

statement entries were made to show for each plot, besides its area, its soil-class under the revised settlement, and, in the case of paddy-land, its soil-class under the current settlement. The two soil-classes of the current settlement were represented by A and B and the three soil-classes of the revised settlement by Arabic numbers; so that 1B was the symbol for a paddy field formerly in the second and now in the first-class of paddy-land, while 3A was the symbol for land formerly in the first and now in the third-class. Paddy-land hitherto assessed as garden-land (because it was garden-land at last settlement) was marked G or Y instead of A or B, but in the summation for the kwin it was regarded as 1A if it was now first class and 2B or 3B if now second or third class. This tabulation was undertaken with a view to devising a system of rates which would avoid excessive enhancements of revenue by making special provision for land which had been raised in class; further consideration of this will be found in the discussion of intermediate rates in Chapter XVII. I consider it desirable to tabulate the soil-classes on these lines in all Lower Burma settlements to show the effect of the reclassification as is done in Statement 20 of this report.

232. The maps used by the settlement party were copies of the current maps of the Land Records Department showing everything on those maps, including the current soil-classification. These had to be copied in the first season by the clerks who first completed their crop-reaping work. But in the succeeding years the current map was copied in the rains preceding the field-work, holding numbers, names of tenants, fallow-marks and similar ephemeral matters being omitted; it was then a trifling matter at the beginning of the next field season to complete the map and correct it where necessary to agree with the new maps which the Land Records Department had by that time prepared. This arrangement was found to give great advantage, especially because the reaping operations had to be so prolonged that otherwise the classifying season was cut very short, as happened in the first year of the operations. A further comparison of the maps was made before the new area statements were compiled, and all changes made in the Land Record Map since the copying—for instance in response to the settlement party's reports of errata—were then embodied in the settlement map. While working in the field the settlement party made no changes in the map (besides adding its new soil-class record) except in crop-symbols and fallow-marks. Finally, when all the tabulation of areas was completed a fair copy of the map was made to show only the fields and the soil-classification and lands exempted from assessment. At first an effort was made to show both the old and the new classification on the fair copies of the maps, but the complexity thus introduced forbade the continuance of this method. It was decided then to show the blocks of the new soil-classes by outlining them in red and stamping the new soil-class numbers upon them in violet; and to distinguish the old soil-class only of land now in the first-class by washing over with blue colour that part which was formerly in the second class and leaving uncoloured that part which was formerly in the first-class. There will thus be complete lists and maps available if the system of special rates for land raised in class is introduced; while of, as will be recommended in Chapter XVII, that system is put aside there will be no difficulty in ignoring the distinctions between A and B either in the area statements or on the maps.

233. When it was found that cultivated land had not been surveyed an application for its survey was sent to the Land Records Department, and generally it was thus brought on to the map. Where that could not be done in time no rough estimates of area were made; the area statements represent the land according to the survey.

234. Land definitely exempted from revenue because it is assigned to a religious purpose or occupied by Government has been distinguished on the maps with as much accuracy as could be achieved; but, the aim being to make simple equitable assessment maps and not to compile a Domesday Book, it will often be found on the settlement maps that other unassessed land is often included in a soil-class block. In reading the maps it must be understood that they do not pretend to show which land is assessed and which is not; they indicate only the category

in the schedule of assessment-rates to which each plot belongs and accordingly the rate to be applied if an assessment upon it is made. Similarly the settlement maps make no pretence to distinguish land subject to the Town and Village Lands Act from that subject to the Land and Revenue Act. It necessarily happens frequently that the edge of the block of a soil-class of paddy-land is the edge of a block appropriated to dwelling-places, but the boundary has been drawn for the purposes of assessment-rates alone, with no attempt to decide under which of the two authorities the assessment is to be made. A return to this subject will be made in Chapter XVI which will deal with land in towns and villages; and a related matter, namely the classification of isolated dwelling-places, will be explained in Chapter XV.

235 In an area of 31,328 acres of which 18,315 are cultivated, in the extreme east of Labutta Township, in the village-tracts of Kazaung and Hlangbôn the operations constituted an original settlement. Here in addition to the work undertaken in other parts a register of holdings was compiled. The greatest care was taken to secure the best possible record and to record precisely all disputes. In particular the date of first cultivation or clearing for cultivation of each part of the holding was recorded, and also whether the entry into each part was made by a squatter or by a grantee. Where the original grantee or squatter was still in possession the origin of the title was distinguished as *mi-mi-da-ma-u-kyā* မိမိတို့ကံ့ or *mi-mi-patta* မိမိပံ့ as the case might be, the words *mi-mi* being omitted when the present holder was not the original grantee or squatter. But, as the area had already been assessed for two years with holding boundaries recorded by the Land Records Department in the usual way, the Commissioner of Settlements and Land Records decided that there would not be sufficient advantage in adopting the settlement party's register of holdings in place of that in use to counterbalance the disadvantage of opening new disputes. The settlement party had no power to examine witnesses on oath, and its record was liable to other errors because in no sense could it claim to have undertaken a full discussion of the statements it recorded and to have given every interested person full opportunity to criticise them. The register and its complementary maps were sent to the District Record Room as usual. It was a great pity that this work was done, one Assistant Settlement Officer was occupied for a whole season in classifying this area because of the extra labour of making the holding-register, and the time and energy so unnecessarily consumed could have been used to real advantage elsewhere. A further account of this area will be found in the discussion of Tracts 28 and 29 in Chapter XIV.

## CHAPTER VII.—PRIMARY TRACTING AND SOIL CLASSIFICATION.

236 Rules 75 and 76 under the Lower Burma Land and Revenue Act of 1876 requires that assessments shall be made by acre-rates and periodical measurements. The system of assessment in the Myaungmya District is that prevalent throughout Lower Burma, depending upon annually revised estimates of the area occupied and cultivated by each assessee.

237. To avoid the uncertainties of assessment which have sometimes arisen under the current settlements I have adopted in this settlement the general principle of assigning every piece of permanently cultivated land to a definite category with which a rate per acre fixed for the term of the settlement may be associated, and of indicating by symbols on the settlement map the category to which every plot belongs. The only exceptions admitted are in the cases of the dhani and betel crops which will be dealt with in Chapter XV.

238. The formation of these categories has been based upon the order of Government which, defining the "net produce" of land as the balance remaining from the gross produce after the cost of cultivation has been met, declares that the assessment shall bear to the net produce a ratio which is to have a standard value of one-half but is to be modified as may be required by a consideration of the incidence and amount of the present revenue demand and of the agricultural economic and social conditions. This order intends, though it does not explicitly say so, that the numerical quantities involved shall be calculated not for each individual assessed plot but from statistics which have a basis sufficiently wide to allow them to represent all the plots of the class to which the results are to be applied.

239. The primary division of lands with a view to forming the categories is made according to the kind of cultivation usually practised in them, these first broad classes being known as main-kinds. Three main-kinds of cultivation were found to be practised, and the areas devoted to each kind were marked with the symbols R, H and Y on the map. R represented the wet paddy cultivation, to which nearly all the cultivated land of the district is devoted, and this and the next seven chapters will be confined to this main-kind. Land devoted to dhani and land of H and Y main-kinds will be treated in Chapter XV.

240. For the purposes of survey and statistics of the Land Records Department the cultivated regions of the district have been arbitrarily divided, as throughout Burma, into blocks called *kwins*, which average in the present settlement area about 500 acres each in area. As each *kwin* is the subject of a separate assessment-roll the *kwin* is necessarily the primary unit of area for a system of assessment-rates. Within each *kwin* every plot of land belonging to R main-kind was assigned to one of a number of grades called soil-classes according to its average net produce. The qualities of each soil-class were then compared with those of the soil-classes similarly formed in other *kwins*; and *kwins* in which the soil-classes were approximately equal in producing capacity and in the difficulties, expenses and risks of cultivation were grouped together in what may (for the moment) be called agricultural *kwin*-groups. Most of the conditions affecting assessment proposals depend so directly upon the conditions which controlled the formation of these groups that they are generally uniform through such a group; but a constant watch was maintained to detect any variations in them which would require that different parts of a group should receive different treatment in assessing or separate tabulation of statistics, and separate groups were formed in such cases. The current rates of land-revenue were regarded as an important factor, and consequently the *kwins* now being settled for the first time were made into two special groups apart from other *kwins* to which they are similar in other respects, and the boundaries of former settlement areas were generally treated as group boundaries. Where, however, the only difference in conditions in parts of a group was a variation in the selling price of the paddy a little too wide to permit uniform assessment yet not too wide for the combination in one tabulation of most of the statistics of the group, the compound group was retained and separation only made where the price-difference required it. The delineation of price-boundaries is discussed in detail in the next chapter.

