sold by English measures. The latter is also sold by the tin or bottle.

Measures of capacity (liquid).

6. *Measures of cubic content.*—Cubic foot is used for certain purposes. For lime, a measure called para is used; it is very nearly 50 Bangalore measures, but it is based upon inches.

Measures of cubic content.

NATIVE STATES.

Our instructions did not require us to consider the question of weights and measures in connection with the Native States; but as in the course of our inquiries we received certain information in this connection, and were specially requested by the Baroda Darbar to discuss it with their representatives it seems convenient to place on record the information received.

Action taken by Baroda.

A considerable number of witnesses from districts bordering on these States urged the great advantage to be derived from the adoption by the States of whatever system was adopted in British India. (See Chap. V, U. P. 19; M. 39; Bo. 2; N. W. F. P. 14; Aj. 12; and Ba. 15.) We were told action has already been taken in several States towards enforcing a uniform system. Thus in Baroda an Act to this effect has been passed and rules have been promulgated, and given effect to. The table of weights there is based on the 180-grain tola, but the 40-tola Gujarat seer (sher) has been adopted so that the seer and maund in Baroda are precisely half those in use on the railways. For length a gaj of 24″ has been prescribed, and for liquid capacity a measure containing one sher of water. The Darbar has specially urged the difficulty of the varying weights in use in the adjoining and interlacing parts of the Surat district.

2. In Gwalior, we understand there are regulations for enforcing the use of the 80-tola seer, but are not able to give full details. In Indore also, we believe the use of this seer is required to a greater or less extent. In Sampthar, a seer of 82 tolas is used, and weights are said to be annually checked at the capital of the State. Bhopal uses a 96-tola seer and weights are reported to be supplied through the Customs Department. We have reason to believe that action is under contemplation by some of the other Central India States.

Central India.

3. In Cochin, we were told that there are very stringent rules for the use of the 42½ tola 'pound', and that "the Cochin people would be glad to adopt whatever was ordered for British India".

Cochin.

PROPOSALS FOR ALTERATIONS IN COINAGE.

Proposals to alter coinage to give connection with British weights.

In connection with the proposal to alter the weight of the coinage with a view to facilitate the introduction of the British system we consulted the Mint Masters of Bombay and Calcutta to ascertain how the proposal might be viewed from their point of view, and though we have come to the conclusion that any such alteration is inadvisable we think it useful to place on record the result of these inquiries.

The proposals were six in number :—

(*i*) To reduce the weight of the rupee to 175 grains or $\frac{1}{40}$ lb. without altering its composition.

(*ii*) To reduce the weight of the rupee to 175 grains leaving the amount of silver unchanged.

(*iii*) To increase the weight of the rupee to $194\frac{4}{9}$ grains or $\frac{1}{36}$ lb. by addition of copper.

(*iv*) To increase the weight of the rupee to $218\frac{3}{4}$ grains or $\frac{1}{32}$ lb. by addition of copper.

(*v*) To reduce the weight of the one-anna piece from 60 to $54\frac{11}{16}$ grains or $\frac{1}{8}$ oz.

(*vi*) To raise the weight of the pice from 75 to $109\frac{3}{8}$ grains or $\frac{1}{4}$ oz.

Reduction of rupee to 175 grains; composition unchanged.

2 (*i*) From the minting point of view no objection was urged against reducing the weight of the rupee from 180 to 175 grains. There would be a slight saving in cost.

Reduction to 175 grains leaving amount of silver unchanged.

3. (*ii*) To reduce the weight of the rupee to 175 grains by reducing only the amount of alloy contained therein from 15 to 10 grains, leaving the content of silver as at present 165 grains. As regards this possibility we made considerable inquiries. To merely reduce the amount of copper in the rupee from 15 to 10 grains gave a coin too soft to stand wear, although the fineness (942·86) would be slightly less than that of the Dutch guelder (945). Accordingly some experiments were very kindly made by the Mint Master, Calcutta, with a view to find some other metal which might take the place of copper and produce a harder coin. Aluminium and nickel were tried but to no purpose and later in accordance with information received an alloy composed of 165 parts of silver and 5 of each of copper and zinc was employed. This was, however, found to be 47 per cent softer than the existing rupee. The only possibility, therefore, of making a rupee of hardness equal to the present coin and of the same intrinsic value would appear to be to add sufficient gold.

Rupee of 194⅘ grains.

4. (*iii*) To raise the weight of the rupee to $194\frac{4}{9}$ grains by addition of more copper. To this there is no minting objection, the extra cost is estimated at Rs. 102 per lakh together with a slight excess in the cost of carriage.

Rupee of 218¾ grains.

5. (*iv*) To raise the weight of the rupee to $218\frac{3}{4}$ grains by addition of more copper. This would reduce the fineness of the rupee to about 755, as compared with 750 the fineness of the subsidiary coinage in some countries; it is not considered that there would be any difficulty in minting. The extra cost is estimated at about 18 per cent, an increase which it is not thought likely to be counterbalanced by the increase in the wearing properties of the coin that would certainly follow on the increased hardness thereof. It is not thought that the colour of the coin would be substantially altered.

⅛ oz. nickel one-anna piece.

6. (*v*) To reduce the weight of the nickel one-anna price from 60 to $54\frac{11}{16}$ grains. To this there is considered to be no objection; the saving in so doing would be very slight.

7. (*vi*) To increase the weight of the pice from 75 to 109⅜ grains. From the minting point of view it is said that this would be an advantage, provided that the diameter were left unchanged, as the life of the die would be lengthened if it had a thicker piece of metal to work on. The increase in cost is estimated at about 13 per cent.

½ oz. pice.

8. The Mint Masters, however, point out that the legal remedy, *i. e.*, the maximum excess or defect in weight as compared with that prescribed, of the one anna and pice are $\frac{1}{40}$ as against $\frac{1}{200}$ in the case of the rupee, and that this would render them unsuited for testing weights. Experimental weighings of new annas and pice made by the Mint Master of Bombay showed, however, that only six anna pieces in 1,00,000 varied from the prescribed weight by as much as one grain; but that in the case of pice out of 15,396 weighed a "fairly large proportion" showed an excess or defect of over 2 grains, while 27 were in excess or defect by as much as 6 grains.

Remedy in weight of annas and pice.

CHAPTER V.—OPINIONS REGARDING A UNIFORM SYSTEM, BEING A DIGEST OF THE EVIDENCE THEREON.

N. B.—With a view to avoiding repetition the questions have been referred to by their numbers only as given in Appendix A.

UNITED PROVINCES.

Places visited and evidence received.

In these Provinces 10 districts, *viz.*, Agra, Aligarh (Hathras), Banda, Benares, Cawnpore, Gorakhpur, Jhansi, Kheri, Moradabad, (Chandausi) and Naini-Tal (Ramnagar) were visited by part or all of the Committee and written replies were received from Almora, Azamgarh, Bulandshahr, Etah, Fatehpur, Garhwal, Gonda, Jalaun, Mirzapur, Partabgarh, Saharanpur, and Sitapur. In all 113 written replies were received, which, however, represented more than 222 individuals as many replies were joint; of these 47 were from officials (21 from Europeans) and 66 from non-officials; 250 persons were examined orally, all but 7 in groups of from 2 to 20. The replies of several of the officials were the results of inquiries from large groups of petty traders.

A very considerable amount of interest was taken in this province more especially in Cawnpore and Gorakhpur, and almost every district officer asked to do so had clearly given his personal attention to the Committee's inquiries.

General desire for a uniform system.

2. There is practical unanimity in the desire for the uniform system of weights being enforced by Government. The Deputy Commissioner of Garhwal opposes it for Kumaon, but this view is not supported by the witnesses from Almora and a zamindar of Gorakhpur sees no necessity for it. Two Agra witnesses are very lukewarm and the Marwari Chamber of Commerce in Cawnpore does not favour action. The Collector of Bulandshahr suggests a uniform system to be used in all towns of 50,000 inhabitants, other areas being left to "use local standards". With these insignificant exceptions all opinions favour action.

System desired.

3. As to the system to be followed, opinion is nearly though not quite as uniformly in favour of the Indian Railway weights. There are, however, some important exceptions in favour chiefly of the metric system; chief of these is the Upper India Chamber of Commerce and a group of large traders in Cawnpore. The Chamber considers, though apparently by no means unanimously, that the metric system is both "politically and practically possible", and that it should be accompanied by a metric system of coinage based on the sovereign, a silver coin equal in weight to $\frac{1}{100}$ kilogramme and in value to $£\frac{1}{10}$ being struck. The metric system has some support from an Agra merchant who, however, does not think it "practical politics". A few Chandausi merchants more or less definitely recommend this system and two, somewhat doubtfully, in Gorakhpur; lastly it is supported by a few officials. The support from any persons really intimately acquainted with the mass of the people, the petty traders and the agriculturists cannot but be termed infinitesimal.

Opinion regarding British system.

4. Somewhat the same remark applies to the advocates of the British system, which is generally proposed in the form of the 2 lb. seer, combined as a rule with a reduction of the weight of the rupee to 175 grains or $\frac{1}{40}$lb. The chief advocates are the Collectors of Banda, Benares, and Moradabad, the Secretary to the Municipal Board of Chandausi and (though in a somewhat

lukewarm manner) a pleader of Gorakhpur. A certain number express a preference for the British system over the metric *if they have got to choose between the two*, and it is as a rule considered that its introduction would be facilitated by altering the weight of the rupee to 175 grains or $\frac{1}{40}$lb., though this idea of altering the coinage is almost invariably disliked, the dislike being always by reason of the confusion of weights likely to be caused thereby, and more often than not also on the ground that there will be suspicion of its value being diminished.

Opinion favours the Railway weights.

5. To sum up, the immense preponderance of opinion in this province is in favour of the introduction and enforcement by Government of the Railway weights as the one uniform system, and this opinion is almost as marked in those areas centring in Moradabad and Gorakhpur where the 80-tola seer is not the usual popular weight, as in the other parts of the province where it is so.

Measures of length.

6. As regards measures of length opinion is practically universally in favour of the 36″ being the unit, to be divided into feet and inches and also into 16 girahs each of 2¼″. Some even of those who advocated the metric system for weights thought it advisable to retain the yard in view of its present widespread use. The only other suggestions are 32″, 33″ and 38½″ yard. But these were not urged with insistence. A Cawnpore cloth merchant thought the abolition of special yards might do away with "trade secrets".

Measures of area.

7. For area, the Committee put forward the proposal that the use of the acre subdivided into hundredths should be aimed at being introduced where not already in use, at re-survey, and entries in the land records being made as regards each field both in this measure and in that in previous use. It was proposed that once this was done it should be required that areas in deeds and suits be required to be shown in acres and hundredths of an acre whether they were or were not also at the same time shown in the old measure. This proposal was very rarely objected to, and was generally thought likely to result in the introduction of the acre. The Collector of Banda suggested a bigha of 56 yard square, and he of Mirzapur the retention of the local bigha. A few witnesses in Cawnpore and Chandausi were doubtful proposal, and it was considered doubtful if the acre could be introduced into the hill tracts in place of the local nali. Advocates of the metric system advocated metric areas as a rule.

Measures of capacity.

8. Measures of capacity occur to an appreciable extent in Bundelkhand, the hill districts and Gorakhpur and neighbouring districts only. A general desire for standardization is expressed though a fear of difficulties in customary payment was urged by some it was usually accepted that the standard measure should be one that contains such an exact number of seers of water as gives a vessel of about the size of the average in use in the tract concerned. This standard would vary in the various tracts. An assimilation to some British measure is not strongly opposed but would not be preferred to the above mentioned system.

Measures of liquid capacity.

9. Of measures of liquid capacity there are none, and all that is desired is that the measures purporting to contain a specified weight of some liquid should really do so.

Use of same name for weight and measure.

10. Very few opinions were expressed as regards the suggestions of confining a particular name to either a weight or a measure, such opinions as there were were about as equally numerous in favour of either course. A few have suggested abolition of measures, but as a rule this is considered inadvisable in tracts where they are used to any extent.

Special weights for special commodities.

11. The custom of using special weights, in particular special maunds and to a less extent special seers, for special commodities is a widespread one in this province, being of particular importance in Agra and Cawnpore. The great majority of witnesses favour entire abolition of the practice. An Agra merchant objected in his written evidence but modified his objection orally: while the only serious objections were put forward by the Marwari Chamber of Commerce of Cawnpore. The reasons alleged for these variations are various, to allow for dryage, dirt, etc., is one, but the chief seems to be trade custom, the merchant making his profit by varying the weight of his maund instead of the price per maund. Variations in the maunds for indigo plant and in bighas are occasionally due to the local influence of the purchaser or the zamindar. The objection urged is that the use of a uniform maund would expose important trade-secrets, and make it easy for (say) a ghi trader to enter the grain trade or *vice versa*, which is not the case now in view of the special knowledge of trade weights required. The Chamber in oral examination somewhat reluctantly concluded that it would be possible always to express the value of the special maund in documents, etc., in terms of the standard weights. All others favoured abolition as likely to lead to increased honesty in dealing.

12. *Special weights for special trades.*—Very few requests for special weights for special trades were put forward. Such as there were, were for the British apothecaries' weights in Agra "if necessary under a license"; other old druggists' weights, and jewellers' weights—usually the old tola and weights connected therewith.

13. *Means of introduction of authorized system.*—As regards means of introduction, the Committee's proposals were as a rule approved; the chief suggestions made are noted—

(*a*) Municipal and District Boards should be specifically added.

(*b*) The issue of sample weights is recommended also to post offices, patwaris, municipalities, Co-operative Societies, pound clerks, town clerks (*i.e.*, Bakshis of Act XX Towns), and weighmen appointed by zamindars. On the other hand, a few consider their issue to headmen and elementary schools as likely to prove too expensive. As a rule, however, such issue is deemed advisable.

(*c*) Copies should also be kept by patwaris and bazaar chaudharis, and at first be kept posted up on village chaupals and in bazaars. The copies sent to headmen, etc., would require periodical renewing.

(*d*) Teaching of weights and measures current in foreign countries should be permitted. The Collector of Cawnpore considers that any weights and measures should be taught so long as they are as matter of fact in current use in the neighbourhood of the school concerned.

(*f*) The testing and stamping of weights and regular inspection and an order requiring the use of stamped weights and measures and of none other are considered by the great majority of witnesses as absolutely essential. A few are doubt ful of the necessity of stamping but these consider testing and inspection necessary. The majority are in favour of the testing and stamping being done free of charge for the first year or so; a few favour immediate imposition of fees and a few that it should always be done free. A stamping party of a muharrir, blacksmith and peon should be appointed to travel about the district. The difficulties of rural shopkeepers were specifically considered by a group of petty traders and agriculturists from the rural portions of the

Agra district; and their opinion is as follows:—

All are strongly in favour of a system of testing and stamping weights and of its being prescribed by Government that only stamped weights shall be used. Stone weights should be prohibited. (They are emphatic as regards this). One or two urge that such an order may be a bit harsh on some of the poorer people and suggest that Government sell weights cheap to such people. But more than this is not urged, all are strongly of opinion that the same order must hold for all, both large and small shopkeepers and vendors of all kinds. Inspection should be periodic, the interval between successive inspection is variously suggested; the general opinion seems to favour annual inspection in the larger towns, and triennial in rural areas.

(*g*) Almost the only opponent of this suggestion is the Deputy Commissioner of Almora who considers it not the duty of Government. Kheri refers to the hard case of petty vendors who ordinarily use stone weights, and thinks that special arrangements to let such have weights cheap are required. From Ramnagar comes the suggestion that to get rid of the present miscellaneous weights Government might take over all, whatever their condition, at $1\frac{1}{2}$ times their value as metal and replace them by new weights at slightly above cost price. From Azamgarh it is suggested that stores of stamped weights be kept at tahsils and be issued through village headmen, Co-operative Societies, etc.

(*h*) Practically all who have specifically considered the proposal that Government pay for the alteration of weighing machines consider it unnecessary.

(*i*) The only comment worth noting is that of the Collector of Cawnpore who points out that a very probable result of insisting on the use of unpopular weights and measures in such markets would be to ruin the markets rather than introduce the use of the weights or measures.

(*j*) The only comment on the proposal to render illegal such incorporation is one of disapproval.

(*k*) There are few comments, such as there are disapprove of the proposal of free import of authorized weights, etc.

(*l*) The proposal to sell at cost price is almost universally disapproved as prejudicial to private enterprise. One suggests such sale for three months, and thereafter that firms be specially authorized to manufacture and sell subject to inspection. Others that manufacturers and vendors of weights and measures be required to take out licenses, such licenses to be given free of cost and freely, solely with the object of enabling Government to check the manufacture or sale of incorrect weights, etc. This received a certain amount of support. Others again thought it sufficient to require weights and measures to be tested and stamped before sale. Still other proposals are that prescribed weights and measures be sold by Government on commission like stamps, or through bazaar chaudharis. Supply by Government is also advocated by some Benares traders.

(*m*) and (*n*) These proposals are disapproved of by the Collectors of Banda, Benares and Cawnpore; the Upper India Chamber of Commerce is doubtful about them; two witnesses from Cawnpore disapprove of (*m*), one of whom approves of (*n*). The Collectors of Etah and Kheri would only require the equivalents of unauthorized weights being expressed in terms of authorized weights.

(*o*) The Collectors of Benares and Cawnpore alone object to unauthorized weights being deemed illegal after a suitable period.

(*p*) Few have commented. A Cawnpore banker deems the proposal harsh and would only throw the burden of proof on the possesser; and a Cawnpore pleader would deem such possession illegal but not presume it.

A few suggested that scales also should be inspected, but that was deemed hardly practicable by others.

14. *Period required for introducing uniform system.*—Opinions vary considerably as to the period over which the introduction of a uniform system should be spread. If the system be the Railway weights the general opinion seems not unfairly expressed by a group of petty traders and agriculturists from Gorakhpur (both urban and rural) who say "we all agree that it would be a suitable procedure if all shopkeepers, etc., were ordered to get their weights tested and stamped within a year and to use nothing but stamped weights after that period, and that any one using other weights after that should have them seized when first detected and be fined if again caught with unauthorized weights". This expression of opinion is of especial importance as coming (*a*) from the very class likely to be most affected by the change, and (*b*) from a district in which the Railway weights are not at present in general use, so that the change would be a reality.

Other opinions vary between that of a Kheri group who considered that the use of the 80-tola seer could be immediately introduced, to that of the Deputy Commissioner of Partabgarh who thinks ten years necessary.

If a foreign system were to be introduced the usual opinion is that anything from 3 to 50 years would be necessary with a preference for the longer period.

As to the periods after which the various proposals put forward in Question 20 be given effect to, there is no definite trend of opinion. Most witnesses give one period for everything. A large merchant of Cawnpore suggests that weights be replaced free for a year, the use of authorized weights be required in documents after six months, and unauthorized weights be deemed illegal after five years. Others would not make unauthorized weights illegal in documents for five years. One witness points out that a suitable date for introducing regulations would be October 1st as that is the date when new accounts are opened.

15. *Penalties.*—The general opinion favours leniency to begin with; probably a fair summary would be that for a first offence the punishment should usually be confiscation, for a second, confiscation accompanied by fine, and for a third or subsequent offence, confiscation with fine or imprisonment. The Marwari Chamber of Commerce, Cawnpore, advocates no punishment but it also advocated no action of any sort. The Collector of Banda would not go beyond confiscation. The Upper India Chamber of Commerce suggests that the English law be followed.

16. *Staff.*—With reference to the staff by which regulations regarding weights and measures should be enforced many opinions were offered. As a rule, the police were not favoured but regarded as indispensable by several. But powers should be restricted to the Sub-Inspector. The Revenue staff was almost invariably approved of, to be limited to officers of a grade not below that of a supervisor kanungo, or, in a fair number of cases Naib-tahsildar. Few, save in the hill districts, favour the patwari.

In Municipalities, the superior grades of the Municipal staff were approved, Secretaries, Inspectors of octroi and Sanitary Inspectors, or such as do not draw less than Rs. 75 per month unless the Secretary draw less in which case he should be employed. In towns the Town clerk (bakshi) is proposed. Several also approve the Excise Inspector especially after a year or two.

Of unpaid agency the chief suggestions are in favour of Members of District and Municipal Boards, Co-operative Credit Societies, Honorary Magistrates and village munsiffs, bazaar chaudharis and (almost universally as the best agency for rural areas) the village headman (*mukhia* or *pradhan*). Some fear that the headman might be inefficient, and a few that he might use his power to gratify private spite, but the great majority view him with favour. Village panchayats, or special committees in villages, lambardars and selected zamindars are recommended by one or two witnesses.

Several have suggested that power to seize incorrect weights and measures be given to the lower grades of officials, such as patwaris, headmen, lambardars, lower grade municipal officials and (rarely) constables, who would then report to some superior officer, such as the Tahsildar or Sub-divisional Magistrate.

Several also whose opinions carry weight consider it advisable to have a special establishment at any rate to start with. The most general idea appears to be to have a special Inspector of the grade of Tahsildar or Naib-tahsildar to supervise inspection work more particularly in the bigger centres, or for larger cities. Many witnesses, however, are strongly of opinion that all work in this connection in extra-municipal areas be done through the tahsil mainly apparently because as one group put it "there is confidence in the Tahsildar and his subordinates".

Effect of uniform system.

17. Opinions as to the probable effect of the introduction of a uniform system are curiously varied. The only undisputed opinion is that dishonest traders will suffer. Otherwise of the three classes of large or small traders and others, each is thought to be likely to benefit by some and to be troubled by others, but all are expected to be benefited in the long run. Perhaps the most general view is that the actual introduction will cause least temporary inconvenience to the large trader, more to the petty trader and most to the poorer and agricultural classes; but this is by no means universal.

Extent of present inaccuracy of weights.

18. Other points worth noting are the suggestion that authorized weights be of a special pattern; and the various estimates of the proportion of weights in actual use that are inaccurate:—'10 per cent.' in Cawnpore and '2 to 10 per cent.' or 'scarcely one really accurate' and '5 per cent. wilfully inaccurate' in Gorakhpur.

Necessity of Native States adopting the same system

19. Several witnesses from districts bordering on Native States especially Agra and Jhansi urge the great advantage of their also joining in adopting such uniform system as may be adopted for British India. One witness from Jhansi points out that in the States of Bhopal, Gwalior, Indore and Sampthar certain action towards maintaining a uniform and accurate system of weights is already taken. Witnesses from Benares, Kheri and Moradabad also urge the necessity of consideration of this point.

BENGAL.

Places visited and evidence received.

Replies to the Committee's written questions were received from 177 witnesses distributed over eight districts in Bengal, namely, Bakarganj, Chittagong, Dacca, Dinajpur, Midnapur, Mymensingh, Rajshahi and 24-Parganas (Calcutta). These witnesses included 22 officials, of whom 8 were Europeans, 4 non-official Europeans and 8 commercial corporations including the Bengal Chamber of Commerce. The evidence of some of the officials represents the views of a large number of traders, etc., whom they consulted. The Committee or a portion of it visited Jhalakati (Bakarganj), Chittagong, Dacca, Narainganj (Dacca), Dinajpur, Midnapur, Bhairab Bazaar (Mymensingh) and Calcutta (24-Parganas). Besides examining individually some of the witnesses who had sent written replies, the Committee examined 297 witnesses

orally in groups varying from 2 to 44 members. The number of groups examined in all was 19.

Desire for uniform system.

2. A great majority of witnesses in Bengal is in favour of a uniform system of weights and measures throughout India; but they are not so unanimous on this point as witnesses in other provinces. The principal reasons urged in favour of a uniform system of weights are that though the various weights and measures are understood locally, their variety is a great obstacle to trade, renders the introduction of a large number of middlemen an absolute necessity, causes much inconvenience and loss to the purchasing public, facilitates fraud and places a stranger at a great disadvantage. A uniform system would therefore facilitate trade, improve the position of the cultivators and poorer classes by putting them in closer touch with the best markets, remove confusion, minimize chances of fraud and enable a stranger and a traveller to understand without difficulty the weights and measures in force in every part of India. Some of the witnesses who would like a uniform system of weights and measures point out the difficulties which they see in its introduction and in some cases state that they do not consider it to be feasible. The reasons urged in support of this view are that at first a uniform system would cause inconvenience to persons accustomed to use local weights and measures, that the people would have difficulty in learning the use of the new weights and measures and their relation with the old weights so as to determine prices in terms of the new system, that the people would be reluctant to use a new system, that illiterate tenants and others would raise objections to the new weights and measures as a pretext for not paying creditors (zamindars, etc.), that traders would take advantage of the situation to the disadvantage of the purchasers and that wholesale traders would object to using the uniform system when purchasing from agriculturists and other producers. Other witnesses are opposed to the introduction of a uniform system of weights and measures throughout India, though two of them favour provincial standardization. Similar objections to those already indicated are urged by these witnesses, the general idea being that the ignorant peasantry and small traders would be put to considerable inconvenience and would resent any change, while the bigger merchants would object to the abolition of the allowances for wastage, dryage, etc., and that chaos and confusion would be the result. Some witnesses refer especially to the difficulty of applying the uniform system to Indian medicines, while others object to any attempt to alter the present land measures.

Railway weights favoured.

3. A great majority of the witnesses in Bengal are in favour of the extension of the use of the Bengal system based on the seer of 80 tolas throughout the rest of India. The principal reasons urged in support of it are that the system is known to everyone, that cultivators and traders are familiar with it, that merchants in all provinces are acquainted with it; that calculations in it are easy, that the tola is used everywhere, even though the seer varies; and that it is a national system. The Bengal Chamber of Commerce states "there is not any indication so far that this system is being generally adopted but seeing that it is in use on all Indian railways, it must be known to a fairly large number of people." The representatives of the Chittagong Chamber of Commerce state that the Bengal seer and maund would do very well so far as Chittagong is concerned and that in the opinion of the Chamber it is not worth the extra trouble to introduce one of the world-wide systems into India.

Miscellaneous systems.

4. A few witnesses have suggested certain miscellaneous systems. The principle involves the reduction of the tola to 175 grains so as to make the seer equal to 2 lb., avordupois. A few witnesses suggest a seer of 100 tolas and the Collector of Midnapur suggests one of 64 tolas as an alternative to the railway system.

Metric system.

5. A few witnesses and the Calcutta Trades Association favour the introduction of the metric system on the ground that it is the best system, most scientific, most simple, most easy for calculation, most convenient and that it would commend itself to the masses when they know it, and that it is likely to be

adopted by all civilized countries. Some witnesses consider that it will be better to wait till it is adopted by Great Britain. A few witnesses orally examined in groups would prefer the metric system to the British system if the railway system is not adopted. Some witnesses have objected to the metric system on the ground that the mass of the population is too illiterate and unintelligent to grasp it and that it would cause much hardship, while another objects that the coinage must be altered and a new system of writing weights and measures in Indian vernaculars must be devised if it is introduced.

British system.

6. There is a certain number of supporters of the British system in Bengal chiefly on the ground that it would facilitate commercial intercourse between India and other parts of the British Empire, that the people are used to it to some extent and that many educated persons, especially traders and merchants, understand it. A few more witnesses prefer it to the metric system if the railway system is not adopted. Objections are raised by some witnesses on the ground that it would take a long time for the people to become accustomed to it, that females would find difficulty in learning it, that it will cause great inconvenience to the public and is too complicated for practical purposes now. The Marwari Association, Calcutta, and some witnesses object, as the coinage will have to be altered.

Alteration of coinage.

7. A majority of the witnesses who have given answers to the Committee's question regarding the possible alteration of the coinage if the British system were introduced are opposed to such an alteration. On the other hand, the majority of those orally examined on the point are in favour of the alteration of the rupee. Both the Bengal and Chittagong Chambers of Commerce are opposed to the proposal. The latter state that a change will cause much inconvenience to bankers in weighing out large quantities of coin. They add that it is risky and inexpedient to alter the coinage and that the alteration would cause much inconvenience and meet with a storm of opposition and that women folk would not like it as they would get smaller ornaments for the same number of rupees when melted down. On the other hand, a group of witnesses state that rupees are not used to make ornaments now and it is also stated that it is unnecessary to alter the coins as British weights can be checked with sufficient accuracy by the present silver coins.

Length and area

8. For ordinary linear measurements, it does not appear there would be any objection to the English linear measures in Bengal, while for the measurement of land the British system of areas is recommended as the local units vary widely and no indigenous system is preferable to the British. Some of the witnesses, however, are in favour of retaining the *bigha*, *katha*, etc., and it is urged that the existing land measures are closely associated with the peculiar land-revenue system and that an alteration to the acre would cause much trouble and inconvenience.

Measures of capacity.

9. Very few of the witnesses in Bengal have touched on measures of capacity. The Chittagong Chamber of Commerce is prepared to accept an *ari* (basket) of 4 gallons, if Akyab, etc., accept it. They state that difficulty may arise in standardizing the *ari* owing to the fact that rents are paid in *aris* of a certain size. Some witnesses state that the measures of capacity should be adapted to the unit of weight. One group of witnesses want different *káthas* for every commodity so as to give the same weight always.

Cubical contents.

10. No witness in Bengal has made any suggestion regarding measures of cubical contents.

Special weights.

11. Special weights fall into two main classes: (1) special seers and maunds used in wholesale trade, and (2) those used for special commodities, such as

gold, silver, jewellery and Indian medicines. The reasons assigned for the former are that the higher weight for wholesale trade is intended to cover wastage, freight dryage and profit, while keeping the price apparently the same as in retail sales. It is stated that these weights have been in use from time immemorial. Several witnesses state that these special weights may be abolished but many others object to their abolition as it will involve a change in the methods of carrying on trade and customers will object to the retail price being higher than the wholesale price. The Narayanganj Chamber of Commerce states that it is extremely questionable whether buying and selling by any of the existing weights and measures can legally be put a stop to in any instance unless it can first be proved that these are being used dishonestly. It is specially stated that an exception should be made in the case of jute, because it is purchased in the first instance in a very wet condition. As regards the second class of special weights, a few witnesses consider that jewellers and vendors of country medicines should be allowed to retain their own weights permanently and in the case of foreign goods it is urged that they should be sold by British weights.

Sale of same commodity by weight and measure.

12. A great majority of witnesses who have answered the Committee's question on the subject of the use of weights and measures for the same commodity are of opinion that the dual system should be disallowed. A few consider it unnecessary especially in the case of liquids where measures are practically used for convenience in place of weights. But, as regards grains, etc., it is urged that the measures are inaccurate, can be easily enlarged or diminished and that the measurer can by his skill reduce or increase the amount contained in the measure. Some witnesses would go so far as to put a stop to sale by measure altogether, as measures are used so much for fraudulent purposes. On the other hand, it is stated that it will be inconvenient to the poorer and agricultural classes if measures are abolished, as they cannot afford to buy scales and weights and sometimes goods are sold on the way to market and it would be inconvenient to have to carry weights and scales instead of measures.

Same name for weight and measure.

13. In Bengal, the same name appears to be used both for a weight and a measure generally in the case of liquids where the measure purports to hold the weight of the same name of the liquid. There is therefore little or no confusion at least for the people of the same locality and many witnesses contend that it is unnecessary to interfere with the existing practice. Many, however, would prefer that the same name should not be employed to denominate both a weight and a measure.

Use of authorized system by Government, etc.

14. No objection is raised to the proposal that the authorized weights and measures should be adopted in all transactions by Government, railways and bodies controlled by Government.

Supply of specimens of authorized weights and measures to village headmen, etc.

15. The Additional Collector of Dacca considers it expensive and unnecessary to supply specimens of the authorized weights and measures to all revenue offices, police stations, village headmen and recognized elementary schools. But this suggestion is approved by other witnesses, some of whom suggest the addition that specimens should also be supplied to all village panchayats, teachers, Municipal and District Board offices, higher grade schools, railway stations, post offices and principal traders in trade centres.

Publication of tables of the authorized system.

16. No objection is taken to the suggestion that the tables of the authorized weights and measures should be published in the district gazettes and a copy should be kept by the village headmen. On the other hand, some witnesses suggest further measures for the publication of the tables. It is proposed that they should include conversion tables between the new and the old weights and that they should be published in local vernacular newspapers and by police officers,

chowkidars, village headmen and zamindars and by beat of drum; also that they should be posted up in post offices, in permanent places in *háts*, markets, etc., and in schools and that copies should be distributed free of cost as widely as possible.

Teaching of authorized system in schools.

17. All the witnesses in Bengal agree that the use of the authorized weights and measures should be taught in elementary schools but some object to the proposal that the use of other weights and measures should not be taught in recognized elementary schools. They say that education should be wide and that a knowledge of other local systems is necessary for some time.

Verifying and stamping weights and measures.

18. The proposals that Government should verify and stamp authorized weights and measures are approved in Bengal. Some witnesses consider that the stamping should be done free of fee for periods varying from one month to ten years, while others consider that no fee should ever be charged.

Free supply.

19. Some witnesses consider it unnecessary for Government to replace free of cost stamped weights and measures which are no longer authorized.

Alteration of weighing machines.

20. The Additional Collector of Dacca states that the suggestion that Government should alter or make grants for the alteration of weighing machines should not be adopted as it would be expensive and involve much labour.

Use of authorized weights in markets.

21. No witness in Bengal has raised any objection to the suggestion that only stamped authorized weights and measures should be used after a certain date in markets under the control of Government or any local authority; but some suggest that this provision should not be brought into force for periods varying from 90 days to three years.

Import, manufacture and sale.

22. Two witnesses consider it unnecessary and too drastic that the import, manufacture and sale of other weights and measures should be declared illegal, while one witness suggests the addition of the words "except under the authority of the Government" and another states that some provision should be made for weights required for special purposes, such as apothecaries' weights.

Import duties

23. The Additional Collector of Dacca states that it is unnecessary for Government to forego the import duties on authorized weights and measures and weighing machines.

Sale by Government.

24. The proposal that Government should undertake the sale of authorized weights and measures is approved in Bengal except by the Additional Collector of Dacca who considers this provision unnecessary unless a new system of weights is adopted, in which case it would be preferable for the Government to sell at a reasonable profit. Generally, witnesses consider that the Government should not sell free of cost except perhaps for a short time when the system is first introduced.

Documents.

25. A few witnesses take exception to the suggestion that civil courts should not recognize any unauthorized weights and measures in documents executed after a prescribed date. They state that this would lead to fraud and the exploitation of the poor by the rich.

Compulsory use of authorized system.

26. Three witnesses do not approve of the proposal that the use of the unauthorized weights and measures should be illegal after a certain date. Others would not have this provision brought into force for periods varying from one to five years.

Possession of unauthorized weights and measures.

27. Three witnesses are opposed to the proposal that it should be presumed that any unauthorized weights or measures found in the possession of a shopkeeper, trader or merchant are intended to be used and that such possession should be illegal.

Period.

28. As regards the period which, it is anticipated, would elapse, before the new system can be established, the most common period stated by witnesses in Bengal is one year and the next most common term is 5 years, especially if the British system is adopted. But some witnesses consider that in the latter event, 50 years will be required for its establishment.

Penalties.

29. Very few witnesses have raised any objection to the penalties of destruction, confiscation and fine proposed for the use of unauthorized weights and measures. Three witnesses object to penalties of any kind. The amounts suggested as the maximum fine vary from Rs. 5 to Rs. 500. A few witnesses suggest that fine should be inflicted only for a second or subsequent offence. A few others suggest imprisonment for repeated offences and one witness suggests whipping as a punishment.

Agencies to detect cases.

30. Only one witness has objected to the employment of the municipal staff on the detection of cases and that only on the ground that the staff has already too much to do. Only two witnesses take exception to the Revenue Department. A larger number object to the village headman and still more witnesses object to the police. Some witnesses suggest the following as the grade of officers to be employed : —Police, Head Constable, Sub-Inspector or Inspector; Revenue Department, kanungo, Sub-Deputy Collector, Sub-Registrar and Sub-Inspectors of Excise; Municipal, Tax daroga, Sub-Overseer, Overseer, officers specially authorized by the Council, Municipal Commissioners, Vice-Chairman and the Chairman. The following officers or persons are also suggested for employment in this connection :—Honorary Magistrates, members of Local and District Boards and village and chowkidari panchayats, zamindars, respectable villagers, school-masters, post masters, honest and educated gentlemen, Government pensioners, elected citizens and the staff of Local Boards. One witness considers special paid agencies will be required.

Effect.

31. The views held by witnesses in Bengal regarding the effect of the introduction of a uniform system of weights and measures on large and small traders and on the agricultural and poorer classes are varied ; some considering that the traders will be most affected and others that the poorer classes will be more affected especially at first; but the general view is that in the long run, all classes will be benefited, though there will be some inconvenience and perhaps hardship when the system is first introduced and people are not thoroughly acquainted with it. Some consider that traders would take advantage of it and raise their prices.