241. It was natural that, in localities in which physical conditions were uniform over a considerable area, a number of *kwins* in continuous contiguity would be associated in one *kwin*-group which thus covered a continuous block of country in the manner required by Settlement Instruction 173. But it was not found possible to adhere to the principle of that instruction in all parts of the settlement area; and it so happened that the northern portion of Wakema Township in which the settlement operations were begun was the part in which this difficulty was most pronounced. The quality in which uniformity was chiefly found was continual diversity. Even if regard had been paid to average outturns alone

classification there would have required at least ten soil-classes, the mere number of which would confuse any classifier. But then there were the added difficulties arising from different variations of outturn, one piece of land having a higher maximum outturn than another of higher general outturn or being subject to more serious catastrophes; and again there were the numerous difficulties which inevitably arise from both physical and psychological sources when outturns are made the criterion of classification. The method was then considered which was used by Mr. Arbuthnot in another deltaic settlement (Hanthawaddy, 1908-10), according to which the fields of a kwin are divided into classes according to their relative fertility and each class is then assigned to some position in a predetermined numerical scale. But I felt a difficulty in assigning positions in a numerical scale to the lands in one kwin on the basis of evidence collected in that narrow area, especially in view of the complexity of the conditions where the dominant agricultural factor is the repeated flooding of kwins partially protected or unprotected; some being liable to complete destruction some profiting by the inundations, some in all intermediate stages, and adjacent kwins often having quite different characters. Not only the depth of water but the times of submergence and subsidence varied; in some places the difficulty was met by late planting, in others by extremely early broadcasting. But beyond this difficulty in estimation of the risks and profits of cultivation there was for both methods the consideration that even if the task of classifying soils by a long scale of classes in one continuous "geographical tract" or one long scale were accomplished the tract would have to be divided up for the purposes of economic statistics; because whole kwins and groups of kwins would be found to occupy the soil-classes at the high end of the scale and others be confined to the low end, and not only was it clear *a priori* that this would affect the economic condition of the people but the differences of economic condition were evident on the ground in the sharp contrasts, often in adjacent kwins, in the houses and condition of the people and sometimes seemed to be suggested even by the fatness of the children. The difficulty resided really in the tacit and hasty assumption of Settlement Instruction 173 that conditions affecting assessments are always uniform over geographically continuous tracts, when that is not the case it seems clearly wrong to attempt to represent them in continuous assessment-tracts. Shortly afterwards Mr. Arbuthnot (the Commissioner of Settlements) inspected the party, and, recognising that Settlement Instruction 173 had possibly not taken account of all possible varieties of country approved of the method adopted to form kwin-groups. This was a modification of his Hanthawaddy method by the rejection of the numerical scale. The kwins were assigned to groups according to their physical and agricultural characters, the chief of which were the efficiency or inefficiency and expensiveness in maintenance of the bunds protecting them from river floods. Later on, in order to prevent the formation of numerous petty tracts, kwins had to be admitted to each tract which did not conform completely to the canonical description of kwins in the tract though they did not differ enough to have essential differences in assessment capacity. The decision that any two kwins were alike in this sense was always reached in consultation with local cultivators to whom at the end of the discussion the question was always put in the direct practical form of whether they considered equal assessment-rates equitable. The Burman Assistant Settlement Officers in the first year proved quite incapable of doing this; they wanted always some simple mechanical criterion and would, for instance, place any two kwins without a bund in the same group, although in the one the inundations were a regular tidal effect and the chief asset of the cultivators and in the other were calamitous occurrences more to be feared than anything else. As a result nearly every one of the kwins classified in the first year had to be visited by the Settlement Officer personally to be graded; and, owing to the demands upon his attention elsewhere in the lack of a European Assistant, the revision of the grading of the first year's kwins was not completed until the third year of the operations. But before that completion was reached the principle of tracting by the officers of the party according to physical characteristics was exchanged for the system described in the succeeding paragraphs by which both the internal classification and the tracting were effected largely by the assesseses themselves.

242. The usual procedure in Lower Burma for the classification of lands within each kwin has been that a Settlement Inspector accompanied by three villagers called *thamadis* or assessors divided up the kwin into blocks of uniform productivity. The inspector is required by the Settlement Instructions to decide the class of each plot, being guided by the results of crop-measurement\* and by information obtained from the *thamadis* and the cultivators. The latter are supposed to accompany the inspector over their holdings. But in practice the inspector, having discovered a soil-class boundary, pursued it until either a closed figure had been formed or the kwin boundary was reached. He then began another similar line either at some point which had been noted for this purpose while pursuing the former line or at some fresh point which was discovered by a new search beginning where that line ended. Consequently every holding was liable to be reached at any time during the process of classification—which lasts anything up to seven or eight days and generally occupies two or three—and different parts of the holding might be reached at some days' interval. Naturally the cultivators who saw the inspector going over to the far side of the kwin lost interest and went away before the inspector returned. Possibly the return occurred after a short interval when the soil-class line formed a closed figure, but the cultivator would know nothing of that. As the cultivator was therefore not generally present when his holding was classified the inspectors had developed a habit of not troubling much about him. If he happened to be there reaping, all well and good; if not,—well, the *thamadis* were sufficient. But the Settlement Instructions give no suggestion as to who are the *thamadis* (who are first mentioned in Instruction 186. The usual practice was to ask the village headman to provide three men. First of all three respectable old men would be provided, but one morning in the hot sun till eleven o'clock and a prospect of several repetitions in mornings and after-noons and a feeling that the inspector after all followed his own ideas all the time caused various emergencies to arise which prevented further attendance; the inspector generally got in fact the three persons least able to resist the feeling in every other cultivator's mind that somebody else had better go. Thus the inspector commonly failed to secure any such continuity in the personnel of the committee (as the group of *thamadis* is called locally) which would conduce to uniformity in the classification and is the *raison d'être* of the system; but, worse than this, he obtained those docile members of the community who would blindly follow his opinions. The use by inspectors of the results of crop-measurements constantly led to a soil-class boundary being stretched so as just to include a field in which such a measurement had been made; and, still worse, led them to attempt to estimate acre-outturns and classify on that basis. Indeed some Settlement Officers have taught this plan, fixing a definite scale of outturns and asking for each plot to be assigned to its class accordingly. But even if the Settlement Officer did not teach this the apparent simplicity of such a mechanical method recommended itself to inspectors, and the only difference was that either by their own fancy or by that of their Assistant Settlement Officer they fixed in their minds a scale of outturns which thus might be slightly different for each classifier. But no information is available for the outturn of every plot; only holding outturns can be learned, and when cultivators learn that their land will be classified according to outturn they naturally keep on the safer side in stating that outturn, especially as they know so well the variations to which it is liable. Even when they stated it correctly, it would often, for reasons which will be adduced in Chapter XI, appear incredible in comparison with the high outturn in a neighbouring crop-experiment. Thus the inspectors have distrusted the cultivators and allowed a too ample margin for understatement, while the cultivators have reacted to this by developing fear and suspicion of settlement operations. The committee of *thamadis* could not help in the matter, either because they did not understand the transition from outturn to a particular soil-class line, or because to them the inspector was the representative of Government—and opinions contrary to his unlawful and best kept to oneself, especially if the assessee was Maung So-and-so who has lately caused this or that annoyance or at any rate won a good deal

\* That is, the measurements in fields selected by the Settlement staff of which the crop is reaped under its supervision and the outturn measured. See Chapter XI.

at the last festival. The whole system in fact turned on the inspector's personal opinion of the land, influenced by the appearance of the stubble, the number of culms in each colony, the spacing allowed in planting, and the general lie of the land. To intelligent persons who are influenced in applying them by careful regional inductive study these criteria give valuable evidence; but the inspectors constantly—and naturally—applied them mechanically, and did not understand that their application in one district of ideas acquired in another was never sufficiently tested, and that their classification was based on the accidental appearance of a particular season. The 'experience' of one district for men of small education operates chiefly to unfit them to classify in another. They do not understand that strong stubble may represent a large water-supply or rich soil but may indicate excesses in these qualities leading to poor outturns; that wide spaces in planting may be due not to fertility but to the necessity of giving less cover to rats, to a short supply of seedings—permanently short because of local flooding conditions—or to the system of payment for transplanting which is in vogue. They believe that low land is good and high land poor, because that is the tradition of the older parts of the country; when they come to the delta this leads to the grossest errors of classification. But the greatest defect of the system has been that by allowing so much play to the personal opinion of the inspector it threw upon him a suspicion of corruption whenever he erred by putting land in a lower class than his superior officers thought proper. No doubt there were cases of genuine corruption to which indeed the system provides the strongest temptations; but these cases were of no importance compared with the tradition, taught by all old inspectors to their juniors and shared by Assistant Settlement Officers and causing systematically severe classification, that there was safety from all suspicion when land was placed in the first class. The observation, too, that in recent years assessment-rates have constantly been raised at the revision of a settlement has been interpreted by settlement inspectors to mean that they are expected to show a large proportion of first-class land so as to secure a large revenue. Assistant Settlement Officers, in checking the inspector's work, commonly worked either on very similar lines or by comparing, holding by holding, the outturn stated by the cultivator with that calculated according to the proposed classification and some assumed rates of outturn. They usually are accompanied by the inspector's advisers who have even less independence of opinion on this occasion, and they meet each cultivator separately in his own holding. There was one of the many truths spoken in jest in the saying amongst Settlement Officers that the final classification depended largely upon what the Assistant Settlement Officer had had for dinner the night before.

243 It has already been remarked that the earliest experiences of soil-classification in this settlement showed that there would be special difficulties because the flooding of paddy-lands by rivers was such an important factor in classification. At the time of classification the rivers were flowing smoothly in their beds and gave no evidence of their behaviour in the cultivating season, but quite small differences of level make all the difference in the world in the quality of adjacent fields. This difficulty was specially felt because the party had worked in the previous year in Prome where the principal difficulties arise from the scantiness of the water-supply. A second difficulty was the lack of solidarity in the villages owing, as was explained in Chapter II to the recent colonisation and to the physical conditions. These physical conditions also caused a third difficulty that owing to the numerous streams many holdings are rarely seen by others than those who actually cultivate them, but this effect was not felt so severely in the first year in the north of Wakèma Township as in the second year when the newer parts of the Mawlamyainggyun Township were classified. Similar to this was the difficulty caused sometimes by the frequent changes of tenants. In some kwins tenants are local residents who by frequently changing their land get to know something of every holding near them; but in others casual tenants working one year and disappearing in February are the rule and it was difficult to get any information concerning holdings worked by such as these. Another difficulty was that people accustomed to travel by boat soon tire of walking in rough fields in the hot sun. No Burman is ac-

customed to walking on hard-baked fields through paddy stubble which rasps the toes, even if Burmese shoes are worn, in a manner only really appreciated after experience; but the people of the delta suffer more than others and will not walk in the fields in the dry weather unless spurred by interest. In some cases the whole local population consisted of tenants who, feeling they had no interest in the assessments, declined to go out to the fields to help. Legal powers may compel attendance, but they cannot compel careful consideration and honest judgment; impressed advisers are useless.

244. In the first year classifiers were instructed to ignore the crop-reaping experiments and to record a memorandum on their map (which was a copy of the current Land Records map showing both tenures and the current soil-classification) whenever they disagreed with the committee of *thamadis*, who were to be men of standing in the village, aged 30 to 40—so that though not too young they would be able to bear the strain of accompanying the inspector better than most. It was further directed that cultivators should be listened to and encouraged to attend; if the reaping season was over they were to be asked to find themselves some employment in their fields if possible so that they could await the inspector's arrival there without impatience or loss of time. The principal reliance, however, was placed upon the Assistant Settlement Officer who did not repeat the inspector's methods but summoned as many interested persons, whether owners, tenants or mortgagees, as lived near, and led them over the whole *kwin* to see not only their own holdings but all others, and to compare the classification proposed by the inspector and his committee in different parts of the *kwin* and rectify any inequalities. Invalids and women were allowed to wait in their own holdings but no others. The Assistant Settlement Officer was bound to follow the general opinion unless it was clearly perverse, in which case he was to report to the Settlement Officer what the village demanded and what he recommended; no such cases however occurred. The inspector's advisers accompanied the Assistant Settlement Officer; but as it was their work which was thus submitted to public criticism they were enjoined to keep silent except when asked to defend any piece of their classification which was impugned by the other villagers. The idea was that every cultivator would thus be present when his own holding was reached and would explain the agricultural qualities of the land; the other cultivators then compared that account, so far as they credited it with their knowledge of their own land and similar accounts of other holdings, and settled the classification by deciding which piece of land already classified each part of the holding most closely resembled. The duty of the Assistant Settlement Officer was to clarify opinion by judicious enquiries, and to explain how special cases—*e.g.* unusually large expenses in cultivating, expenses incurred in improvements—should be met in classification. Doubtful cases were decided by a vote of the majority of the cultivators present.

245. It was not intended that so much reliance should be placed upon the Assistant Settlement Officer's inspection as came to be in practice; and moreover the extensive corrections required in the work of the *thamadis* and inspector showed that some change in their work had to be made. A further advance was made therefore in the second year. Notices in plain language were published in all the villages concerned, and also in all the usual places of publication of public notices throughout the district, stating the area to be dealt with in that season, warning all assesseses to be ready to defend their interests by assisting in the classification, and mentioning that as the workers would move steadily and continuously across the country they could easily learn through their tenants or local agents when their land was about to be treated. In Mawlamyainggyun, where reside many persons who own land at a distance, a public meeting was held and the method of the settlement party explained. Inspectors also gave generally, though not always, two or three days' notice to the local headman of the precise date on which they would arrive in the *kwin*. On arrival a few cultivators would naturally gather round, and these were asked in a general way where the best land of their *kwin* lay. A holding