Miscellaneous suggestions

32. The Bengal Chamber of Commerce and the Calcutta Trades Association draw attention to the necessity for a systematic inspection and verification of weights and measures by duly qualified inspectors when the new system has been brought into force. Among other miscellaneous suggestions made are the following :—

(*i*) that weights should be made of strong and hard metal so that they will last for a long time ;

(*ii*) that the Government should make them ;

(*iii*) that the prices should be as low as possible so that they should be accessible to all, poor and rich, and a set of weights can be kept in every house ;

(*iv*) that certain firms should be recognized by Government as suppliers of weights or that they should be supplied by municipalities ;

(*v*) that lists of authorized weights should be published in every village and hamlet preferably on the anniversary of the last Delhi Durbar ;

(*vi*) that a schedule of all existing systems of weights and measures should be made and a comparative table should be prepared and made part of an Act which should be freely and widely circulated ;

(*vii*) that all customers should be vested with power to arrest any man attempting to sell by wrong or false weights and to take him to the local custodian of the standard weights but not to the police ;

(*viii*) that the result of all cases relating to the fraudulent use of possession of false weights and measures should be printed in the vernacular and published in markets and other public places as a warning to others ;

(*ix*) that a penalty should be prescribed for the wilful harassment of innocent traders by unlawful confiscation and destruction of their authorized weights and measures ;

(*x*) that measures should be used struck ;

(*xi*) that as the method of weighing goods at railway stations by weighing machines at present in use is not understood by the common people and machines easily get out of order steps should be taken to remove these defects .

MADRAS.

Evidence received.

In the Madras Presidency thirteen districts were visited by part or all of the Committee and in the case of Bellary, Malabar and Trichinopoly, two places were visited in each district. Written replies were received from South Arcot, Bellary, Godavari, Kistna, Madras, Madura, Malabar, Ramnad, Salem, Tanjore, Tinnevelly Trichinopoly, and Vizagapatam. The total number of individuals whose replies were received is 841 ; 19 witnesses were individually examined by the Committee orally as well as 130 persons in 13 groups. The replies of several of the officials represent the results of inquiries from local people.

Desire for uniform system.

2. A great majority of the witnesses in the Madras Presidency are in favour of a uniform system of weights and measures throughout India. The principal reasons given for desiring a uniform system are that the present diversity of system is very confusing and leads to litigation and facilitates fraud. Traders find it difficult to understand the weights and measures prevailing in other parts of the country ; in consequence errors sometimes arise as they think that they are purchasing by one weight, whereas they find that the goods are delivered by another weight, the seller not having enlightened them as to the difference in weights ; the use of the same name for different weights and measures, therefore, leads to confusion and litigation. This tendency is increased by the fact that weights and measures which purport to be of the same weight or capacity at the same place or neighbouring places differ among themselves. A uniform system would facilitate internal and external trade and create confidence among traders and customers who would be able to understand the weights and measures in force and would save calculations both to traders and to purchasers, would save labour and expense, while litigation would be lessened. People would be able to follow the variations in prices in different places with greater ease. An example given in the Tinnevelly district is that the people think that the Tuticorin prices are high because the tulam there is 144 palams while in Tinnevelly it is 100 palams.

Objection to a uniform system.

3. The principal reasons urged against the introduction of uniform system of weights and measures are that the present weights would be useless and new weights will not be understood and that traders and people will be put to much trouble and inconvenience. New weights and measures will have to be specially purchased and the ignorant masses will take a generation to learn new tables of weights and measures. The Collector of Ramnad considers that any attempt to interfere with the existing units will be fraught with immense difficulties and possibly even with political danger. He says

that "we should be told that Government was introducing a 'small loaf' or something corresponding to it". At the same time, he is prepared to recommend the introduction of the metric system or some system based on it after Great Britain has adopted it. The Collector of Madura considers that a uniform system will not be attended by advantages commensurate with the inconvenience and disturbance of local custom which would be involved; in theory difficulties may arise and fraud is possible between local purchasers and sellers in other parts of India, but the purchaser is likely to satisfy himself regarding standards of weights and capacity in force at the place of sale and in the last resort transactions can be in terms of the English pound and Railway maund. No other officials are opposed to the introduction of the uniform system. A few traders have objected to the introduction of the uniform system because it would disclose their trade secrets and deprive them of the profit which they now derive owing to the diversity of weights and measures. One witness stated that unless there is difference in weights and measures in different places, there is no scope for the exercise of one's intelligence. A variety of systems keeps people who are not in trade ignorant of current prices. If everyone knew what the current prices are, traders would lose their profits.

Systems proposed.

4. Of the witnesses who have expressed an opinion regarding the system which should be introduced, some are in favour of the extension of their local system throughout India, and particularly of the Madras city system of

3 tolas	...	...	...	...	=1 palam
8 palams	...	...	...	...	=1 seer
5 seers	...	...	...	...	=1 viss
8 viss	...	...	...	...	=1 maunds,

with a candy of 20 maunds. The Collector of Godavari recommends the introduction of this system in addition to the Railway weights and the British system for the Madras Presidency. Some of the witnesses of Ramnad suggest the retention of the old palam of $\frac{1}{7}$ lb. av. and the tulam of 144 palams in preference to the Madras system.

New systems proposed.

5. Some witnesses suggest systems of their own invention. The Collector of Bellary suggests a decimal system with an Indian series of names. The Collector of Ganjam apparently favours a decimal system based on the tola for weights and the seer for measures of capacity until Great Britain adopts the metric system. The Collector of Kistna also suggests a decimal system based upon the tola. The Collectors of Malabar and Salem suggest the following system:—

175 grains	...	...	...	...	=1 tola.
40 tolas	...	...	...	...	=1 lb. av.
25 lbs. av.	...	...	...	...	=1 maund.
20 maunds	...	...	...	...	=1 candy.

A witness of Madras suggests a decimal system based on the seer of 80 tolas, if the metric system cannot be introduced. Another witness of Madras suggests a tola of 175 grains, a seer of 25 tolas, a lb. of 40 tolas, a Bengal seer of 2 lbs., a Madras maund of 24 lbs. and a Bengal maund of 80 lbs. A witness of Madura suggests a palam of 5 tolas, a viss of 20 tolas and a maund of 80 visses. The Chamber of Commerce, Cochin, suggests that the Railway maund should be reduced to 80 lbs., until the metric system or some other decimal system is adopted in the United Kingdom. The Tuticorin Chamber of Commerce is apparently in favour of "the tola, seer and maund" in districts and the British avoirdupois weights at ports and in foreign trade. A witness in Tinnevelly suggests a decimal system based on the palam. Some witnesses suggest the maund of 1,000 tolas.

Indian Railway weights.

6. A certain number of witnesses suggest the introduction of the system of weights at present in use on railways. Some of the witnesses recommend this, only if the local system or the British system cannot be introduced. Some state villagers would understand this system easier than the British avoirdupois system. The Collector of Godavari states that it is well-known on account of its use on railways. Some witnesses recommend it, because it is used on railways and by Government; and because it is used by the important firms. One witness of Madras states that the educated public knows the system as well as villagers away from railways; but the latter is denied by other witnesses. Another witness of Madras recommends it, because it is known to 125 millions of people, because the 80-tola seer fits into the Madras viss and because it can be easily correlated approximately with the British and metric systems. One witness of Madura recommends it, because Indian trade is carried on with British territories on a larger scale than with other countries. One group of witnesses prefers it to the British system, because the seer is an exact number of tolas.

Objection to Railway weights.

7. On the other hand, some witnesses object to the system, because it is not known to any one except railway people and those dealing with railways, because it is inconvenient to traders and agriculturists, because the seer is too big for local trade and is not suited for retail trade and because the railway maund is a very awkward unit with very awkward submultiples.

Metric system.

8. Certain witnesses including the Collectors of Bellary, Ganjam, Kistna, Nellore, Ramnad and Tinnevelly recommend the adoption of the metric system. The Collectors of Ganjam and Ramnad and the Cochin Chamber of Commerce recommend its adoption after it has been adopted by the United Kingdom. The Collector of Bellary later suggests a decimal system with an Indian series of names and the Collector of Ganjam apparently favours a decimal system based on the tola for weights and the seer for measures of capacity. The Collector of Kistna also apparently favours a decimal system which is based on the tola. Some of the more educated witnesses in Bellary, Kistna, Madras, Malabar, Trichinopoly and Vizagapatam also recommend the adoption of the metric system as well as groups of witnesses orally examined in Malabar and Tanjore. The principal reasons urged for its adoption are that as the majority of the population is ignorant and unintelligent and lives by produce, the uniform system must be a simple system and the decimal system is the most simple that can be devised; that it is the only rational system; that it is already in use in most civilized countries; that it is convenient for calculation; that it is adaptable to all sorts of materials and even to electricity; that the aim should be to have one system for the world to facilitate commercial intercourse; that the adoption of the system by India will accelerate its adoption by England; that if it is not adopted now and has to be adopted later, two changes will have to be made giving unnecessary trouble; that trade will be facilitated, confusion avoided, time and energy saved; that it could be easily learned; that it is in world-wide use for scientific purposes; that the introduction of a third system into the world will make confusion worse confounded.

Objections to metric system.

9. Against the metric system, it is urged that it is novel, foreign and unknown that it is in conflict with the existing system, that the people are not sufficiently intelligent to understand a decimal system and are accustomed to binary subdivisions; that it would puzzle country people and put them at the mercy of the traders and that it would be difficult to overcome local custom; that it is not easy for traders to use; that it would cause a new line of cleavage between England and India which would divert foreign trade from England into other countries and play a sad havoc with the English language.

British system.

10. The number of witnesses who have expressed themselves in favour of the British system is larger than the number of those who have given opinions in favour of the metric system or in favour of the Railway weights, though

some of the witnesses stated that they want a system "connected with the British system"; for instance some suggest that the seer should be made 2 lbs. and a maund 25 lbs. Some witnesses would accept it failing the metric system. The Collector of South Canara qualifies his recommendation with the condition that the system should not lose connection with the rupee. The main reasons urged in favour of the British system are that India has dealings chiefly with British countries; that the pound is already largely used, and traders, shopkeepers and villagers already know it to some extent; wholesale trade with other districts of South India and Burma is carried on in terms of English pound and it is in vogue in many countries as well as in many places in India and Burma. It appears from the evidence that the pound weights are largely used even in villages in the Northern Circars, while one witness of Madras estimates that 10 per cent. of transactions in villages are done by the pound and a group of witnesses of Madura estimate that 50 per cent. of the rural population and more in towns are acquainted with the pound.

Objection to British system.

11. Objections were taken to the British system on the grounds that it is complicated; not free from anomalies; not easier than any of the Indian systems; not indigenous; not divisible binarily; is almost unworkable even in Britain; is a collection of irregular discordant denominations, the relationship between the various denominations; being so incongruous that it baffles any attempt at reasonable systematization; that it is neither scientific nor logical and as between two bad systems they would prefer the indigenous system. A witness of Madras and a group in Malabar say that the pound is not based upon the weight of the rupee, but a group in South Arcot state that this objection is not sound.

Alteration of coinage.

12. A certain number of the official and more educated witnesses have given written replies to the Committee's questions regarding the possible alteration of the coinage in the event of the introduction of the British system; while groups of witnesses and others were orally asked questions regarding this matter. Not much objection is raised to the alteration of the nickel and copper coins, though some witnesses consider it undesirable even to change those coins and some witnesses think that the change would not serve the purpose intended, as they are more liable to loss of weight by wear and tear than silver coins. Some of the witnesses consider that it is unobjectionable to alter the weight of the rupee, while others consider that it would give rise to considerable suspicion especially if the quality of silver is altered and that the reduction in the weight of the rupee would lead to confusion and inconvenience; that the addition of alloy would spoil the silver for ornaments; that any alteration in the coins would create mistrust and lead to fraud. The Collector of Kistna objects to the proposal as altering the only standard weight in India. Other witnesses state that they do not use coins to check weights, as coins vary in weight and they can get their weights checked by the establishment provided for the purpose by the Government; that the coins are only used as a rough check of small weights; that, if necessary, weights can be checked with sufficient approximation now by coins; that it is therefore unnecessary to provide coins to check weights especially if the Government undertake to check weights periodically.

Measures of length, area and cubic content.

13. *Length, area and cubic content.*—The British system of length and cubical contents are in use throughout the Presidency, and no objection is raised to the proposal that they should be made the standard system for India in addition to the acre and cent. ($\frac{1}{100}$ of an acre) for areas, as they are already understood. Two witnesses in Tanjore state that the cent. and the link (100th part of a Gunter's chain of 66 feet) should be abolished and that a square pole, foot and yard be used for the measurement of land. Their objection to the link is that it does not fit in with the foot and yard. One witness suggests that $\frac{1}{10}$ yard should be an authorized measure.

Measures of capacity.

14. Most of the witnesses in the Madras Presidency are in favour of a uniform system of measures of capacity. Some of the witnesses state that the measures of

capacity should correspond to the standard weights. Witnesses were generally prepared to accept English measures if the British system of weights were adopted. Some have expressed preference for the Madras type measures.

Simultaneous sale by weight and measure.

15. Some commodities appear to be sold sometimes by weight and sometimes by measure in every district of the Presidency. The commodities which are so treated vary in different districts, but they are generally salt, chillies, spices, ghi, oils, jaggery, dals, coriander, wheat-flour, ground-nut, mustard seed and sometimes rice and grains. Some witnesses state that the practice leads to confusion and fraud; but others state that as the local practice is well-known to the people of the locality and prices vary according to the weights or measures used, there is no confusion and no deceit so far as local people are concerned; and it is undesirable to interfere with local practice in this matter. Several witnesses, however, have expressed a desire that sales should take place by weight only and that measures should be abolished. The reasons given are that measures vary in capacity and can be easily altered; that the measurer can make a difference in the amount which a measure will hold; that some articles weigh less when dry than when green; that, in the case of grains, chaff, bad grains, etc. are mixed up with the grain. On the other hand, it is said that it would be a hardship to ordinary ryots to make them keep weights and scales; but, as against this, it is stated that merchants would carry weights and scales with them when purchasing produce. Some witnesses urge that salt should be sold by weight only, because its specific gravity varies when the crystals break up; that it is sold by Government by weight and, as retail sales are by measure, traders endeavour to obtain salt with large crystals and the salt of particular factories is preferred by traders. The objection to the measuring of ghi is that it has to be melted before it can be measured and it expands as its temperature rises. On the other hand, it is urged that it is convenient to deal especially with small quantities of all commodities by measures.

Use of same name for weight and measure.

16. As regards the question whether confusion arises in consequence of the same term being used both for weights and measures in some parts of the Madras Presidency, this does not appear to be invariably the practice; but where it is the case confusion does not arise generally among the people of the locality because they know what commodities are sold by weight and what by measure and consequently they realize whether a weight or a measure is going to be used. On the other hand, strangers may be put to some difficulties in consequence of the practice. A few of the witnesses that have given evidence on the point appear to think that in the case of the new system it is desirable to make the names of weights and measures distinct, but that it is not necessary to interfere with local practices already in vogue.

Special weights in special circumstances.

17. Special weights are used in certain cases in the Madras Presidency especially in connection with wholesale transactions and special articles such as jewellery and native medicines. The principal reasons assigned for this practice are long usage; convenience and suitability; allowances for dryage, wastage, etc.; the sale of articles by the weights in vogue in the places from which they were imported; the sale of articles by the weights in vogue in the country to which they are to be exported (*e.g.*, ground-nuts by the kilogramme on account of the export to French territory); the sale, by the Forest Department of Government, of firewood by English weights (cwt. and ton); the benefit of retail merchants; and in the case of jewellers' weights, the fact that they are based on former current coins and that small weights are required for valuable articles. Generally, witnesses state that there would be no objection to dealing in commodities by means of standard weights, though there would be initial inconvenience and trouble to illiterate customers and even to petty dealers. Some witnesses, however, desire the retention of local weights or of jewellers' or apothecaries' weights.

Methods of introduction; use of authorized weights by Government, etc.

18. No objection is raised in the Madras Presidency to the suggestion that the authorized weights and measures should be adopted in all transactions by Government, Railways and bodies controlled by Government.

Supply of samples.

19. In the Madras Presidency, no objection is taken to the proposals to supply specimens of the authorized weights and measures to Revenue offices, police stations and recognized elementary schools. One witness would not supply them to the village headman or to the police, as the headman or police constable may parade the bazaar to check weights and take people to task whether weights are right or wrong. Others suggest that specimens should also be supplied to municipalities, unions and respectable traders and landholders.

Supply of tables.

20. Some witnesses suggest that the tables of the authorized weights and measures should also be published by means of pamphlets distributed free. It is also suggested that the tables should be published by beat of tom tom and that copies of the tables should be pasted in *diglott* at the entrances of markets and in other conspicuous places and important shops and in all post offices, revenue offices, railway stations, police stations, schools, choultries and travellers' bungalows.

Teaching of new system.

21. As regards the proposal that the use of other weights and measures should not be taught in recognized elementary schools, some witnesses in the Madras Presidency state that at first the local weights and measures should also be taught as it will take some time for their use to cease, especially with reference to documents which have already been executed. Some witnesses urged that the use of the authorized weights and measures should be taught in all schools.

Stamping.

22. The suggestions regarding the stamping of weights and measures are approved in the Madras Presidency. Some witnesses, however, object to the present system adopted by the Madras Government on the ground that the stamping gumastahs, being ill-paid, are open to corruption, and for a consideration are prepared to stamp weights and measures which are not strictly accurate. It is urged therefore that the original stamping should be done at some central place and that the stamping establishment should be properly supervised. The Collector of Madura does not approve of the proposal that only the authorized weights and measures should be stamped. He considers it an extreme step to force shops dealing in English articles to abandon the English weights. The witnesses generally approve of the proposal to remit the fees of stamping for periods varying from one to five years. Some witnesses, however, consider it unnecessary to forego the fees, while the Collector of Trichinopoly considers that local conditions should determine the fees.

Replacing existing weights and measures.

23. Some witnesses state that Government should replace all weights and measures by corresponding authorized weights and measures free of cost; while others suggest that new weights and measures should be supplied free to persons having less than a certain income. Some witnesses, however, consider it unnecessary to supply weights and measures free. The proposal to do so will involve a considerable outlay on the part of Government and one group of witnesses pointed out that when the Madras Government altered the measures in use in certain districts, they did not supply new measures free in exchange for old ones.

Alteration of weighing machines.

24. Some witnesses state that it is unnecessary for Government to make grants for the alteration of weighing machines, because the owners of weighing machines are generally firms or well-to-do persons who could afford to alter the machines without any grant from the Government.

Use of authorized weights in Government markets.

25. No objection is raised to the proposal that only stamped authorized weights and measures should be used after a certain date in markets under the control of Government or any local authority; but some witnesses suggest that this provision should apply to all markets and others that it is unnecessary to limit the application to markets.

Import and manufacture of unauthorized weights.

26. Generally, no objection is raised to the suggestions that the import, manufacture and sale of other weights and measures should be declared illegal. One witness, however, suggests that the importation of foreign weights and measures should be permitted. In this connection, some witnesses urge the desirability of Government undertaking the manufacture of weights and measures, while others suggest that the manufacture should be undertaken only by firms licensed by the Government. It is stated that locally made measures are inaccurate.

Remission of import duties on authorized weights and measures.

27. Some witnesses state that it is unnecessary to forego the import duties on authorized weights and measures and weighing machines, because it would make very little difference to the price, and it is further urged that it is desirable to encourage the manufacture of weights and measures and weighing machines in India. Most witnesses, however, approve of the proposal to forego the import duties temporarily.

Sale by Government.

28. As regards the question whether the Government should sell the authorized weights and measures at cost price or at a price which would allow reasonable profit to private trade, many witnesses expressed their agreement with both suggestions ; but many prefer the second, which would allow a reasonable profit to private trade, rather than the first proposal. A suggestion is made that the first proposal should be adopted for two years and then the second. Another suggestion appears to be that the Government should sell at cost price to the trade and with reasonable profit to persons not in the trade.

Use of authorized weights in documents.

29. As regards the suggestion that after a certain date documents should be drawn up only in terms of the authorized weights and measures and that civil courts should not recognize any others in documents executed after a certain date, the Collector of Kistna in the Madras Presidency considers this suggestion impracticable, while the Collector of Nellore considers it would be an unwarrantable hardship. A few other witnesses also object to the suggestion, while some are apprehensive that it might affect documents which have already been executed. It is suggested that parties may be allowed to enter their own weights and measures as well as the authorized weights and measures in documents and that the courts may be allowed to recognize weights and measures in documents executed after the prescribed date, provided the *bonâ fides* of the executant is not doubted. Another witness suggests that such documents should be admitted on payment of a fine.

Registration of documents referring to unauthorized weights

30. Exception is taken to a certain extent to the suggestion that documents drawn up after the prescribed date in terms of unauthorized weights and measures should not be registered in the office of the Registration Department on the grounds that it would be a great hardship to the people and will lead to fraud. It is suggested that registration may be allowed on payment of higher fees.

Illegality of unauthorized weights.

31. Exception is taken to the suggestion, that the use of any weights and measures except those authorized should be illegal throughout India after a certain date, by witnesses who consider that special weights and measures are necessary in particular localities or for a particular purpose. One or two witnesses are opposed to it, apparently on the ground that it will be a considerable hardship.

Presumption regarding possession of unauthorized weights and measures.

32. A few witnesses object to the suggestion that it should be presumed that any unauthorized weights and measures found in the possession of a shopkeeper, trader or merchant are intended to be used and that such possession should be illegal. They consider this suggestion severe ; other witnesses, however, approve of the proposal.

Period required for introduction.

33. The periods suggested by witnesses after which the various steps are to be brought into force in connection with the introduction of a uniform system vary very widely. Many witnesses have given one period for all the steps, varying from one month to ten years. The favourite period seems to be one year. A few witnesses suggested 3 years under the misapprehension that the new system would affect documents previously executed. Other witnesses vary the periods after which the principal measures are to be adopted, and they generally recognize that the last measures to be taken will be those relating to the declaration that the use of unauthorized weights and measures is illegal. The period after which this notification might, according to witnesses, be issued, varies from six months to ten years. The Collector of Tinnevelly and another witness of Madura district consider, however, that documents should not be required to be drawn up in terms of the authorized weights and measures for 30 years.

Penalties.

34. The penalties proposed namely, destruction, confiscation and fine for the use of unauthorized weights and measures appear to be generally approved in the Madras Presidency. Some witnesses have pointed out that it is desirable that all unauthorized weights and measures concerned in cases should be destroyed as, if they are confiscated and not destroyed, there is a danger that they may be sold by public auction and then used again. Some witnesses consider that fines should not be inflicted until the second or third offence. Many witnesses appear to contemplate the possibility of confiscation or destruction without prosecution before a Magistrate which would involve the accused attending at perhaps a distant court. Some witnesses propose that the fines should be limited and the limits proposed vary from one rupee to Rs. 250. A few witnesses propose that imprisonment should also be made a substantive punishment for repeated offences.

Staff.

35. The proposals made by the Committee regarding the agencies to be employed in detecting cases of unauthorized weights and measures are generally approved in the Madras Presidency. Many, however, suggest that the lowest grade of officials to be employed should be fixed, *e.g.*, Sub-Inspector of Police, Revenue Inspector, Chairman of the Municipal Council, Sanitary Inspector, Overseer, Market Superintendent in municipalities, the Union Chairman in unions. A few witnesses would prefer that the work should be done by the Revenue Department ; while others state that the Revenue Department has already got its hands full. Some witnesses suggest the employment of officials in every Department, such as Salt, Abkari and Customs and Forest Departments. A few suggest that the village headman should not be employed, while others propose that he should be associated for this purpose with three or four influential persons in the village. Honorary and Bench Magistrates are also suggested as suitable persons to be empowered to detect cases.

Effect of uniform system.

36. As regards the effect of the introduction of a uniform system of weights and measures, most of the witnesses in the Madras Presidency who have expressed any opinion on the point state that it will have no effect on anyone. But some state that it will cause inconvenience initially to smaller traders and the agricultural classes, but in the long run the results will be beneficial. The larger traders will find their accounts and calculations simplified and have a clear conception of the fluctuation of prices in various markets. Smaller traders and the public will benefit, as there will be less liability to confusion and the poorer classes being able to understand weights and measures more easily will be less liable to be defrauded.

Struck and heaped measures.

37. A few witnesses suggest that measures should be struck as the heaps vary. A few other witnesses prefer heaped measures ; some witnesses state that it sounds inauspicious to knock off the head ; while others state that there would be disputes regarding the method of striking and difficulty in measuring large quantities by means of struck measures.

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Testing of scales.

38. One or two witnesses in the Madras Presidency suggested that scales should be tested every year and that the rough bazaar scales now in use should be replaced by good metal balances to prevent the frauds now extensively practised by petty shopkeepers owing to the scale now in use.

Desirability of Native States adopting the same system.

39. Witnesses of South Arcot, Bellary, Kistna and Cochin have drawn attention to the desirability of the adoption by Native States and Foreign possessions in India of the uniform system of weights and measures which may be adopted in British India, so as to facilitate trade between British India and other parts of India.

Miscellaneous suggestions.

40. Among miscellaneous suggestions made by witnesses of the Madras Presidency are proposals that weights and scales should be of iron; that measures should be made of a metal which cannot be corroded by salt, oil or ghi; that if measures are made of sheet metal, there is chance of fraud being practised as they can be altered; that the diameter of measures should be the same at the top and bottom; that large measures are required for certain purposes and the measures should be of convenient shape; and that weights should be made of one uniform moulding like coins so as to prevent tampering. Two witnesses suggest that rewards should be paid to informers of offences. The Collectors of Kistna and Salem consider that fairly drastic measures should be taken at first and that such a course would be the truest kindness in the long run for the alleviation of the difficulties of the agriculturists and poorer classes who are now cheated by petty shopkeepers. The Collector of Kistna suggests that measures should be adopted first in large towns and then in smaller towns and he is of opinion that if this is done, the inhabitants of rural villages will soon fall into line without difficulty, when they find that their produce is bought according to the new system.

BIHAR AND ORISSA.

Places visited and evidence received

Written replies were received from 512 persons in Bihar and Orissa; these included 39 officials (of whom 21 were Europeans), five European non-officials and the representatives of two Associations. In some cases the replies of officials represented synopses of opinions obtained from large numbers of persons. Replies were received from all the 20 districts in the province. The Committee or a portion of it visited six districts, *viz.*, Bhagalpur, Champaran, Cuttack, Manbhum, Muzaffarpur and Patna. In these districts 130 persons were examined orally in 13 groups, ranging in size from 2 to 18 persons besides a few witnesses who had sent written replies and were examined individually.

Desire for uniform system.

2. Witnesses in Bihar and Orissa are almost unanimously in favour of the introduction of a uniform system of weights and measures throughout India. It is stated that a trader purchasing articles from a distant place has now to ascertain the system of weights and measures in force there as well as the price of the articles and to convert the weights and measures to his own system and that the consequent delay sometimes affects rates; that commodities are sold to ignorant persons by smaller weights than they should be according to the price quoted; that unscrupulous traders deliberately use short weights; that hundreds of civil cases arise out of disputes regarding the length of the *lagga* or the weight to be used in determining the landholder's share of the crop; that a traveller finds great difficulty in calculation when he visits a place where the standards of weights and measures differ from those at home; that in consequence the adoption of a uniform system will facilitate trade, help in its growth, prevent fraud and cheating and minimize misunderstandings and litigation between landholders and their tenants.

Objections urged.

3. The Collector of Patna considers that the practical difficulties in the way of imposing a uniform system of weights and measures on the agricultural classes appear to be insuperable; but thinks that a system based on the seer of 80 tolas might be introduced by legislation in the future. Only two other witnesses and one group are opposed to the adoption of a uniform system on the grounds that any change will be very inconvenient; that the people are mostly uneducated; that confusion will arise in converting old weights into new; that the people are conservative and opposed to innovation; that the market-price of staple-foods, etc., would rise; and that it would be difficult to insist on uniform linear measures as villagers use their forearm for measuring cloths. One witness states, however, that if the new weights have different names from the present weights, the conversion from the old to new weights could be easily made and the danger of a rise in prices would probably be avoided.

Local system.

4. A few witnesses are in favour of their own local weights as opposed to the railway system, as it would take the people a long time to learn any other system and there would be difficulty and confusion in the future. The seer of 101 tolas is recommended because it is practically 100 rupees weight, the extra tola being allowed for inaccuracy, dust, etc.

Miscellaneous systems.

5. One witness recommends the seer of 100 tolas, because the labourer is paid in grain and if the seer is reduced, the labourer as well as those who receive alms will lose. Three witnesses favour a seer of 2 lbs., while one witness suggests a seer of one kilogramme with the usual Bengal table of weights.

Railway system.

6. The Railway system of weights is the favourite system among the witnesses of Bihar and Orissa. A few witnesses add certain local weights to the table. It is stated that it will rouse the least opposition; could be most easily enforced and most easily understood by villagers and traders, being already in use in many places. Another reason given is that it is an indigenous system and one group of witnesses urges that the weights can be easily checked with rupees. Two witnesses would prefer it to the British system if the metric system cannot be introduced.

Metric system.

7. A few educated witnesses are in favour of the metric system. The reasons given are that it is easy to learn, simple to remember, simplifies calculations, saves unnecessary trouble and waste of time in calculations; is the most convenient known system and has been recognized by all civilized nations as affording for the future the advantages of a universal system. Two of these witnesses, however, regard its introduction into India as impracticable ; while the District Officer of Champaran is doubtful whether the change would not be too sudden or violent as suspicions might be aroused amongst the illiterate and there might be a good deal of opposition to be overcome. A few witnesses recommend the metric system, failing some other system recommended by them.

British system.

8. Only four witnesses in Bihar and Orissa, all officials, select the British system as their first choice. The reasons given for the selection are that India has more trade with British territories than other countries and that there would then be one uniform system throughout the British territories and United States of America. A few witnesses prefer the British system to the metric if the local system or the Bengal system is not adopted. The principal reason is that the British system is already known to some extent. One witness prefers it as the pound is divided into 16 ounces. A few witnesses are opposed to the system on the ground that it will give rise to much confusion and inconvenience; that uneducated classes will take a long time to understand it; and that it is not akin to any system in India.

Alteration of coinage.

9. The great majority of the witnesses who dealt with this question, especially of those orally examined, consider it unnecessary to alter the weight of the rupee if the British system is to be introduced. It is stated that any change would create difficulties, inconvenience and confusion and hamper business transactions; that counterfeit coins may be introduced; that it would upset the weights now used for gold, silver and Indian medicines and might lead to fraud in connection with the making of jewellery from rupees. There is not so much opposition to the proposal to alter the nickel or copper coins.

Measures of length and area.

10. Witnesses of Bihar and Orissa are prepared to accept the English yard and a cubit of 18 inches and a girah of $\frac{1}{16}$ yard. For areas, some witnesses prefer the bigha, katha, and dhur system. One witness would have the bigha made equal to an acre. The Collector of Bhagalpur makes a similar suggestion; but other witnesses would fix the length of a lagga at $5\frac{1}{2}$ cubits which would give a bigha of 3,025 square yards or $\frac{5}{8}$th of an acre. Only three witnesses, two of whom are Collectors, recommend the acre and decimals but one group state that there would be no difficulty in expressing areas in acres and decimals in the surveyed portion of their district. On the other hand, one witness states that the measures of area vary and have been in existence from time immemorial and that it would therefore be difficult to alter the system now and that these measures should not be interfered with.

Measures of capacity.

11. A few witnesses of Bihar and Orissa, who have given evidence regarding the question what should be the uniform measure of capacity appear to accept a measure fixed on the unit of weight of water or of some multiple of it. For instance, at Cuttack, witnesses are prepared to accept a gauni of one gallon.

Cubical contents

12. No witness in Bihar and Orissa has made any suggestion regarding the measures of cubical contents.

Special or authorized weights.

13. Grains, oil-seeds, liquids, ghi, milk, oil, salt, tobacco, coal, fuel, etc., are sometimes dealt with by special weights in wholesale trade. The reasons given are, custom, allowances for dryage, variation of coins, concession for wholesale purchase, method of obtaining profit without raising the prices apparently and for purposes of cheating. As regards gold, silver, etc., it is said special weights are used as they are sold in small quantities. Generally, it is thought that there would be no objection to standard weights and measures being used in all cases. Some witnesses would make an exception in favour of druggists and jewellers, etc. There would be temporary confusion by the introduction of the standard weights and measures while traders and others become accustomed to them.

Trade in the same commodity by weight and measure.

14. Grains, rice, pulses, liquids are sometimes dealt with by weight and sometimes by measure. In the case of liquids such as milk and oil, the measures purport to hold a particular weight of the commodity sold. In such cases, witnesses are generally of opinion that there is no objection to permitting the present practice to continue. In the case of grains, etc., however, where measures are used, there is a more general desire for the prohibition of the double practice except in so far as it may affect backward races who are not used to weights. It is said that measures can be easily manipulated and are frequently inaccurate. On the other hand, it is stated that the total abolition of measures which is suggested by some witnesses would be inconvenient, especially to the poorer classes.

Use of same term to denote both weight and measure.

15. Generally, witnesses in Bihar and Orissa consider that no confusion arises owing to the use of the same term for a weight and also a measure except among strangers. Consequently the majority of those who have expressed any

opinion do not consider it necessary to make any change in the existing practice, especially as in many cases the weight and the measure purport to represent the same quantity, *e.g*, generally in the case of liquids.

Adoption of the authorized system by Government, etc; methods of introduction.

16. (*a*) No objection has been raised to this proposal. A steamer agent suggests the addition of steamer offices trading only in Indian waters.

(*b*) This proposal is approved. Some witnesses suggest that they should also be supplied to zamindars' village kutcherries, mustajirs, lease-holders of *hats* and fairs, presidents of village panchayats, co-operative credit societies, post offices, all registration offices, presidents of village unions, presidents of chowkidars' unions, brokers, etc.

(*c*) Witnesses generally approve of this proposal. Some witnesses suggest that the tables should also be published by or supplied to zamindars, village chowkidars, village panchayats, presidents of chowkidari unions, co-operative societies, elementary schools, lease-holders of *hats* and of fairs, local bodies and police stations. It is also suggested that the tables should be published in vernacular newspapers and should be distributed at fairs, railway stations and other places of public resort.

(*d*) No comment is made on this suggestion except that one witness proposes that the use of the corresponding English measures should be taught in schools where English is taught.

(*e*) This proposal is approved throughout Bihar and Orissa. A few witnesses suggest that no fee should ever be charged for this service.

(*f*) A few witnesses consider it unnecessary for Government to supply authorized weights and measures free of cost, in place of the weights and measures now in use.

(*h*) A few witnesses consider this unnecessary as they are used only by well-to-do people.

(*i*) One witness suggests that owners of private markets and landed proprietors should be asked to adopt authorized weights and measures ; otherwise no comment is made on this proposal.

(*j*) The only suggestion made is that the words " except for scientific purposes " should be added.

(*k*) A few witnesses in Bihar and Orissa consider it unnecessary that Government should forego the import duties. Two witnesses suggest that no import duty should ever be charged.

(*l*) Witnesses generally approve of the proposal that the Government should sell weights and measures but some consider it unnecessary for Government to sell at cost price, while others suggest that sale might be at cost price for a limited period.

(*m*) and (*n*) These are generally accepted but the Collector of Patna is wholly opposed to the suggestion as it will cause inconvenience to trade. Two other witnesses consider this provision unnecessary and a hardship.

(*o*) Only two witnesses are opposed to the suggestion that the use of any weights and measures except those authorized should be illegal throughout India after a certain date.

(*p*) The proposal that it should be presumed that any unauthorized weights and measures in the possession of a shopkeeper, trader or merchant are intended to be used and that such possession should be illegal is approved by all witnesses in Bihar and Orissa except two.

Periods after which the measures to be adopted.

17. Witnesses in Bihar and Orissa have generally given one single period by which they expect that the uniform system of weights and measures will be completely introduced. The most favourite period is one year and the next is two years. The periods mentioned vary from one month to 20 years, while one group of witnesses state that it will take 20 or 30 years for the acre to exclude the bigha.

Penalties.

18. The proposal that the penalties for failure to adopt the prescribed system should be destruction, confiscation and fine is generally approved by witnesses in Bihar and Orissa. While a few consider that confiscation is unnecessary, others would inflict a fine only for a second or subsequent offence or after a certain period after the first introduction of the system. Some witnesses point out that destruction is necessary in any case to prevent the use of the unauthorized weights and measures again. Sums varying from Rs. 2 to Rs. 100 are mentioned as suitable amounts for the fine. It is also suggested that arrangements should be made to punish offenders locally without making them go to distant places. Two witnesses suggest a penalty of imprisonment for repeated or serious offences.

Agencies to detect cases.

19. The agencies proposed for the detection of cases are generally approved by the witnesses in Bihar and Orissa, but a few witnesses object to the employment of the police as they are liable to abuse their powers, while others would only allow the police above the rank of head constable or Sub-Inspector to detect cases. Others, on the other hand, suggest the employment of the police only. The suggestion to employ the revenue staff, including the kanungo, has been more generally approved though some witnesses appear to fear that the revenue officials may harass the people. The employment of municipal authorities and village headmen or village panchayats is generally approved. The employment of officers of Co-operative Credit Societies, inspecting officers of Excise, Education and Public Works Departments, Local and District Boards and Sub-Registrars, Headmasters, Government pensioners, all gazetted officers, Zamindars, Municipal Councillors, Members of District Boards and presidents of chowkidari unions is also suggested as suitable persons to be employed in this connection

Effect.

20. Witnesses in Bihar and Orissa generally consider that the ultimate effect of the introduction of a uniform system of weights and measures would be beneficial to all concerned, though there may be some temporary confusion and inconvenience until everyone has become familiar with the new system.

Miscellaneous suggestions.

21. The following are among the miscellaneous suggestions made by the witnesses of Bihar and Orissa. Weights and measures should be made easily available and as cheap as possible. They should be manufactured in Government factories or under the supervision of Government and issued to the public after being stamped. The Government should license recognized reliable firms to manufacture and sell standard weights and measures at prices fixed by Government. The Government should reserve the right to manufacture and sell weights and measures for some time, after which the right should be given to recognized private firms over which the Government should retain control. The Government should confiscate all the old weights giving a rebate for them. Licenses should be granted to approved firms to stamp standard weights. Weighing machines for weighing authorized weights should be kept at every municipal office and in every bazaar. Owners of markets should be made responsible for the use of standard weights and measures and they should be fined if they fail to report the use of illegal weights. If it is not practicable to introduce a uniform system for India, provincial standards should be fixed. Gorakhpuri pice and dhebuas should be done away with. A confidential enquiry should be made regarding the inaccuracy of scales.

PUNJAB.

Places visited and evidence received.

Seven districts were visited (Ambala, Amritsar, Ferozepore, Lahore, Ludhiana, Multan and Sialkot), and written evidence was only received from these districts. 81 replies were received, though these represented considerably more individuals as several were the result of inquiries from a considerable number. 24 were received from officials (7 Europeans), and 57 from non-officials; of persons who sent in written replies 6 were examined individually, and 15 with 195 others in 16 groups.

Uniform system desired.

2. Opinion is unanimously in favour of a uniform system being enforced. Thus, the Deputy Commissioner of Sialkot writes ".....uniform system, which I thoroughly believe is strongly desired by all honest people". The great majority favour the Railway weights, a few saying that unless that system be enforced there should be no uniform system. This is more particularly noteworthy, as all the districts visited except Multan are districts in which the 80-tola seer is not the prevailing rural weight, and certainly in some cases the opinions of the petty trader and agriculturist were obtained; one witness of Ferozepore suggested retaining the kachha weights in rural areas. It is to be noted that the Railway weights are frequently known as the "British" system and that the 80-tola seer is often known as the *Angrezi* seer. This is in consequence of these weights having been introduced by the British at the time of the annexation. This introduction is said to have been effected without great difficulty, the Tahsildars calling up the traders and explaining to them the new system. The introduction of any other system is considered to be very difficult. One group is ready to accept any system based on the tola.

Other systems.

As regards alternative systems, a few witnesses favour the British system, as a rule by way of the 2 lb. seer; one or two prefer the metric system, while the Deputy Commissioner of Lahore proposed that the existing weights be allowed to continue side by side with the metric system for some time. When asked to choose between the metric and British systems on the hypothesis that one or the other was to be introduced, the majority favoured the British, only three preferring the metric, while one group was about equally divided in favour of either. But it was quite clear that the selection was only that of what was least disliked, the real preference being for the 80-tola seer.

Change of coinage.

As a rule, a change of coinage is deemed necessary if the British or metric systems are introduced. But a fair number say that there is no necessity to change the rupee if the pound be introduced, one witness urging that 39 of the present rupees are quite near enough to the pound for all practical purposes. But the proposal is very obviously disliked as a rule, and suspected by some. Others say that it would be necessary to convince the people that the reduction in weight was for general convenience and not for Government's gain. The objection on the score of upsetting weights is, as usual, really the greater. A greater or less approval is expressed by some. The majority of those orally examined disliked the suggestion unless the amount of silver be left unchanged; approval is only more or less expressed by three groups. If the metric system were decided on, a new coin of £ $\frac{1}{10}$ is approved of by a few.

As grounds for the preference for the Railway weights, it is urged that through the railways and post office the system must be more or less known all over India.

As regards weights below the tola, not many witnesses have expressed any opinion. Some have advocated that the tola be fixed at 180 grains; others have asked for the retention of the current tola on the ground that if it were reduced, prices of articles weighed by it would remain unaltered.

Measures of length

3. For measures of length the British yard is with very little exception recommended, its division into 16 girahs and 2 haths should be recognized. It is pointed out that piece goods from metric countries even (France, Germany and Austria) practically always come made up into yards. One witness in Sialkot suggested the recognition of a 33-inch yard, but admitted that he could do with the 36 inches. Another proposed a somewhat fantastic system involving a 10-inch foot and a 40-inch yard, and one the recognition of the 24-inch hath. The furlong and mile were recommended by such as proposed anything larger than the mile save by one witness who wished for the 5,000 feet Canal mile.

Measures of area.

4. *Area.*—As already noted, the acre is fairly widely known but is not subdivided decimally. The bigha of $\frac{5}{8}$ acre is recommended from Ambala and the 4,000 square yard *ghumaon* from Amritsar. A fair number are quite prepared to accept the proposal that the acre and its subdivision into one hundred parts be introduced in the way adopted in several other provinces, *i.e.*, by giving the areas of all fields at next re-survey in both acres and hundredths, and also in the current measure, the two methods being used side by side in the Land Records until people were sufficiently familiar with the acre. A few think there would even then be difficulty in insisting on areas in deeds and suits being expressed in acres and hundredths, whether they were or were not at the same time also expressed in the old measure. The necessity of a uniform system of land measurement is specially urged by reason of the difficulty experienced where districts using different systems adjoin, more especially as this is frequently on the banks of rivers liable to alluvion and diluvium.

Measures of capacity (dry).

5. Only one of the districts in which measures of capacity are used to a considerable extent was visited (Sialkot). They are used to a moderate extent in Ferozepur, but appear to be dying out in Lahore and Multan. In fact most of the Lahore witnesses thought it unnecessary to recognize any such measures, but some considered that this should be done and that a *topa* about equal to a gallon would be suitable. In Sialkot the Deputy Commissioner proposed that the topa be standardized so as to contain, when struck, 2 seers of dry wheat. The witnesses thought that if the daropa were fixed at about the size of the gallon it would be suitable, the topa and paropi being respectively $\frac{1}{2}$ and $\frac{1}{8}$ thereof. It was considered very improbable that the custom of heaping could be stopped. As regards shape, the existing bulged more or less circular shape was naturally preferred but it was thought possible to secure acceptance of a cylindrical shape, but height and diameter must be more or less equal.

Measures of capacity (liquid).

6. As a rule, the only liquid measure used is one made to hold some exact weight of the liquid for which it is used. An Amritsar milkman asked that the *babki* be made to bear some fixed proportion to the *gadwi*, a measure, usually holding a seer of milk. An oil seller similarly asked for the prescription of a uniform *palli*, while a group of witnesses in that town recommended the adoption of the British Imperial liquid measure for milk.

Simultaneous use of weights and measures.

7. Opinions as to the advisability of abolishing the simultaneous use of weight and measure are, as a rule, of comparatively little value, as measure is very little used in most of the districts visited. In such (Ambala, Ferozepur, Lahore and Multan) the general opinion favours abolition of measures, and even in Sialkot several favour such action. The ground, where any is given, is that in this way fraud would be prevented. A few witnesses, especially those from or acquainted with rural areas where the use of measures is still considerable, consider that abolition would not be practicable.

Use of same name for weight and measure.

Most witnesses, who have considered the point, consider it inadvisable to use the same name for a weight and measure, but the matter, as a rule, is of

academical interest, as practically the only measures that bear the same name as any weights are measures that purport to contain that weight of the particular liquid sold by it, and in that case the use of the same name is deemed unobjectionable.

Special weights for special commodities.

8. The use of special maunds and seers for special commodities is moderately prevalent. Such use is variously attributed to ancient custom, the necessity of allowing for dryage, wastage, etc., or to different weights having originally been in use in the place whence the article comes. The great majority of witnesses advocate abolition of all such special weights, and consider that at most there may be some temporary inconvenience. The Secretary to the Punjab Chamber of Commerce at Amritsar considers it "impossible to put a stop to these variations by legislation" quoting in particular the 97-tola seer for tea. Accordingly the evidence of a tea merchant on this very point is specially valuable. He discusses the tea seers and tea-trade customs in detail and after pointing out the inconveniences that may arise from abolition winds up by saying that "if a standard weight is fixed.....there would be a great advantage for all buyers and sellers alike". The silk trade is another in which in Amritsar there are several special measures. A silk merchant says, "Such seers.....cause much inconvenience and hindrance and are troublesome for trade and commerce." An Ambala witness asks for the retention of the special firewood maund, but other Ambala witnesses do not support him.

Special weights for special trades.

9. A few witnesses have suggested special weights or measures for special trades. Two propose the retention of the old tola, etc., for jewellers, one for medicines, and an important Lahore witness urges that the prohibition of the British weights would be very inconvenient, and urges that their use be permitted if some other system be prescribed either under a license or else accompanied by orders requiring these weights to be always of a different shape from the usual weights.

Methods of introduction

10. With reference to methods of introducing and enforcing a uniform system the proposals of the Committee, as set forth in Question 20, met with a considerable amount of approval. The following are the chief suggestions and criticisms made :—

(*a*) It is suggested that pressure be also exerted on other bodies to persuade them to take similar action.

(*b*) Distribution of specimens is also recommended to Municipalities, District Boards, Notified Area Committees, Octroi posts, zaildars and chowkidars, bazaar chaudharis, and patwaris. The only adverse criticism is that of the Deputy Commissioner of Lahore who would restrict distribution to treasuries and sub-treasuries.

(*c*) It is urged that publication be in all the vernaculars, Urdu, Hindi, Multani and Gurmukhi ; that the tables be hung up in post offices and railway stations, police stations, schools, dispensaries, public libraries, and Municipal and District Board offices, and wherever samples of the weights are kept ; that they be published in all newspapers, engraved on stone and set up in bazaars and large villages ; and lastly that the new weights and measures be proclaimed by beat of drum.

(*d*) Teaching of other weights as well is only urged by one witness. Special instruction on first introduction is also urged.

(*e*) The Deputy Commissioner of Lahore urges that no weights should issue at all without a Government stamp.

(*f*) A system of regular testing, stamping and inspection of weights and measures is disapproved by none, and specially approved or recommended by a large number. The only criticism offered is on the score of expense, and several advocate that it be done free, while only one specifically proposes a fee and one after 50 years. The period between successive inspections is variously recommended; annually for shopkeepers in towns and triennially to quinquennially elsewhere may be taken as the general opinion.

(*g*) Several urge the free replacement of all weights to begin with as a good way of starting the system, and popularizing it with the poorer classes, and especially with those who at present use stone weights, a fairly numerous class in parts of the Punjab. One recommendation as regards poor people is that a free set be given to every 25 families, but this witness appears to contemplate the enforcement of the use of prescribed weights in private households for purposes other than ordinary trade. One or two suggest that Government arrange to buy up old weights as old iron, or at a slightly higher price. One witness (a pleader and trader of Multan) urges that if free replacement be done at the beginning it would "ensure the success of the new system".

(*k*) Disapproved, except for a short period for weighing machines.

(*l*) Opinions are various. A considerable number think that the supply of weights should be arranged for by Government; some simply at cost price, or for a period of 6 months, or of 10 years, or combined with free licenses to private firms. The Deputy Commissioner of Ferozepur thinks that no private trade in weights should be allowed, Government arranging all, and a group of witnesses in that district urge that Government should see that a supply of stamped and tested weights is available; the Deputy Commissioner of Lahore puts forward an elaborate scheme for the manufacture and distribution of weights by a method similar to the central distillery system for liquor, sales to be through treasuries and sub-treasuries, with a system for withdrawing and replacing weights when worn out, on the lines of coin and an important Lahore witness suggests that weights be replaced for a period at cost price free of charge, but that after that had expired double cost should be charged. The Deputy Commissioner of Sialkot would employ a monopolist contractor thinking this the best way of regulating the prices. A Multan witness suggests that Government should provide traders with weights and measures at cost price on condition that they sell at a price not more than $3\frac{1}{2}$ per cent. in excess thereof, Government recasting old weights by a contractor. An Ambala witness suggests that weights be made by private firms under the control of Government and one from Amritsar that they be made by Government agency. A few favour the suggestion that manufacturers of weights and measures should be required to take out licenses which should be given free of charge while more think this unnecessary if testing and stamping be insisted on. Six witnesses definitely recommend that Government either sell at a profit, or leave the supply entirely to private enterprise.

(*m*) and (*n*) The only criticism offered is that of the Deputy Commissioner of Lahore who urged that scribes of such documents are, as a rule, not well-trained men.

(*p*) One witness, an Ambala banker, objects to this presumption. Other suggestions are:—That weights should show what they are by inscriptions in English and vernacular; that prescribed weights should be coloured red; that stone weights be absolutely prohibited; that there should be no interference with weights used otherwise than by shopkeepers; that balances should also be

inspected; that shopkeepers in rural areas might record the fact of having provided themselves with standard weights with the patwari; and lastly that to arrange for the introduction of the new system into a town, a committee should be appointed consisting of a grain-dealer, cloth-merchant, shroff, landlord, general merchant, druggist, factory-owner, leather-merchant, engineer and lawyer.

Period.

11. The period deemed necessary for the complete introduction of the Indian Railway weights with stamping of weights is variously estimated at from 3 months to 6 years; most opinions vary about 1 to 2 years. For the British system anything from 5 years to a generation is deemed necessary.

Penalties.

12. The progressive exercise of confiscation and imposition of fine was generally approved. Leniency at first is generally urged. A group of Ferozepur witnesses urge that the word 'penalty' be used instead of 'fine' as implying less stigma.

Staff.

13. As regards the staff by whom inspection etc., is to be carried out, opinions are very numerous and varied. Most do not care about the Police, but there are a fair number who favour the employment of the superior grades, *i.e.*, not below a Sub-Inspector, a fair number favour the Excise Inspector, and the Secretary to the Punjab Chamber of Commerce proposes a properly organized Weights and Measures Department to be connected with the Excise Department. On the other hand, one witness objects to the Excise Inspector on the ground that his methods are likely to be similar to those of the Police. The employment of the Revenue staff, as a rule, of rank not below supervisor kanungo, occasionally not below Naib-tahsildar, is approved. A few would also employ the patwaris. In towns the Municipality, it is universally agreed, should supervise matters, the members themselves, with the bazaar or trade chaudharis and the superior staff, being generally recommended, though one witness would go as low as officials drawing Rs. 15 per month. In rural areas the headman (with zaildar, safedposh and lambardar) is generally recommended; only two witnesses urge definite objections, one on the ground of his being frequently illiterate and likely to use his powers to gratify personal spite, and the other on the ground that he is less reliable than a constable; one or two would select headman for this purpose—but it is clear that he has the general confidence of the witnesses. That he or the bazaar chaudhari be paid for their work in this connection, or at least rewarded in cases of successful prosecution is recommended by some.

A special establishment, or at least special Inspector, is recommended for the larger places by some. A special committee of shopkeepers, etc., is also proposed; and others suggest that the inspecting officer, be he Excise Inspector or other, be accompanied, when inspecting, by one or two respectable residents of the place. One important group of witnesses urge that cases should go to a revenue court.

Effect of uniform sytsem.

14. Opinions as to the effect of the introduction of a uniform system are less divergent than usual. It is practically agreed by all that the ultimate effect will be a benefit to all, a few consider that there would be some slight temporary inconvenience, more especially to the small traders and poorer and agricultural classes. These opinions are, it must, however, be remembered, practically invariably based on the assumption that the uniform system introduced will be the Indian Railway weights. It is also urged that interference with weights and measures must be confined to shopkeepers, traders and merchants; and that no attempt at touching weights or measures in use in private houses must be made.

BOMBAY.

Districts visited and evidence received.

The Committee visited seven districts besides Bombay City. 238 replies were submitted by 572 witnesses, of whom 524 were non-officials. 29 witnesses were Europeans and 542 Indians. Besides, several officers had consulted a large number of people before submitting their replies. The Committee examined 41 witnesses individually and 114 in groups. Among the witnesses were the representatives of the Bombay Chamber of Commerce, the Karachi Chamber of Commerce, the Great Indian Peninsula Railway Company, the Bombay Presidency Trades Association, the Bombay Cotton Trade Association, the Indian Merchants' Chamber and Bureau, the Bombay Commission Agents' Association, the Bombay Grain Merchants' Association, the Bombay Country Tobacco Trade Association, the Karachi Indian Merchants' Association and the Mill-owners' Association at Ahmedabad.

A uniform system favoured.

2. The weight of the evidence as a whole is in favour of uniformity, but there is divergence of responsible opinion as to the pace at which uniformity should be introduced or enforced. The Bombay Chamber of Commerce are of opinion that "uniformity in weights and measures is a matter that will take years to bring about." They would deprecate compulsion, but would advise persuasion and co-operation of local bodies. Some attempt should be made towards uniformity, but it should not be of a penal character. The Bombay Cotton Trade Association and the Indian Merchants' Chamber and Bureau hold more or less the same view. The Karachi Chamber of Commerce, the Bombay Presidency Trades Association, the Bombay Commission Agents' Association and the Ahmedabad Mill-owners' Association are for uniformity. The Bombay Grain Merchants' Association and the Bombay Country Tobacco Trade Association think that the masses in India are so illiterate and so accustomed to their own weights and measures that a uniform system would cause confusion and paralyse trade, and the latter body further remarks that the "remedy would be worse than the disease." There are also several individual witnesses who generally agree in this view. Another set of witnesses would introduce uniformity gradually and without any measures of a penal nature. There are again a few witnesses who would introduce uniformity into a small area, spreading it gradually over the rest of the country.

Desirability of Native States adopting the same system.

There is also some evidence pointing out the necessity of the Native States adopting the uniform system that may be introduced into British India.

Railway weights preferred.

Apart from the witnesses who want their own local weights adopted for the whole of India, the balance of evidence, especially that of Indians, is in favour of the Railway system of weights which are either familiar to the people generally or are used throughout the Presidency. The Bombay Chamber of Commerce in general terms and the Karachi Chamber of Commerce specifically recommend the Railway system, but the latter make a proviso to the effect that if and when the United Kingdom adopts the metric system, it should also be introduced into India. It is significant that many Indian witnesses of Bombay who use a seer of 28 tolas have recommended the Railway system. Several Europeans, and a few Indians who are residents of towns like Bombay or Ahmedabad, have recommended the adoption of the British or the metric system, but it is clear that they are not much in touch with the rural population. The idea of making the Railway seer (80 tolas) exactly equal to 2 lbs. by reducing its weight by $\frac{1}{80}$th with a similar reduction in the weight of the rupee or the tola has also been supported by several witnesses, but in this connection it must be remembered that to the witnesses of smaller towns and villages the idea was absolutely new till the Committee actually examined them orally, and their opinion could not therefore be characterized as well-considered. On the whole, there is no doubt that the witnesses generally, and those of smaller towns and rural areas particularly, would prefer the Railway system, without any alteration, to any other system.

As between the British and the metric systems, the balance of evidence is generally in favour of the former, provided that the weight of the rupee is reduced to 175 grains so as to bring the Railway weights into line with the pound. The alteration in the weight of the rupee which would reduce its intrinsic value is not much liked, especially by witnesses in the districts, as they think that it would create difficulties, but they would accept it rather than have no simple connection between the rupee weight and the uniform system of weights.

British and metric systems. Change in rupee.

3. As to weights below the tola, it has already been shown in Chapter IV (Bo. 7) that there are special tolas for gold, drugs, etc., only in a few tracts and that these are used side by side with the tola of 180 grains. That these special weights should be retained for jewellers and Indian druggists is maintained by very few witnesses, while the general trend of evidence is in favour of the smaller weights being based on the present rupee-weight. Mr. Ramchand Nathumal, a jeweller who has dealings in several parts of India where these special tolas are used, advocates uniform weights based on the tola of 180 grains.

Special gold tolas.

4. As regards measures of length, the people generally are so familiar with the British yard or its adaptations (18," 24," 27" and so forth), corresponding in some degree with their old indefinite measures, that scarcely any objection has been raised to its adoption as a uniform measure for the whole of India. It would appear, however, that there is a general desire to retain the popular subdivision of the yard into 16 *girahs* (of $2\frac{1}{4}$ inches) or 32 *tasus* (of $1\frac{1}{8}$ inches).

Measures of length.

5. As regards area measures, the British yard and its subdivisions in one shape or another being recognized, the only measure to consider is one for agricultural land. The acre is widely known and witnesses who have given evidence on this subject accept it as the unit. Throughout the Presidency, the acre is divided in the Land Records into 40 *gunthas*, and this subdivision is widely known. In Sind, the *jarib* is half an acre. It is difficult to say how a decimal division of the acre would be liked by the people, but such evidence as there is is in favour of the retention of the *gunthas*.

Measures of area.

6. As to measures of capacity (dry), these are not used in the Ahmedabad, Broach and Kaira districts, and are used only for domestic purposes in the Panch Mahals. In the rest of the Presidency, they are very largely used. Uniformity in the matter of measures is generally supported by the evidence, evidently the result of the great confusion that exists at present. Of course many of the witnesses would prefer their own measures being extended over the rest of the country, but it seems to be recognized much more than in the case of weights that this is not possible. While the present measures are generally based on a definite weight of one or more kinds of grain, the evidence generally is in favour of a definite weight of water being made the basis. Several witnesses have advocated or suggested the adoption of British measures. A larger number of witnesses would abolish measures altogether, as there is a considerable amount of cheating done with them.

Measures of capacity.

The above remarks, *mutatis mutandis*, apply to liquid measures.

7. There is scarcely any evidence as regards measures of cubical contents, and there are practically no such indigenous measures, the British cubic foot being used where required.

Measures of cubic contents.

8. Considering the localities in which witnesses were examined, and not merely their number, opinions appear to be evenly divided as to whether the sale of the same commodity both by weight and by measure in the same place should be prohibited. There is no evidence to show that in places where such a practice obtains, customers have been allowed no choice.

Simultaneous use of weight and measure.

9. As regards the use of the same term for both a weight and a measure of capacity, the witnesses who recommend its prohibition on the score of its causing confusion are in the minority. The majority of witnesses are of opinion that there is no confusion, as the parties clearly understand whether a certain article will be sold by weight or by measure and that even if some misunderstanding is caused, it is not advisable to legislate on the subject.

Use of same name for weight and measure.

10. As will be seen from Chapter IV (Bo. 4 and 8) the use of special maunds and seers for certain commodities is widespread. The saying among grain sellers and grocers, quoted by a Bombay witness, that there are 52 maunds and 56 weights is almost literally true. If we consider vested interests in the different trades which wish to maintain the present confusion of weights as a trade secret for their own advantage and the preponderance of their representatives among the witnesses, the evidence in support of the abolition of these trade variations is remarkably strong. The dissentients urge that the people are accustomed to the weights for certain commodities and their abolition would cause confusion or that abolition may be desirable but is not practicable.

Special weights for special commodities.

11. Local standards are scarcely recommended. The Bombay Chamber of Commerce think that they may be necessary temporarily, and possibly, even permanently. As regards special standards for special commodities or for special purposes, such as the British weights for export trade or for certain imported or other articles like Europe stores or tea, or the apothecaries' weights and measures for European medicines, there is very little evidence, but such evidence supports the retention of these weights. The question of the retention of the special tolas has already been dealt with.

Special weights for special purposes.

12. As regards the methods to be adopted for introducing and enforcing a uniform system of weights and measures, the suggestions of the Committee contained in Question 20 are generally approved, subject to the following remarks:—

Methods of introduction.

(*a*) This is practically unanimously approved.

(*b*) This suggestion is also generally approved. Some witnesses further propose that specimens of weights and measures should also be kept in Municipal and Local Board offices and with *shetyas* of bazaars. A few think that it is not necessary to keep specimens at police stations, or with village headmen or in schools.

(*c*) There are no District Gazettes in this Presidency. The suggestion is accepted, and some witnesses would include school-houses and all public places, and would periodically distribute the tables to leading merchants, etc., or would issue them free to the public, the penal clauses being inserted in them.

(*d*) The witnesses accept the suggestion, but some of them think that it is not desirable to prohibit the teaching of other systems including foreign systems.

(*e*) The Bombay Chamber of Commerce would proceed very cautiously in the matter, and Mr. Metaxa, their representative and agent of Messrs. Ralli Brothers at Bombay, would stamp only authorized measures 10 or 15 years after the introduction of a uniform system. The General Traffic Manager, Great Indian Peninsula Railway, also thinks that this should be done after a certain period of grace. Periodical stamping is recommended by witnesses generally.

(*f*) Here again the Bombay Chamber of Commerce enjoins great caution. The stamping of measures free of charge as a permanent measure is recommended by several witnesses, and by others for one to five years, while Mr. Metaxa recommends a period of 10 to 20 years.

(*g*) The Collector of Bombay, the Collector of Customs, Bombay, the President of the Karachi Municipality, and the Collectors of East Kandesh and Satara consider this measure unnecessary. The period for which this concession is recommended to extend is six months to five years.

(*h*) This affects only a limited class of people; while many witnesses approve of the proposal, others consider it as unnecessary on the ground of expense to Government.

(*i*) The Bombay Chamber of Commerce would advise great caution, and Mr. Metaxa would enforce this after 20 years. The other witnesses who approve of the proposal generally recommend that it may be enforced from six months to five years after the introduction of the system.

(*j*) The Collector of Customs, Bombay, is doubtful as to the necessity or wisdom of adopting this proposal. Mr. Metaxa thinks this should be done 5 or 10 years after the introduction of a uniform system. The Collector, Nasik, thinks that this restriction should apply only to weights and measures intended for public use.

(*k*) The Collector, East Khandesh, does not agree in this proposal, while two witnesses say that import duty should be levied with a view to encourage manufacture of weights and measures in India, and there is no valid reason for any exemption. The period of exemption proposed by several witnesses ranges from one to five years, and Mr. Metaxa recommends 20 years.

(*l*) (*i*) and (*ii*) Several witnesses urge that the sale of weights and measures should be left entirely to private enterprise, while others recommend that their sale should be undertaken by Government for a few years. A few witnesses would restrict sale by Government to outlying areas beyond the scope of private enterprise.

(*m*) This is objected to by a few witnesses. Those who agree to the proposal recommend its being enforced 1 to 20 years after the introduction of a uniform system.

(*n*) This is generally accepted, and the period of grace recommended generally is one to five years. One witness urges that registration should not be refused if the equivalents in terms of the authorized weights or measures are also specified.

(*o*) This is opposed by a few witnesses including the Bombay Chamber of Commerce. The Collector of Bombay and several other witnesses do not recommend the adoption of this measure till a considerable time after a uniform system is launched or till the people are familiar with it.

(*p*) The Collector of Bombay thinks that this measure should be adopted after a considerable period, and Mr. Metaxa suggests 20 or 25 years.

Penalties.

13. As regards penalties, destruction or confiscation of unauthorized weights and measures in the first instance and fines subsequently are recommended. Several witnesses think that for the first offence a warning should suffice and that for some time offenders should be leniently dealt with. The maximum amount of fine recommended generally is Rs. 50.

Agency to be employed.

14. As to the agencies to be employed for detection, there are a few witnesses who object to the employment of the Police, but the majority are of opinion that officers not below the rank of head constable or Sub-Inspector may be entrusted with this duty. One witness suggests that no prosecution should be instituted without the sanction of a special officer

appointed in this behalf. The employment of the Revenue staff for this purpose is more readily approved, and the general recommendation is that the officials should not be of lower rank than the *Awal Karkun* or Circle Inspector (Naib-tahsildar and Revenue Inspector in other parts of India). The agency generally recommended for Municipalities is the President, the Secretary and Chief Officer, and by some witnesses, members of the Committee and paid officials on a salary not below Rs. 50. The employment of village headmen is generally approved, and several witnesses also recommended kulkarnis (Patwaris) and committees consisting of non-officials, while a few would have a special trained staff.

Effects of a uniform system.

15. It is generally agreed that a uniform system will eventually benefit the public as a whole, especially the ignorant masses. According to many witnesses, petty traders will suffer as there will be no trade secrets, but it is also argued that honest trade will benefit. For some time illiterate and ignorant people will be imposed upon.

CENTRAL PROVINCES AND BERAR.

Number of witnesses.

The Committee visited seven districts. 82 written replies were received from 163 witnesses, but these latter do not include many tradesmen and agriculturists whom several district officers had consulted and whose opinions have been incorporated in the replies. Of the 163 witnesses, 9 are Europeans and 154 Indians; 22 officials and 141 non-officials. 112 witnesses were examined orally, 22 being examined individually and the rest in groups.

Desire for a uniform system.

2. The non-official evidence is all but unanimous in favour of the adoption of a uniform system of weights. Messrs. Ralli Brothers, who do a considerable amount of business in the province, are of opinion that uniformity will take years to bring about; they deprecate compulsion, but urge persuasive measures and the co-operation of local bodies in the matter. One witness says that the present multifarious weights cause no inconvenience, and is against a uniform system, as it would deprive tradesmen of their profits and would afford an opening to petty officials to harass ignorant people. Some cultivators and artizans consulted by the district officers in Nagpur were divided in their opinion. The Deputy Commissioners, Nagpur, Jubbulpore, Drug and Bilaspur are of opinion that under present conditions uniformity in a vast country like India is not feasible and they would deprecate compulsion. The Deputy Commissioner, Bilaspur, is of opinion that the most that could be done at present would be the standardization of measures in municipal towns. The Deputy Commissioner, Narsingpur, is of opinion that it is impossible to enforce one system all over the country, and he advises such system being enforced only in the principal towns and other trade centres.

System to be adopted.

3. As regards the system to be adopted, the evidence in favour of the Railway seer of 80 tolas and the maund of 40 seers preponderates. The chief reasons for this are that the people in this province are familiar with these weights, that the system is simple and admits of convenient binary subdivisions down to the lowest weights required for ordinary transactions and that the whole series of weights are based on the tola or rupee weight and are therefore susceptible of easy check. On the other hand, there is also some evidence of weight in favour of the British or the metric system and opinions seem to be evenly divided as to which of these two systems should be preferred. Two witnesses would introduce the Railway or some other Indian system as a step to educate the people to uniformity and to facilitate the eventual adoption of the metric system. The Deputy Commissioner, Bilaspur, would adopt

the British, and the Deputy Commissioners, Nagpur, Jubbulpore and Drug, the metric system, if a uniform system is feasible in India, of which they are very doubtful. Some advocates of the British system have confused it with the Railway system which the British Government have introduced. Several witnesses have either supported or acquiesced in the proposal to adopt the Railway system but to reduce the weights down to the weight of the tola or rupee by $\frac{1}{80}$th, so that the seer may be exactly equal to two pounds. But the evidence of the petty traders, etc., in this respect should be accepted with caution, as they had not considered this matter till they were actually examined by the Committee. The objections to the alteration of the rupee were the reduction in its intrinsic value (which is important from the point of view of the people who hoard money as so much silver), the confusion and inconvenience that would be caused when the rupee is used as a weight, so long as the old coins are current side by side with the new, and owing to the very small difference, the probability of prices of articles not adjusting themselves to the new weights.

On the whole, the weight of opinion is on the side of the Railway system because it is familiar to the people and because it involves no change in what has always been the fundamental unit of weight, *viz.*, the current coin of the realm.

As regards weights below the tola, it has been pointed out in Chapter IV (C. P., 6) that in a very few places the tola for weighing drugs, gold and silver and other valuable articles is different from the rupee weight, and that even in those places the rupee weight is used for some or all of the articles. There is practically no opposition to the tola or rupee weight being standardized throughout India for weighing all articles.

Measures of length.

4. As to measures of length, as already shown in Chapter IV (C. P. 10), the British yard is widely known and used, and such witnesses as have given evidence in this matter are practically unanimous in recommending the adoption of the yard or half-yard measure (or a *hath* of 18 inches) as the unit; but they are generally for the retention of the popular subdivision of this measure into *girahs* of $2\frac{1}{4}$ inches each. The foot and the inch with which the people are to some extent familiar are not objected to, so long as the above binary subdivisions are retained.

Measures of area.

5. The same remarks apply, *mutatis mutandis*, to the area measures. As regards agricultural land, the witnesses who have given evidence on this point approve of the adoption of the acre, and the Central Provinces witnesses also approve of a decimal division of the acre, as at present. But in Berar, the acre is divided into 40 *gunthas* (1 × 1 chain of 33 feet each) and none of the witnesses of Akola (the only centre visited by the Committee in Berar) has expressed any opinion as to the desirability of a change to a decimal division of the acre.

Measures of capacity (dry).

6. Coming to measures of capacity for dry articles, uniformity is desired by the witnesses generally. Two witnesses think that there would be some difficulty in introducing uniformity, but one of them says that this difficulty would be removed by Government replacing the old measures free of charge. Many of the witnesses who advocate uniformity, however, want their own measures introduced elsewhere, so that their recommendation practically amounts to local standardization. These witnesses would have the capacity of the measures based on a definite quantity by weight of a particular kind of grain, as at present, while others realize that the fixation of capacity by the weight of water would be a more scientific method. Some witnesses again would abolish the use of measures entirely, while one would have grain and oil sold by weight only, but this recommendation is a counsel of perfection. A few witnesses either approve of or have no objection to the British measures being

adopted, but generally measures based on the Indian system of weights are recommended. Practically all witnesses recommend the custom of using measures heaped being allowed to continue, either because this method is easier or because the method of striking allows of malpractices.

Measures of capacity (liquid).

7. The above remarks, so far as they are applicable, hold good for liquid measures. Several witnesses (cultivators, artizans, etc.) in the Nagpur district, consulted by the district officers, were of opinion that the same measures should be used for dry articles as well as liquids.

Measures of cubical contents.

8. There are practically no indigenous measures of cubical contents, and the few witnesses from rural areas who are interested in the matter have raised no objection to the adoption of British measures, while the townspeople use these measures.

Sale of same commodity by weight and measure.

9. Opinions are fairly evenly divided as to whether the custom of selling the same commodity both by measure and by weight should be prohibited. The general impression is that the tradesman adopts the one or the other method according as it suits him, to the disadvantage of the customer. While this may be true in some cases, it appears that the general desire of customers, with the competition that undoubtedly exists among tradesmen, especially in towns, would certainly regulate a custom. Then the tradition of popular suspicion of all tradesmen as a class is not peculiar to India, although perhaps it is more pronounced than in more advanced countries, as ignorance breeds suspicion. Further, amongst a people suspicious by nature, a desire for change in the abstract suggested by the belief that they would get the better of their neighbours is a very different thing from such abstract proposition taking a concrete form. Many of the advocates for the abolition of the present practice would probably resent a change by legislation as unnecessary interference with an old custom.

Same name for weight and measure.

10. Regarding the question whether the use of the same term for a weight and for a measure of capacity causes any confusion, the bulk of the evidence is in the negative and is against any interference in this respect. The evidence as a whole shows that the parties to a transaction exactly know whether a particular commodity is to be sold by weight or by measure and the custom in any particular locality is more or less fixed in this respect, so that there is no likelihood of any misunderstanding. The Deputy Commissioner, Jubbulpore, says that no confusion is caused and adds "Theoretically, no doubt it would be better to separate terms. Practically, I do not think that it matters."

Special maunds.

11. Considering the interests involved, and the widespread net-work of multifarious maunds and other weights for various commodities, the evidence in favour of abolishing such weights is remarkably overwhelming. It is suggested that while the proposal is favourably received, the difficulties would be insuperable; that tradesmen would lose their profits and that no allowance for wastage would be possible. But apart from these notes of warning, inevitable in connection with any reform, it is clear from the evidence generally that the measure would be welcomed by the bulk of the population.