which included some part of this was selected to begin work, and the remaining holdings were taken up one by one in approximately numerical order so as to provide a continuous passage over the kwin. For each morning or afternoon definite holdings were marked down and only the persons concerned in those went out to their fields. Any persons could be told at any time within a few hours when his land would be reached, and on the preceding day could be told generally within half an hour. Owners and tenants and all persons liable to assessment under section 37 of the Land and Revenue Act were all invited and each holding was dealt with as a separate unit, save where an extensive holding was divided into tenancies which were then taken as units. Each unit was completed before a new one was begun. A committee of three local men, partly owners, partly tenants, was called to assist the inspector, but their functions were modified. In each holding the assessee (or his tenant or representative or all together) was asked to show the best part of his holding and to separate from it all inferior parts. Bounding lines were actually traversed in every case, and an apparent detail which was really of extreme importance was that the assessee went first to show the line, and the inspector went last so that he could never even unconsciously convey the impression that Government wished some particular line to be chosen. The committee walked in the middle of the procession. The assessee thus divided his holding into blocks of approximately equal agricultural value and in a conversational way described, as he went, the qualities of each block. The committee were not expected to know these qualities (as they are by the Settlement Instructions); their duty was to judge the credibility of the assessee's statement in the light of their general knowledge of the lines of flood-flow and similar local conditions and with the evidence of soil, weeds, stubble, etc., open to their senses and with other information elicited from the assessee by enquiry and discussion, and to compare the quality of each block with blocks already treated and so to assign to it a place in a scale of quality which was an intrinsic property of the kwin. The practical definition of equality was that equal taxation would be just and equitable. It was understood that three degrees in the scale would usually be recognised, but even this was not rigidly determined; the universal adoption of three degrees is partly an expression of the local views and partly the result of the restricted area of each separate kwin. The assesses may be regarded as additional members of the committees freshly co-opted in each holding for their special knowledge. The duty of the inspector was to record on the map with red pencil the classification upon which the assessee and the committee agreed, and to assist their discussion by suggesting matters requiring consideration. He was in fact to be a secretary to the committee. He had no vote and was not required to be an expert in land, but to be able to deal with men and assist them in the discussion with the experience he had gained from similar work in other kwins, giving no decisions but asking questions. When the whole holding or tenancy seemed to have been dealt with the inspector briefly reminded the group of the lines of classification they had traced and asked the assessee if he wished for any further divisions or if he was satisfied. On receiving assurance of satisfaction the inspector told him his duty was finished and thanked him for attending; politeness of the inspector on this occasion has an important effect on the demeanour of the people towards the Assistant Settlement Officer and thereby affects the quality of the work. Where agreement could not be reached the inspector showed in red pencil on the map the assessee's view and in a marginal note explained the committee's view; in similar marginal notes he reported all cases in which he thought the local decision mistaken. All such marginal notes were of course the subject of the special attention of the Assistant Settlement Officer, and the inspector warned the assessee that this would be the case. The inspector's map thus showed in red pencil with marginal notes each assessee's view of the proper classification for his own holding, the committee's influence ensuring a similarity of standard in each class throughout. There was no room in drawing the red line for the exercise of the inspector's judgment; he was required to record only facts, namely the decision of the committee and the co-opted assessee and the path actually traversed as the boundary of each block of land. This also gave the Settlement Officer better control, as no plea of error of judgment was admissible when bad work was done—a fact which some inspectors discovered at an early stage. Although not giving decisions inspectors



paid attention to the superficial characters of the land and the stubble and weeds upon it, and in tracts in which soil became of importance in comparison with water-supply, they dug up samples of soil and subsoil and recorded their observations. But they were taught that all they learned in this way by induction was to be regarded as of purely local truth, useful in suggesting questions to assesses; this is the antithesis of the idea they had hitherto held that the interpretation of superficial characters is the same in all districts, and that experience gained in one district could be transferred to another and applied there as *à priori* knowledge. Inspectors were required not to be agricultural experts, which they never can be, but to have general intelligence and to be able to deal with men, obtaining their confidence and stimulating their co-operation.

246 The Assistant Settlement Officer then proceeded, as in the previous year, to submit the inspector's map to the criticism of the general body of assesses, not by exhibiting the map in the village—which is entirely useless "eyewash"—but by visiting each holding and soil-block in their company and enquiring if they considered the proposed classification of the ground they actually stood upon equitable in relation to their own and all other holdings. The inspection in fact was to be performed by the assesses rather than by the Assistant Settlement Officer, and the work of the inspector was a basis to facilitate the real work of classification which was done by the general body of assesses. But having learned by the experience of the preceding year, orders were issued that the Assistant Settlement Officer before beginning the inspection should deliver a short lecture explaining the reasons for taxation and the return obtained for it and the object of soil-classification. With homely illustrations, such as the customary method of sharing the cost of village festivals, the principle of equitable distribution was made clear, and I found in checking the work of my assistants that it was always best done where the people had understood the lecture, and where numerous mistakes had been made I always found that the lecture had been omitted or hurried. I came at length to regard this explanation to the people as of prime importance, and encouraged the Assistant Settlement Officers to introduce the ideas in informal conversation in the village in the previous evening when possible. The cultivators were reminded that the peace and order which they admittedly enjoyed was the product of Government's expenses, and that the rise in the price of paddy in recent years had been accompanied by an increase in those expenses. Learning that the object of the settlement was equitable distribution of the revenue between holding and holding, *kwin* and *kwin*, and not—as they previously thought—a general conscienceless enhancement all round but only such an enhancement of the redistributed total as was necessary to defray an equitable share of the cost of peace and order, the usual fear of a settlement party and consequent apathy towards its operations was often replaced by a keen interest and friendly co-operation which led to intelligent accounts of the various qualities of land. Aid in attaining this was lent by an appeal to the altruistic teachings of the Buddhist religion which made it incumbent upon each assessee to work for an equitable classification; some felt the direct religious appeal and others were unconsciously influenced by a resulting feeling that the process of classification was not a hard official technicality but a matter of human interest.

247. In addition the Assistant Settlement Officer was required to give warning of the date and time of his inspection in a notice sent to the headman for proclamation with beat of gong and publication on his notice board. The notice was sent in time for the publication to be made four clear days before the inspection. Since the inspector had already given a preliminary warning this was considered sufficient notice. In a few *kwin*s at the end of the third season it was not possible to give four days' notice on account of difficulties arising from the resurveys for which the party had to wait. Headmen, too, sometimes kept the notice till the day before the inspection before publishing it. But as much was done as the state of education of the people permitted.

248. It has already been noted that the basis of classification was a comparison in which those lands were placed in the same class for which the assembled cultivators and assesseses thought equal rates of taxation would be equitable. *Classification is comparison* was the motto of the party. No assumption as to outturns was made, no classification was based on outturns. The experimental reapings were entirely and deliberately ignored. Estimates of the relative value of lands were made in terms of relative outturns; but only the relation was considered, not the absolute figures. More often men were asked directly to state whether two equal holdings in two parts of the kwin would fairly be assessed at the same amount; this very practical question had the great advantage of direct stimulation of interest and of a clear comprehension of the purpose of the work. By constantly speaking only in terms of comparison of one field with another practically all danger of misrepresentation was evaded. A might claim that his land was poor absolutely; but if he said it was poorer than B's, there was at once a protest from B. Absolute statements might be false while comparative statements were true. Understatement of fertility was no longer an enterprise with the sympathy and tacit support of all bystanders against an impersonal Government. There was constant reminding of the doctrine that, just as in the village collections for festivals an insufficient contribution by one villager entails enhancement of the contributions of others including the poorest, so too unfair relief of land-revenue for one assessee meant not only a relatively unfair burden for others but actual increase of rates because the expenses of administration must be met. The doctrine is not true of course in this crude form, but it conveyed a rough notion of truth which could be appreciated. Consequently the whole kwin was commonly united in trying to prevent errors of classification. It was remarkable sometimes how readily men admitted that the excellence of their land made it fair for them to pay the first-class rate for it, and amusing how others jeered when they failed to do so. It was often noticed, too, that the inspector's advisers, having the general criticism in mind, had often classified their own land with undue severity. Some defects of land were doubtlessly assessed on a scale which did not correspond exactly to their purely objective effect upon net produce; their subjective valuation played some part. But as the valuation was communal and not individual this appeared to be an advantage; and it was still quite reasonable to take the normal net produce of a class as the basis of assessment. As it was expected that some assesseses would be dissatisfied with the decision of the general body of cultivators or that the Assistant Settlement Officers might find it difficult to accept that decision—for instance in cases of collusion or village feuds—those officers were directed to enquire of every assessee as his land was treated whether he was satisfied that he had received equitable treatment, and to report any case of dissatisfaction on the part either of themselves or of an assessee. No reports had to be made. But in one kwin which I visited after classification the owners said they were not altogether satisfied. On enquiry I found the dissatisfied owners were wealthy townsmen of Kyōnmangè who had shirked the rough walking over paddy fields and had sent to the inspection agents who commonly knew nothing of cultivation whatsoever; some of their claims for modification of the classification were however met in a re-inspection in which they took part as well as the cultivating tenants and the owners who had not complained.

249. The method of building up kwin groups can now be easily understood.

Kwin-grouping. Amongst the general body of the cultivators who accompanied the Assistant Settlement Officer to criticise the classification were always some who tended to thrust themselves forward and to talk a great deal and required tactful treatment by the Assistant Settlement Officer to prevent them from discouraging the more modest assesseses. Some (occasionally of the same class) were distinguished from other by the quality of their remarks and grasp of the problem and knowledge of the conditions. These last were noted and at the end of the inspection they were asked to take part, to the number of three to six, selected generally by the headmen or Assistant Settlement Officer with the approval of the other assesseses, in the inspection of the adjacent kwin next day. As they had seen some men from the previous day's

kwin taking part in their own kwin they knew what was required and generally agreed readily. When a sufficient part of a kwin had been checked to give a reliable idea of the meaning of first, second or third class the work was stopped and a consultation held as to the relative qualities of each class in the adjacent kwins. If only prices or outturns differed an estimate of the difference was made—a much easier problem than estimating the absolute rates of outturn—and a note was made to be of guidance in assigning representative outturns and prices later on. Sometime the differences were a complex relating to outturn, risk, price, method of cultivation, appreciation or depreciation of the land, liability of the people to fever and other causes; and the problem had to be reduced, after some discussion of these, to the question whether equal rates or what distinction would be equitable. The people were always, in my experience, reasonable. No suggestion of absolute amount of rates was ever made within my knowledge, but only relative rates were discussed; and usually these were discussed in terms of two holdings in indefinite size but with the same areas of each soil-class, one in each kwin. The opinion would be expressed in such terms as these: that if in the other kwin the revenue were Rs. 60, a charge of Rs. 70 in this would be equitable but Rs. 80 would be unfair and Rs. 75 doubtful. Great care was needed to ensure that relationships were established class by class; so that a kwin should not be ranked as superior or inferior to another merely because it had a larger proportion of first or third class land. As soon as the relationship was established the visitors returned home and the kwin was completed on the basis of the standards already established. Frequently men from two or three kwins would be present, and often men who owned or worked land in two kwins. In the Settlement Officer's inspections men from two or three kwins were commonly assembled near their junction and samples of all examined by all together. When the relationships had been established the men of the last kwin reinspected part or all of the remainder of their kwin while the others went home.

250. As each kwin was compared with every contiguous kwin the comparison of adjacent or proximate kwins was commonly made both backwards and forwards and again, the kwins being taken in closed circuits of fifteen or twenty—usually a revenue surveyor's charge—the comparison of the last kwin with its neighbours which had been treated at the beginning of the circuit afforded a general check on the work throughout the circuit and prevented the steady though gradual appreciation or depreciation of standards which might otherwise have occurred. In discussing the grading of kwins constant enquiry was made about the general trend of the conditions in all directions; the knowledge so gained gave frequent guidance or reassurance and facilitated the process, and in the cases, which sometimes arose, in which different groupings (associated with different internal classifications) were permissible, aided in the selection of that grouping which most facilitated the extension of the work to other kwins and gave the least discontinuities in the tractings.

251. A few matters of importance have been passed over in the foregoing to avoid digressions. The number of soil-classes in no kwin exceeds three. This is a result of the people's ideas which recognise only the three classes of good, middle and bad in any main-kind. The party was ready to adopt more whenever the people asked for it, and would have insisted upon a distinct system of classes if a sufficiently distinct system of cultivation had been met; but neither of these contingencies arose. Moreover the system of three classes does give generally sufficient gradation. The outturn of a particular field year by year varies widely. The agricultural conditions may vary gradually from field to field, but the cultivator emphasises the difference at certain points by his treatment of the fields, forming them into two or three classes for the purposes of cultivation. Thus the gross result from a holding is well represented by division into two or three classes of quite a wide range. The classification may be regarded as assigning to the acre-rates weights proportional to the acreage of the fields within the holding. of each class to calculate an average rate of revenue, and small variations in the

weighting have very small result on the average acre-rate which results. The weakness of the small number of classes arises when the whole holding is rather below the normal of second class but above that of the third class, while the whole of another is rather above the normal of second class but below that of first. But a system which aims mechanically at too fine an adjustment is likely to introduce still worse mistakes; and moreover, in such a case as that suggested, the general body of assesseses inspecting a kwin usually recognise the facts and place the most inferior portion of the inferior holding in a lower class.

252. Occasionally it was desired to divide a single survey-plot between two soil-classes. In a large proportion of such cases the required boundary, being a definite feature on the ground—often a fieldbound omitted in surveying—was specially surveyed by the Land Records staff. But for any reason this could not be arranged the soil-class boundary was shown in a straight broken line joining two clearly defined points and the area in each class calculated accordingly.

253. No minimum area for a soil-block was prescribed. The rule was that the map should be clear, and where it was necessary to obtain clearness the soil-class line might be simplified in such a way that no assessee's revenue was enhanced thereby to an extent exceeding two or three annas. It was held that Government is entitled to make such simplifications in the map as will conduce to accurate accounting by the surveyors, but may not do so at the expense of individual assessees. In cases of great complexity the classification was occasionally averaged out; but only after it had first been traced in detail and in consultation with the villagers. No Burman Assistant Settlement Officers can be trusted to average out otherwise without being unfair to the assessee.

254. The instruction on page 28 of the "Land Revenue Policy of the Government of India" (1902) that the existing classification, if found to be in the main equitable, should not on resettlement be disturbed was not forgotten. But for the reasons which appeared in Chapter V the condition was frequently not fulfilled, and further the introduction of a third class of soils was a consideration; essential obedience to the order was rendered by giving special attention to all cases in which the inspector's map proposed that the classification should be raised. Inspectors were not taught to explain the old classification to the classifiers in general lest they should seem to be dictating the new classification. They were taught to do so when classifiers found difficulty in deciding; and when, as occasionally happened, their decision was that a field was on the border-line and could be put fairly into either of two classes the nearer to its present soil-class was adopted.

255. A more difficult consideration was the declaration upon page 26 of the same publication that "Assessment upon actual as distinct from prospective assets has thus become a cardinal principle of the land revenue policy of Government." A reference to the diagram in paragraph 101 of this report will make the difficulty clear. Few will dispute the unfairness of considering prospective assets which depend upon the investment of labour and capital by the assessee. But when the productive value of land is varying according to a definite law quite independent of any action of the assessee beyond the normal annual cropping which is done in accordance with the ordinary practice of cultivation in the locality and is a necessary condition for assessment, the matter wears a different aspect. It is clearly wrong to place on a level land which are inevitably appreciating and lands which are equally inevitably depreciating. To the case of appreciation complex considerations apply; but it is clear for the depreciating lands that "actual assets" must take account of the present tendency to depreciate, and that relief should be given in comparison with land of equal quality at the instant and free from depreciation. "Actual assets" must be interpreted dynamically and not statically. Two plots of land must be regarded as of equal fertility not when they are yielding equally in the year of examination but when the asymptotes of their curves of fertility-development are at the same distance from the axis. A field yielding sixty baskets per acre cannot be assessed for the next twenty years in a

higher class than a neighbour's field which though it is yielding fifty now is following the same course of development as the former field but is one or two years younger and therefore one or two years behind in development. Nor could a field which is yielding fifty baskets now at the summit of its curve and will inevitably go down to thirty in the next ten years be associated with a field now yielding the same but having an inevitable future of rising to a summit of seventy and then falling steadily to fifty again. The principle adopted was that "equal fertility" meant having the same asymptote. Land which was temporarily above its asymptote—on either the rising or the falling side of the dome or had already approached quite close to the level of the asymptote on the rising side, was treated as being on its asymptote, the extra yield which it enjoys for a few years being a recompense for the cost of bunding and jungle-clearing which is always going on in such cases or has gone on quite recently. For land which was so young that it had not yet reached its asymptote the next lower class was given in consideration of the cost of its development unless it was already so near the level of its asymptote that it would reach it in the first or second year of the new settlement. Local cultivators have no difficulty in deciding classification on these lines; it is almost entirely a question of age and level and is indicated with perfect clearness by the trees and undergrowth. In the newest tracts, towards the south, are many kwins in which every holding is in the dome of its development curve, but the same principle applied. It is worthy of note in this connection that the large yields obtained in the dome of the development-curve are always of lower specific gravity than those along the asymptote; the corresponding excess of net-produce value above the normal of the soil-class is consequently less than the difference of bulk of outturn would otherwise imply.