Local standards.

12. As regards local standards, the general opinion is that they should not be allowed temporarily or permanently, the principal reason being that they would retard the progress of a uniform system throughout the country. Messrs. Ralli Brothers are of opinion that "it may and probably will be necessary to prescribe local standards temporarily, or possibly, even permanently."

The Deputy Commissioner, Drug, who considers a uniform system for India impracticable, is also of opinion that local standards would be necessary as a temporary measure.

The Agent at Raipur of Messrs. Bansilal Abirchand, one of the biggest banking firms in the Central Provinces, considers that local standards would be necessary as a permanent measure. The Deputy Commissioner, Seoni, says that no permanent local standards would be necessary "if the uniform standard or the unit approaches fairly nearly to some standard or unit already recognized," and looking below the surface, this is really what the evidence as a whole practically amounts to, especially so in the case of measures of capacity, for the bulk of the witnesses have advocated the Railway system which is the predominant system in the province, and the adoption of their own measures of capacity.

Special weights for special trades.

13. There is scarcely any evidence as regards allowing the use of special weights for special trades. It has already been shown in Chapter IV (C. P., 4 and 18) that the British pound is largely used for imported and certain other articles, and also the gallon, but to a much smaller extent. It may fairly be presumed that the witnesses did not contemplate the total prohibition of these weights and measures. The jewellers' special tola weights in some tracts, which are also generally used for Indian drugs, have already been referred to, but apparently no difficulty is anticipated in the case of these commodities, the rupee weight being also concurrently used for these articles. The case of precious stones and pearls is a special one and is outside the ken of the witnesses generally.

Methods of introducing and enforcing a uniform system.

14. Subject to the following remarks, the methods of introducing and enforcing a uniform system, outlined by the Committee in Question 20, have been generally approved by the witnesses—

Use of authorized system by Government, etc.

(*a*) The Deputy Commissioner, Nagpur, who maintains that "the introduction of a uniform system into India is an almost impossible undertaking," goes on to say that "in practice it may prove impossible to establish such a concert of action."

Supply of specimens of authorized weights and measures to village headmen, etc.

(*b*) The Deputy Commissioner, Bilaspur, would exclude the village headmen, because it is unnecessary to supply them with specimens of weights and measures and the Deputy Commissioner, Narsingpur, who would introduce a uniform system only in towns, would exclude villages as the cost would be large. Another witness negatives the whole proposal as unnecessary. The Deputy Commissioner, Nimar, and two other witnesses suggest the addition of the offices of Municipal Committees, District Councils, Local Boards, Sanitation Committees and Cantonments and Courts and Excise warehouses.

Tables of the authorized system.

(*c*) Three witnesses suggest the addition of all public places and schools, and the supply of these tables to patwaris and touring officers, these latter being required to explain the tables to villagers.

Teaching of the authorized system in schools.

(*d*) Some witnesses urge that the teaching of the old systems of weights as also of foreign systems is necessary.

Stamping of authorized weights and measures.

(*e*) One witness considers the stamping of authorized weights unnecessary while another fears that the poorer tradesmen will be put to inconvenience by this system.

(*f*) This proposal is generally accepted (with one dissentient). The period suggested by several witnesses for Government stamping measures free of charge is six months to ten years, while one witness would have permanent exemption from fees. Another witness thinks that petty officials will harass the poorer tradesmen.

Facilities and fee for stamping, etc.

(*g*) Some witnesses consider this concession as either unnecessary in itself or because it would entail considerable expenditure on Government.

Free supply.

(*h*) The proposal is not approved by several witnesses.

Alteration of weighing machines.

(*i*) The Deputy Commissioner, Akola, considers that this proposal is quite feasible in Berar, where the cotton markets are under Government, and grain markets and weekly markets are under the control of Municipalities or District Boards. He further remarks that if uniform weights and measures are used in these places, the people down to the agricultural labourers will soon get to know and understand such weights and measures. One witness says that this rule would cause hardship to the poorer tradesmen, while another would confine its application to towns only. The period suggested for bringing such a rule into operation is six months to ten years. One of the witnesses thinks that it will take the people a generation or two to get used to a new system while another says that no arbitrary period should be fixed.

Use of authorised weights and measures in markets.

(*j*) The Deputy Commissioner, Bilaspur, considers that this measure would be far too radical a change. The Deputy Commissioner, Jubbulpore, deprecates this step which he thinks would cause great discontent, and he advises that the use of authorized weights and measures should be spread by persuasion and by subsidizing it.

Import, manufacture and sale

(*k*) This is agreed to except by two witnesses.

Import duties.

(*l*) (i) Some witnesses approve of this suggestion as necessary only for a certain period while two consider sale of weights and measures by Government as unnecessary.

Sale by Government at cost price.

(ii) The Deputy Commissioner, Akola, considers this unnecessary and even objectionable. The Deputy Commissioner, Narsingpur, and two other witnesses would leave the sale of weights and measures entirely to private enterprise.

Sale by Government at reasonable prices

(*m*) The Deputy Commissioners, Nagpur, Jubbulpore, Bilaspur and Akola, are against this proposal, and one of them (Bilaspur) characterizes it as "revolutionary" and not possible to enforce. Several other witnesses also more or less object to the proposal, while one suggests that documents in terms of unauthorized weights or measures should be admitted in evidence on payment of a penalty.

Admission of documents by civil courts.

(*n*) There is very little evidence on this suggestion which, however, has not been objected to.

Registration of documents.

(*o*) The Deputy Commissioners, Nagpur, Jubbulpore, Bilaspur and Narsingpur, condemn the proposal generally. The Deputy Commissioner, Bilaspur, would restrict the application of such a rule to Municipalities only. The Deputy Commissioner, Jubbulpore, recommends the use of unauthorized weights and measures being licensed, the license fee being gradually raised till it becomes prohibitive. The Deputy Commissioner, Akola, suggests that it should be left to Local Governments or local bodies to apply such a rule to any area after giving fair notice. One witness says that those unable to buy stamped weights and measures should be allowed to use their own, provided they are up to the standard. Some witnesses approve of the suggestion subject to a considerable amount of time, say, ten years being allowed from the date of introduction of a uniform system. The period generally suggested ranges from 6 months to 3 years.

Compulsory use of authorized weights and measures.

15. As regards the punishments for the use of unauthorized weights and measures suggested in Question 21, the Deputy Commissioners, Nagpur, Jubbulpore, Bilaspur and Narsingpur, as also Messers. Ralli Brothers deprecate penalties of any kind. But generally the penalties suggested are approved, fines ranging from Rs. 2 to Rs. 50 being recommended as a last resort.

Penalties.

16. As regards the agency to be employed for the detection of cases, a few witnesses consider the present agencies sufficient. But the majority are emphatically against the employment of the police for this purpose, and this is the opinion of those who seem honestly to desire a uniform system. The other agencies recommended are Revenue officials not below the rank of Revenue Inspectors, malguzars and mukaddams in the Central Provinces and patels in Berar, committees consisting of respectable merchants or tradesmen, members of Municipal Committees, Octroi Superintendents, District Councils and Local Boards in the Central Provinces and District and Taluq Boards in Berar. According to a few witnesses, the Excise staff and patwaris may also be employed. Witnesses also urge that no low-paid officials should be entrusted with this work.

Agencies.

17. Coming to the question of how the introduction of a uniform system would affect various classes, the opinions are, as may be expected, of a speculative character. Briefly, some think that large or small traders or both would suffer, others that they would eventually benefit. The general trend of the evidence is that agriculturists, etc., who are not familiar with the system that may be prescribed, would be cheated, but that they will eventually benefit most by uniformity.

Effect.

No inconvenience is anticipated from a uniform system in connection with the various existing sizes of gunny bags.

BURMA.

The towns actually visited were Akyab, Bassein, Bhamo, Henzada, Magwe, Mandalay, Moulmein, Myingyan, Pegu and Rangoon, while evidence was received from Pakokku, Prome, Putao, Pyapon, Sagaing, Shwebo and Toungoo. In all 284 written replies to our questions were received, of these 46 (21 from Europeans and 25 from others) were from officials and 238 from

Places visited.

non-officials (18 from Europeans, 140 from Burmans, Talaings or Arakanese, 55 from Indians and 25 from Chinamen). 247 persons were examined orally, including 123 who had sent in written replies; for the most part these persons were examined in groups, but 20 were examined individually.

Great interest was shown in the subject of the Committee's inquiries in this province, and the officials responsible for preparing evidence and collecting witnesses for us had evidently given the matter careful attention in spite of the time allowed having been distinctly short.

Possibility of a uniform system

2. Opinion is practically universally in favour of Government taking action to enforce a standard system of weights and measures throughout the country, practically the only objector is a Burman paddy broker of Henzada who pleads that this would deprive the middleman of his profits; the very thing which is urged as one great advantage by many witnesses. There is very little genuine opinion in favour of having one system for India and Burma, it being pointed out that there is very little direct communication between the two countries, and such as there is of the nature of wholesale trade and by sea. There is, however, a certain amount of opinion in favour of doing this and the majority of those who favour such action consider that the introduction of the British system into both countries is the most hopeful method. There is also some but less opinion in favour of introducing the metric system into both and the chief supporter of this view is the Chamber of Commerce of Rangoon which believes that such action is both "practically and politically possible." They are not, however, universally supported even by the European merchants of Rangoon, while those of Bassein as well as some of those of Rangoon advocate the British system, while those of Moulmein favour the standardization of the existing Burmese weights with no attempt at one system for India and Burma. The demand for a uniform system for the two countries cannot be said to be strong even among European merchants. Save in Akyab there is the strongest opposition to the introduction of any Indian system, *e.g.*, the Indian Railway weights into Burma.

British system.

3. The introduction of the British system, apart from whether it is or is not introduced into India, is urged by a few witnesses, but not with any force. Pegu is apparently the most in favour of, or possibly a more correct description of the attitude would be, less against such a course. The Director of Agriculture and Registrar of Co-operative Societies (examined at Mandalay) advocate the mere authorization of the British system, and the leaving of this and the indigenous Burmese system side by side, Government to recognize both, but apparently to take no action, such as testing or stamping weights of the one system and not of the other in favour of either. Such action, they consider, combined with the introduction of a pure weight system on the British pound in the paddy trade, would result in the natural death of the Burmese system in the course of a decade or two. They further lay stress on the spread of the knowledge of the pound among cultivators resulting from intercourse with the exporting firms of Rangoon in consequence of the large proportion of agricultural produce grown for export. The evidence of witnesses consulted on the suggestion that the British system should be introduced by being used in Government and *quasi*-Government transactions and on railways, by sample weights of the system being supplied to all offices, village headmen, etc., and by British weights alone being tested and stamped while viss weights were left alone does not favour the idea.

Change of coinage if new system introduced.

4. As regards the necessity and advisability of a change of coinage if the British or metric system were introduced, the general opinion seems to be that if one of these systems were to be introduced a change of coinage with a view to

giving a direct relation between the weights in use and the weights of the coins would be advisable though such was not considered absolutely indispensable. If the pound were adopted, preference seemed to be for the $\frac{1}{8\frac{1}{2}}$ lb. rupee, if the metric system, a decimal system similar to that in Ceylon was preferred. On the whole, there did not seem very great opposition to such a change of coinage, nor did it seem to be feared that the alteration would affect the value of the rupee; but the proposal was certainly not popular.

General opinion favours standardization of the Burmese system of weights.

5. As special reasons against any fundamental change in the weights used at any rate in retail trade, it is urged that conditions in Burma are different from those in India in that practically every household does a certain amount of retail trade, and, therefore, possesses weights, so that the number to be replaced is per 1,000 of the population very much greater than it is in India; and also that there are a very large number of female traders who are specially conservative. It is also urged that the system in force in the greater part of Burma (practically all except Akyab) is much more uniform than it is in India, and that hence there is less internal reason for any change. Opinions may, therefore, be summarised as distinctly against any change of system, such as the introduction of the British, metric or Indian Railway systems would entail; but there is a strong desire for the standardization and enforcement of the Burmese system of weights. Akyab, however, forms an exception: in that district as also in North Arakan and the Cheduba township of Kyaukpya Indian weights predominate though not to the total exclusion of the viss.

Measures of length.

6. For length, the British yard is unanimously approved as the fundamental unit, to be subdivided, however, according to the Burmese system as well as into feet and inches, thus, the *taung* should be fixed at 18", the *htwa* at 9" and so on.

Measures of area.

7. For area, the acre subdivided into hundredths is unanimously approved.

Measures of capacity (dry).

8. As regards the basket, the great desire is for a standard of some sort, it does not so much matter what. The majority of opinion is in favour of an 8-gallon basket, at present recognized as more or less a standard. The Rangoon Chamber of Commerce, however, is averse to changing from the 9 to the 8-gallon basket, though their Secretary admits that they would "of course adopt this if ordered to, just as we deem it certain the people would adopt the metric system if directed so to do." The representative of one of the chief European paddy firms in Rangoon admitted that the only difficulty resulting from such a change would be that "certain tables would have to be recalculated once for all." The European merchants of Moulmein expressed themselves as quite ready to accept an 8-gallon basket, as also did those of Bassein, where, however, the more important objection that it might entail a larger labour bill was put forward. The majority of non-European merchants in Rangoon appear to consider the standardization of the basket the important point, and to be ready to accept an 8-gallon basket, though one preferred a 9-gallon one. In Myingyan and Pegu a preference for the 9-gallon basket was expressed, but in both places the general opinion was that an 8-gallon one would be far better than the present confusion. Elsewhere, and especially in Mandalay where a conference of Co operative Societies representing 15,000 cultivators were of this opinion, preference for the 8-gallon basket was expressed, it being urged that this size is nearer the real Burman basket of $12\frac{1}{2}$ visses of paddy.

It may, therefore, be said that throughout Burma (as opposed to Arakan) there is a very strong desire for the standardization of the basket, and that the majority of opinion favours an 8-gallon basket. In Akyab a 4-gallon basket is preferred. There is also a certain amount of opinion in favour of standardiz-

ing the weight of paddy in the basket, as is done in respect of bushels of wheat in England.

Measures of capacity (liquid).

9. Measures of limited capacity practically do not exist; all that is desired is that it be laid down that a measure purporting to contain some definite weight of liquid should really do so.

Measures of cubic content.

10. For cubic content opinion unanimously favours the British measure.

Simultaneous use of weight and measure.

11. Simultaneous sale of the same commodity by weight and measure occurs to but a very slight extent, practically the only instances being due to the preference of Indians for retail sale of food-grains by weight which leads to rice being sold to them by weight in bazaars where they are numerous, such as Akyab, Pegu, Rangoon, etc. No opinions adverse to the continuance of this practice were received. The system by which food-grains, etc, are dealt in by the basket which is supposed to hold a certain weight was fully discussed in considering that measure (Chapter IV Bu., 13 and 14). One or two witnesses did suggest that the use of measures be abolished for food-grains and one or two advocated prohibition of weight. There was a good deal of opinion in favour of paddy being dealt with wholesale by weight. The same term is practically never used to denote both a weight and measure in Burma, the only approach to anything of the sort is the use of certain measures bearing the names of certain weights which are made so as to hold those weights of certain definite liquids, such as oil or milk. As, however, the measure is made for one liquid only and is merely used to avoid the necessity of weighing on each occasion, it being, however, always open to the customer to insist on a check by weight, the vessel so used can scarcely be called a measure in the ordinary meaning of that term. No objection to this practice was urged though a few witnesses in Magwe, Mandalay and Rangoon requested that steps be taken to enforce such measures holding what they purported to.

Special weights for special commodities and trades.

12. There are practically no special weights for special commodities in Burma, the only examples brought to our notice being special baskets for groundnuts and sesamum. To the abolition of these there was no opposition. In Bassein, Mandalay and Pegu requests for standard jewellers' weights were made, though the Collector of Rangoon deemed such unnecessary.

Methods of introduction.

13. Comments on the proposals for enforcing the standard system are not very numerous, most of the witnesses contenting themselves with a general approval of all. The comments and suggestions made are :—

(*a*) The President of the Rangoon Municipality would add also 'markets controlled by municipalities.'

(*b*) The Director of Agriculture and the Deputy Commissioner of Pakokku consider that it would be too expensive to supply specimens of weights and measures to every headman and that it would be sufficient to supply them to all public offices and bazaar goungs and market superintendents. On the other hand the Registrar of Co-operative Societies and the witnesses orally examined at Mandalay were strongly in favour of every *thugyi* having a standard basket. From Henzada comes a suggestion that Co-operative Societies should have a set of standard weights and measures, and from Rangoon one in favour of all *hpongyi-kyaungs*. The Assistant Registrar of Co-operative Societies proposes that an acre plot be marked out in every village as a means of familiarizing people with the acre.

(*c*) The proposals are to print tables of standard measures on all school exercise books (Akyab); and to have these tables in the *thugyi's* almanac and in the village manual (Mandalay); while from Bassein it is urged as specially necessary that vernacular notices be in easily intelligible language.

(*d*) It is urged from Bassein and Rangoon that schoolboys should be taught the weights and measures of other countries as well, the question having been misunderstood to mean that these also should not be taught.

(*e*) and (*f*) Several have expressed special approval of Government stamping weights.

(*g*) From Akyab it is objected that the expenses of replacing weights would be too great.

(*h*) From Bassein it is urged that it is unnecessary for Government to alter weighing machines.

(*l*) The Deputy Commissioner of Amherst and the representative of the Bombay, Burma Trading Corporation in Rangoon would leave the supply of weights to private enterprise; on the other hand the Chamber of Commerce at Rangoon who propose the metric system advocate a regular Weights and Measures Department the cost of which would be provided by stamping fees and the profits on the sale of weights.

(*m*) and (*n*) The Deputy Commissioner of Amherst does not approve of these proposals.

The only additional proposal is from the Trading Company, Rangoon, that foreign exporters should be required to note on all parcels sent into the country the weight thereof in standard weight in both English and vernacular, and that this regulation be enforced by the Customs staff.

Period required for introduction.

14. As regards period only a few witnesses have expressed an opinion; the most general view seems to be that if it be merely a question of enforcing the use of standard Burmese weights, one year would be enough. Some say two. One witness who advocated the metric system thought two years enough for that.

Penalties.

15. General opinion favours destruction and confiscation for the first offence, the same with fine for the second and the same with fine or imprisonment or both for the third or subsequent offence. A headman in Moulmein considered that wealthy offenders should be imprisoned without the option of a fine, as being probably indifferent to a fine. The Chamber of Commerce suggests the publication of convictions in the Government Gazette. Several urge special leniency to begin with.

Staff.

16. As regards staff, general opinion favoured the employment in rural areas of the Land Revenue staff down to an Inspector of Land Records, though one or two would not go below a *myook*. As regards urban areas, the work of enforcing the use of the standard weights and measures should devolve on the municipal or town staff. The bazaar-goungs and market superintendents are advocated by all, also generally the superior officials of the municipal staff such "as may be approved by the Board." As regards the Police, there is a considerable body of opinion adverse to their employment at all, this is stronger as regards their employment in rural areas than in urban. Witnesses who have considered the point are practically unanimous in recommending that powers in respect of weights and measures be restricted to officers of rank not below Sub-Inspector, though there are one or two exceptions; thus, one or two would extend powers to a head constable, and a landowner of Magwe thinks any Police official might exercise powers, but he is almost solitary in this opinion save in so far as he is supported by the Deputy Commissioner of Pegu who considers that any Police or Revenue official might exercise powers provided that orders

for confiscation or destruction of weights were only issued by a Magistrate. In Pegu generally there appears to be the least distrust of the Police. Excise Officers down to the rank of Inspector are fairly generally approved. For rural areas, all, with the solitary exception of the Collector of Rangoon, are of opinion that the working of any Act on this subject should be mainly entrusted to the village headman (*thugyi*). It is suggested that he be given powers to fine under the Village Act and that tables of weights and measures be printed in his almanac and in the Village Manual. It is also suggested that the block-elders and ward headmen, the *ywa-goung* and *ywa-ok* should have powers of inspection, etc., and in Rangoon it is suggested by one witness that the *ayat-lugyis* be employed and in Moulmein the *so-cin-goungs*. The Deputy Commissioner of Henzada suggests that the provisions regarding searches be the same as those in Excise cases. A few witnesses have suggested a special establishment, the chief of these is the Chamber of Commerce of Rangoon ; three witnesses of Bassein propose a Special Inspector.

17. The general opinion is that a uniform system would be of great advantage everywhere except the middleman whose occupation would probably be largely gone and certainly a considerable portion of his gains. The standardization of the basket would be of great assistance to the cultivator as enabling him to deal direct with the exporting firms. Any change in the system of weights was not thought likely to cause inconvenience so far as regards gunny bags save only in Akyab, where the Deputy Commissioner reports that "European firms agree that any alteration would cause them the greatest inconvenience in this respect."

Effects of a uniform system.

ASSAM.

Three districts in Assam—Cachar, Kamrup and Sylhet—were visited by the Committee or a portion of it and written replies to the Committee's questions were received only for these districts 27 written replies were received in all, 6 from officials and 21 from non-officials; of these 3 officials and 3 non-officials were Europeans. The Committee also examined orally 7 groups of witnesses, the size of a group varying from 3 to 12 and the total number of witnesses examined in groups being 48.

Evidence received.

2. All the witnesses in Assam are in favour of a uniform system of weights and measures throughout India. The reasons given are that it will minimize uncertainties and inaccuracies ; that it will do away with the difficulty now felt in ascertaining and comparing prices of the same commodity in distant places ; that it will facilitate the wholesale merchants' calculations and that it will lessen the opportunities for cheating by unscrupulous dealers. One official witness recommends that the system should be introduced gradually as the people will not be able to give up their old customs easily, while another considers that the introduction of a uniform system should be postponed until such a system has been adopted and enforced in the United Kingdom and that system should then be adopted if found convenient for India.

Desire for uniform system.

3. The predominant opinion amongst witnesses in Assam is that the Railway system of weights should be made the uniform system for India This is the system generally in force in Assam ; so the people are familiar with it. It is urged that as Bengal and Assam are more densely populated and more advanced than the rest of India and as the rest of Northern India is familiar with the system, it is the most suitable for adoption.

Railway system.

4. One group of witnesses orally examined is in favour of the reduction of the tola to 175 grains combined with the Bengal table of weights. Another group is prepared to accept a seer of 100 tolas, but prefers the Railway system.

Miscellaneous system.

Metric system.

5. One witness recommends the adoption of the metric system as it is already in use in most civilized countries; two other witnesses recommend its introduction when adopted by Great Britain. Another would adopt the metric system in preference to the British system if the Railway system is not adopted. On the other hand, the Collector of Kamrup is opposed to its introduction as it would involve a violent change of existing weights or a new system of nomenclature.

British system.

6. A few witnesses of Assam recommend the adoption of the British system on the grounds that Indian weights and measures can be brought into exact relation with them by very slight modification, that the greater portion of India is under British sway and British trade is likely to predominate, that the people are fully acquainted with it, and that it approximates more nearly to Indian practice and is more natural to Indian mensuration and methods of calculation. One witness would adopt it if the metric system cannot be introduced, while another group prefers it to the metric system as easy to understand if the Railway system cannot be introduced. On the other hand, another group objects that it will be difficult for the masses to understand the British pound.

Alteration of coinage.

7. The prevalent opinion in Assam is against the alteration of the rupee if the British system is introduced, as the rupee is taken by everyone as an honest weight of one tola and any alteration will facilitate counterfeiting and lead to cheating and confusion.

Length and area.

8. Two groups of witnesses want the local systems of measurement of land maintained as the acre is not convenient and as the local measurements are very complicated and any new standards will cause confusion and would not be understood by landholders. The only two other witnesses who have expressed an opinion regarding measures of length and area are in favour of the English systems.

Measures of capacity.

9. Witnesses in Assam state that either the British measures of capacity (quart, etc.), or a system based on the measure holding so many seers of 80 tolas of water would be suitable; but one group wants a five-seer one.

Cubical contents.

10. No suggestions have been made by witnesses in Assam regarding measures of cubical contents.

Special weights and measures.

11. Two kinds of weights are used in some of the neighbouring localities for dealing with such commodities as rice, paddy, pulses, jute, chillies, ghi, lime and limestone. The reasons commonly assigned are local custom, allowances for wastage, dirt, dryage or shortage and the adoption of modern methods. Generally, it is said that there will be no objection to abolishing special weights and measures, but it is stated that dealers and consumers will be losers to some extent as the wholesale prices will not alter and dealers will add to the retail prices. One witness would make an exception in favour of jute as it becomes light by drying up. One witness recommends the retention of special weights for gold, silver and medicine permanently, while two others recommend the local standards.

Use of weights and measures for same commodity.

12. Grains, rice, pulses, oil and milk are sometimes dealt with by weight and sometimes by measure in Assam. Witnesses generally take the view that this double practice should be stopped as the measure holds more or less according to the cleverness of the measurer; as measures are inaccurate; as purchasers cannot test the correctness of measures and as traders keep measures of different sizes for buying and selling and there is, therefore, confusion and fraud. Only three witnesses are in favour of the continuance of the practice on the ground that prevention of it will cause inconvenience to the

poor cultivating classes. On the other hand, two groups specifically suggest that measures of capacity must be abolished.

Use of same name for weight and measure.

13. In Assam, the same name is sometimes used both for a weight and a measure; but no confusion is generally said to arise from this practice as it is well-known except to strangers. Generally, the witnesses prefer that the same term should not be used both for a weight and a measure.

Means of introduction.

14. (*a*) No objection has been raised in Assam to this suggestion.

(*b*) No objection has been taken to this proposal. On the other hand, it is suggested that they should also be supplied to leading zamindars, merchants, traders, and shopkeepers, to one or more toll-collectors in every market and also to post offices, dispensaries, local board officers, municipalities and selected members of the village panchayat.

(*c*) Witnesses in Assam approve of the proposals regarding the publication of tables of weights and measures. It is further suggested that tables should be hung up in local markets and village schools and should be published as standing matter in vernacular newspapers and as widely as possible.

(*d*) The suggestion that the use of authorized weights and measures and no others should be taught in all recognized elementary schools is approved, but one witness would also have foreign weights taught.

(*e*) All witnesses of Assam except one approve of the proposal that the Government should stamp only authorized weights and measures. Four witnesses consider that no fees should ever be charged by Government for verifying and stamping weights and measures. The other witnesses, however, approve of the proposal that no fees should be charged for a certain period. One witness suggests that weights and measures should be re-stamped every five years.

(*g*) Two witnesses of Assam consider this unnecessary. Other witnesses, however, approve of this suggestion.

(*h*) One witness considered this unnecessary but this suggestion is approved by other witnesses.

(*i*) All witnesses in Assam approve of the proposal.

(*j*) The Deputy Commissioner of Cachar is the only witness in Assam who disapproves of the suggestion. One witness, however, states that the Government need not interfere with the manufacture and sale of weights and measures.

(*k*) The Deputy Commissioner of Kamrup does not consider this necessary. Other witnesses of Assam have approved of this suggestion.

(*l*) The proposal that Government should sell authorized weights and measures has received general approval in Assam but one witness considers that they should be sold at cost price only as a temporary measure and that Government interference with private trade is to be deprecated. He suggests that Government should sell wholesale at cost price to accredited private traders and retail at a reasonable profit only. Other witnesses are in favour of the proposal that the Government should sell at a reasonable profit and suggest that the sale should be done through post offices, village headmen or head panchayats.

(*m*) and (*n*) The Deputy Commissioner, Cachar, is the only witness in Assam who disapproves of these suggestions; other witnesses approve of the proposals. The Deputy Commissioner, Cachar, disapproves of penal legislation altogether.

(*o*) All the witnesses in Assam except two approve of the proposal that the use of unauthorized weights and measures should ultimately be illegal throughout India.

Periods.

15. The periods which must elapse before the various measures can be adopted for introducing a uniform system of weights and measures are estimated at from six months to 16 years by witnesses in Assam. Six months or one year appear to be the favourite periods unless the British system is to be introduced. In this case, three groups of witnesses estimate that its introduction will take from 5 to 15 years and one group states that it will take 40 or 50 years to replace the existing systems entirely.

Penalties.

16. The Deputy Commissioner of Cachar is the only witness in Assam who disapproves entirely of penal legislation; otherwise the proposal that the penalties for failure to adopt the prescribed system should be destruction, confiscation and fine is approved; but one witness does not consider confiscation desirable and others consider that a warning or simple destruction or confiscation will be sufficient for a first offence. One witness suggests that imprisonment should be a substantive penalty for a second offence.

Agencies to detect cases.

17. Little objection is taken in Assam to the suggestions in the Committee's questions regarding the agencies to be employed in detecting cases of the use of unauthorized weights and measures. A few witnesses including two groups disapprove of the employment of the Police, while another would allow the Police to interfere only on complaint; others would not allow any Police officer below the rank of Sub-Inspector or head constable to interfere. Objection is taken to the employment of the Revenue Department only by the Deputy Commissioner, Kamrup, while others would only allow officials of the standing of kanungo, Excise Sub-Inspector or Special Deputy Collector to detect cases. The employment of municipal officials is generally approved, the municipal overseer being usually mentioned as the lowest official to be empowered to detect cases. The Deputy Commissioner of Sylhet would not employ the village headman for this purpose, while the Deputy Commissioner, Cachar, would only empower selected village headmen. The employment of the following authorities or persons is also suggested: village panchayats, members of Local Boards, Sub-Inspectors of schools, owners of markets and all officers of different departments.

Effect on trades and other classes.

18. The general opinion in Assam is that the effect of the introduction of a uniform system of weights and measures would be beneficial to all, though it might cause temporary inconvenience as ignorant classes will not be able to understand how to convert the new weights in terms of those to which they are accustomed.

Miscellaneous.

19. Witnesses in Assam suggest that standard weights should be supplied by Government or manufactured by companies recognized by Government, that in posting parcels the sender should be required to enter the weight of the parcel in terms of the authorized weights and that medical institutions should issue instructions in respect of patients in harmony with the authorized weights.

NORTH-WEST FRONTIER PROVINCE.

Districts visited and evidence received.

Two districts (Dera Ismail Khan and Peshawar) were visited, and in addition written evidence was received from Bannu. 33 written replies were received, 5 from officials (3 Europeans), and 28 from non-officials. 409 persons were examined orally in five separate groups, of these 18 had sent in written replies. A considerable amount of interest was taken in the subject of our inquiries, and the replies received showed that care and attention had been bestowed on the matter by the officials responsible.

Uniform system generally favoured.

2. With one exception, opinion is universally in favour of a uniform system of weights being enforced. This one exception is one member of a group examined

at Peshawar (a Peshawar tea merchant) who fears lest there should be loss of profit to traders if the different weights in force in various parts of the country were to be done away with. One other trader goes no further than to say that there is "no objection" to a uniform system. All others view it with favour. The great majority recommend the enforcement of the Indian Railway weights which are often referred to as the "British system," or British weights, through their having been introduced by the British on annexation as the uniform system of weights, and this opinion is the more striking when it is remembered that in the three districts from which evidence has been received the use of these weights is practically restricted to the railways (which are not numerous) and to Government transactions. The ordinary seer in common use is of 100 or 105 tolas. It is, therefore, of special importance to examine alternative proposals or objections. A group of traders in Dera Ismail Khan prefers the 100-tola seer urging that a change to the 80-tola one might affect trans-frontier trade, they receiving produce by that seer from Afghanistan and selling by the 80-tola seer in the Punjab, making their profit by the difference in the weight. They fear also "some inconvenience as regards internal trade," but agree that the chief thing is uniformity. A zamindar of Peshawar expresses a similar fear. Another expresses a preference for the Peshawar weights but has "no objection" to the Railway weights. Some members of a Peshawar group who are in favour of the Railway weights fear there may be some difficulty in adjusting prices and ask that special efforts be made to induce shopkeepers to lower rates in proportion to the decrease in the weight of the seer. These are the only objections urged against the 80-tola seer amongst the opinions of 63 persons received by the Committee.

Railway weights preferred.

3. There is a certain amount of opinion in favour of, or not strongly against, the reduction of the weight of the tola and therewith also of the rupee, seer, etc., by $\frac{1}{36}$ part. This proposal is supported by the Deputy Commissioners of Bannu, Dera Ismail Khan and Peshawar, but the first named states that general opinion is against any alteration of the rupee, and though the witnesses to some extent favoured the idea, there is on the whole a decided feeling against any such alteration. This would be less were it possible to alter the weight without reducing the amount of silver, or if the tola and rupee were raised to $\frac{1}{8}$ lb., but there was even then a feeling of objection based on the confusion in small weights that was anticipated.

Possible change of coinage.

The Deputy Commissioner of Peshawar was under the impression that the pound was equal to 30 rupees in weight, and so apparently were some of the witnesses; he only recommends reduction of weight if this is possible without altering the amount of silver. The proposal met with no support among the Peshawar witnesses.

One witness went so far as to say that there would be "no necessity to introduce and enforce any measure if the seer of 80 rupees were adopted as the standard weight. Every person will welcome the said weight."

4. For a measure of length, opinion is universally in favour of the yard, to be subdivided into 16 girahs as well as into feet and inches.

Measures of length.

5. For areas, the acre is widely known, but is not subdivided decimally. It is generally agreed that if areas were recorded in the papers in acres and hundredths thereof, side by side with the present method, there would be no objection to requiring them to be so recorded in deeds and suits, and that in time the new notation would be learnt. One group of witnesses fear some trouble as "there is no word to represent the hundredth of an acre," and as there might be mistakes in the placing of the decimal point.

Measures of area.

6. A desire for standardized measure of dry capacity is expressed wherever dry measures are to any extent in use. One Peshawar group advocates total abolition as also one or two witnesses in their written replies to Question 9, but

Measures of capacity (dry).

the general desire in Dera Ismail Khan is clearly for standardization. In that district the topa, it is said, should be such as to hold about five 80 tola seers of wheat, but one of about the size of a gallon or such as would hold about 5 seers of water would be accepted. As regards shape, opinion naturally favours the more or less circular bulged and squat shape in use at present; but it is generally agreed that after a possible temporary difficulty a cylindrical shape would be accepted, but the height must not be much greater than the diameter. Also the measure must be light. As regards heaping or striking, one witness says it might be possible to insist on striking, but the majority certainly favour a continuance of the present system.

In Peshawar where measures are only used in the Swabi tahsil, an *odhi* of about the size selected for the topa is held suitable.

Simultaneous use of weight and measure.

7. A few witnesses favour the prohibition of the simultaneous use of weight and measure on the ground of possible fraud, but very few witnesses refer to the point, and the Deputy Commissioner of Dera Ismail Khan thinks prohibition unnecessary. The majority of those who have expressed any opinion think it unnecessary to prohibit the use of the same term for a measure and for a weight. This only occurs as regards milk measures, and such measures where called by the name of the weight purport to hold that weight of milk.

Special weights for special commodities.

8. There are a few special maunds for special commodities and no one has offered any objections to such as there are being abolished. Three witnesses recommend special goldsmiths' weights and one, special weights for druggists.

Methods of introduction.

9. The suggestions contained in Question 20 are generally approved. The following comments are made :—

(*b*) Samples should be supplied also to heads of panchayats and of baradaris, and also to mullas and pandits.

(*c*) Proclamation should also be by beat of drum, and the new system should be carefully explained, the services of maulvis and respectable residents being enlisted, and copies of the tables should be supplied to all shopkeepers, and others.

(*f*) Testing and stamping is disapproved of by none, and definitely approved by many, especially by the witnesses examined orally. Many consider that the stamping should be done free; some say, free for a time. Inspection should be done periodically—annually according to two groups, quinquennially or once in 5 to 10 years.

(*g*) Old weights should be replaced free for a time, or in the case of poor shopkeepers who might be defined as those who do not pay income tax. The importance of removing all old weights and replacing them by new ones is urged, as it would not be possible to correct a 105-tola seer into an 80-tola one.

(*l*) There is a certain amount of opinion in favour of Government supplying weights, at least temporarily, or arranging for their supply. Some consider that Government should supply at cost price. One suggests that weights be sold at tahsils, and through patwaris and headmen. The witnesses examined at Dera Ismail Khan thought anything in the way of licenses for manufacturers of weights unnecessary. Those at Peshawar thought Government supervision advisable.

(*m*) and (*n*) The Deputy Commissioner of Dera Ismail Khan disapproves of these proposals, he of Bannu thinks that they should be brought into force a year or so later than the other measures, while a pleader of the first named district approves, but considers that no penalty should attach to infringement.

(*o*) Penalization should only occur in cases of use of such weights in trade transactions, or use only should be illegal.

(*p*) There should be no presumption. Inspection of scales is deemed unnecessary.

Period.

10. As to the period for enforcement, two years is about the average, a considerable number think one year or even less enough, others that as much as five or in one case ten years would be necessary for complete enforcement; the period is shorter in towns and longer in rural areas.

Penalties.

11. As usual leniency is advocated to begin with, and for first offences a warning, or destruction of the weights with or without confiscation of the pieces; for subsequent offences fine is approved, and one witness advocates imprisonment.

Staff.

12. As regards staff for enforcing the orders, there is the usual objection to the employment of the Police which is more unanimous than in most provinces. One or two would employ them, of a grade not below that of a Sub-Inspector. The Revenue staff is universally approved, down to the grade of a Naib-tahsildar or kanungo; in municipalities the municipal staff should be employed, "such as may be approved of by the Committee" or such as the octroi superintendent, but most witnesses do not specify. For rural areas the village headman is unanimously approved, some witnesses suggest lambardars, but these, as another points out, are frequently also headmen. This witness suggests that the work of inspection devolves on this man in his capacity as malik (*i.e.*, headman), as that title connotes more honour than that of lambardar. The patwari is proposed by a fair number, District and Municipal Board Members are proposed, and also the bazaar chaudhari and mahalladar. A special agency is recommended by a few, mainly for large cities, and payment of the patwari or headman for this work is also sometimes proposed.

It is generally agreed that the stamping should be done through the tahsil but one witness suggests that it be done by means of "local bodies and panchayats" and another by the tahsildar, patwari or headman.

Effect of a uniform system.

13. Opinions are almost invariably to the effect that a uniform system will benefit all, a few think there will be some temporary inconvenience, but even these consider that there will ultimately be a more than commensurate advantage.

Frontier tribes.

14. One witness, a Peshawar zamindar, urges that the frontier tribes also be induced to accept the prescribed system.

AJMER-MERWARA.

Evidence received.

Ajmer itself was visited. Written replies were received from 21 persons, 9 officials (1 European) and 12 non-officials. 25 persons were examined, in 5 separate groups, of these 15 had submitted written replies.

Railway weights desired.

2. With the exception of two, who appear to be somewhat lukewarm over the matter, all witnesses favour a uniform system; and the great majority recommend the 80-tola seer, which is the system most prevalent at present. One group of small traders suggests provincial systems if this cannot be accepted

Other systems considered.

and another a 100-tola seer as a compromise. There is, however, a certain amount of evidence in support of the possibility of introducing either the British system in the shape of the 2-lb. seer with reduction of weights and of the rupee by $\frac{1}{80}$ part each, or the metric system. Thus, a group of merchants think that the ultimate ideal should be the metric system, to be attained after

15 to 20 years, the country to be first got used to a uniform system by the enforcement of the Railway weights during the next 5 or 10 years. An Extra Assistant Commissioner favours a decimal system. The proposal to make the seer equal to 2 lbs. by reducing the weight of the rupee, etc., by $\frac{1}{86}$ part is viewed with some favour by some witnesses, with not very great disfavour by a few others, or with considerable disfavour by certain others. The chief support for a radical change in system is to be found among the group of merchants above referred to which think the ultimate ideal should be the metric system, and two other groups one of which included four Indian officials and a Medical Missionary who is Chairman of the Municipality. The latter consider that more stress should be laid on a perfect system than on one easily understood by the people, thinking that such system could be learned in 2 or 3 years, though one said a generation. They were somewhat divided in opinion between the British system to be introduced by making the seer 2 lbs., etc., and the metric system with coinage based on the decimalization of the sovereign, the new coin of £$\frac{1}{10}$ to weigh $\frac{1}{80}$ kilogramme. On the whole, opinion in both groups was more in favour of the metric system. But any such changes met with but little support from the other witnesses, and the Deputy Commissioner only favoured the 2-lb. seer if it were decided to introduce the British system, but he himself recommends the Railway weights. The objections to reducing the weight of the rupee are those usually urged, *viz.* suspicion of decrease in value, though the more educated are beginning to realize that the rupee is merely a token, but more especially the confusion in weights caused by the change, and fear lest prices should not decline *pari passu* with the decline in weight. Accordingly one group thought there would be less inconvenience if the seer were made equal to the kilogramme and the weight of the rupee raised to $\frac{1}{80}$ thereof

Measures of length and area.

3. As regards measures of length and area, the 36" yard was universally approved, to be divided into 16 girahs, as well as into inches and feet, though one set of witnesses suggested that girahs be abolished. The acre was accepted as suitable by all and objected to by none.

Measures of capacity (dry).

4. Measures of capacity (dry) being scarcely used, but few referred to them. One group suggested that they be made so as to contain a fixed weight of water.

Measures of capacity (liquid).

5. The use of British Imperial liquid measures was proposed by the Locomotive Superintendent of the Bombay Baroda and Central India Railway. None else proposed anything.

Same names for weight and measure.

6. Two witnesses thought it wise to confine the use of a term to either a weight or measure, but, as noted above, measures are practically not used, and the expression of opinion is mainly academical.

Special weights for special trades.

7. One witness urges the need of special weights for jewellers.

Methods of introduction.

8. With regard to methods of introduction the following suggestions were made :—

(*b*) Samples should be supplied to commercial and industrial institutions.

(*c*) Tables of weights should be posted up in railway carriages and stations.

(*f*) Testing and stamping of weights is expressly approved by all the witnesses orally examined, and not disapproved of by anyone. Two recommend that it be free always, and one free for five years. The period between successive inspections is variously set at 2, 3 or 5 years.

(*g*) One set of three witnesses recommends that weights be replaced free for three years. A group from Beawar urge the hard case of those poor people who use stone weights.

(*h*) Considered unnecessary by some.

(*j*) English and foreign weights should be permitted for foreign trade. The proposal is deemed harsh by one.

(*k*) Deemed unnecessary.

(*l*) One set of three witnesses suggests sale at cost price for five years and two at a profit by Government, but most would prefer to leave it to private enterprise. The idea of licensing manufacturers is not generally favoured.

Period.

9. The period necessary for introducing a uniform system is variously estimated, one to two years being generally regarded as enough for enforcing the Railway weights, or even less by some. For a new system the estimates vary between 2 to 3 years and a generation.

Penalties.

10. Nothing fresh is suggested.

Agency.

11. Authority to enforce a uniform system The Police are objected to, though one or two would have Police of grade not below a Sub-Inspector, and one would go lower. The Revenue staff down to kanungo is generally approved, and the patwari by some. The headman is generally approved, exception being taken by one group of witnesses on the ground that he would not be impartial. Municipal and District Board members are usually advocated, and the superior Municipal staff. The Excise Inspector is advocated by the Deputy Commissioner. The present agency (Chapter IV, Aj. 3) is considered enough by some. Others recommend a special staff. The lower grade officials would only report. The Deputy Commissioner's proposals seem to be in accord with the general view.

Native States.

12. It is specially urged that whatever system is adopted the same should also be accepted by the Native States by which Ajmer is surrounded.

BALUCHISTAN.

Evidence received.

The Committee visited Quetta and Chaman. Five written replies involving 19 witnesses were received, and 41 witnesses were examined in groups.

Uniform system desired.

2. All the witnesses are agreed that there should be a uniform system of weights for India. The Political Agent, Quetta, is of opinion that discretion might be given to Local Governments to exempt such local areas as might be considered necessary owing to local circumstances. One group of witnesses is doubtful whether it is feasible to enforce a uniform system on the rural tribal population of the province.

System recommended.

3. As regards the system to be adopted, the Political Agent, Quetta, recommends the British or the metric system, retaining, however, the Indian nomenclature, *e.g.*, the tola, chatak, pao, seer and maund. One other witness also recommends the British system. But the evidence in favour of the Railway system preponderates. The witnesses are not agreed as to whether it is desirable to reduce the Railway weights by one-thirtysixth and also to reduce the weight of the rupee (which is practically the tola-weight) in the same proportion, so that the seer may be exactly equal to two British pounds. The Political Agent is against the alteration of the weight of the rupee. On the whole, the trend of the evidence is against alteration of weights or of the coinage.

Length.

4. As regards length, the British yard is recommended.

Area.

5. For areas, the British acre is deposed to as possible.

Capacity.

6. For measures of capacity, a *kasa*, to hold 4½ to 5 seers of wheat, or possibly, a measure of the same capacity as a gallon, is approved. If the capacity of the measure is to be based on a definite weight of water, such weight should be in seers. The present custom of using measures heaped may be allowed to continue.

Cubic contents.

7. Indigenous measures of cubical contents do not exist.

Special weights.

8. No local standards or special weights for certain commodities are recommended, and no objection has been raised to the abolition of the variations in the maund.

Simultaneous use of weights and measures.

9. The Political Agent, Quetta, thinks that the same commodity should not be allowed to be sold at the same place both by weight and by measure.

Methods of introduction.

10. As regards the measures to be adopted for introducing and enforcing a uniform system, the suggestions in Question 20 of the Questions framed by the Committee are generally approved. The only suggestions and criticisms offered are these :—

(*b*) Some witnesses suggest that specimens of authorized weights and measures should also be supplied to the headmen of village panchayats.

(*m*) The same witnesses also recommend that documents relating to trade with Afghanistan should be exempted from the proposed rule.

(*o*) The Political Agent, Quetta, is of opinion that "it would be desirable to leave the penal clause to the discretion of the Local Government. For instance, in the case of the town of Chaman, which is on the Afghan border, it would be difficult to prosecute traders for using the Afghan weights and measures, in addition to the authorized weights and measures, as the Afghan traders would, for many years to come, insist on using their own weights, etc." The period for enforcing this proposal should be a year after the introduction of a uniform system.

Penalties.

11. As regards penalties, destruction and confiscation of unauthorized weights and measures and a fine not exceeding Rs. 50 are recommended, these penalties to be operative a year after the introduction of the scheme.

Agency.

12. Regarding the agencies to be employed for detection of offences, most of the witnesses approve of the Police being entrusted with this duty, only Police officers not below the rank of Sub-inspector being empowered. Some witnesses of Chaman are of opinion that only an Extra-Assistant Commissioner should deal with these cases, on production of the unauthorized weights or measures before him. All witnesses are agreed that Revenue officers not lower in rank than a Naib-tahsildar should also be employed on this work. In Municipalities and other towns, the agency recommended is members of the committees

and paid officials like the Secretary, Assistant Secretary and octroi daroga. In rural areas the village headmen and such members of panchayats as may be authorized in this behalf are considered a suitable agency.

Effect.

13. All the witnesses think that a uniform system would benefit all classes of people.

Licenses for vendors of weights.

14. Several witnesses have recommended that the sale of weights should be under licenses, but that such licenses should be freely issued.

DELHI.

Evidence received.

Delhi was visited and 26 written replies were received from as many persons, (2 from officials, both Europeans); 30 persons were examined orally, three individually and the others in 3 groups.

Uniform system desired.

2. The majority of opinion is very decidedly in favour of the enforcement of a uniform system. The Secretary to the Municipality, however, considers it "possible but inadvisable", but admits his experience to be small; two other witnesses are dubious of the use of changing or doing much. The representatives of the Punjab Chamber of Commerce and the Delhi Piece Goods Association, after beginning by saying that they consider a uniform system desirable and that steps be taken to introduce the metric system without compulsion, finally appear to recommend the Railway weights, which "could be introduced at once into Delhi" and the use of which "if alone stamped by Government" could be made obligatory on all shopkeepers within a year and in rural areas in a somewhat longer time.

Railway weights favoured.

Most witnesses favour the Railway weights for the uniform system of weights; two add that any other system would cause great inconvenience; and another points out that there are no terms in Hindi for decimal fractions. On the other hand, there are a certain number of larger merchants more or less prepared for a more radical change. There is here a certain amount of opinion in favour of the metric system which is thought to be more or less practicable, though one makes its introduction into India conditional on its prior introduction into Britain, while two others appear really to prefer the Railway weights which another witness would enforce pending the introduction of the metric system into Britain. One other witness also advocates the metric system, but together with the retention of local weights and measures as local or provincial standards; on the other hand, the President of the Delhi Hindustani Mercantile Association considers that any attempts to introduce the metric system would result in a world of confusion.

Metric system.

Change of coinage.

3. There is, as is to be expected in a more highly educated community, less fear of an alteration in the value of the rupee if its weight be reduced so as to make the 80-tola seer equal to 2 lbs., but both Chamber and Associations oppose any change in the coinage. Some witnesses consider that there would be no serious objection to such a change. On the other hand, several distinctly dislike the idea, which on the whole cannot be said to have been welcomed by any, except one who suggested it *suo motu*. Two witnesses consider the introduction of the pound not to be likely to be successful, but, if decided on, would prefer a $\frac{1}{2}$ lb. rupee One group express themselves as so far convinced of the value of uniformity as to be prepared to accept any system based on the rupee weight as it is at present.

Length.

4. For length, opinion invariably favours the 36" yard, the Chairman of the Delhi Hindustani Mercantile Association pointing out that not once in a

hundred times is cloth, etc., imported from ordinarily metric countries made up according to the metre, but almost always according to the yard.

Area.

5. For areas, there is but little opposition to a gradual introduction of the acre by its being entered in the patwari papers side by side with the existing measure. One witness urges a preference for the bigha as better known and one group of witnesses fear there might be inconvenience.

Capacity.

6. Dry measures are practically unknown; for liquid measures the Chamber of Commerce and the Piece Goods Association propose the British Imperial measures and one witness asks for standard milk measures; those at present used purport to contain the weight of milk by which they are called, but apparently do not always do so.

Simultaneous use of weight and measure.

7. Measures not being used, opinions as to the simultaneous use of weight and measure are few; such as there are favour prohibition. No objection is urged to the use of the word seer for the measure supposed to hold that weight of liquid. Anyone suspecting incorrectness is expected to check it by weighing.

Special weights for special commodities.

8. There are a few examples of special tolas and maunds for special commodities. Only preliminary difficulty is urged to their abolition.

Special jewellers' weights.

9. Four witnesses urge that separate weights for jewellers be permitted presumably those now in force are meant but details are not given.

Methods of introduction.

10. As regards methods of introduction, the suggestions put forward are :—

(*c*) Tables should be stuck up in schools, chaupals and bazaars, and, instead of being given to headmen, should be sent to respectable and intelligent shopkeepers, men who would expound them to their neighbours; proclamation by beat of drum and explanation through trade and caste chaudharis and panchayats is urged and also advertisement in news papers.

(*d*) Other weights should be also taught; but the educational authorities should be required to make boys thoroughly acquainted with the new system prior to its introduction.

(*f*) Testing and stamping of weights is definitely approved by many and disapproved of by none. One urges that it must be done by Government to prevent cheating. It is generally urged that it be done free of charge, at least in cases where no correction is required or if brought voluntarily by the owner or for the first time. Privately made weights should only be sold after stamping. Periodical inspection is approved, triennial inspection being proposed.

(*g*) Replacement of weights should be free according to some; others also approve the idea generally; the only opponent being one who considers that this would cause confusion and should be left to private persons to do themselves.

(*h*) One witness objects.

(*i*) One witness considers this inexpedient.

(*l*) Sale by Government at a profit or on commission like stamps is proposed by some; others merely approve in general terms. Two groups advocate licenses for manufacturers and vendors of weights.

(*m*) and (*n*) The Chamber of Commerce and the Piece Goods Association and one witness disapprove of this proposal.

(*o*) and (*p*) The Chamber of Commerce and the Piece Goods Association do not like anything "so drastic" and one witness objects to presumption.

11. As to the period before enforcement is made absolute, the general recommendation is one to two years for the railway weights, variations being from 2 months to 5 years. For enforcing any foreign system from 2 to 20 years are suggested.

Period.

12. The usual plea for leniency to begin with is made by many. The proposals are generally approved, one suggests that the fine imposed should be proportionate to the daily sales of the shopkeeper.

Penalties.

13. As an authority to enforce the rules, the police are as usual objected to, though some would allow those of a grade not below that of a Sub-Inspector. The Revenue staff down to kanungo is generally approved, and a large number of witnesses would add the patwari, only two specifically objecting to him. For municipalities, the municipal members and staff are considered suitable, staff to include only the superior officials, drawing not under Rs. 100 or "only Europeans so that there be no partiality". For rural areas, the headman (lambardar, zaildar and safedposh) is generally approved, though two object to him as likely not to be sufficiently above private feuds. The bazaar chaudharis or a sub-committee of them under a Municipal member are also proposed. Several also consider that a special establishment is advisable: 'Inspector on Rs. 100' or 'similar to the Food and Drugs Inspector', or a 'Special Inspector' are proposed. The Chamber of Commerce considers that a well-organized Weights and Measures Department is necessary, and suggests the employment of a pensioned soldier as Inspector.

Agency.

14. Opinions as to effects are few, such as there are are generally that a uniform system would benefit all especially the poor.

Effects.

15. Some consider that if any other system than the British is introduced the use of that system should be permitted either unrestrictedly or else under license.

Licenses for British weights.

COORG.

Coorg is the only province in India which was not visited by the Committee, but two members visited Bangalore, the headquarters of the Chief Commissioner. Written replies were received from the Commissioner, the First Assistant Commissioner, a Subedar and two merchants; the second and third of these drew up their replies after consulting leading merchants in two places.

Evidence received.

2. All the witnesses in Coorg are in favour of a uniform system of weights and measures throughout India. The First Assistant Commissioner states that he had repeated complaints from ryots regarding the practice of the Moplahs in giving them advances of grain by a small *para* and recovering the advances and purchasing from the ryots by a large *para*.

Desire for a uniform system.

3. The only witness in Coorg who has suggested a system to be adopted throughout India is the Commissioner, who proposes the Railway weights with a viss of 4 seers of 80 tolas each. He considers the metric system outside the range of practical politics. The merchants of Virajpet state that it does not matter what weights or measures are prescribed so long as some definite standard weights and measures are fixed.

System to be adopted.

4. No witness in Coorg has dealt with the question of altering the coinage in connection with weights and measures.

Alteration of coinage.

Measures of capacity.

5. The Commissioner of Coorg suggests that the English system of liquid measures of capacity should be adopted throughout India and that a seer holding 40 fluid ounces should be used as a dry measure of capacity, 40 seers being made equal to one maund and the measures being used struck. No other witness in Coorg has suggested any system of measures.

Length, area and cubical contents.

6. No witnesses in Coorg have made any suggestions regarding the systems of length, area and cubical contents to be used in India.

Sale of same commodity by weight and by measure.

7. Areca-nut, ground coffee, onions, turmeric, chillies, etc., are sold in Coorg both by weight and by measure. Two witnesses object to this practice as purchasers are likely to lose at the hands of middlemen if they buy by measure, as the practice makes it difficult for the producer to estimate what price he ought to get and as purchasers and sellers are swindled by wily traders; but the First Assistant Commissioner does not consider that the custom need be interfered with as retail prices vary very little, and another witness states that there will be great trouble if the practice is stopped and that business will not be carried on properly.

Same name for weight and measure.

8. It is not considered in Coorg that the custom of calling both a weight and a measure by the same name leads to confusion and trouble as the different seers are distinguished by epithets and all the local people know them. All but one witness have expressed the opinion that it will be preferable to confine the use of a term to one or the other.

Special weights.

9. Different systems of weights are used in Coorg in dealing with different commodities and sometimes for the same commodity. The reason assigned for the former is that the weights were originally borrowed from Mysore and Canara where different systems were and are still in use. Commodities are sold by the English pound when the customer desires it. But otherwise, the same weights seem to be always used for the same commodity. Two witnesses state that goldsmiths may be allowed to retain their present weights as their trade is very local and their weights are in most cases fractions of the rupee-weight.

Supply of weights and measures to village headmen, etc.

10. The Commissioner of Coorg considers that it will be expensive to supply specimens of the authorized weights and measures to all revenue offices, police stations, village headmen and recognized elementary schools.

Import duties.

11. The Commissioner of Coorg considers it unnecessary to remit the import duties for a certain period on unauthorized weights and measures and weighing machines as most weights and measures will be manufactured in India.

Sale of weights and measures by Government.

12. The Commissioner of Coorg is opposed to the suggestion that Government should sell at cost price authorized weights and measures; but suggests that the Government should provide facilities for stamping them so that any private manufacturer can get weights and measures stamped before sale to the public.

Other measures for the introduction of a uniform system.

13. No other comments are made by witnesses in Coorg on the proposals in the Committee's questions regarding measures to be adopted for the introduction of a uniform system of weights and measures throughout India.

Period.

14. As regards the period after which these measures should be adopted, the Commissioner of Coorg suggests that two years should be allowed to elapse before the provisions should be brought into force, that civil courts should not

recognize any other weights and measures in documents executed after the prescribed date and that the use of any other weights and measures should be illegal throughout India. Another witness suggests a period of 3 years.

Penalties.

15. The Commissioner of Coorg considers that punishment for failure to adopt the prescribed system should be fine on conviction before a Magistrate which would be more popular than the other penalties suggested, namely destruction or confiscation, because the former would involve a trial before the Magistrate. Two other witnesses approve of all the three penalties.

Agencies to detect cases.

16. Of the four witnesses in Coorg two express approval of the proposals in the Committee's question regarding the agencies to be employed in detecting cases of unauthorized weights and measures. Another witness suggests the employment of (*a*) head constables, (*b*) shanbhogues, (*c*) shettis in pettas and notified areas and (*d*) patels in villages.

Effect of uniform system.

17. The Commissioner of Coorg considers that the introduction of a uniform system of weights and measures would be beneficial to all. Another witness considers that it would affect no one though it may cause some confusion at the outset.

BANGALORE (CIVIL AND MILITARY STATION).

Evidence received.

Two members of the Committee visited the Civil and Military station, Bangalore, which is also the headquarters of the Chief Commissioner, Coorg. Written replies were received from 9 witnesses including the Collector, a representative of the United Planters' Association of Southern India and the Director of Industries and Commerce in Mysore. The Collector placed before the Committee a note by one of his predecessors on the subject of introducing a uniform system of weights and measures in Bangalore, and certain connected papers. Two groups of witnesses were examined orally, one consisting of two and the other of nine persons.

Uniform system favoured.

2. In Bangalore all but two of the witnesses are in favour of uniform system of weights and measures throughout India. The reasons given by those in favour of the system are that it is advantageous to the public who are now put to great inconvenience and loss, that buyers and sellers will understand the correct way of carrying on transactions and that it will put a stop to fraud on the part of those who intend to cheat. The two witnesses who are opposed to a uniform system state that there would be confusion in wholesale dealings, that the wholesale merchants will make no profit and consequently will not obtain large quantities of commodities and that it will therefore be difficult for the public to procure articles.

System favoured.

3. As regards the system to be enforced as a uniform system throughout India, a group of witnesses desire the use of the local weights to be extended throughout India. Another witness suggests a seer of 100 tolas. The representative of the United Planters' Association of Southern India suggests the following table: 100 tolas=1 seer; 50 seers=1 maund; 100 seers=1 double maund; his reason for this suggestion is that the rupee is the common unit used throughout India. Another witness (Mr. Alfred Chatterton) suggests the following table: 175 grains=1 tola = 16 annas; $2\frac{1}{2}$ tolas=1 ounce; 16 ounces=1 lb.; 100 lbs.=1 maund; 10 maunds=1 candy. Two witnesses suggest the Railway system as it is used in all Northern India. Four witnesses included in a group orally examined suggest the same system as it is already used in the sale of mutton and beef. No witness suggests the metric system. On the other hand, the Collector states that it will not suit merchants and buyers in India. Mr. F. J. Richards, a former Collector, states that the

kilogramme answers to no known weight in India; that its introduction will involve a gigantic disturbance of existing conditions of trade and commerce and that the decimal system is awkward for people who are accustomed to binary sub-divisions. Mr. Chatterton states that practical men pay very little attention to the metric system; that its adoption will not improve export trade, that its units are not so convenient as British units and that serious errors occur by putting the decimal point in the wrong place; one witness states that no foreign system is workable in India. On the other hand, some of the witnesses seem to think that the British system would be the best and would be acceptable. The Collector and Mr. F. J. Richards are both in favour of the British system. The latter states that the various seers, visses and maunds, etc, now in use must be expressed in pounds before a bargain can be struck; that all big contracts, such as municipal and military contracts, are now expressed in pounds, that the pound is in general use in the station bazaars; and that many articles can be purchased by the pound; he would adopt a quarter of 25 lbs., hundredweight of 100 lbs. and the ton of 2,000 lbs. Other witnesses consider that the British system should be adopted because it is the best for India and safe in the interests of buyers and sellers if made uniform throughout the British realm. Eight witnesses in another group orally examined prefer it if coins are altered so that their weights fit in with the pound.

Change of coinage.

4. The witnesses who have expressed an opinion on the point generally regard the alteration of the rupee as objectionable because people would think it less in value. It is used in jewellery and is not accessible to many. One witness approves of the proposal to alter the rupee while another states that the weight may be increased to $\frac{1}{3}\frac{1}{2}$ lb by the addition of silver only. Another witness accepts the proposal to increase the weight to $\frac{1}{3}\frac{1}{2}$ lb. by the addition of alloy. No objection is raised to the alteration of the nickel or copper coins, these suggestions being regarded as better than altering the rupee as these coins are always ready to hand and copper coins are harder than silver.

Length, area and cubic contents.

5. No opinion is expressed in Bangalore regarding the units of length, area and cubical contents.

Measures of capacity.

6. Some witnesses in Bangalore approve of the adoption of the Imperial quart, etc., as measures of capacity throughout India. The representative of the United Planters' Association of Southern India suggests a measure holding 100 tolas of water. Mr. Chatterton suggests the following tables :—

10 tolas=1 ollock ; 10 ollocks=1 seer; 4 seers=1 gallon ; 10 gallons= 1 maund ; 10 maunds=1 candy ; or $12\frac{1}{2}$ tolas=1 ollock ; 8 ollocks=1 seer, etc., as before, the tola being 175 grains.

Simultaneous use of weight and measure.

7. Poppy seeds, coriander, oils, etc., are sold both by weight and measure in Bangalore. One witness considers this practice unobjectionable while two consider that this practice should be stopped.

Use of same name for weight and measure.

8. The term seer is used both as a weight and measure of capacity in Bangalore ; but the witnesses state that no serious confusion arises in consequence of this practice as the people are accustomed to it and both parties to the transaction know which is meant. Mr. Chatterton states that in administrative work confusion arises as it is not clear whether a weight or a measure is intended in reports and returns. All the witnesses who have expressed an opinion are in favour of restricting the use of the term to one or the other.

Special weights for special commodities.

9. The same commodities are sometimes sold by different weights. This is explained as a local practice to allow for dryage and wastage, or in the case of

firewood to make up the loss by splitting; it is also ascribed to usage. The witnesses generally say that there would be no objection to the adoption of standard weights only in such cases but two witnesses say that it would cause much inconvenience to wholesale merchants, who would give up trade as they would think that they will not get profit in future. The Collector states that dealers in gold and silver as well as all chemists and druggists should be allowed to use their own local standards permanently.

Methods of introduction.

10. (*a*) No objection is raised to this suggestion.

(*b*) Mr. Chatterton considers that this would result in considerable expenditure without any corresponding advantage. This proposal is, however, approved by other witnesses in Bangalore.

(*c*) Mr. Chatterton does not think that the publication of such tables would influence matters either way. Other witnesses, however, approve of the proposal to publish such tables.

(*d*) Mr. Chatterton regards the proposal as too narrow-minded. This suggestion, however, has not been objected to by other witnesses.

(*e*) and (*f*) No objection is raised to this.

(*g*) Mr. Chatterton does not see why the general community should not be expected to bear the cost of the change, considering the advantages, provided that the cost does not fall too heavily on any individual.

(*h*) Mr. Chatterton considers this unnecessary because the cost of altering a weighing machine is not large and the owners are generally either Government, public bodies or wealthy persons; the Government should make such arrangements that private owners can get their weighing machines altered at the least expense.

(*i*) and (*j*) No comment is made.

(*k*) Mr. Chatterton considers that there is no reason why Government should forego its import duties on authorized weights and measures. This would merely withdraw from private enterprise in this country the slight amount of protection it receives from the levying of import revenue duties. Other witnesses have raised no objection to the suggestion.

(*l*) The Collector of Bangalore does not approve of the suggestion that the Government should sell authorized weights and measures at cost price. Mr. Chatterton prefers the second alternative by which the price will be such as to allow a reasonable profit to private trade. In his opinion, the Government should undertake the manufacture of weights and measures or license private firms to do so. They should be reasonably accurate and be made to a standard pattern so that people may easily recognize them; they should be of scientific design and as cheap as possible allowing for reasonable trade profit. He suggests that tenders should be invited from manufacturers all over the world for the supply of the very large quantities which will be taken over by Government and distributed throughout the country for sale. The representative of the United Planters' Association of Southern India and another witness of Bangalore are opposed to the suggestion that Government should sell weights and measures at a reasonable profit.

(*m*) and (*n*) Two witnesses in Bangalore object to these proposals. They state that Courts and registration offices should recognize whatever is entered in agreements and that this should not be interfered with. The Collector also does not recommend that Civil Courts should be debarred from recognizing any other weights and measures entered in documents.

(*o*) and (*p*) No objection has been raised to these suggestions.

Period.

11. As regards the period after which the several measures should be adopted to enforce the use of the uniform system of weights and measures, one

witness in Bangalore suggests six months. The representative of the United Planters' Association of Southern India suggests three years. Mr. Chatterton states that the period should be as short as possible, and suggests one year for the introduction of the system on railways and in public markets and two years in all municipalities and three years throughout the country.

Penalties.

12. The Collector and three other witnesses of Bangalore disapprove of the proposal that unauthorized weights and measures should be liable to confiscation when used. Otherwise, the proposals made by the Committee are generally approved. Mr. Chatterton regards confiscation as the only method by which we can compel the general public to adopt the new system. The representative of the United Planters' Association of Southern India suggests that confiscation should not be adopted for two years and that an offender should not be punished with fine until after three years.

Agency.

13. As regards the agencies to be employed to detect cases of unauthorized weights and measures, the Collector of Bangalore suggests that no official of the Police Department below the rank of Inspector should be employed for the purpose ; while other witnesses suggest that the Police should not be employed. Mr. Chatterton considers that the Police will have to be employed, but that steps should be taken to prevent this additional power placed in their hands from becoming a means of oppression. He suggests that the Police should be empowered to seize unauthorized weights and measures and forward them to the chief public office in the town where they should be publicly inspected once a week by the chief civil officer who will order their destruction if satisfied that they are unauthorized after hearing any complaints made by the owners. He considers it unwise to entrust the Police with any authority in villages, and would leave the matter in the hands of the village headmen.

Witnesses state that in the Revenue Department no one below the rank of Revenue Inspector should be employed in this matter. It is suggested that Municipal and Revenue officials including the Revenue Officer, Manager and Tax-Inspector should be employed in this connection. The Collector is opposed to the proposal that village headmen should be empowered to detect cases.

Effect.

14. Two witnesses think that the introduction of a uniform system of weights and measures will adversely affect large traders as purchasers will demand goods at their original price without making any allowance for the cost of carriage, commission, etc. Other witnesses think that there will be little or no effect and that the trouble and confusion caused by its introduction will be only temporary and that there will be considerable benefit to all concerned.

Native States.

15. Two witnesses and two groups of witnesses orally examined suggest that the uniform system of weights and measures should be used in Native States.

Other suggestions.

16. One witness suggests that the use of measures of capacity should be abolished ; he states that no abuse appears to exist in Hyderabad and other places where all transactions are by weight; it is easy to see whether weights are duly stamped but difficult to check measures.

Municipal action.

17. A by-law was passed by the Municipal Council with the intention of enforcing the use of British avoirdupois weights, (with a maund of 25 lbs. and the cental of 100 lbs.) and the English measures of capacity and length ; but it has not been brought into force owing to certain difficulties in testing weights and measures.

CHAPTER VI—CONCLUSIONS.

Necessity and desire for a uniform system.

The evidence we have received shows a general necessity and desire for a uniform system, provided that this does not involve too radical a change from existing practice, and we consider that uniformity subject to this proviso is both advisable and desirable. In what follows it is to be understood that the regulations, penalties, etc., are only intended to apply to weights and measures used for purposes of trade, and certainly at the outset we would restrict actual inspection to weights and measures used in a recognized shop or stall, allowing, however, persons affected to bring to light illegal practices as regards weights and measures used for trade but not occurring in a shop or stall in the ordinary sense of the word, *e.g.*, cultivators possessing weights for the sale of their own produce.

System of weights to be adopted.

2. Over the whole of India (excluding Burma) except Madras, the great majority of witnesses have advocated the Bengal or Indian Railway weights as the system of weight to be adopted and in Madras a certain number have done so also. Other systems also, however, have their advocates and it will be convenient to consider these first.

Metric system.

3. *The metric system.*—The most important advocates of this system have been the Chambers of Commerce of Cawnpore and Rangoon (Chapter V, U.P., 3 and Bu., 2). In Bombay and the Punjab (Chapter V, P., 2) very few favoured it. In Madras (Chapter V, M., 8) a certain number did so, but the proportion of those who had any real experience of the system was infinitesimal.

The special arguments put forward in support of the metric system are the usual ones of its simplicity and world-wide adoption. The advocates generally agree (more often than not on being questioned on the point) that decimalization of the coinage either on the basis of the rupee, as in Ceylon, or of the sovereign would be advisable. Against it we have specially the fact of its being almost unknown in India at the present time, and also that a decimal system is foreign to Indian ideas. This system has indisputably been introduced into a great many countries, and been generally found satisfactory, much stress being laid by its advocates on the fact that no country that has really introduced it ever desires to revert to its old system. We do not consider that much stress can be laid on such an argument, as being in favour of the metric in preference to any other uniform system. In the first place, a change of weights and measures of any sort is inevitably disliked; and in the second, in most countries that have adopted the metric system weights and measures were, before such adoption, in such a state of confusion as would have rendered the adoption of *any uniform* system most desirable. We consider further that the circumstances of India are very different from those of any other country that has adopted the metric system. In the first place, the European countries which have adopted it are themselves very much smaller in extent and population, and much more closely connected with their neighbours from which, as a rule, they are separated by merely artificial frontiers. As a consequence the proportion of the population interested in international trade is very much larger than it is now or is ever likely to be in India. For one transaction between a resident of India and one of another country in which the existence of the same system of weights and measures would be of benefit, there are at least 10,000 such transactions in which such uniformity would not be of the least advantage, and for which mere internal uniformity would be sufficient. Secondly, while the merchant engaged in foreign trade is generally a man of intelligence and education well able to overcome the difficulties caused by the varying systems of different countries, education in general is much more backward than is the case in most European and American countries, and in those countries in which it is much on a par with India the metric system would appear not to have been by any means easily or universally adopted. Thus, as regards Southern Italy, "it may be gathered that the transition from the old to the new

system has been difficult and that in parts of the country it is still far from complete". In Greece "the metric system was legally established by Royal Decree in 1836" but "as regards weights and measures of capacity, neither the Government nor the public uses it. The Greek Government has at various times had under consideration the expediency of rendering the use of the metric system compulsory on the public. It has, however, always refrained from doing so in deference to the habits and prejudices of the people". In Spain, the employment of the metric system was made obligatory from 1st January 1853, but was postponed from time to time until 1st January 1869. "All these postponements took place in consequence of the passive resistance which the substitution of the new for the old system had to encounter. At the present day, that system may be considered as in force but not completely so. It may be said that in the provincial capitals, in the head judicial districts and in the chief towns the adoption of the metric system is complete, but this is so especially as regards weights and length measures. In the smaller towns and especially in those that possess less industry and commerce and slight intercourse with important cities the ancient system is still adopted except as regards weight in which the metric system may be said to be generally adopted". In Turkey, by a law of 1886 the adoption of the metric system was to be compulsory in Constantinople from 1891, and in that year "the old measures were confiscated and destroyed with some difficulty. The opposition of the people led to the concealment of the old measures and a refusal to use the new. The difficulties of enforcing so unpopular a measure on an ignorant and illiterate people appearing insurmountable the rule was allowed to lapse." In Peru, "in spite of official adoption the old Spanish measurements are retained by the common people for market purposes and by the merchants for all ordinary commercial transactions". In Guatemala, "one cannot properly speak of the ease or difficulty with which the change of system was made as nobody in commerce has ever taken any notice of it". The case of Egypt has already been referred to (Chapter III, paragraph 1).