256. It is desirable to emphasise that the principle of the last paragraph is not contrary to the principle that land should be assessed on its present output rather than its future possibilities. It does not deal with possibilities at all but with inevitabilities; and it takes a correct survey of those instead of being controlled by the accident of the year of settlement. It leads to forestalling future improvement, but this was restrained as described to very narrow limits; it leads in other land to a due recognition of inevitable depreciation, a matter which was not contemplated in the order of the Government of India which was quoted at the beginning of this discussion. In this settlement the case of the recognition of inevitable depreciation was the most general effect in all tracts except in the newly cultivated areas near Kazaung and Hlaingbôn. And in tracts 28 and 29 in which this future appreciation was most generally considered all the holdings were on the same footing in this respect.

257. It is not possible to form groups of kwins in which the cultivation is of equal age because there are wide variations within a single kwin. In the tracts towards the south cultivation is generally younger than in those farther north because they were colonised subsequently; but there may be cultivation of any age from one year to sixty or more in almost any kwin. Thus it is not true that the rate of outturn is uniform now throughout any soil-class of a particular kwin-group. Where the cost of cultivation is uniform the fields of a given soil-class have fertility-asymptotes at approximately the same distance from the axis; but since there are fields in all stages of development there are wide variations in their outturns at the present moment. Even this does not complete the discussion because variations from the normal cost of cultivation have to be considered; equal assessment must be related not to equal gross outturn but to equal net outturn. Thus a uniform outturn throughout a soil-class of a group is far from the truth; with the limitations and qualifications imposed by the various ideas of this section and a recognition of the cost of development it may be said that the aim was to secure uniform "net produce" (that is gross outturn less cost of cultivation) when the land has settled down to steady production.

258. Special treatment was given to the lands in North Kyônpadôk Circle which the cultivators build up with silt conveyed from the Irrawaddy by ditches. The land so built up yields a profitable crop of chillies for one or two years and

then declines to be garden land or inferior paddy-land, and was therefore classified simply as third-class paddy-land, this being the classification invariably appropriate if no improvement had been made. By the time the cost of the improvement has been recouped the land will often have become fit for this class, or will have been planted as a garden. In the latter case the treatment accorded still seems fit if one recognises the cost of making the garden and the initial unproductive years. It is moreover not possible to foretell whether the land will become garden or paddy-land, and an enormous simplification of the work of assessment is effected by the system adopted. The area concerned is a minute proportion of the tract though it is of considerable importance to the people of its immediate neighbourhood. It is indifferent whether the special treatment of this case is regarded as a case of granting a temporary exemption from enhancement of revenue on account of the improvement effected with silt-channels and in agreement with the lines discussed in Chapter XVII below, or as a case of development of fertility similar to the cases discussed in the preceding paragraphs.

259. The distinction between the synthetic method of forming kwin-groups and the analytic method of Settlement Instruction 173 which works by dividing the district, was clearly brought out when the last kwin was assigned to its group only on the day on which the field-work of the party was completed. But it will be noted that although the analytic method recommended by Instruction 173 could not be followed, the alternative, which it condemns, of grouping kwins according to their assumed rates of outturn was not adopted. Comparison was the sole basis of the tracting, no absolute values of any kind being assumed. The groups are such that (1) the conditions affecting the statistics in them are sufficiently uniform for those statistics to be resumed in averages or other representative figures; (2) their recent assessment history is fairly uniform, and (3) apart from small differences due to the local variations of the price of paddy (some of which however have already been considered in forming the groups) uniform rates of assessment throughout each of their various soil-classes are equitable and appropriate. Fertility is not necessarily uniform throughout a soil-class of a group; as explained in the preceding section, a more nearly correct description of the basis, if the many limitations to the application of the phrase are borne in mind, would be ultimate uniformity of the value of the net produce. The groups formed in this comparative study of the area constitute the primary tracts for the purposes of this report; divided where necessary according to variations of price they will form the assessment-tracts.

260. The twenty-two primary tracts are shown in Map III. They are numbered from eight to twenty-nine so that when reference is made to them by number there need be no confusion with the tracts formed by Mr. Duffin in the area which he settled in 1910-12 in the Kimmè and Labutta Townships and numbered from one to seven. The map shows the tracts as they will presently be divided according to price, but the parts of each primary tract which are distinguished only by price (and therefore form separate assessment-tracts) have the same colour modified by hatching or other device and have the number of the primary tract with a letter added. Considerations of the cost of printing have forbidden the use of more colours on the map, but it is hoped that the map will be easily read with the aid of the explanation given upon it and the numbers written on the tracts, and that the use of the same colour for more than one tract will not cause confusion.

261. The primary tracts proved in the end to be more continuous than was at first expected. The chief discontinuities appear in the Wakèma Township and in an adjacent part of the Mawlamainggyun Township, continuous tracts being the rule almost everywhere else if apparent discontinuities due to salient points of the forests in the south are overlooked. Strictly speaking, a great part of the Myaungmya and Mawlamainggyun Townships could have been tracted by the analytic method; but with the developments in the method of soil-classification it was found better to hold to the one system throughout. It will be seen on

the map that there is a general tendency of tract boundaries to be lines running a little east of north in the western side of the district and north-west on the eastern side, in both cases at right angles to the line of steepest change in salinity of water and stiffness of soil; and it will be observed that this agrees with the general conception of the configuration of the district as due on the eastern side to being built by a river which flows from the north-east to the south-west and on the western side to the up-thrusting which formed terraces lying roughly parallel to the same direction.

262. In Statements 20 and 21 will be found set out the changes in tracting and internal classification tract by tract; an explanation of these statements is given at the beginning of Chapter XIV.

### CHAPTER VIII.—PRICE TRACTS

263. The problem of fixing a settlement-price, that is a rate for the valuation of the produce for the purpose of a settlement, is in practice a double one, it involves firstly the division of the area into tracts throughout which a uniform price can be assumed in compiling statistics and proposing assessments, and secondly the assignment of a price to each tract. Two methods of determining that price have been prescribed. One proceeds on a basis of the locally recorded prices for the past twenty years. But this method does not aid in forming the tracts, it only discovers a figure relating to a tract already formed. Moreover the local prices are in fact governed by the prices at the export markets of Rangoon and Bassein which are nearly independent of local conditions. Thus the second method of price-determination was devised in which the relationship of the price of each tract to that of the export market is determined and this method has the advantage that in tracting this relationship the boundaries of the tracts are also discovered. In the present case, too the former method proceeding on the basis of local records, besides solving only half the problem, is quite inappropriate to the other half, because, on account of the changes in the method of transport which were described in Chapter III the relationship between local prices and the market price which governs them has changed during the years which are to be averaged and, further, a more valuable kind of paddy is grown. In 1902-03 when a part of the present area was settled the Settlement Officer found that *ngakyauk* (which is the cheapest kind in the market) was the commonest in Mawlamyainggyun Township; now it is unknown there and has been replaced by the more valuable *kaukgyi*. That officer found it reasonable to fix the local price in terms of local baskets at Rs. 10 less than the nominal price quoted for nine-gallon baskets in Rangoon, now-a-days in the same area brokers have a working rule that they should pay Rs. 8 to Rs. 10 above the nominal Rangoon price. This change is due in part to the additional value of the weight-allowance with a higher nominal market, but it is due equally to irreversible changes in local conditions and the system of marketing. Clearly a price determined on the basis of local prices by a method which gives weight to such irrelevant prices as those ruling under the old conditions is not a suitable basis for a settlement which is to be applied in the future. There are also difficulties residing in the records of the local prices. It is therefore necessary to grapple with the difficulties of the second method.