The metric system has of course been successfully introduced into many countries, but the foregoing cases of failure in countries in some of which there are representative institutions of a considerably more advanced nature than there are in India must be held to demonstrate the unwisdom of attempting to introduce a system of weights and measures that is not supported by the bulk of the people. We would take this opportunity of acknowledging with thanks receipts of several communications from the Decimal Association and expressing our regret at being unable to agree with their views.

British system.

4. *The British system.*—Though this has more advocates than the metric system, still the arguments against it are to a great extent those already given as regards that system. It is practically unknown throughout Northern India, being scarcely used save in a few large shops for imported articles when sold to Europeans and to some extent in the export trade. It is better known in parts of the Central Provinces, Bombay and Madras, and has penetrated inland from the seaports to a considerable extent. In Bombay and in the Central Provinces, this is apparently in connection with the export trade, more especially in cotton, practically all of which is done by weights based on the British pound (Chapter IV, C. P., 4). In Madras, there seems to be no such connection. The system is, however, better known there than anywhere else in India. The spread of British weights appears to be due to a not inconsiderable extent merely to the fact that well-made weights based thereon are, and have long been, more readily available than weights of any other system. The weight of articles weighed with such weights is, however, expressed in terms of the local weights and not in pounds.

Proposed assimilation of British and Indian systems by change in coinage.

5. The nearness of the seer to 2 lbs. has attracted many towards the proposal to reduce the former to equality with the latter by reducing the whole

series of weights (tola, chatak, seer and maund) by $\frac{1}{80}$th part, giving rise to the following table :—

Tola=175 grs.; chatak=2 ozs.; seer=2 lbs.; maund=80 lbs. and 28 maunds=1 ton.

The fact, however, that the rupee weight is the same as the tola in the Bengal series and that it has practically come to be the one common unit throughout India and is extensively used both for checking weights and as a weight for valuable articles makes it, in our opinion, extremely difficult, if not impossible, to alter the weight of the tola, seer, etc., without at the same time reducing the weight of the rupee from 180 to 175 grains. Though in parts of Madras, the United Provinces and the Punjab the original basis was either some other weight or the weight of some other coin, the weights in actual use have, as a rule, come to be recognized as equivalent to that of some definite number of rupee weights. This proposal to reduce the weight of the rupee received our attention and we took a large amount of evidence thereon, and also consulted the Mints as to the possibility of reducing the weight of the rupee by only reducing alloy therein. We find that though a fair number of witnesses recognize that the rupee is now merely a token coin and though one or two have gone so far as to say that were it made of leather they would still accept it if Government laid it down as worth the same, there is so large a number of people in this country unable to realize these facts that any such attempt would raise so large an amount of suspicion that it would be inadvisable to risk it. A few witnesses consider that the change in the weight of the seer, etc., could be introduced without any change in coinage, merely by insistence on stamped weights, with a system of inspection, but this is not the opinion of the majority. The possibility of supplying the desired connection between coins and weights by means of the nickel and copper coins was also considered. To an alteration of these little opposition was expressed, but the smallness of the opposition was an almost exact measure of the smallness of the value of such change for the object in view. When this is the case as regards the proposal to introduce what is practically the British system by the line of least resistance, it must *a fortiori* be regarded as impracticable to introduce the British system as it is in force in the United Kingdom, quite apart from any possibility of Great Britain changing to the metric system.

The opposition to the change in the weight of the rupee is based at least as much, if not more, on the confusion likely to result in weights as on the suspicion above referred to as to alteration in value. The strength of this opposition is a significant measure of the extent to which the rupee weight has become a universally recognized unit of weight, and before this one common unit is rejected we feel that it would be necessary to be very sure that the balance of advantage is in favour of such a course.

Somewhat similar arguments apply to the change of coinage that would be necessitated by the introduction of the metric system.

Decision in favour of the Railway weights for India.

6. We, therefore, with some regret as the Indian Railway weights cannot be regarded as an ideally perfect system though distinctly convenient by reason of the number of subdivisions it allows for, after a careful examination of all the arguments for and against, and with an eye to the easiest possible system of assimilation, come to the conclusion that the uniform system of weights to be adopted in India must be one based on the 180-grain tola; and of all such systems there is no doubt that the most widespread and best known is that known as the Bengal or Indian Railway weights. The introduction of this system involves a more or less considerable change of system in parts of the United Provinces (Gorakhpur, Bareilly and neighbouring areas), practically the whole of Madras, parts of the Punjab (rural portions of Amritsar and neighbouring districts), of Bombay (South Bombay, Bombay city, and Gujarat), and the North-West Frontier Province.

In the parts of the United Provinces and the Punjab concerned and the North-West Frontier Province, in spite of the fact that the Railway weights are very

little used save in official transactions and on the Railways, the great majority of the witnesses favoured them. In the Punjab and Frontier Province these weights are known as the British (*Angresi*) weights, and were only introduced on the annexation, and the ease with which they were adopted in the cities of the Punjab is of considerable significance as to what can be done where the system to be adopted is one based on a unit known to the people. We cannot but think that had the same energy been shown by Government in attempting to spread the use and knowledge of the 80 tola=seer in Madras, (where much more has been done in connection with weights and measures than elsewhere in India), as has been shown in standardizing local weights and measures, the knowledge of that system would have been much wider and the readiness to adopt it at least no less, than is the case in the areas above referred to in Northern India, where Government made but very slight efforts towards introducing the system.

Burma, a special case; Madras not so.

7. So far we have omitted reference to Burma. We consider that that province must be treated separately. It has at present a separate system of its own, which is practically uniform throughout the country. There is, therefore, no *internal* necessity for change to secure uniformity as there is in most Indian provinces. This system, though nominally based on the tola inasmuch as the viss is now deemed to be 140 tolas, is really radically different, as the true basis is the tikal of which 100 go to the viss (the Burmese name of which it must be remembered is peiktha, the name viss being unknown to the ordinary Burman). Further, inter-communication between Burma and India is at present wholly by sea, and even when there is railway communication between the countries, the bulk of the commerce will still go by sea; while lastly, the bulk of Burma's commerce is with foreign countries, and not with India so that the adoption of an Indian system of weights and measures would be of practically no use whatever as regards foreign trade. Hence, if Burma were to change its system, it should clearly do it in order to adopt one of the world systems, the British or the metric, and against doing this the arguments are practically those already put forward in the case of India.

We think, therefore, that Burma should be permitted to retain its present system until (if ever) it shows a general desire to adopt one of the world systems.

It may be, and by some (but not a great many) witnesses has been, urged that Madras should also be treated separately inasmuch as its weights and measures in many respects differ greatly from those in force in the rest of India. But the arguments in support thereof are very different from and far less convincing than those in the case of Burma. In the first place, no one system of weights and measures can be said to be prevalent throughout the Presidency; there are several very diverse systems in force, so that the argument of internal uniformity does not apply; to secure internal uniformity would involve a change of system in at least a great part of the province. Secondly, the tola is recognized as the one common unit of the greater part of the weights in force which is not in practice the case in Burma. Thirdly, inter-communication between Madras and the rest of India is much greater and easier than in the case of Burma and being by rail all goods are necessarily weighed by the Indian Railway weights which again is not the case in Burma. For these reasons we think that Madras should not be treated separately from the rest of India.

Details of systems to be adopted.

8. We conclude, therefore, that there is a widespread desire and necessity for the establishment of a uniform system of weights and measures throughout India, and for a separate system for Burma, that action should be taken for establishing and maintaining such systems, and that the system to be adopted should be for India the Indian Railway weights and for Burma the present Burmese system. The systems should be respectively :—

For India.	For Burma.
8 khaskhas = 1 cháwal.	2 small ywés = 1 large ywé.
8 cháwals = 1 ratti.	2 large ywés = 1 pè.

For India.		For Burma.	
8 rattis	= 1 másha.	2 pès	= 1 mu.
3 máshas	= 1 tánk.	5 pès or 2½ mús	= 1 mát.
12 máshas or 4 tánks.	= 1 tola.	1 mát	= 1 ngámú.
5 tolas	= 1 chaták.	2 ngamús	= 1 tikal.
16 chatáks	= 1 seer.	100 tikals	= 1 peiktha or viss.
40 seers	= 1 maund.		

The tola is the tola of 180 grains, equal to the rupee weight. The viss has recently been fixed at 3·60 lbs. or 140 tolas, but the change has penetrated but slightly into the country, and the majority of witnesses seem to be of opinion that the viss is still 3·65 lbs., though it would not be advisable to revert to this, now that the change has been initiated, as the new value gives a much more convenient connection with the Indian weights. We do not think there should be any objection to the use of other names for any of these weights, provided that the same name be not used to denote more than the weight anywhere in India.

Special weights for special commodities and trades.

9. We have received comparatively few recommendations for special weights for use under special circumstances or in special trades. In the former category fall the innumerable special maunds and seers for special commodities. General opinion strongly favours the abolition of these, there being but small opposition to such a step. We think that this should be done so far as may be possible, but we fear that it may be difficult to carry such abolition into effect. We would recommend that it be at least definitely laid down that wherever the name of any of the prescribed weights or measures be used in any registered document, it be held to mean that prescribed weight and no other; *e.g.*, that a maund of cotton or sugar shall always be deemed to be of 40 seers of 80 tolas each of 180 grains. As regards documents not requiring registration and oral agreements involving the use of unauthorized weights and measures, we recommend that evidence be only admitted to prove what these are on payment of special costs. (See paragraph 31 and Mr. Rustomji's note of dissent there recorded).

Jewellers' weights.

10. Of special weights for special trades requests have been put forward for such on behalf of jewellers and druggists. As regards jewellers, throughout Northern India there are special tolas used for gold and to some extent for precious stones. These are probably based on the weights of various coins no longer extant. Whatever their origin, they are now practically invariably defined as of so many rattis in excess or defect of a rupee weight, the excess usually varies from *nil* to 12 rattis, being more often between 2 and 4 than anything else. This very mode of expression coupled with the varying nature of this tola appears to us a strong argument against recognizing the necessity or advisability of allowing any tola other than the one of 180 grains. But in addition to the general table already given in paragraph 8 above, we consider that the tank of 21 rattis or ¼ tola divided into 20 bissas or biswas should also be recognized. We do not consider it advisable to recognize the large ratti of which 64 go to the tola, though used to some extent in the Punjab and Burma.

Druggists' weights.

11. The case of the druggist and physician stands on somewhat different ground. The argument urged in support of permitting separate weights for these is that a change of system would make it very inconvenient to use prescriptions made up according to the old system and that there would be considerable liability to mistake. We think it would be advisable to permit the use of such old systems in making up prescriptions until the general body of Indian physicians take sufficient interest in the matter to lay down some more definite system, but to require the use of the standard weights for actual sale of drugs.

We think that the mere presence in such dispensaries of such standard weights will go far to bring them into more general use.

Use of British weights.

12. The question of the British avoirdupois and apothecaries' weights is again somewhat different. The avoirdupois weights are used to a considerable extent in some of the seaport towns (Bombay, Madras, Cochin, etc.) and in the export trade. They have penetrated inland to some extent especially in Southern and Western India, where they have come into ordinary use in some of the markets, largely as already noted owing to the ease with which good weights of these systems are procurable. Here they are a frequent cause of fraud as a 2-lb. weight is often used for a seer, or a 3-lb. weight for a viss of 120 tolas and we are of opinion that the possibility of this should be put a stop to. On the other hand, it appears to us impossible or at least inadvisable to prohibit the use of such weights entirely. It has been proposed that the use of British weights should be permitted under a license and that they should be of a shape differing from that of the prescribed standard Indian weights. Either method would probably prove effective, but in view of the fact that the adoption universally of any one shape for the standard weights is bound to be a lengthy process we would recommend that in India (not Burma where the chances of fraud are insignificant owing to the different system there prevalent) both conditions be laid down, *i.e.*, that firms or shopkeepers desiring to use British weights should be required to take out a license and that the weights used should be of some prescribed shape different from that of the standard Indian weights. Mr. Rustomji considers that a license would be unnecessary, and would cause inconvenience owing to the inquiries required before it would be granted. Such license should, we think, be granted free of charge on cause being shown for the necessity of the use of such weights. The grounds of the grant of such license would be the necessity of the use of such weights for the convenience of the person using them or of his customers. Thus, firms exporting by British weights, which is the system generally used, would receive permission; so also would importers of articles received by British weights and many shops selling imported articles, especially in larger towns and cantonments.

Apothecaries' weights are only used in connection with European drugs and we would recommend that permission to use them be granted on similar lines.

Use of metric weights.

13. As regards the metric system, weights of this system are practically used nowhere in India at the present time; to provide for future contingencies it might be advisable to lay down that their use may be permitted under license in a manner similar to that recommended in respect to British weights.

Use of British and metric weights in documents

14. These recommendations regarding licenses only refer to the actual use of the weights in India. We do not consider it necessary to prohibit in any way the use of either British or metric weights in documents, or their use in any way in Burma.

Measures of length.

15. The British yard is recognized practically throughout the whole country and is recommended as the unit of length to be adopted by the vast majority of witnesses including some of those who would have the metric system of weights. We recommend that it be adopted as the fundamental unit. At the same time we see no necessity to insist on its multiples and submultiples alone being used. We recommend that the commonly recognized measures in the various provinces be standardized in respect to it. Thus the *hath* of Northern and Central India or the *taung* of Burma would be standardized at 18″, the *balisht* at 9″, the *girah* at $\frac{1}{16}$ of the yard of 2¼″. We give some more examples of our proposals in this respect in Appendix C, but it must be remembered that these proposals are not intended to be exhaustive, further enquiry may show it to be advisable to recognize some other measures fixing their length in terms of British measure.

For measures larger than the yard, there are two classes, those used in measuring distances, and those used in connection with land survey. For the

former class, the mile and furlong have practically superseded every other measure and we recommend that no other be recognized; this involves the abolition of the special 5,000′ mile of the Punjab canals. For the latter class the measures to be proposed depend on the system to be adopted for areas, which (see paragraph 16) is the acre and its decimal subdivisions. We, therefore, recommend the use of the chain of 66 feet subdivided into 100 links.

Measures of area.

16. *Areas.*—As already shown, the indigenous measures of area show an absolute lack of system, and wherever land survey has been undertaken for revenue assessment purposes, *i.e*, throughout all India except the permanently settled areas in Bengal, Madras and Bihar and Orissa, it has been found necessary to adopt some unit based more or less directly on the British system of measures of length. In many provinces, the British acre or a local measure easily convertible thereinto (as the *bigah* of $\frac{5}{8}$ acre of the United Provinces) has been adopted, and in several the acre and its decimal subdivision into 100 or 1,000 parts (according to the size of the fields); *e g.*, Madras, Central Provinces except Berar, and Burma is in force while in certain others it is being adopted as districts come under survey (Bengal) or resurvey (United Provinces); elsewhere (Punjab, Berar and Bombay), the acre is used but subdivided according to the British or some local system. Thus, throughout India and Burma except Bengal, Bihar and Orissa and Assam, the acre is the fundamental unit of area, and the system of subdividing it decimally is coming more and more into vogue, and even in Bengal, Bihar and Orissa and Assam it is gradually being adopted. We recommend that it be adopted throughout India, and that it be subdivided decimally into 100 cents or 1,000 maunds (usually known as decimals). We propose that the method of introducing these measures be that adopted in many places, *i.e.*, that at next survey of the district the areas of all fields be recorded in the village papers or in the case of permanently settled areas, slips given to the tenants and other records in terms both of the current local measure of area and of acres and cents (or mils), and that it be required that areas be given in documents and suits in terms of acres, etc., with or without, at the option of the writer, the same area in terms of the local measures. Mr. Rustomji, however, would not insist on the decimal subdivision of the acre, thinking it hardly worth altering the records to do this in Bombay and Berar.

Measures of capacity (dry).

17. *Measures of capacity (dry).*—These are extraordinarily various, and their use is almost entirely (except in Burma and to same extent in Madras and the Punjab) local, and chiefly confined to retail trade. They vary from district to district and often from place to place in the same district. The desire for uniformity, though distinct, is not so strong as in the case of other measures. We are of opinion that it is unnecessary and would be extremely difficult to attempt to lay down one hard and fast system for the whole country. On the other hand, we are strongly of opinion that some action should be taken. We, therefore, recommend that the various measures in use in the different parts of India be standardized so as to contain some definite weight of water.

Existing measures are almost invariably now, whatever may have been their origin, fixed, so far as they are fixed, according to the weight of some grain (usually rice or wheat) that they contain, and there are a large number supposed to contain an integral number of seers of grain. The wheat-water ratio being 4: 5, there is much to be said for adopting, as far as may be possible, the bulk of $1\frac{1}{4}$ seers of water as the unit of capacity in precisely the same way as the bulk of $1\frac{1}{4}$ lbs. of water is the British pint. We recommend, therefore, that the various measures be standardized, as far as possible, as multiples of one holding $1\frac{1}{4}$ seers of water. A consideration of the evidence before us and of the reported capacities of the various measures extant leads us to think that this will prove a more practical unit than the bulk of one seer of water. Almost the only substantial disagreement to measures based on this is the capacity seer holding 160 tolas of water introduced in East Khandesh. We have scarcely sufficient evidence to make definite recommendations with confidence, but we think it may be useful to place on record what we think might be suitable

equivalents for some of the principal measures in use in various parts of India, though quite aware that more complete inquiries may show it to be advisable to modify these proposals; and such are the more necessary owing to the essentially rural nature of these measures in many parts. (See Appendix C.)

As far as possible any one name should indicate a measure of only one size throughout India, but we doubt whether this will be possible to enforce in respect of the measures bearing the names topa and paili, which indicate at present two or more distinctly different measures in different areas. Thus, the topa indicates a measure containing about 2½ seers of water in the Central Punjab and one of roughly double that size in the Western Punjab and Frontier Province (Chapter IV, P., 14); and the paili of Jhansi in the United Provinces is approximately double that of the paili of Akola in the Central Provinces. In view of the essentially local character of most of these measures, we do not think that discrepancies of this sort are as objectionable as they at first sight appear, though undoubtedly if it be found possible to do away with them we are of opinion that this should be done. We are, however, of opinion that the same name should not be recognized as denoting both a weight and measure; this we think objectionable as liable to lead to confusion if not also to fraud. Mr. Rustomji objects to these proposals regarding names thinking it to be impracticable to give effect to.

As regards the question of heaped and struck measures, while we consider struck measures by far the most satisfactory we doubt if the custom of heaping could be stopped in those parts of the country where it is in force. We, therefore, recommend that, wherever possible to do this, the dimensions and shape of the mouth of the measure be prescribed as well as their capacity, which latter should be determined in the way above proposed without reference to the quantity contained in the heap—practical experience will very soon show what that is. If it is found possible to introduce striking, the form of the striker should be prescribed. A suitable form is a stout cylindrical rod or roller. Mr. Rustomji would, however, make no attempt to interfere with the custom of heaping under any circumstances.

Burma measures of capacity (dry)

18. The dry measures of Burma as already noted, stand on a very different footing from those of India. The fundamental unit here is the basket or tin the variations of which have been fully discussed as also the opinions as to how it should be standardized. For reasons set forth at length in these passages we think that the basket should be standardized at 8 gallons, except in Akyab where a basket of 4 gallons should be recognized. On the analogy of Setion 8 of the Corn Return Act, 1882, which requires that a bushel of wheat, barley and oats be deemed equal to 60, 50 and 39 lbs, respectively, we would strongly urge that the same system should be adopted in respect of paddy as in respect of other agricultural produce, *i.e.*, that the basket of paddy should be of a standard weight and that paddy be dealt in by weight instead of by the peculiar measure-*cum*-weight system at present in force. As to what weight should be taken as equivalent to the standard 8-gallon basket, we have scarcely sufficient evidence to state with certainty, but we are inclined to think that 12½ visses or 45 lbs. of paddy or 75 lbs. of rice is approximately correct. We are aware of the difficulties involved in a change of system, but are inclined to think that they are somewhat over-estimated by the Rangoon Chamber of Commerce.

2 lamò	=	13 zalè.
2 zalès	=	1 hkwet.
2 hkwets	=	1 pyi.
2 pyis	=	1 sayat.
2 sayats	=	1 seik
2 seiks	=	1 khwè.
2 khwès	=	1 tin or 'basket'.

All other measures would depend on the basket, and we recommend recognition of the table given in the margin.

Measures of capacity (liquid).

19. *Measures of capacity (liquid.)*—There are very few true indigenous liquid measures in India or Burma. Rarely some of the dry measures are used for liquids, but as a rule liquids are in reality sold by weight, though for convenience sake a measure made to contain a definite weight of the particular

liquid for which it is used is often employed. Occasionally, as in the case of the garwi of the Punjab (a measure containing a seer of milk), such a measure has a name different from that of the weight it contains, but as a rule this is not the case. We think it unnecessary to prescribe any liquid measures, but that it should be prescribed that either one of the dry measures of a shape suitable for the purpose be used, or else that liquids be sold by weight and that in the latter case if a vendor wishes to use for convenience sake measures containing particular weights of particular liquids he shall be legally bound to see that such is really the case, and to check by weight, if so desired by any customer, and for this purpose be bound to keep scales and weights on his premises. We further think that it is desirable that a limit should be prescribed in respect of some liquids, such as oils and ghi, beyond which sale must be by weight only or by standard liquid measures. Mr. Rustomji would not permit the use of measures made to contain definite weights in the manner above described, as this would lead to multifarious measures according to densities, but would insist on the use of weights direct or else of standard measures, irrespective of quantity, whichever might be preferred by the parties concerned.

Use of British and metric measures of capacity.

20. As there seems no fear of fraud being perpetrated through permission to use British measures of capacity (dry or fluid) concurrently with Indian measures, which was the reason for the recommendation made as regards licenses for the use of British and metric weights, we think there should be no restriction placed on the use of British or metric measures, dry or liquid, provided these conform to Board of Trade regulations.

Measures of cubic content.

21. For cubic content there are also practically no indigenous measures, and opinion generally favours the adoption of British measure. We think, therefore, that that measure should be prescribed with permission also to express cubic contents in terms of any of the legal measures of length.

Simultaneous use of weight and measure.

22. A certain number of opinions has been given as regards the question of permitting the use of weight and measure side by side for the same commodity in the same place. Where such is the general custom, but little opposition to its continuance is expressed; it is mainly where it is somewhat unusual that it is objected to. There is, however, some opinion against measures in consequence of the greater ease with which the measurement can be manipulated. We do not think it necessary to recommend any interference with existing custom in this respect. With standard weights and measures, and different names for weights and measures there should be very little risk of fraud or mistake.

Measures for the introduction of a uniform system.

23. *Measures for the introduction and enforcement of a uniform system of weights and measures.*—The Committee in their list of questions put forward certain suggestions for criticism which it will be convenient to consider in a somewhat different order from that in which they occur in the questions.

Publication of tables of authorized weights and measures.

24. *That tables of the authorized weights and measures and conversion tables showing their connection with the weights in current use be published in the District Gazettes in the vernaculars and English, and that copies be kept by the village headmen.* This proposal is generally approved. The publication in the District Gazettes only applies to Madras. Criticisms have been practically invariably in the way of recommending wider distribution of tables. We would suggest two methods of publication:—

(*a*) in the form of posters suitable for putting up on notice boards, etc., which would show the new tables of weights and measures with the equivalents in local measures, and

(*b*) in pamphlet form, giving the same information with possibly information as to where the new weights are procurable. The posters we think should be put up at all Revenue and Sub-Registrars' Offices and Civil Courts, also at Post Offices and on the village chaupal, athai, chavadi or chauri, while the pamphlet forms should

be sent to all schools, patwaris, village headmen, bazaar chaudharis, market superintendents and bazaar-goungs, co-operative societies and the contents be printed on the back of the headmen's sanad of appointment and in the thugyi's almanac and the Burma Village Manual, and as far as it may be possible to arrange this, on the covers of school exercise books. A copy of the pamphlet might also for some time be issued with each set of weights. We would specially urge the necessity of all such notices being printed in the vernacular of the locality and in extremely simple language.

New systems to be taught in schools.

25. *That the use of the standard weights and measures be taught in all recognized elementary schools and the use of no other weights and measures be taught in such schools.* This is fairly generally approved, subject to the proviso that foreign systems be not excluded. Some consider it advisable to defer omission of existing systems until such begin to fall into desuetude. We think, however, that only the standard system should be taught together with, for a certain period, tables of conversion of the old into the new systems (such as the British or metric) to be also taught where deemed advisable.

Distribution of samples of authorized weights and measures.

26. *That specimens of the authorized weights and measures in general use should be supplied by Government to all Revenue officers in districts, all police stations, all village headmen and all recognized elementary schools.* The distribution here referred to is intended for purposes of instruction. The great majority of witnesses approved these proposals and the greater part of the criticism received took the shape of proposing additions rather than the reverse. The chief additions proposed were that samples should also be issued to patwaris, bazaar chaudharis, market superintendents and bazaar-goungs, co-operative credit societies, heads of panchayats and baradaris, mullas and pandits (in the North-West Frontier Province) and to hpongyi-kyaungs in Burma. Very few even of official witnesses urged what is of course the chief objection to wide distribution, *viz.*, the expense thereof, and this we feel is the chief difficulty. It must, however, be remembered that the object of the distribution being educational, the weights and measures might well be recalled and sold after the new system was properly understood. Moreover, if the systems adopted be those recommended by us, we think the financial difficulty will be less, as the distribution of sample weights will only be necessary in those parts of the country where the standard weights are not at present known to an appreciable extent. This reduces the area in which distribution is likely to be required to be the greater part of Madras, and possibly parts of Bombay, the United Provinces, Punjab and the Frontier Province, and (as regards the basket) Burma. We think further that even in Madras it would be required in but few of the larger towns, while elsewhere the systems proposed are generally well-known in all towns, so that practically only rural areas and the smaller towns would have to be considered. The necessity for such distribution is also intimately connected with the extent to which action is taken in the way of replacing existing weights and measures by those of the prescribed pattern considered below (paragraph 33). If replacement of weights and measures be freely carried out, we think distribution of samples on any extensive scale scarcely necessary. If, however, as we consider to be the case, such be deemed impracticable we consider that distribution should be widely effected. We would suggest that in those areas where the weights and measures to be introduced are not at present widely known, samples be sent to all recognized elementary schools, to the headmen in Bengal and in Bihar and Orissa (if there are any areas in those provinces requiring such action) the presidents of panchayats of chowkidars and to all bazaar-chaudharis, market superintendents and bazaar-goungs. In the Frontier Province, we think the suggestion that the services of headmen of panchayats and baradaris, mullas and pandits be enlisted in this matter probably a sound one. In Burma, it is deemed of special importance that the thugyis of at least the more important villages be provided with a standard basket, and this we recommend. If so extensive a distribution be found financially impossible, the smallest villages or those with no shops should be first omitted.

Stamping of weights and measures.

27. *That Government should stamp only authorized weights and measures and provide due facilities for stamping and verifying authorized weights and measures free of charge for a certain period.* The testing, correcting, stamping and inspecting of weights and measures is deemed a *sine qua non* by far the greater part of the witnesses examined, as also is the prohibition of the use of unstamped weights and measures after some prescribed period. We are of opinion that it is absolutely essential for this to be done and that it is the only practicable method of bringing about uniformity throughout the country. We are of opinion that the introduction of these operations is now desired by so large a section of the population as to make it most advisable for Government to undertake it. We would further recommend that testing, correcting and stamping be done free of charge in respect of the first set of weights and measures presented by the owner, provided that this be done voluntarily by him and within some specified period. If this be deemed financially impracticable it might be feasible to charge fees from the beginning, but we are strongly of opinion that, if possible, the stamping should be done free to the extent suggested with a view to minimize difficulties at the outset.

Provision of stamped authorized weights and measures.

28. *That the import, manufacture and sale of other weights and measures should be declared illegal; that no import duties be levied for a certain period on authorized weights and measures, etc.; and that Government should sell at cost price or at a profit authorized weights and measures.* It is convenient to discuss together the whole question of the manufacture, sale and provision of weights and measures. The general opinion is against allowing import free of duty; it is thought that such action would not appreciably diminish the retail price, and at the same time would tend to discourage the local manufacturer. With that view we agree, and consider that no such action is required.

While there is a fair amount of opinion that the provision of weights and measures should be left to private enterprise, there is on the whole a preponderance of opinion in favour of Government supervising it in some way or other, and it is obvious that some action of some sort at least in some parts of the country be necessary to ensure a proper supply of the standard weights and measures. There have been various suggestions, amongst which may be mentioned that manufacturers or vendors of weights, or both, be required to obtain a license, such licenses to be given free of charge and freely, the sole object being to enable Government to prohibit the manufacture or vend of incorrect weights. Others have suggested that it be merely prescribed that no weight be sold until it has been tested and stamped by the authority appointed for this work. Others again would favour the leaving of the testing and stamping of weights to the purchaser. We are of opinion that the safest and most convenient course would be to require that all weights and measures be tested and stamped before they leave the premises of the manufacturer or importer, and that the retail vendor be held responsible for not selling unstamped weights or measures. It might be found convenient for Government to enter into an arrangement with a manufacturer to stamp weights and measures up to a certain limit for a fixed payment, so as to reduce the sale price as far as possible. As to how far it may be necessary for Government to arrange for the supply and sale of standard weights we consider local conditions must determine, but we think it probable that in some parts of the country at least, such as backward and rural tracts, it will be necessary or at least advisable for such to be done. Where this is necessary, we would suggest that weights be provided by Government agency and sold direct or on commission in a manner somewhat similar to that in which stamps are sold, the prices to be such as to cover the cost of purchase and management, and not to discourage private trade.

We further think that definite patterns should be prescribed for authorized weights and measures. Every weight and measure should, as far as possible, show its denomination clearly in the vernacular and also bear the maker's name.

Adoption by Government, Railways, etc.

29. *That authorized weights and measures should be adopted on all transactions in which Government, Railways or bodies controlled by Government are concerned.* This met with universal approval. It was suggested that District and Municipal Boards should be specifically added, but we consider that these are included among bodies controlled by Government.

Use of authorized weights and measures in Government markets.

30. *That only stamped authorized weights and measures should be used after a certain date in markets under the control of Government or any local body.* This was generally approved though one witness pointed out that such action if taken in respect of a system of weights not generally approved is more likely to ruin the market than to encourage the use of the weights. We think that there is little fear of this being the case if the systems proposed by us are adopted and therefore recommend action on these lines.

Only authorized weights and measures to be used in documents

31. *That after a certain date documents should be drawn up only in terms of authorized weights and measures and civil courts should not recognize any other weights and measures in documents executed after the prescribed date, an exception being made in reference to documents relating to external trade with countries in which the authorized weights and measures are not recognized, and that documents drawn up after the prescribed date in terms of unauthorized weights and measures should be refused registration.* Opinions on these two proposals are not numerous; the Bengal Chamber of Commerce favours both, that of Bombay thinks both "inadvisable at present", the Punjab Chamber opposes, those of Rangoon and Madras express no opinion. The proposal must be considered together with that recommended in paragraph 12, which if accepted would require that in any registered document the names denoting the authorized weights and measures shall denote them and nothing else. The logical result of such action would be to refuse to recognize other weights or measures of names different from those of authorised weights or measures. We would therefore recommend that registration of documents containing references to weights or measures of names other than those of authorized weights and measures be refused, the document being merely handed back for correction. Where the names are the same as those of the authorized weights and measures, registration should be effected without it being incumbent on the registration officer to make any inquiry as to whether authorized weights and measures of those names are referred to or not, the Court is to assume such to be the case and to admit no evidence to the contrary. This method would dispose of all documents save such as require no registration and oral agreements and as regards such we think that the presumption should be that authorized weights and measures are alone used, and that as regards weights or measures of names different from those of authorized weights or measures the Court should presume ignorance and that evidence to show that the former are different from the authorized weights or measures of the same name and what the latter are in terms of authorized weights and measures should only be admitted on payment of special costs. These proposals are considerably less drastic than the English law which makes documents in terms of unauthorized weights or measures void (Weights and Measures Act, 1878, Section 19). Mr. Rustomji would however not inflict special costs in such a case (see his note at the end of paragraph 41 below).

Unauthorized weights and measures to be illegal and possession thereof by traders to be presumed to be for use.

32. *That the use of weights and measures except those authorized should be illegal throughout India after a certain date, and that it should be presumed that any unauthorized weights or measures found in the possession of a shopkeeper, trader or merchant thereafter are intended to be used as such and that such possession should be illegal.* There is no strong body of opinion against these two proposals. The former is certainly generally regarded as an inevitable necessity, and the latter also to a great extent. We recommend that the use of such weights and measures should be declared illegal, and that it should be presumed that all weights and measures found on the premises of any shopkeeper, trader or merchant are for use as such, unless

he be able to prove the contrary. We do not think that with an appropriate procedure this should prove an undue hardship in actual practice.

Replacement of weights and measures free of cost by Government.

33. *That Government should replace free of cost by corresponding authorized weights and measures those no longer authorized but stamped by or under the authority of Government before a certain period.* This was generally approved, though a considerable number urged the expense of so doing. As the proposal stands, it would only apply to Madras and a very few Municipalities in the Central Provinces and Burma, as elsewhere there has been no stamping. Witnesses have, however, usually interpreted the question in a more general sense, and taken the suggestion to be one for the general replacement of existing weights and measures. We think, however, that anything of this sort is financially impossible, or at least that the advantages from such a course are incommensurate with the cost, considering the small cost to the individual of a set of weights or an ordinary measure. But we would suggest that, where necessary, facilities be provided for the purchase of old weights incapable of correction as old metal either by Government itself or through some contractor or otherwise, so as to ensure their being rendered useless as weights. Mr. Rustomji dissents thinking this to be too large an undertaking.

Alteration of weighing machines.

34. *That Government should alter or make grants for the necessary alterations of weighing machines which are in British India at a certain date and in good order and in use or for sale.* The majority of those who have expressed any opinion on this point are against it. It is pointed out that the cost of doing this is small and that the persons affected are such as are well able to afford such small cost. Such a change was effected on the Burma Railways when the viss was altered and gave rise to but little trouble. We consider that any action of this kind is unnecessary beyond seeing that as far as possible there are facilities available for the necessary corrections. If the systems adopted be those recommended the necessity of anything of the sort will to a large extent be non-existent.

Inspection of scales.

35. Although not strictly within the scope of our inquiries, we think we should mention that several witnesses suggested that scales also should be inspected and tested. We think, however, such a course would at present be scarcely practicable on any extended scale, though it is distinctly an object to be aimed at, and one which it might be found possible to give effect to even now in the Presidency Towns and some of the larger Municipalities to some extent, as for example in Municipal Markets.

Method of, and period required for, the introduction of a uniform system.

36. The scheme which the Committee would suggest is somewhat as follows:—In the first place, if this be necessary owing to non-acquaintance with the new system, samples, pamphlets and posters should be distributed in the manner proposed in paragraph 24 above. Next, arrangements must be made for the provision of standards for testing, correcting and stamping of weights and measures, and to ensure the necessary supply of authorized weights and measures. The Local Government would then notify that from a certain date none but stamped authorized weights and measures are to be used in certain places; and that from the same date none but these weights are to be used in all official and *quasi*-official transactions. By *quasi*-official transactions we mean transactions in which District and Municipal Boards and other bodies controlled by Government are concerned. At the same time it should be intimated that up to some specified date weights and measures would be tested, corrected and stamped free of charge or at a reduced charge, under certain conditions. Such date might well be fixed so as to be somewhat later than that from which only authorized stamped weights were to be used. The insistence on the use of authorized weights in documents might well have effect from a still later date, while the absolute illegality of unauthorized weights, and the presumption that the possession of such was for use would come later still. The exact periods must, we think, be left to the discretion of Local Governments, who would doubtless take

into consideration local circumstances, such as, the extent to which the system of weights and measures to be enforced differs from that in ordinary use, the general intelligence and education of the people, and the ease with which arrangements for the supply of new weights and measures and their stamping, etc., could be made. Thus we think it would probably be quite possible to insist on the use of stamped weights and measures of the systems we have recommended in a city such as Delhi within six months of the promulgation of the order and would only allow free testing, stamping, and correcting to any degree for the same period; the use of authorized weights and measures in documents might be enforced within a year of the issue of the notification and absolute illegality enforced within two years. In Delhi these weights are those in ordinary use and little more would be required than to arrange for the testing, correcting and stamping; there would be no need of educating the people in their use. For a district in which this was the case we think that the first period might be lengthened from six months to a year, for documents two years might be allowed and for absolute illegality three. Longer periods would be required for areas where the new weights were less known, but we are strongly of opinion that too long a period between the issue of a notification and its coming into force is inadvisable as in such case there is great fear of nothing whatever being done until within the last few months before the period expired. We would suggest that in places where the system adopted is not known to the people the distribution of sample weights, pamphlets and posters be made not less than six months before the issue of a notification. We consider that in the case of backward areas it would probably not be advisable to issue any notification until the new system had to some extent come into force in the larger towns.

A notification might issue immediately for the use of stamped authorized weights and measures in all municipalities where no preliminary distribution of samples was deemed advisable, within a year of issue thereof, and in Notified Areas and Towns with anything in the shape of local self-government (as the Act XX Towns of the United Provinces) within two years of issue, leaving the rural areas unaffected otherwise than by the issue of notices regarding the new tables, and possibly of sample weights and measures. After the expiry of the two years notifications might issue requiring the use of stamped authorized weights in certain rural areas within another two years, though it is quite possible that it might be suitable to take up some rural areas where the use of the 80-tola seer is at present customary even earlier—perhaps simultaneously with some of the towns and so on, the areas being selected with regard to (*a*) their general state as regards education, intelligence and trade, (*b*) the extent to which the knowledge of the authorized system existed or was penetrating from the towns, and (*c*) the staff available for explaining and introducing the system. In Madras we think the less acquaintance with the proposed system is likely to be largely counterbalanced by the fact that the people of that Presidency are more accustomed to Government action in respect to weights and measures.

We think that all such notifications should be issued so as to have effect within at most two years from the date of issue. We further think that it should be possible to enforce the use of stamped authorized weights throughout India within ten years of the date of beginning to make the arrangements, with the exception perhaps of some specially backward tracts such as the Madras Agency Tracts and parts of the Central Provinces and Chota Nagpur.

Alternative methods of maintaining the correctness of weights and measures.

37. In the preceding paragraph we have considered the method of introducing the new system. For its maintenance and to ensure the continued correctness of the weights and measures in actual use a system of inspection is necessary. As to what this should be there are two alternatives:—(*a*) to require periodical production of weights and measures for the purpose of testing, correcting and stamping. Such production to be annual in urban areas and triennial in rural; and the weight or measure after correction to be stamped with a stamp indicating the year of stamping. In this way the work of the inspecting officer would be merely to see if the stamp bore the correct date or not, though of course if an officer of sufficient standing, *e.g.*, Naib tahsildar or higher, had reason to believe a correctly stamped weight or measure to be incorrect he should not be precluded from taking action; and (*b*) to rely on inspection only, merely insisting

on the use of weights and measures which had been stamped before sale. In this case the inspecting officer would have to have with him scales, weights and measures sufficiently accurate to test the weights and measures of the trades, and also to possess the skill required for this purpose. Which method is advisable must depend largely on the staff to be employed, a full discussion regarding which will be found in paragraphs 38 to 40.

Staff required for enforcing regulations regarding weights and measures.

38. The staff to enforce the regulations regarding weights and measures must vary from province to province and we are not able to do more than indicate the general lines that should decide what this should be. Such staff falls naturally into two parts:—(*a*) the executive staff, which will do the testing correcting and stamping of weights and measures, and (*b*) the inspection staff.

Executive staff. (Stamping parties.).

39. (*a*) *Executive staff.*—The former may either be peripatetic or fixed. In favour of a peripatetic stamping staff it is urged that there will be much less convenience to the owner of the weights and measures to be stamped if this be done near his residence, against it is the fact that over such a party supervision cannot but be decidedly lax; and we have had it urged that there is considerable fear of corrupt practices in such cases unless the party is in charge of a fairly well-paid officer. For a fixed party with headquarters at a tahsil, supervision would be more complete, though the Tahsildar has now so much to do that he would in most places have but little time to spare to look after the stamping party. If, however, our proposal be accepted that no new weights or measures be sold without being first tested and stamped, the arrangements for doing this after the first year or two, during which existing weights and measures would be stamped, would be greatly simplified. Weights are made by comparatively few persons, and it should not be difficult to arrange for their stamping and testing at convenient centres; measures are more widely made, but even in their case probably by far the greater portion is made in a comparatively small number of large places, and it should be possible to arrange for the testing and stamping party to have its headquarters at the district headquarters or possibly the tahsil, and from time to time go on tour after giving due notice. This would probably suffice to provide for the periodical testing, correcting and stamping recommended in paragraph 37. Traders practically always have occasion to visit some considerable centre once or twice in the year and could get their weights and measures put right at such times.

The extent to which it would be advisable for a stamping party to tour would depend on the type of officer in charge thereof. We consider that, if it were found possible, the best arrangement would be to place the party in charge of an officer of the Naib-tahsildar rank, such Naib-tahsildar to be one of the regular district staff selected from among ordinary Naib-tahsildars or candidates for Naib-tahsildarships and eligible for promotion in the ordinary way. He should receive some technical training in the work and not be placed on this duty for more than two years at a time. If this were done, we think it would be possible to allow touring without any more restriction than that it should be so arranged as to give all shopkeepers reasonable facilities for the testing, correcting and stamping of their weights. If a lower grade officer were in charge, it would probably be advisable to keep the party more at the headquarters of the district or at least of a tahsil, and only allow them to visit the larger centres. The party might consist of the Naib-tahsildar, one (or possibly at first more) blacksmiths and a peon or two. We are very strongly of the opinion that it should be part of the regular district revenue staff subordinate to the District Officer and not under a separate Department. This we consider most necessary at the beginning of the scheme, as unless the sympathies of the district staff are enlisted, success is improbable, and such is less likely to be the case if the work is done by a separate Department.

As egards the financial aspect, we think that after the preliminary period of free stamping, fees should be charged at a rate calculated to cover the cost of the establishment. It would, we think, be found possible, after the system had gone into working order, to considerably reduce the number of stamping parties, and to possibly have one for two or more districts where these are small.

The larger municipalities should arrange to do their own stamping, the smaller ones, notified areas and towns would probably find it convenient to share in the district stamping parties.

Inspecting Staff.

40. (*b*) *Inspecting staff.*—Witnesses have been almost unanimous in recommending that the subordinate Police be not employed ; a certain number think that officers of a rank not lower than Sub-Inspector might be utilized, and we think that this should be done, though possibly it would be advisable to defer doing so during the introduction of the new system. Mr. Rustomji would not employ any member of the Police under any condition; he thinks that the prejudice against their employment is too strong. In municipalities, opinion is practically universal that the work of inspection be arranged for by the Municipal Board, and as a rule it is urged that only municipal servants drawing a substantial salary—Rs. 80 is a general limit—should be employed. For some of the larger cities and the Presidency Towns, a Special Inspector is usually deemed advisable, and where this is the case he would also be in charge of the stamping staff. For example, the staff recommended for both duties in Karachi is, 1 Inspector on Rs. 150, with a carriage allowance of Rs. 30 ; 1 adjustor on Rs. 50 ; 1 clerk on Rs. 40 ; and 2 coolies on Rs. 12 each or a total monthly charge of Rs. 294 to which would have to be added possibly Rs. 16 for contingencies, making a total annual charge of Rs 3,720. If it were decided also to test scales (paragraph 35), an Additional Inspector on Rs. 150 with a carriage allowance of Rs. 30 and two coolies at Rs. 12 each is considered necessary. The members of the Board would also be able to render valuable assistance, and every effort should be made to enlist their services, both in the way of inspections and supervision of the inspecting staff. The bazaar chaudhari, market superintendent or bazaar-goung as he is variously called could also, we think, be usefully employed for inspection purposes.

In rural areas, if our suggestion that a Naib-tahsildar be in charge of the stamping party be accepted, he would be also able to do a considerable amount of inspection and would be able to aid in supervising the inspecting work of such of the various *ex-officio* inspectors we propose below as are subordinate to him in rank. We would very strongly recommend that even before the issue of any notice requiring the use of stamped weights by a certain date, preferably simultaneously with the distribution of sample weights where this is done, a Naib-tahsildar be deputed to the tract concerned to tour throughout it and to explain what is required to the people and to generally initiate them into the new system. Such officer may, we think, well take charge of the stamping party when this is formed.

Such an officer would, however, not be able to do the inspection required to give effect to the orders, and we would recommend that the revenue staff should also be empowered ; this would include the Tahsildar, ordinary Naib-tahsildar, touring kanungo (or Inspector of Land Records), and possibly the patwari. But in addition to this we would very strongly recommend that the village headman be employed. The witnesses have almost unanimously recommended his employment and we think that if properly utilized he could do more to bring the new system into force without an undue amount of friction than anyone else. Members of the District Board, Honorary Magistrates and village munsifs could also render valuable assistance and should also be made *ex-officio* inspectors of weights and measures. We would suggest that officers below the rank of Naib-tahsildar be empowered to examine weights in use in shops and if they had reason to believe that they were contrary to regulation, to take possession of them in presence of some respectable neighbour and to forward them with a report to the nearest Magistrate. Such Magistrate, if he saw no sufficient reason to summon the owner, would merely notify him that such weights or measures had been received by him and that they would be confiscated and destroyed unless he appeared and showed cause to the contrary within some specified period. As a rule it would, we think, be unnecessary to summon the owner, and he would thus avoid the trouble of attending at a distant Court unless he really thought it worth while so to do.

We would empower any Magistrate to inspect, and seize weights and dispose of any case concerning those weights on the lines of the United Provinces Village

Sanitation Act (Act II of 1892), and we think that the Naib-tahsildar in charge of a stamping party might be similarly empowered. We would include among such Magistrates the thugyi or village headman of Burma, and the village munsif of Madras. We would not allow a search to be made save on the issue of a warrant and in accordance with the usual procedure laid down in the Criminal Procedure Code. We do not recommend, as some of our witnesses have proposed, that weights and measures cases be disposed of by the Revenue Courts as such, but we think that they should be treated as non-cognizable third class cases.

The foregoing proposals are unsuited to Bengal, Bihar and Orissa and parts of Assam where there is neither revenue staff nor village headmen. The place of the latter is to some extent taken by the President and Members of the Chaukidari Unions and we think it possible that the duties we propose to assign to headmen in other provinces may be undertaken by them. To replace the revenue staff is more difficult. It might perhaps be feasible to place the stamping and other operations in charge of a Sub-Deputy Collector on lines similar to those suggested for the Naib-tahsildar, or to work through the Excise Department or Income-Tax Inspector. All we feel able to do as regards these provinces is to recommend some system as near as may be on the lines suggested for provinces possessing a revenue staff and that Police agency should *not* be employed.

It is impossible to lay down any hard and fast rule to be adopted throughout India and the foregoing must be regarded as a sketch of what in the light of the evidence produced before us appears to be possible—to be modified to suit local conditions. A considerable number of witnesses have suggested that the patwari should not be entrusted with any powers in this connection, and it is quite possible that this may be advisable in some provinces, or he may in parts have more than enough to do in connection with his own duties, but he is probably the only possible man in such an area as the Kumaon Division of the United Provinces. Again, the term headman is general, we include therein the mukhia or mukaddam of the United and Central Provinces, the zailadar and safedposh of the Punjab and Frontier Province, the patel of Bombay and Berar and the thugyi and ywathugyi of Burma.

Several witnesses have suggested that a local committee of respectable shopkeepers and others would render valuable assistance in introducing and enforcing the system in some places, and we think this possible in such places as bazaars or where there is any considerable body of traders, more especially when these are united in any way in the form of a panchayat, or association of any sort.

Some witnesses have suggested the employment of Excise staff. On the whole, however, we are inclined to think this scarcely advisable at any rate to begin with, except possibly in Bengal, Bihar and Orissa and permanently settled parts of Assam where there may be no alternative. It might hereafter in some provinces be found possible to amalgamate the Weights and Measures and Excise staffs to a greater or less extent. In such case the duties of the Naib-tahsildar in charge of the stamping party would possibly be amalgamated with those of the Excise Inspector or Sub-Inspector, but there are difficulties in such a course, one of the chief of which is that in many provinces the Excise staff is not deemed part of the ordinary district staff, an arrangement which is sometimes productive of friction, which would be even more objectionable in connection with weights and measures than with Excise.

Discussion of alternative methods of maintaining the correctness of weights and measures.

41. To revert to the alternative methods of maintaining the correctness of weights and measures referred to in paragraph 37, we assume that the stamping parties which would be required for method (*a*) would be in charge of a Naib-tahsildar, and that for method (*b*) there would also be a Naib-tahsildar, specially provided, and that the *ex-officio* inspecting staff would be the same in both cases. The arguments that might be urged against method (*a*) are that it would be an expense to and unduly harass traders to require them to produce their weights and measures annually or triennially, that unless the stamping party were carefully supervised there would be risk of extortion by it, that there would be account difficulties in respect of the fees to be levied for stamp-

ing after the period of free stamping had expired, and lastly, that a fraudulent trader could alter a duly stamped weight or measure. We do not think these arguments are of much weight. We do not think annual or triennal testing, correcting and stamping unduly expensive or harassing. The expense would be trivial and as we propose that the stamping party go on tour it would probably only be the few traders who reside in villages with but one or at most very few shops who would not be able to get their stamping, etc., done without leaving their villages. As regards the risk of extortion, we propose that the stamping party be in charge of a Naib-tahsildar and deem it essential that he be a member of the ordinary district staff eligible for reversion to and promotion in the ordinary line in exactly the same way as any other Naib-tahsildar. We think that in such circumstances honesty should be presumed and certainly see no greater reason why such a man should speculate over stamping than why he should accept money in lieu of taking action in respect of incorrect weights and measures when found. Account difficulties should not prove any greater than they are in the case of pounds; in fact, this should be less as we assume that a man of a Naib-tahsildar's rank is in charge and are, therefore, entitled to presume honesty. As regards the possibility of fraudulent alteration after due stamping, while it is impossible to guard completely against this, the superior inspecting staff would not be precluded from taking action in respect of a duly stamped weight or measure if they had sufficient reason to believe such to be the case, while the necessity for producing such weight or measure for periodical inspection and the consequent liability to detection and punishment for fraudulent alteration must act as a considerable deterrent. For method (*b*) in addition to the contrary of the arguments urged against method (*a*) greater simplicity is pleaded, and this last is undoubtedly true. But we think that this would be gained at too great a loss of efficiency.

Apart from the Naib-tahsildar with or without his stamping party, reliance for maintaining the regulations is placed on a large number of *ex-officio* inspectors not possessed of any training, but so distributed that they are practically liable to turn up anywhere and at any time. If periodical stamping is insisted on the only thing that it is necessary for such an inspecting officer to do is to look at the weight or measure and see if it bore the stamp indicating that it had been stamped within the prescribed period. This is within the power of any illiterate person to do; he merely has to pick up the weights or measures as they lie in the shop. If, however, periodical stamping be not insisted on, it becomes necessary for the inspecting officer to be provided with a set of scales, weights and measures sufficiently accurate to enable him to test the weight or measure on the spot before seizing it. We thus practically lose the use of every one of our *ex-officio* inspectors, once the traders have adopted the use of authorized weights and measures stamped before purchase (paragraph 27) and have to rely solely on the one solitary inspecting Naib-tahsildar. Such Naib-tahsildar, moreover, being encumbered with his scales, weights and measures would be required to be accompanied by a peon and would be very soon recognized; his chances of detecting any incorrect weights would obviously be limited to the first shop he visited in a village or town, though of course not having to supervise a stamping party he would have more time for inspection. As regards expense, though compared with the foregoing we consider this a matter of comparatively small importance if our proposals are accepted, method (*a*) would result in no extra charge once the preliminary period of free stamping is over, as the fees charged should be at such a rate as to make the method self-supporting, whereas method (*b*) would involve the extra cost of the Naib-tahsildars.

Finally, there is a large body of evidence in support of method (*a*) and very little against it. [See Chapter V., U. P., 13 (*f*); B., 18; M., 22; P., 10 (*f*); Bo., 12(*g*); Bu., 13(*e* and *f*); N.-W. F. P., 9(*f*); Aj., 8(*f*); D., 10 (*f*); Ba., 10]. We are therefore strongly of opinion that method (*a*) should be adopted.

Mr. Rustomji Faridoonji, in disagreeing with our proposals as regards the *periodical* stamping of weights and measures in rural areas and the treatment of documents in Courts (paragraph 31) submits the following remarks :—

Objections to periodical re-stamping of weights and measures in rural areas.

"The introduction of a uniform system of weights and measures in India, with a population in various stages of civilization and also

otherwise unhomogeneous, will be an achievement of great magnitude. It must be recognized that a considerable amount of inconvenience and some dislocation of trade, though absolutely temporary, must accompany such a great change from the custom of centuries. Under these circumstances the progress should be slow and cautious, and should not be encumbered with any Western methods, however desirable in themselves, which are likely to cause general irritation. I am of opinion that, while there is no difficulty in regard to the stamping, at the outset, of new weights and measures, and of those already in the possession of the people, the *periodical* stamping of weights and measures in rural areas is calculated to irritate the people. The case of the Madras Presidency is not to the point, as such stamping is not enforced by legislation, and such executive measures, to ensure a considerable amount of stamping, as have been found suitable for the population of that tract would not necessarily be so for the rest of the country. The stamping of weights and measures, free of charge, either by Government or by local bodies would be financially impracticable. The levy of petty fees, the character of the agency that it is financially feasible to employ for collecting such fees and for stamping measures, the audit of accounts in connection with such collections all over the country, and the amount of work that would be thrown on district officers, present great difficulties and are likely to be a source of much irritation. And this fact must outweigh all considerations of efficiency. The inspection of weights by the special Naib-tahsildar and the *ex-officio* agencies proposed by the Committee would ensure the use of stamped weights and measures, and to some extent their accuracy. Facilities may be provided at the headquarters of each tahsil for the correction of weights on payment. I entirely concur in the proposal to stamp all weights and measures in municipalities, and this may be possible years hence in rural areas, but it would not be expedient to consider this for the present.

I admit that my opinion is against the weight of evidence, but in India more than in other countries, there is a wide gulf between the acceptance of abstract propositions and their reception when materialized. And I believe I am supported by a small but responsible minority of witnesses. Further, the people generally asked for stamping of weights and measures free of charge. What I lay stress on is, however, not the pecuniary aspect of the case, but the trouble inevitably connected with a party of petty officials practically let loose on the people.

Objections to the imposition of special costs in the case of documents referring to unauthorized weights and measures.

For the reasons at the commencement of this note, I also object to the proposed treatment of documents in Courts. In my opinion it would be sufficient to lay down that a Court shall presume any measures specified in documents to be authorized measures. The multifarious measures for different commodities, which to some extent obtain even in the United Kingdom, will, I think, gradually die out, once the uniform system is well established in the country. I do not approve of any penalty being imposed by Courts for the admission of documents drawn up in terms of unauthorized weights and measures.

In regard to all the measures recommended by the Committee, in which I concur generally, subject to dissent, where recorded, in the matter of details, I am of opinion that, while the *introduction* of a uniform system throughout India, almost at the same time, after the necessary preliminaries have been gone through, is quite feasible, and should be arranged for simultaneously, as far as possible, for all the provinces, to avoid or minimize the incidental inconvenience and confusion in business, the *enforcement* of all or any of those measures in any particular tract should be left, subject to

the control of the Government of India, to the discretion of Local Governments and Administrations, as this must greatly depend on local conditions ".

Penalties.

42. Opinions on penalties were fairly unanimous in support of the application of all those suggested by us. Leniency in the beginning is advocated. We think that at the beginning for a first offence the usual penalty should be confiscation or destruction, but that for second and subsequent offences fine should be inflictible in addition to confiscation and destruction. We consider that destruction is essential to prevent any possibility of re-use. We do not think it necessary to allow imprisonment, otherwise than in the case of non-payment of a fine; any offence meriting such a punishment would almost certainly come under the Indian Penal Code.

Provision of standards.

43. If the scheme suggested by us is accepted, it will be advisable to provide a set of bronze weights and brass measures at every district treasury. These standards would be used only to compare with the working standards in the hands of the stamping parties. These working standards we think should be of brass, and checked against the standards in the treasury when deemed necessary. A set of carefully made bronze standard weights and brass measures would be required at the headquarters of each of the larger provinces, by which the district standards would be tested, and an Imperial set of standards of scientific accuracy for the correct maintenance of the provincial standards. We would suggest that these latter might be kept at the Calcutta Mint, and that the whole of these standards be in charge of a small Standards Department, which we think might be attached to the Department of Commerce and Industry, and the provincial portions of which could supervise the training of the Naib-tahsildars (paragraph 38) and of the stamping parties. We think that all the standards required, save possibly the Imperial standards, could be manufactured at the Calcutta Mint.

We do not think that the terms of our reference require us to make more detailed proposals as regards the technique of the testing of the standards and the testing, correcting and stamping of weights and measures. Methods for doing this are set forth in great detail in the Board of Trade regulations (Statutory Rules and Orders, 1907, No. 698) and in the Weights and Measures Regulations for the German Empire (of the 8th November 1911) which latter contains clear and detailed instructions.

General effect of standardization.

44. As regards the general effects of the introduction and enforcement of a uniform system of weights and measures, most varying opinions have been expressed as will appear from a reference to the provincial summaries of the evidence. The great majority, however, are convinced of the ultimate benefit to all concerned. The general impression, and we agree therewith, is that such benefit would be most immediate, though finally probably of least relative value, and least temporary inconvenience, to the large trader, less immediate and of more ultimate real benefit to the small trader, and of most immediate inconvenience, but of the greatest ultimate benefit to the agricultural and poorer non-trading classes. It is agreed on all sides that it would interfere with the profits of the dishonest trader.

It being suggested that a radical change in system such as to the metric system might cause inconvenience in connection with the size of gunny bags, inquiries were made on this point. But with very few exceptions—the chief being the Deputy Commissioner of Akyab—it was universally agreed that anything of the sort would be either non-existent or of a very temporary character, and there are already various sizes in gunny bags.

Advisability of Native States adopting the same uniform system.

45. A considerable number of witnesses from districts bordering on Native States have urged the necessity of those States taking similar action to whatever is taken by the Government of India in respect of weights and measures. Several of these States have already taken action in this direction and we think that all that can be done to induce the States to adopt the system adopted for British India should be done. (See Chapter V, U. P., 19; M., 39; N.-W. F., 14; Aj., 12; Ba., 15).

CHAPTER VII.—RECOMMENDATIONS.

We make, therefore, the following recommendations and suggest that so far as is necessary legislation be undertaken to give effect to them :—

1. The following systems of weights and measures should be declared the standard weights and measures for India and Burma. (Chapter VI, paragraph 8).

Weights.

INDIA.			BURMA.		
8 khaskhas	=	1 chawal.	2 small ywés	=	1 large ywé.
8 chawals	=	1 ratti.	2 large ywés	=	1 pè.
8 rattis	=	1 másha.	2 pès	=	1 mú.
3 máshas	=	1 tánk.	5 pès or 2½ mús	=	1 mát.
4 tánks or 12 máshas	=	1 tola.	2 máts	=	1 ngámú.
5 tolas	=	1 chaták.	2 ngámús	=	1 tikal.
16 chaták	=	1 seer.	100 tikals	=	1 peiktha or viss.
40 seers	=	1 maund.			

The tola is to be of 180 grains British weight.

The peiktha or viss is to be equal to 3·60 pounds avoirdupois or 140 tolas of 180 grains.

Measures of length.

The unit to be the British yard, but with permission to recognize Indian and Burmese measures standardized so as to bear a direct relation to this unit in the manner set forth in Chapter VI, paragraph 15 ; for higher measures the chain of 66′ subdivided into 100 links and the furlong and mile of 220 and 1,760 yards, respectively. (Chapter VI, paragraph 15.)

Measures of area.

The squares of any authorized measure of length for small areas, and the British acre subdivided decimally for agricultural land. (Chapter VI, paragraph 16.)

Measures of capacity (dry).

For India.—The chief local measures of capacity to be standardized at the most suitable integral multiple of a measure made to hold 1¼ seers of water at a temperature of 86° F. or 30° C., and such other local measures as may be deemed necessary in proportion thereto. (Chapter VI, paragraph 17.)

For Burma.

2 lamès...	=	1 zalè.
2 zalès ...	=	1 hkwet.
2 hkwets	=	1 pyi.
2 pyis ...	=	1 sayat.
2 sayats...	=	1 seik.
2 seiks ...	=	1 hkwe.
2 hkwes...	=	1 tin or basket.

The tin or basket to be equal to one British bushel of 8 Imperial gallons. (Chapter VI, paragraph 18.)

Measures of capacity (liquid).

No separate measures, except in Madras, but liquids to be sold by any authorized measure of capacity (dry) or by weights, with permission to use measures made to contain definite weights of particular liquids for selling small quantities of those liquids. (Chapter VI, paragraph 19.)

(See dissenting note of Mr. Rustomji, Chapter VI, paragraph 19.)

Measures of cubic content.

British cubic measure, or the cube of any authorized measure of length. (Chapter VI, paragraph 21.)

2. The use of British and metric weights should be permitted, subject to possession of a license for this purpose as regards use of the actual weights and subject to such weights being of a different shape from that prescribed for the authorized weights. (See, however, dissenting note of Mr. Rustomji, Chapter VI, paragraph 12.)

The use of British and metric weights in documents and of other British and metric weights generally should be permitted.

N. B.—By British and metric weights and measures are meant such British and metric weights and measures as are authorized for use in the United Kingdom under the Board of Trade Regulations.

3. Standards in accordance with the weights and measures prescribed in paragraph 1 should be provided. (Chapter VI, paragraph 43.)

4. No special weights or measures of any kind save as provided in paragraphs 1 and 2 above should be permitted for any purpose save that physicians and druggists may continue to use their special weights and measures for the preparation of prescriptions only, but they should use the authorized weights and measures for the actual sale of drugs, etc. (Chapter VI, paragraph 11.)

5. Authorized weights made after a prescribed date should be of a prescribed shape and of the following sizes:—

For India:—1, 2 and 4 khaskhas; 1, 2 and 4 cháwals; 1, 2 and 4 rattis; 1, 2, 3, 4 and 6 máshas, (the 3 and 6 máshas to be known as 1 and 2 tánks, respectively); 1, 1¼, 2 and 2½ tolas; 1, 2, 4 and 8 chatáks; 1, 2, 2½, 4, 5, 10 and 20 seers; and 1, 1½ and 2 maunds. *For Burma*:—1 small ywè; 1 large ywè; 1 pè, 1 and 2 mús, 1 mát; 1 ngámú; 1, 2, 5, 6¼, 10, 12½, 20, 25 and 50 tikals and 1, 2, 2½, 4, 5, 10, 12½, 20 and 25 visses.

If other weights are found necessary they should be permitted, provided they be an integral multiple of one of the above mentioned weights. (Chapter VI, paragraph 28.)

6. Dry measures should, as far as possible, be used struck, a striker in the form of a stout cylindrical roller being used; if, however, 'heaping' cannot be abolished, the shape and dimensions of the authorized measures should be prescribed as well as their capacity. (Chapter VI, paragraph 17.)

7. No dry measures should bear the same name as any weight; and, as far as possible, a name denoting a dry measure should signify a measure of the same size throughout India. (Chapter VI, paragraph 17.)

8. Dry measures used for liquids may be of a shape suitable for such purpose. (Chapter VI, paragraph 19.)

9. All weights and measures should be tested, corrected and stamped periodically by or on behalf of Government and the use of any but stamped authorized weights and measures for the purpose of trade should be prohibited. New weights and measures should be stamped before reaching the premises of the retail vendors thereof. The same rules for stamping, etc., should apply to all weights and measures alike, whether authorized Indian and Burmese, British or metric. (Chapter VI, paragraphs 28, 37 and 41.)

10. For testing, correcting and stamping, the necessary number of stamping parties consisting of an official of the rank of a Naib-tahsildar, with one or

more blacksmiths, peons, etc., should be provided, to tour sufficiently to give reasonable facilities to all traders; such Naib-tahsildars to be part of the regular revenue establishment of the district not to be retained on this work for more than two years and to be eligible for promotion in the same way as other Naib-tahsildars. We are doubtful what to propose in the permanently settled areas of Bengal, Bihar and Orissa and Assam, but suggest tentatively a Sub-Deputy Collector or if that be quite impossible a suitable member of the Excise staff. (Chapter VI, paragraphs 37 to 39 and 41.)

11. A system of inspection should be instituted on the following lines :—

Municipal areas.—To be arranged for by the Municipality; in larger towns a special staff will be necessary, elsewhere the work can be supervised by some of the existing staff preferably by such as draw not less than Rs. 50 per month. Bazaar chaudharis, market superintendents, etc., should be made use of in this connection.

Rural areas, and non-municipal towns.—Inspection should be done primarily by the revenue staff and the village headman; whether the patwari should or should not be employed would depend on circumstances. The stamping Naib-tahsildar should also supervise this work and inspect personally. For the permanently settled areas of Bengal, Bihar and Orissa and Assam, we suggest the president and members of the chaukidari panchayat; the Police should *not* be employed. (Chapter VI, paragraphs 37, 40 and 41.)

12. For penalties, destruction, confiscation and fine should be provided. (Chapter VI, paragraph 42.)

13. The necessary standards—Imperial, provincial and district—should be provided, except possibly as regards the Imperial standards this can be done by the Calcutta Mint; and a small Standards Department should be constituted. (Chapter VI, paragraph 43.)

For the first introduction of the new system we recommend the following procedure, the earlier steps of which will be less necessary the greater the previous knowledge and use of the proposed system; and in some cases may to some extent be omitted entirely. (Chapter VI, paragraph 36.)

(1) Pamphlets and posters giving details of the new system and conversion tables showing its connection with existing weights and measures should be widely distributed. (Chapter VI, paragraph 24.)

(2) The new system and its connection with the old should be carefully taught in all schools. (Chapter VI, paragraph 25.)

(3) Samples of the new weights and measures should be widely distributed to village headmen, bazaar chaudharis, Co-operative Societies, heads of panchayats, etc. (Chapter VI, paragraph 26.)

(4) The services of the local heads of the people should be enlisted in explaining and recommending the new system and a special official should be deputed for this purpose. (Chapter VI, paragraphs 27 and 40.)

(5) Arrangements should be made which would ensure an ample supply of the authorized weights and measures and the availability of means of testing, correcting and stamping existing weights and measures. Stamping should be done free of charge to begin with. (Chapter VI, paragraphs 28 and 39.)

(6) A notification should issue to the effect that throughout the area affected only authorized stamped weights and measures are to be used for purposes of trade after some prescribed date which should be not more than two years from the date of issue of the notification. From the time of issue of such notification the use of authorized weights and measures should be introduced

in all Government and *quasi*-Government transactions and in all markets controlled by Government or any local body. (Chapter VI, paragraph 36.)

(7) Separate notifications should prescribe dates from which (*a*) the use of any but authorized weights and measures should be refused recognition in documents and in law courts, and (*b*) the use of any unauthorized weights and measures be declared illegal and their possession by a trader be presumed to be for purpose of trade. (Chapter VI, paragraph 36.)

(8) The selection of the areas regarding which, and the periods at and for which notifications should issue be left to the discretion of Local Governments, the selection being, we would suggest, such that the system be applied first to the large centres and those rural areas where there is the greatest knowledge of the system and then gradually from these to other areas according as knowledge spreads and staff is available, the aim being to establish the new system throughout the whole country, except in a few specially backward tracts, within ten years.

CH. A. SILBERRAD, *President.*

(Subject to minute of dissent.)

SIMLA; *The 8th July 1914.*

A. Y. G. CAMPBELL,
RUSTOMJI FARIDOONJI. } *Members.*

[*Note by President.*—The following minute was presented after the report was signed and with no previous suggestion that any such dissent was contemplated].

Minute of dissent by Mr. A. Y. G. Campbell.

I regret that I am unable to concur in the recommendation of the majority of the Committee that the uniform system of weights and measures of capacity should be based on a seer of 80 tolas. It appears to me that the proposal to enforce this uniform system throughout India is fraught with considerable difficulty and that it would be better to attempt to adopt the metric system in India.

2. There are two kinds of weights and measures to be considered; first, what may be called the material weights and measures—the actual pieces of stone, iron or other material and the vessels used as weights or measures; and secondly, weights and measures of account such as the ton and some of the seers and maunds used especially in wholesale trade.

3. The principal advantages claimed on behalf of the system recommended by the majority are—

(*a*) that the people are already familiar with the names of the weights;

(*b*) that this particular seer and maund are already used by Government and on railways and that the whole table of weights is known to a greater number of people in India than any other;

(*c*) that it is based on the weight, a newly coined rupee, *viz.*, 180 grains;

(*d*) that it is an indigenous system.

4. As regards the first two of these reasons, it may be noted that, in the Madras Presidency at least, many of the names would be new to a very large

proportion of the population and the seer of 80 tolas is hardly used there at all except by Government and on railways. I will revert to the third reason later. The last is not strictly accurate, the table being mainly the result of a cross between a Bengal system of weights and the English troy weights; for the maund is 100 lbs. troy. The names no doubt are Indian, but the actual weights are not Indian, but are based on English troy weights.

5. Among the disadvantages of the system are the following:—

(*a*) The table is complicated and in introducing a uniform system it is most desirable that in the interests of the poorer, less educated and less intelligent classes, the table of weights should be as simple as possible—easy to learn and easy to remember. This is to my mind a very important point if the classes who form the bulk of the population are to obtain the full benefit from a uniform system in the shape of protection against the astute trader.

(*b*) The material weights of the same name now in use vary widely; there are, for example, seers of 21, 24, 28, 60, 62, 72, 80, 84, 90, 93, 105, etc., tolas. To replace a weight by another weight of the same name, is, it appears to me, a more difficult matter than to replace it by a weight with a new name. In the south of Madras Presidency, for example, the old palam was $5\frac{5}{9}$ tolas (1,000 grains); this has been replaced by the action of the Government by a palam of 3 tolas; the result has been a certain amount of discontent and want of confidence in trade as dealers were supposed to make use of the change in the value of the palam to their own advantage; it appears to me that the change would have raised less objection if the new weight of 3 tolas had been called by some name not used in the neighbourhood, such as 'navatak', leaving the 'palam' to retain its old meaning. A small change could no doubt be effected without change of name as the weights are often, if not generally, inaccurate to some extent, but it appears to me that there will probably be more opposition and objection to the change of the customary seer of 21, 24 or 28 tolas to a seer of 80 tolas and of the maund of 960 or 1,000 tolas to a maund of 3,200 tolas than there would be to the introduction of new weights bearing new names. Similar remarks apply to measures of capacity.

(*c*) In dealing with measures of account the difficulty also seems to me to be very great. It is proposed to enact that after a certain date the term seer in a document shall mean 80 tolas whatever the commodity is and whatever the conditions are under which it is sold. Now in a large part of India, at least, it appears from the evidence before us that it is a commercial custom, instead of (or perhaps in addition to) allowing a lower price in wholesale dealings than in retail dealings, to give a larger seer and maund in wholesale dealings, so as to allow for dryage, wastage, freight, retail dealers' profit or commission, etc. Now I am doubtful whether traders will readily abandon such a commercial custom in favour of western practice on the issue of a notification by Government and whether the Courts will not uphold the customary seers and maunds, so long as traders choose to use them. As far as possible, it is desirable that traders who are the chief users of weights should support the proposals of the Government and an order upsetting their trade customs is not likely to conciliate them.

(*d*) Another disadvantage is that the proposed uniform system must be introduced everywhere much more quickly than would be necessary in the case of a new system; it would be undesirable to have for any length of time the seer of 80 tolas enforced in a town while the seer continued to be 24 tolas in the country round; the

trader would be tempted to take advantage of the situation by, for example, endeavouring to get the party with whom he is dealing to think that he means one seer and then alleging that, as he made his bargain when he was in the area in which the other seer is in force, the latter must be the one by which the contract is to be fulfilled. This could not be done if a new system of weights altogether with different names were introduced into the town first.

(*e*) Burma has to be left out of account altogether or rather a separate system has to be devised for that province and the introduction of that new system will involve the correction of all weights in use or their replacement by new accurate weights.

(*f*) The proposed system will be of assistance neither in foreign trade whether western or eastern—nor in the industrial development of the country.

6. I will now consider some of the objections urged against the adoption of the metric system.

(*a*) I do not attach much weight to the objection that in India the system has been recommended only by Europeans, big merchants and educated Indians, for it appears to me quite unreasonable to expect a witness to recommend a system of which he knows nothing.

(*b*) It is objected that the metric system is practically entirely unknown now in India; so is the proposed system in Southern India now; so was the British pound at one time and so were other weights and measures which are now used more or less in various parts of India. The want of knowledge can be removed by explaining the system to the people in the manner proposed by the Committee, and, once the introduction of the system has begun, the knowledge of the system will be spread by trade and its introduction will be rendered more easy in parts of the country where at present it would be less acceptable.