264. Amongst these are difficulties which relate to the value of the paddy when it arrives at the central market, and others which are related to the process of collecting it from the cultivators and depend not only upon the cost of transport but upon the variations of local conditions and the organisation of the markets for particular kinds of paddy. Some of the factors are discussed in Appendix A; the general effect is that the price received by the cultivator is affected by various causes which often operate with striking results within narrow areas; two hundred yards, or the division by a river, may make a difference of Rs. 5 per hundred baskets. Sometimes the various factors have small, even imperceptible individual effects, but by acting in one direction have a large cumulative effect; sometimes

large individual effects are mutually neutralised. The reasons why the difficulties of price-tracting are greater than in the districts served by the railway are not far to seek. In those districts the agricultural conditions depend chiefly upon soil and rainfall and are uniform through large tracts which therefore produce a uniform quality of paddy. Carts carrying small loads of 15 to 25 baskets to the railway stations deal on equal terms with any consignment whether it comes from a place of large or of small supply. Each railway station is thus the centre of a system of roughly circular zones of cart-hire. Railway freight is practically proportional to the distance of each station from the destination, and the consignor has no concern with the technicalities of the transportation—so that the paddy dealers' expenses (apart from the cart-hire which they charge to the cultivator) are approximately the same for all dealers at one station and increase or decrease almost only by the change of railway freight at other stations. Under these conditions the country falls naturally into price zones. But the present case is different. Conditions of water-supply, which are the dominating influences in the cultivation, change rapidly and variously from kwin to kwin and the kind and quality and value of the paddy changes with them. During the rains the boats start chiefly from a few centres in which paddy has been collected at harvest-time, but this collection is merely a complication of the predominant system of disposal in which there are no foci like the railway stations but the boats in collecting their cargoes can choose routes amongst numbers of creeks ramifying in all directions, the technical difficulties of transport are the concern of most of the dealers, *i.e.* all those who do not hire boats on the *nawalt* system—and the freight depends largely upon these difficulties and merchants' expenses differ according to narrowly local conditions and the system adopted by each individual merchant for meeting them. The application of the second method of price-determination under these conditions will be made in two steps. The course of prices in Rangoon and Bassein in the last twenty years will be discussed in Chapter X. The present chapter deals with the establishment of the relationship between the price in each kwin and in the central market controlling its price, and the grouping of kwins into tracts in which that relationship leads to an approximately uniform price.

265. The complexity and variability of the conditions affecting the price received locally for paddy induced first the habit of applying to local prices the same principle of continuous comparison as was used to form primary tracts, and later this developed into the method of forming price-tracts. The cultivators and assesses of every kwin as it was classified were asked to give any information they could with regard to the usual relation borne by the price in that kwin to the price in adjacent kwins or neighbouring centres of trade; later their statements were checked or elucidated by reciprocal enquiries in the adjacent kwins or at that centre. Paddy-brokers and traders and their agents were also constantly consulted, the same man in some cases being interviewed two or three times as added knowledge suggested new difficulties or made some matters more intelligible. Continuous care was exercised to deal with the kind of paddy most commonly sold at harvest time in each locality. Cultivators frequently knew little about the size of basket in which their paddy was measured, which was of course an essential point of the enquiry, and sometimes in kwins worked by the poorer tenants knew little of the price because they never have any paddy left to sell; but occasionally they gave clues which led to the discovery of matters which would have been overlooked if the enquiries had been confined to the middlemen. Then again, there were cases in which either the brokers' or the cultivators' minds had been so obsessed by war conditions or by the effect of a flood or drought that their statements were not true of normal times; but by asking of both brokers and cultivators and reciprocally in all kwins such cases were easily brought to light. In some cases a broker stated that a certain kwin received, say, Rs. 5 or 8 per hundred baskets more than its neighbours because the paddy was heavier and had less chaff; local enquiry confirmed the broker's explanation that the neighbours reaped identical crops but by threshing less thoroughly obtained a larger bulk of lighter paddy, so that the difference in the money received was less than the difference in price suggested. In other cases a



kwin growing the more valuable *kaukgyi* was found to obtain only the same price as its neighbours growing *ngasein*, because its low level led to splashing of the paddy with mud and occasional damping. In other cases again cultivators insist upon the use of a small measuring basket, the broker agrees but modifies the price in proportion and both parties are satisfied. Sometimes compromises were necessary. A low price in a kwin is sometimes due to the light weight of a particular strain of paddy thought to be adapted to local conditions and compensating for its low price by a large yield. Such cases were discussed with the assesses or cultivators of the kwin and its neighbours, and the soil-tracting and price-tracting were settled at one and the same time so as to represent as nearly as possible the relation of the net produce of the kwin to that of its neighbours. Of course no large number of such kwins could be so treated; if five or six neighbouring kwins were anomalous in the same way they would have to be formed into a separate group. Neither could large variations be treated in this way. Similarly low prices in kwins in which much new land is producing unusually large harvests of low specific gravity were discussed locally in conjunction with the primary tracting and treated to give the fairest result in relation to their neighbours and with regard to the regular course of development of new land. The result of these comparisons was the construction of a map of price-tracts which in combination with primary tracts give assessment-tracts in which the conditions are sensibly uniform for all the purposes of the settlement. All through the work of price-tracting regard was paid to the primary tracting, the price conditions of the larger part of each primary tract being taken as the standard of a price-tract, in this way the frequent division of primary tracts by price boundaries has been avoided. As a result of the simultaneous construction of primary tracts and price-tracts the latter have become broad masses in spite of the numerous differences which occur from kwin to kwin. No definite price was determined by this process for any tract, but the relative prices of the various tracts were determined and were shown as relative excesses or defects throughout. The map was constructed as the work of soil-classification progressed, and the last kwin was added simultaneously to its primary tract and price-tract on the last day on which the Settlement Officer was engaged in field-work. The reasons for all variations in price were of course sought and studied as closely as possible, without a knowledge of these the enquirer would soon be at sea. But these were not the real basis of the work. The principle observed was to accept, after testing, that integration of the relative effect upon price in neighbouring localities of all the causes in action which was made by the observation and experience of those who had the closest knowledge of the matter, the elements which they integrated were of interest, so far as tracting was concerned, only as a check upon the integrated statements, protecting chiefly against temporary aberration being treated as permanent.

266. Here and there a difficulty was found to arise from the growing prevalence of the system of contract-buying amongst brokers and dealers. But although this tends to blur the boundaries of price-tracts the buyers are well aware of the areas in which they have the wider margin of gross profit to work upon, and it may be assumed that on an average they allow much the same benefit to these areas as do the dealers who trade on the old single cargo plan. The difficulty does not affect the tracting seriously; it concerns rather the estimation of the allowance for each tract and is met by the estimates of expenses or by consulting dealers who work without contracts. Similarly the barges which come from Rangoon or Bassein and collect a cargo as they go often pay the same price for all paddy through a considerable area within which differences of Rs. 5 or even more are recognised by dealers who collect for local storage and find a greater proportional difference in their expenses for a difference of one or two tides than men who come from a greater distance. On the other hand, within one or two tides of large centres like Mawla-myainggyun and Kyonmangè such local purchasers give the same price in small creeks as in large, although the barge men give less. Discussion with local cultivators indicated the general relative result in each kwin of all such influences upon price as these. It was of course necessary to keep a careful watch all through upon variations in the size of the basket used for selling paddy. As explained at

the end of Chapter III this could always be learned in terms of milk-tins so that reduction of price-differences to the standard measure was easily made. As a matter of convenience the 128 milk-tin basket was used in recording comparisons, as this saved much arithmetic and the *differences* of prices are not sensibly different whether this or the Government measure is used.

267. Not only were kwins of equal price grouped in this way into tracts, but although no absolute figure for a settlement price was yet determined, the relative prices of pairs of tracts were established and checked by reciprocal enquiries.

Relation of Local to Rangoon and Bassein Price.