(*c*) It will be necessary for the people to learn a few new names, but the people of India have in recent years added to their languages many words taken from English or other languages foreign to them and I do not anticipate that they will experience any great difficulty in assimilating the few new terms required for those metric weights which are in ordinary use.

(*d*) It appears to be a common belief that the weights must be based on the tola of 180 grains because that is the weight of a new rupee; this weight is known to all people and weights can be checked by means of rupees. Some witnesses have suggested a decimal system based on the tola. When coins are first minted, it is natural that some well-known commercial weight should be adopted as the weight of the coin and then that the coin in its turn should be adopted as a standard weight, so long as no other means of verifying weights exist. In Burma, however, the tikal and viss had originally no direct and simple relation to the tola nor has the British pound avoirdupois which is fairly extensively used, and there are many weights used for gold, silver, precious stones and Indian medicines in Madras Presidency which have no such relation with the tola; where such weights and measures have been brought into direct connection with the tola it has been generally through the action of the Government or of some official or municipal authority. Now it appears to me that if anything is to be done in the direction of unifying weights and measures, the Government must provide an efficient establishment

to maintain standards and see that weights and measures are kept up to standard throughout the country. Indeed, unless the Government are prepared to take this action, it is useless to introduce a uniform system, for the weights and measures in use at least in retail trade will soon become inaccurate. If any one wishes to check by coins weights used in wholesale or retail trade in ordinary commodities, he can do so with sufficient accuracy, even if the weight does not profess to be an exact number of tolas, by using half-rupee, quarter-rupee and two-anna pieces to make up the fraction. For example, the kilogramme is very approximately $85\frac{3}{4}$ tolas. It must be remembered also that coins are not absolutely accurate even when they are issued from the mint, a remedy of $\frac{1}{200}$ of the weight being allowed, while of course they become still more inaccurate by wear and tear and the ordinary person has not a stock of new coins always ready to hand to check doubtful weights when he does his marketting. In any case, the evidence obtained by the Committee on the subject indicates that an appreciable proportion of weights in use in retail trade are materially inaccurate and the conclusion to be drawn from this evidence is that the sooner the system of depending on coins for checking weights is stopped the better. It appears to me particularly obnoxious that the weights used in dealings in precious metals should be checked by coins and that coins should be actually used as weights in such dealings; the temptation to use heavy coins when buying and light coins when selling must be strong and if yielded to must be a fruitful source of undue gain to the dealer. The proper course is for the Government to verify and stamp weights and measures and then it is immaterial whether or not there is any direct and simple relation between the weights of coins and the weights of trade and commerce. There is abundant evidence that the verification and stamping of weights and measures would be highly appreciated by the people of India.

(*e*) An objection raised to the metric system is that it is not a sedecimal or a duodecimal system; no doubt, such a system would have certain advantages if we could adopt at the same time a sedecimal or duodecimal system of notation, but there does not seem to be any prospect of mankind adopting such a system of notation in the near future. When man makes his primitive weights, it is natural that he should first make two weights of the same weight and then make a third equal to the weight of the first two, *i.e.*, double the original weight and then make another weight equal to the weight of the three already made, which would be four times the original weight and so on. But when he has reached the stage of adopting a decimal system of notation there is no reason why he should continue his primitive system, and it has been found by the experience of a large portion of mankind more convenient for him to adopt a decimal system of weights and measures as that simplifies his calculations. It may be urged that a decimal system of weights and measures cannot be conveniently used with the present system of coinage in India; fortunately, we have in Burma an example of a decimal system used with Indian coinage and the Burmans show no desire whatever to give up their decimal system for the Bengal system of 16 chataks to the seer.

7. Now it appears to me that the introduction of the metric system possesses the following advantages:—

(*a*) It is a very easy system to learn and to remember, and the same simple table of weights is applicable to all commodities including precious metals and medicines. This, as I have already said, I regard as of the greatest importance in the interests of the less

intelligent classes. It is true that education is spreading in India, but the simpler the system of weights and measures can be kept, the more easily will it be understood and acquired by adults and the less time will be occupied in teaching it in schools, leaving more time for other subjects.

(*b*) It simplifies accounts and calculations very materially.

(*c*) Customary seers and maunds may remain everywhere as local weights of account, though it is probable that in course of time they will fall out of use, because bigger merchants on the one hand will prefer to quote prices in terms of the kilogramme and retail sales on the other hand will be carried on by material metric weights. These two forces will operate on the local weights of account as an upper and a nether mill-stone.

In the meantime, the 'seer,' 'maund', etc., will be relegated to the same category as the 'bale', 'bag', etc., if the terms are used at all. The sudden upheaval of the Indian commercial practice already referred to will be avoided, but the desired effect will be brought about gradually by the traders themselves.

(*d*) It will be possible to introduce the system gradually by areas; *e.g.*, if the metric system is enforced in a town, it will create no further confusion in the meaning of the term seer, maund, etc., in the neighbouring country, and it will be possible to allow a sufficient time for the country people to become well acquainted with the metric system before its use is extended to rural tracts.

(*e*) Metric standards can be easily obtained.

(*f*) The metric system can be applied to Burma as well as India.

(*g*) The metric system being an international system and designed as such prevents any feeling of jealousy which might arise at the attempt to extend the use of a system of a particular province to other provinces and Native States.

(*h*) The system will be useful in foreign trade. The metric system has in recent years been making steady headway in all parts of the civilized world. It has been already adopted by most countries in Europe and South America and is being adopted by China and Siam, while in Japan it is used in the Customs, and for other purposes.

(*i*) It will, I believe, facilitate the future industrial development of India, more than the system proposed by the Committee. Machinery made on metric measurements can be readily obtained, and scientific researches affecting industries are carried on in terms of metric units.

8. In introducing the metric system into any place, the local weights should be expressed in terms of metric weights. It may be worth noting that the gramme is about the masha of Northern India, 7 dekagrams is 6·0011179 tolas or very approximately 6 tolas, and the following are close equivalents:— 3 seers of 80 tolas and 28 hectograms; 3 maunds of 40 such seers and 112 kilograms; a seer of 34 tolas and 28 dekagrams; 3 Burmese visses of 140 tolas and 49 hectograms. Many other similar equations can be found for different weights. In each place it is not unlikely that except where Government verify and stamp weights, the weights are not very accurate and it would probably be possible to choose convenient equivalents; for example, a seer of 21 tolas is slightly less than 24·5 dekagrams; for smaller weights in ordinary retail trade, it would be sufficiently accurate to treat it as equal to 24 dekagrams; this would probably give weighments quite as accurate as those by present weights.

9. The new weights should be such that their denomination can be readily recognized without a close examination, so that an illiterate purchaser in a retail shop can readily see that the correct weights are used. For example, the weights in a retail shop would be 1, 2, 2, 5 dekagrams; 1, 2, 2, 5 hectograms;

and 1 kilogram ; the unit weight in each case might be circular in form, the weights representing 2 of the unit in each case might be square and the weights representing five times the unit might be pentagonal, corners being rounded off in the last two cases to avoid excessive wear and tear. It might be possible to apply a similar principle to metric measures. It would be better to replace old weights by new than to correct the old weights ; it would then be possible for a purchaser to see at a glance without touching them that the new weights are used in a shop ; but if the use of old weights is still permitted the purchaser will have to examine them closely to see that they have been corrected and stamped and there will be some risk that old uncorrected weights will be used in places where there is not constant inspection. It will be exceedingly difficult for the Government to make sure that all old weights have been corrected ; it will be much easier for the people to see that they are not used at all.

10. Metric weights and measures of capacity could probably be introduced now. There is not so much urgency for the introduction of metric measures of length, area and cubical contents, but the English measures especially combined with an acre divided into 100 parts are unnecessarily complicated. The Indian would like to see the $\frac{1}{100}$ part of an acre—the 'cent' of Madras Presidency—defined as a square of which the side is so many of the ordinary unit of length used in trade, etc., but that is impossible. The 'link', the $\frac{1}{100}$ of a Gunter's chain of 66 feet, does not fit into the ordinary English linear measure and the cent is 1,000 square links. With the metric system, the ordinary agriculturist would have a set of measures for lengths and areas which would be simple and simply related to each other and would serve all purposes. In order to give the agriculturist this simple system, the metric measure of area should be introduced when possible at resettlements, the metre being brought into use for ordinary measures of length meantime. It may be noted that the metre approximates more closely than the yard to some of the old Indian *gases* or double cubits. Mural standards in schools, etc., would be a useful method of showing the length of the metre and in the same way an 'are' (or 'hectare' if possible) could be indicated in the school play-ground.

11. Some witnesses have suggested that India should not adopt the metric system till the United Kingdom has adopted it. It appears to me, however, that the United Kingdom is likely to be the last country to adopt it. Where weights and measures are in a comparatively primitive and inaccurate condition it is easier to introduce a new system than in a country like England where the weights and measures are stereotyped and accurate ; greater advantages are immediately apparent in the former case than in the latter. Moreover, the United Kingdom can obtain all she wants in the way of machinery, etc., made to her own weights and measures within her own borders, whereas other countries have to import machinery and manufactured articles and desire to buy them in the cheapest market and consequently may find it advantageous to obtain machinery, etc., made to metric measurements. The trader in England, so long as he has a sufficient market for his goods, may feel that by adopting the metric system he will not gain a profit commensurate with the trouble of making the change. On the other hand, countries less advantageously placed commercially than England have found it advisable to adopt the metric system in their own interests in preference to any indigenous system or any system based on indigenous weights and measures. The British Colonies are, I believe, practically unanimously in favour of the metric system. But I do not think that England is likely to adopt the metric system before the Colonies adopt it.

12. I believe that the introduction of the metric system will be ultimately of great advantage to all classes of the community. The simplicity of the system will especially make it more intelligible to backward classes than any other system and will be of advantage to all who have to use weights and measures in their daily life. It will put a final stop to variety in the weights and measures introduced or patronized by Governments, municipalities or officials ; for, if it is once introduced throughout the country no one will ever suggest any further change, whereas now other weights and measures are favoured in different localities in preference to the Bengal system ; moreover, even if that system is adopted throughout India, it is not unlikely that a few years hence proposals may be

put forward for the adoption of the metric system in India, and, if such proposals were accepted, the trouble and expense involved in a change of weights and measures would have to be incurred a second time.

13. I would strongly advocate, therefore, that the metric system should be introduced now with the least practicable delay. Delay will, I believe, only increase the difficulty and expense of introducing it. In many parts of the country, weights and measures are still in a primitive condition, stones being used as weights and baskets, etc., as measures. In such places, the introduction of good material weights will probably be appreciated in itself; an example is afforded by the extensive use of the British avoirdupois weights in the Northern Circars of the Madras Presidency in spite of the fact that the British avoirdupois table of weights is not widely used and of the action of the Local Government in endeavouring to encourage the use of another system of weights based on the tola. As time goes on, however, a larger number of fairly good manufactured-weights will be scattered abroad over the country and the trouble and cost of replacing them by accurate authorized weights will be materially increased. Further, it appears to me to be a fallacy to urge that the people are not sufficiently intelligent or sufficiently educated to understand the metric system; if they can understand the more complicated system proposed by the majority of the Committee, *a fortiori*, they can understand the metric system if it is properly explained to them. Education, however, is now spreading rapidly and the Government are doing all they can to extend its advantages to all classes. But so long as a uniform system is not adopted, one result of the spread of education will be that a larger proportion of the population will be taught local and other tables of weights and measures; but nearly every one who has learnt and used a particular system of weights and measures is naturally prejudiced in favour of it and that prejudice constitutes in each case an additional obstacle to be overcome.

14. For these reasons, it appears to me eminently desirable that the Government should take steps now without further delay to constitute the metric system the uniform system of weights and measures in India. When its use has become established throughout India, the action of Government in introducing it will, I am convinced, be appreciated by all.

SIMLA,
The 8th July 1914.

A. Y. G. CAMPBELL.

187CID—4,000—2-6-15—GCBP Simla

APPENDIX A.

No. 8492—8511-4.

GOVERNMENT OF INDIA.

DEPARTMENT OF COMMERCE AND INDUSTRY.

Weights and Measures.

Simla, the 10th October 1913.

RESOLUTION.

The question of prescribing a uniform system of weights and measures for the whole of India has been under the consideration of Government from time to time since the passing of the Indian Weights and Measures of Capacity Act, 1871 (XXXI of 1871), by section 8 of which the Governor General in Council is empowered to introduce a system of weights and measures of capacity consistent with the statutory unit prescribed by section 3. Although the Act has been on the statute book for more than 41 years no notifications have yet been issued under it, as it was hoped that weights and measures based on the statutory unit would be gradually and generally adopted without further intervention on the part of Government. This hope has not, however, been realised. The Indian Railways and the Government Departments have, it is true, adopted as standards the tola of 180 grains, the seer of 80 tolas and the maund of 40 seers; but no general tendency has manifested itself on the part of Indian Commercial Circles to follow the lead given them by Government.

2. The whole question was examined very carefully between the years 1890 and 1894 by the Government of India in consultation with Local Governments and Administrations, and the policy since followed has been to prescribe, as necessity arose, standard weights and measures for particular districts or groups of districts similar to those adopted by the Indian Railways and the Government Departments. Some of the Local Governments have taken action in this direction, but the general state of affairs is at present far from satisfactory, for the systems of weights and measures in use vary considerably, not only in different provinces, but also in different areas of the same province. The Government of India are fully alive to the difficulties which beset attempts to impose a uniform system of weights and measures for adoption throughout British India. At the same time, they are satisfied that the existing lack of uniformity is seriously prejudicial to trade, and they have reason, to believe that the development of railway communications and commerce in this country, the formation of Chambers of Commerce and the advance of municipal and trade organizations have gone far to remove objections formerly felt to the introduction of a single uniform system.

3. The Government of India have, therefore, decided to re-open the question of the feasibility of securing the use of uniform weights and measures in India, and to appoint a Committee to enquire into the whole subject. The Committee will assemble at Bombay on the 10th of November 1913, and will proceed to such places as it may consider desirable to visit in order to obtain the opinion of the Chambers of Commerce and leading merchants and others. The Government of India trust that Local Governments and Administrations will afford the Committee all the assistance which it may require, and will comply with any request for information and advice which may be addressed to them by it. The Committee will submit its report in six months and the report will then be referred to Local Governments and Administrations for consideration before action is taken upon it.

The Committee will consist of :—

President :

The Hon'ble Mr. S. R. Arthur, I.C.S.,

Commissioner, Central Division, Poona.

Members :

Mr. C. A. Silberrad, I.C.S.,

Magistrate and Collector, United Provinces.

Mr. A. Y. G. Campbell, C.I.E., I.C.S.,

Acting President, Corporation of Madras.

Mr. Rustomji Faridoonji, U.C.S.,

Commissioner of Excise, Central Provinces.

Order.—Ordered that a copy of this Resolution be forwarded to all Local Governments and Administrations, to the Home, Finance and Education Departments and the Department of Revenue and Agriculture, and to the President and Members of the Committee.

Ordered, also, that the Resolution be published in the Supplement to the *Gazette of India* for general information.

J. F. GRUNING,

Offg. Secretary to the Government of India.

No. 215-4-C., dated Delhi, the 23rd December 1913.

From—S. H. Slater, Esq., I. C. S., Under Secretary to the Government of India, Department of Commerce and Industry,

To—C. A. Silberrad, Esq., I.C.S., Acting President, Weights and Measures Committee.

I am directed to say that the Government of India are pleased to appoint you to be President of the Weights and Measures Committee with effect from the 4th December 1913, *vice* the Honourable Mr. S R. Arthur, I.C.S, resigned.

APPENDIX B.

QUESTIONS ISSUED BY THE WEIGHTS AND MEASURES COMMITTEE TO THE MORE HIGHLY EDUCATED WITNESSES.

N.B—(1) Please state your name, caste, address, profession, occupation or appointment, and if representative of a body, the name and address of the body represented.

(2) Please reply to each question on a separate sheet of paper.

(3) In answering the questions, please give, if practicable, the equivalents of the Indian weights and measures to which you refer in terms of any of those mentioned in the following tables—

Weights.

180 grains is equal to	...	...	...	...	...	1 tola.
80 tolas ,,	...	...	...	...	...	1 seer.
40 seers ,,	..	...	...	...	...	1 maund.

(*Note.*—One rupee weighs one tola.)

Lineal measures.

12 inches is equal to	...	...	...	...	...	1 foot.
3 feet ,,	...	...	...	...	...	1 yard.
100 links=22 yards is equal to	...	...	...	...	...	1 chain.
220 yards is equal to	...	...	...	...	...	1 furlong.
8 furlongs ,,	..	...	...	...	...	1 mile.

Area.

Any of the above lineal measures squared, or 10 square chains (4,840 square yards) is equal to	...	...	...	...	...	1 acre.

Cubical capacity.

The approximate weight of water contained by the measure when full expressed in terms, of any of the above weights.

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1. What weights are in most general use in the neighbourhood with which you are acquainted?

2. What other weights are in use?

3. (*a*) Are different systems of weights (whether called by the same or different names) used in dealing with different commodities? (*E.g.*, the maund for weighing firewood is in some places very different from that for weighing grain). Give full details of these weights and the commodities for which each is used.

(*b*) What are the reasons for their variations?

(*c*) What objection would there be to the adoption of a standard weight in these transactions?

4. Are different weights of the same name ever used in the same town or tract when purchasing and when selling the same articles? Give examples.

5. What measures of capacity are in use in the neighbourhood with which you are acquainted? Are they used heaped or struck?

6. How are the measures defined? If as containing some particular weight of some particular article, state weight and article.

7. What commodities are dealt with by these measures and under what circumstances—*e.g.*, are they only used in measuring out grain for sowing; or only by cultivators when selling their produce; or by villagers in making payments to village servants for customary services, etc?

8. Are different measures of the same name ever used in the same town or tract for buying and for selling the same article? Give examples.

9. Are the same commodities ever sold at the same place both by weight and by measure? Do you consider that this should be prohibited? If so, why?

10. Under section 3 of the Indian Weights and Measures of Capacity Act, 1871 (Act XXXI of 1871), the unit of weight is called a seer, but a seer is also a measure of capacity in many places.

(*a*) Does any confusion arise owing to the use of the same term to denote both a weight and a measure of capacity?

(*b*) Do you consider it preferable to confine the use of a term to designate either a weight or a measure of capacity but not both?

11. What measures of length are in use in the neighbourhood with which you are acquainted?

12. Are special measures of length used in dealing with special commodities? If so, give full details.

13. What measures of area are in use in the neighbourhood with which you are acquainted?

14. Does the measure of area of land ever vary according to the crop sown? If so, give full details.

15. Suggestions have been put forward that the United Kingdom should adopt the metrical system or some other uniform system of weights and measures based on the decimal or duodecimal system of notation.

(*a*) Do you consider it desirable that the introduction of a uniform system of weights and measures should be postponed until such a system is adopted and enforced in the United Kingdom and that the same system should then be introduced and enforced in India; or

(*b*) are you in favour of a uniform system of weights and measures being prescribed for all India; or

(*c*) do you consider that no attempt should be made to enforce the use of a uniform system of weights and measures in India? Please give full reasons for your opinion.

N.B.—Even though you are not in favour of a uniform system being prescribed, your replies to the following questions are requested on the assumption that a uniform system of weights and measures will be introduced.

16. Do you consider that weights and measures in force in other countries should be taken into consideration in determining the uniform system to be adopted for India?

17. There are two chief systems in use in the civilized world. The British is in use in the British territories and United States of America and the metric system is used in most other countries except Russia. If a uniform system of weights and measures is to be introduced at once throughout India, should a system connected with either the British or the metric system be adopted for India? If so, what system do you suggest? Please give full reasons for your suggestion.

18. If, however, you consider that a separate uniform system of weights and measures should be prescribed for India what would you suggest?

19. (*a*) Would it be advisable to prescribe in addition to the universal system for all India and Burma local standards corresponding as nearly as possible to some weight or measure in general use over some considerable area? (*E.g.*, as the viss of 140 tolas for Burma). Name any such local standard you would consider it advisable to prescribe, giving reasons for your recommendations and the area over which such local standard should be permitted.

(*b*) Would it be advisable to allow some special weights to be used in special trades? If so, state what you would suggest with reasons.

(*c*) Should this be done temporarily or permanently?

20. What measures should be adopted to introduce and enforce the use of an authorized uniform system of weights and measures throughout India? The following suggestions have been made; please criticise and add to them:—

(*a*) The authorized weights and measures should be adopted in all transactions by Government, Railways and bodies controlled by Government.

(*b*) Specimens of the authorized weights and measures in general use should be supplied by Government to all Revenue offices in districts, all police stations, all village headmen and all recognized elementary schools.

(*c*) Tables of the authorized weights and measures should be published as standing matter in the District Gazettes (Village sheet) in the vernaculars as well as in English; copies of the tables should also be kept by the village headman.

(*d*) The use of the authorized weights and measures should be taught in all recognized elementary schools and the use of no other weights and measures should be taught in such schools.

(*e*) The Government should stamp only authorized weights and measures.

(*f*) The Government should provide due facilities for stamping and verifying authorized weights and measures throughout the country. No fee should be charged for stamping authorized weights and measures for a certain period.

(*g*) The Government should replace free of cost by corresponding authorized weights and measures any weights and measures no longer authorized but stamped by or under the authority of Government before a certain date and still in good order.

(*h*) The Government should alter or make grants for the necessary alteration of weighing machines which are in British India at a certain date and in good order and in use or for sale.

(*i*) Only stamped authorized weights and measures should be used after a certain date in markets under the control of Government or any local authority.

(*j*) The import, manufacture and sale of other weights and measures should be declared illegal.

(*k*) No import duties should be levied for a certain period on authorized weights and measures and weighing machines for weighing authorized weights only.

(*l*) (i) The Government should sell at cost price authorized weights and measures,

Note.—This might discourage private trade in weights and measures.

or (ii) The Government should sell at Revenue offices at reasonable prices (so as to allow a profit to private trade) authorized weights and measures and simple weighing machines adapted for authorized weights.

(*m*) After a certain date documents should be drawn up only in terms of the authorized weights and measures and civil courts should not recognize any other weights and measures in documents executed after the prescribed date. (An exception should be made in favour of documents relating to external trade with countries in which the authorized weights and measures are not recognized).

(*n*) Documents drawn up after the prescribed date in terms of unauthorized weights or measures should not be registered in the offices of the Registration Department.

(*o*) The use of any weights and measures except those authorized should be illegal throughout India after a certain date.

Note.—Your views are invited as to the length of the periods mentioned above, if the proposed measures are adopted.

(*p*) It should be presumed that any unauthorized weights or measures found in the possession of a shopkeeper, trader or merchant are intended to be used and that such possession should be illegal.

21. What penalties should be prescribed for failure to adopt the prescribed system? What is your opinion on the suitability or otherwise of the following:—

(*a*) Destruction (without confiscation) of unauthorized measures found in use contrary to law.

(*b*) Confiscation of unauthorized weights and measures found in use contrary to law.

(*c*) A fine on conviction before a Magistrate of using an unauthorized weight or measure contrary to law.

22. What authority should be employed to detect cases of unauthorized weights and measures? What are your views (with reasons) on the advisability and practicability of employing for this purpose—

(*a*) the Police;

(*b*) the Revenue staff;

(*c*) in municipalities and towns, the municipal or town staff;

(*d*) some other agency either paid or unpaid as, *e. g.*, village headmen;

Note.—As regards (*a*), (*b*) and (*c*), please state the lowest grade of officer of each of these classes who should be empowered to detect cases.

23. In your opinion how would the introduction of a uniform system affect (*a*) large traders, (*b*) small traders, (*c*) others generally, especially agriculturists and the poorer classes?

24. Do you use any tables for the conversion of weights or measures? If so, where are copies procurable?

25. The Committee has been appointed to enquire into the whole question of the feasibility of securing the use of uniform weights and measures in India. Have you any further suggestions to make to the Committee?

26. It has been suggested that if the British pound were made the unit of weight it would be advisable to alter the coinage so as to give some direct connection between it and that unit. What is your opinion on this point?

If it were decided to so alter the coinage, which of the following methods would you deem best suited for this end:—

(*N.B*—Save Nos. (*i*), (*ii*) (*a*) and (*ii*) (*b*) the methods are not mutually exclusive).

(*i*) To make the rupee weight 175 grains instead of 180 as at present leaving the proportion of silver to alloy unaltered. This would make the rupee weigh exactly $\frac{1}{40}$ pound.

(*ii*) To raise the weight of the rupee by the addition of alloy leaving the amount of silver contained therein unaltered so as to make it weigh either (*a*) $\frac{1}{36}$ pound or (*b*) $\frac{1}{32}$ pound: in the latter case, the rupee would weigh half an ounce avoirdupois, or very approximately the same as the English half crown.

(*iii*) To reduce the weight of the nickel one-anna piece from 60 grains to $54\frac{1}{16}$ grains (*i.e.*, one-eighth ounce avoirdupois).

(*iv*) To raise the weight of the bronze quarter-anna piece from 75 grains to $109\frac{3}{8}$ grains, (one-quarter ounce avoirdupois). It would then weigh only $9\frac{3}{8}$ grains, more than the old copper quarter-anna.

27. Is the gunny bag in use in your district always of the same size? If so, how is the size determined? Would any alteration in the system of weights and measures cause any inconvenience in this connection?

28. What weights and measures are stamped by Government in your district and to what extent? What staff is employed for the purpose?

29. Is the use of stamped weights and measures enforced to any extent, *e.g.*, in markets? If so, to what extent and how is the use of other weights and measures prevented?

30. Do the Government sell any weights and measures either generally to the public or for special purposes (*e.g.*, for use in liquor shops)? If so, to what extent and through what agency and at what prices? Is there any private manufacture or trade in weights and measures? If so, what are the usual prices charged?

QUESTIONS ISSUED BY THE WEIGHTS AND MEASURES COMMITTEE TO THE LESS WELL EDUCATED WITNESSES.

[Answers to be submitted to the Collector].

N.B.—(1) Please state your name, caste, address and occupation.

(2) As far as possible give the equivalents of any weights mentioned by you in the Railway (or Sirkari) weights, 80 tolas is equal to 1 seer; 40 seers is equal to 1 maund, and give the equivalents of measures of length in English feet.

I.—What weights do you generally use or does your baniya generally use when you buy or sell? Please give the weights in order of size beginning with the smallest; mention how many times each of the larger weights contains one of the smaller weights.

II.—(*a*) Do you use different kinds of weights (whether called by the same or different names) when dealing with different commodities? (*E.g.*, the maund for weighing firewood is in some places very different from that for weighing grain). Give full details of these weights and the commodities for which each is used.

(*b*) What are the reasons for this variation? Would there be any difficulty in using some other weight prescribed by Government for use throughout India in these transactions?

(*c*) What objection would there be to the adoption of a standard weight in these transactions?

III.—Are different weights of the same name ever used when purchasing and when selling the same articles? Give examples.

IV.—What measures of capacity do you use? Please give the measures in order of size beginning with the smallest and state how many times each of the larger measures contains one of the smaller ones. Also state whether the measure is used "heaped" or "struck."

V.—Many measures are said to contain a certain weight of a certain grain or other article. State which of those mentioned by you are so determined and in what way.

VI.—What commodities are dealt with by these measures and under what circumstances? *E.g.*, are they only used in measuring out grain for sowing; or only by cultivators when selling their produce; or by villagers in making payments to village servants for customary services, etc.?

VII.—Are different measures of the same name ever used for buying and for selling the same article? Give examples.

VIII.—Are the same commodities ever sold at the same place both by weight and by measure? Do you consider that this should be prohibited? If so, why?

IX.—In some places the same term is used to denote both a weight and a measure of capacity. Is this the case in your neighbourhood? Does this cause confusion?

X.—What measures of length do you use? Please give the measures in use in order of size beginning with the smallest and mention how many times each of the larger measure contains one of the smaller ones.

XI.—Are special measures of length used in dealing with special commodities? If so, give full details.

XII.—What measures of area do you use for land or for other purposes? Please give these measures in order of size beginning with the smallest and mention how many times each of the larger measures contains one of the smaller ones.

XIII.—Does the measure of area of land ever vary according to the crop sown? If so, give full details.

XIV.—Different weights and measures are now in use in different parts of India, in some cases the same term is used to denote different weights and measures. *e.g.*, the Madras maund is less than the Bombay maund, and the Bombay maund is less than half the Railway or Sirkari maund; the result is that much inconvenience and hindrance is caused to trade, and sometimes merchants suffer losses owing to mistakes as to the weights or measures meant by the terms used in their agreements. It has been proposed, therefore, that a uniform system of weights and measures should be introduced throughout all India and that the use of other weights and measures should be prohibited. This will involve some inconvenience to persons accustomed to use local weights and measures but the inconvenience will be temporary as the use of the new weights and measures can be readily learnt and understood. What are your views on the proposal to introduce and enforce a uniform system of weights and measures throughout the whole of India?

XV.—The following suggestions have been made to facilitate the introduction of a uniform system of weights and measures throughout India. Please give your opinion regarding them and state if you think anything else should be done:—

(*a*) The authorized weights and measures should be adopted in all transactions by Government, Railways and bodies controlled by Government.

(*b*) Specimens of the authorized weights and measures in general use should be supplied by Government to all Revenue offices in districts, all police stations, all village headmen and all recognized elementary schools.

(*c*) Tables of the authorized weights and measures should be published as "standing matter" in the District Gazettes (Village sheet) in the vernaculars as well as in English; copies of the tables should also be kept by the village headman.

(*d*) The use of the authorized weights and measures should be taught in all recognized elementary schools and the use of no other weights and measures should be taught in such schools.

(*e*) The Government should stamp only authorized weights and measures.

(*f*) The Government should provide due facilities for stamping and verifying authorized weights and measures throughout the country. No fee should be charged for stamping authorized weights and measures for a certain period.

(*g*) The Government should replace free of cost by corresponding authorized weights and measures any weights and measures no longer authorized but stamped by Government before a certain date and still in good order.

(*h*) Only stamped authorized weights and measures should be used after a certain date in markets under the control of Government or any local authority.

(*i*) The Government should sell at Revenue offices at reasonable prices (so as to allow a profit to private trade) authorized weights and measures and simple weighing machines adapted for the authorized weights.

(*j*) After a certain date, documents should be drawn up only in terms of the authorized weights and measures and civil courts should not recognize any other weights and measures in documents executed after the prescribed date. (An exception should be made in favour of documents relating to external trade with countries in which the authorized weights and measures are not recognized).

(*k*) The use of any weights and measures except those authorized should be illegal throughout India after a certain date.

Note.—Your views are invited as to the length of the periods mentioned above, if the proposed measures are adopted.

XVI. What penalties should be prescribed for failure to adopt the prescribed system? What is your opinion on the suitability or otherwise of the following :—

(*a*) Destruction (without confiscation) of unauthorized measures found in use contrary to law.

(*b*) Confiscation of unauthorized weights and measures found in use contrary to law.

(*c*) A fine on conviction before a Magistrate of using a non-authorized weight or measure contrary to law.

XVII. What authority should be employed to detect cases of unauthorized weights and measures? What are your views (with reasons) on the advisability and practicability of employing for this purpose—

(*a*) the Police ;

(*b*) the Revenue staff ;

(*c*) in municipalities and towns, the municipal or town staff ;

(*d*) some other agency either paid or unpaid as, *e.g.*, village headmen ?

XVIII. The Committee has been appointed to enquire into the whole question of the feasibility of securing the use of uniform weights and measures in India. Have you any further suggestions to make to the Committee?

Extract from letter addressed to Local Governments.

* * * *

2. The Committee feel that the real difficulty in introducing any uniform system will be not so much with the larger firms and persons of considerable, and more particularly English education, but with the smaller traders, artisans, petty professional men (*e.g.*, *hakims* and *vaids*), and the cultivator class. Any change of system will affect such persons in a way which is considerably different from that in which it affects a large firm. The change will so to say "bulk much more largely in the horizon" of the small trader, etc., than in that of a large firm, and his objections will very probably differ considerably from those of the larger people. It is next to impossible for any one save members of the District Staff who are willing to interest themselves in the matter to get hold of persons of these classes who will express their opinions.

3. The Committee have, therefore, framed a simple list of questions which they would ask to be translated into the chief vernaculars of the province. They would ask that these questions together with copies of this and the enclosed letter to Collectors and of questions for Collectors be sent to selected Collectors, and also that Collectors may be permitted to reply direct to the Committee.

* * * *

Extract from letter addressed to Collectors.

I have the honour to enclose a list of questions regarding the possibility of introducing into India a uniform system of weights and measures and would ask the favour of your replying to them (copies of these questions for witnesses nominated by Local Governments have already been sent to Collectors concerned for distribution).

2. The Committee would especially ask you to obtain the opinion of persons likely to be affected by any changes to be made who are not in a position to give expression to their opinions unless specifically called on to do so. In many ways the effect of any changes of system is likely to affect more vitally artisans, petty professional men (*e.g.*, *hakims* and *vaids*) and the smaller non-English knowing traders, residents of the smaller bazaar towns, where there is often a very considerable amount of trade altogether though no individual trader is very wealthy. These men purchase direct from the cultivators, and it is they who very largely employ the local measures. Unless such men accept any new system there is but little hope of such system being to any extent universally adopted within any reasonable time. It is, therefore, very necessary that the advantages of a uniform system of weights and measures throughout India should be made clear to them and the inconveniences to which these smaller people are likely to be put ascertained and methods of removing or alleviating them suggested. To a probably somewhat less, though still very considerable, extent similar remarks apply to the growers of crops, at any rate to those who cultivate a considerable area of land. Such people are not in a position to express their opinions unless called on for them, and unless the proposals are made clear to them; and in practice it is only the District Staff who can do this. The Committee feel that they are asking what may cause a considerable amount of work, but equally feel that there is no other way of obtaining the information required. To assist in this a simple list of questions which it is hoped may be at least partly answered by persons of the classes referred to is enclosed.

3. When the Committee visit your district they would be very glad if you would select and send before them a few persons of the classes mentioned.

* * * *

APPENDIX C.

(Chapter VI, paragraphs 15 and 17.)

In view of the evidence received the following suggestions are made as to what may possibly prove suitable standardized measures of length and capacity ; they are meant as examples and are not intended to be exhaustive.

I.—Measures of length.

Province.	Measure.	Suggested standard.
United Provinces	Gaz	36 inches.
	Hath	18 ,,
	Girah	2½ ,,
	Tasu	1½ ,,
Bengal	As for the United Provinces omitting tasu.	
Madras	Gaz	36 inches.
	Mura or muzham ...	18 ,,
Bihar and Orissa	As for the United Provinces.	
Punjab	As for the United Provinces.	
Bombay	As for the United Provinces, the gaz being also known as gaj, var or val.	
Central Provinces	As for Bombay.	
Burma	Lan	6 inches.
	Gaik	36 ,,
	Taung	18 ,,
	Ntwa	9 ,,
	Maik	6 ,,
	Letthit	¾ ,,
Assam	As for Bengal.	
North-West Frontier Province	As for the United Provinces.	
Ajmer-Merwara	As for the United Provinces.	
Baluchistan	As for Bombay.	
Delhi	As for the United Provinces.	

II.—Measures of capacity (dry).

Province.	District.	Measure.	No. of seers of water in proposed standard.
United Provinces	Banda	Paila	5
	Gorakhpur	Sei	1¼
	Jhansi	Paila	10
	Naini Tal	Nali	2½
Bengal	Calcutta	.....	2⅔
	Chittagong ...	Ari	20
	Dacca	Bouta	20
	Dinajpur	Rathia ...	5
Madras	Arcot (South), Salem and Tinnevelly measure.	.....	2⅔
	Bellary, Godavari, Madura, Malabar and Ramnad.	.....	1¼
	Kistna	Kancham ...	5
Bihar and Orissa	Cuttack	Gouni	5
	Manbhum	Paila	1¼
Punjab	Sialkot ..	Daropa ...	5
		Small topa* ...	2½
Bombay	Bombay	Paila	5
	Dharwar	Dharwar seer measure	2⅔
	Hyderabad ...	Toya	5
	Khandesh (East) ...	Paila	5
Central Provinces	Akola	Paila	5
	Nagpur	Ruro	10
	Nimar	Chauki... ...	5
	Raipur	Katha	5
	Saugor	Chauthia ...	2½
	Seoni	Ruro	...
Assam	Cachar	Rathi	2⅔
	Kamrup	Don	5
North-West Frontier Province... ...	Dera Ismail Khan ...	Large topa ...	5
	Peshawar	Odhi	5
Baluchistan	Quetta	Rasa	5

* The large topa occurring elsewhere in the province (Chapter IV, para. 14) and in the North-West Frontier Province might be of capacity of 5 seers of water.

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