The cultivators of kwin **A** on the boundary of a tract were asked to state the price relation borne by **A** to **B** an adjoining kwin on the other side of the boundary; and similarly the men of **B** were asked about **A**, where possible the two groups were consulted together. The relation of **A** to **C** and of **B** to **C** gave a further check on the relation of **A** to **B**. It was found after a time that one could in the same way establish the relationship between each group and the Rangoon or Bassein market, because local dealers and brokers had always a rule to guide them in the difference they could afford to allow between the Rangoon or Bassein price and the local price for the quality of paddy obtained in a normal year. Initially it was intended to follow the usual method of calculating this relationship on the basis of specific gravity and merchants' profits and as a check upon that (by collecting with the Rangoon or Bassein price of the same date) Assistant Settlement Officers for a time recorded particulars of all sales personally witnessed. But later the importance of variations of quality of paddy from different tracts was better understood, and the need was felt to go to dealers to discover if the specific gravity determined from the samples weighed by the settlement staff was the normal for the tract. Then it was seen that it was just as easy to ask the dealers to state the total effect of the forces affecting prices as to ask for the values of these factors in the calculation. Indeed it was easier because in this way one evaded the difficulty of estimating profits and expenses. The cost of interest upon capital is always a difficulty, and the rate of the profit per hundred baskets is not uniform but depends upon the degree of competition and the method of business adopted. Profits moreover are an elusive figure, although the Settlement Officer explains there is nobody whom he hates so fiercely as the Collector of Income-tax there is always some reluctance in admitting to him that any profit is obtained—and, indeed, as Burmans by profit mean an excess of net income above the cost of living, there generally is a negative profit made up by some other activity. Consequently the brokers were asked for the ordinary relation between local prices at the river-bank or threshing-floor and the nominal Rangoon price when the latter is in the neighbourhood of Rs 100 to 105, that range having previously been seen to be near the price which would ultimately be adopted in this report. Details of expenses were also enquired for in numerous cases as some collateral check and two sample cases are quoted in paragraph 276 below but the emphasis was taken from such estimates and placed upon the principle of continuous comparison because with correct relations between the various kwins a small error in the general pitch of prices is of little significance. An allowance of Rs 3 has been made as a fair representative figure for the transport from the threshing floor to the place of loading the barges.

268. The relation between local and Rangoon or Bassein price as stated by brokers in two tracts could be sufficiently checked by the difference between the tracts as learned from cultivators. It will appear in Chapter XI that by this comparative method of study an inequality of treatment in one tract which would have resulted from the application of the ordinary method to the prices recorded at Bassein has been avoided.

269. It would be quite feasible to group the price-tracts into a small number by arbitrarily increasing or reducing the ascertained prices by one or two rupees where such a change would have no effect upon the deduced assessment-rates. But though this would make the price-map look simpler it would disguise the fact that the prices would be the result

Grouping of Price-tracts.

of very different conditions in different parts of a price-group, one part getting a low price on account of distance from Rangoon or difficulties of navigation and another on account of, say light weight and muddiness of the grain. Already this is the case in the price-tracts adopted because in determining both these and the primary tracts the combined effect of changes in outturn and in price were considered. but there is, in the tracts shown, a standard of price and outturn from which only a minority of the kwins of each tract show variation. An attempt has been made in Map IV to give some idea of these larger price-groups by using plain and hatched colours, but the detailed price-tracts have been retained. The processes described in this Chapter determined those tracts and the relation of their prices to each other and to the price in Rangoon, the absolute prices will be discussed in Chapter X.

### CHAPTER IX—ASSESSMENT TRACTS

270. The superposition of price-tracting upon primary-tracting yields the thirty-two assessment-tracts which are shown in Map III and form 37 tracts if those divided by a township boundary are cotated as two. Of the latter number four however are composed of only the thirteen odd disconnected kwins in the south-west corner of the settlement area which form one primary-tract (No. 27) divided into two for price and have each part again divided by the township boundary. Apart from these there are only seven primary tracts which are divided between price-tracts. In some tracts this division fails to occur because the chief factor in their price is the quality of the paddy which depends upon the causes that determine the primary tracting and in such cases there are often sharp lines of division between two assessment-tracts. In other cases the factors on which primary tracting depends vary by imperceptible stages, but this occurs chiefly towards the south where the increasing saltiness of the water is the most important factor reducing the outturns, and the price diminishes concurrently because of the effect of the salt upon the quality of the paddy and on account of the increasing distance from market-centres and the milder competition amongst buyers. In these cases the boundary for both primary tract and price-tract was placed where the conjunction of outturn and price made instructed local opinions agree that a distinction in assessment would be equitable. The principal changes in the tracting of Mr Lowry's area are due to the introduction of a third soil-class and to changes in physical conditions. In Mr. Mackenna's area the current tracting was intentionally broad and was bound to be changed at revision even apart from the variation in the average stage of development of the several tracts and the effects of the change in the system of disposal of the paddy and of introducing an additional soil-class. In Lieutenant-Colonel Ormiston's area the final result led to a somewhat kaleidoscopic map of assessment-tracts, which has become capable of simplification by using the third soil-class and as a result of an increase in the local supply of carts which has led to more equal prices through the tracts.

271. Throughout the work of forming assessment-tracts the comparative method, applied on the spot, has been used with the constant aim of grouping together kwins which the people thought should receive uniform treatment and distinguishing those which they thought should be distinguished. It would thus be better in some ways to describe the tracting system as the direct formation of assessment-tracts, the price-tracts and primary tracts being groups of assessment-tracts formed for particular statistical purposes. Indeed, it may be said that each soil-class of each assessment-tract was built up field by field on the basis of a comparative study in which an endeavour was made so to instruct the assesseees and to enlist their interest that the greatest possible use of their special local knowledge could be made and a classification effected which should be approved by them as a basis of assessment. This is quite different from the analytic method of Settlement Instruction 173, but the common view, due largely to the influence of German thought, that scientific means analytic is erroneous. The most scientific method of soil-classification is that which takes the truest account of all the relevant conditions. The conditions of paddy cultivation are complex and

little understood, but in the descriptions and comparative valuations of the fields given by the local cultivators all the multitudinous elementary qualities have been correctly integrated, and with the aid of these integrations the problem of classification becomes susceptible of easy yet correct solution. Suggestions have been made that the analytic basis of classification used in Bombay should be introduced into Burma, but it appears that that system is not altogether satisfactory in lands in which it is so difficult as in Lower Burma to assign a numerical equivalent for the relative importance of soil and water, and further that, in Lower Burma (with some small modifications in deltaic tracts by allowances by holdings for ease of access to the lines of transport instead of the comparatively crude system of price-tracts as it is now used), the Burma system synthetically applied is far more truly scientific and gives greater promise of the eventual attainment of a satisfactory assessment-system. But apart from the technical matter of getting an accurate classification there are advantages in the synthetic method. By consistently treating the distribution of the revenue-demand upon the assessees of each *kwm* and upon different *kwns* as an affair of the people and teaching that Government desires equitable distribution, and by exhibiting the basis on which the new settlement is built, it should tend to make that settlement more acceptable. By enlisting the aid of the people so emphatically it shows that Government is willing to co-operate with the people—and this is the first right step in getting the people to co-operate with the Government. It also gives a morsel of political education and is susceptible of development into a system of settlement suited to responsible government and making proper provision for appeals, which if it is to be genuine must provide some equivalent for appeal against classification. And this term must be interpreted for that purpose in the sense which does not limit it to the internal classification of each *kwm* or holding but extends to the tracting, which in fact regards each soil-class in any assessment tract as a separate category for which an equitable assessment-relation to all similar categories in the district (or province) must be determined, and desires to place every field in the category most appropriate to it.

272 There will be sceptics who doubt if the system was really carried out consistently. I am in some degree such a sceptic myself. But on numerous occasions surprise inspections showed the instructions being obeyed. There is no organic difficulty in the method, the chief difficulty lies in the habits and mentality and general *Weltanschauung* of the Assistant Settlement Officers and the staff so long accustomed to different methods and especially to distrust of the assessees. It would be easier to work with new instruments. The Assistant Settlement Officers failed for some time to realise the importance of the spiritual factors. They saw soil-classification as a prosaic matter of purely material character. So it is in a sense, but the co-operation of the cultivators is an essential condition for its success, and the enlistment of that co-operation is a spiritual process. In one-fourth of the *kwns* inspection in detail has been conducted by myself after careful explanation of the functions of the cultivators, and in still more *kwns* parts have been inspected in the same way. I have invariably found the work best done in those *kwns* where the aim of classification and tracting as equitable distribution had been understood, while equally invariably I have found bad work accompanied by ignorance of this idea. The correctness of classification depended in fact chiefly upon the care with which the principles of distribution of the tax-burden were previously made clear to the people. Knowledge of these both aroused their interest and gave them an opportunity for intelligent co-operation. There is reason to believe that the party began after a time to understand the system, and then applied it with fair consistency. In spite of all care in supervision there must have been failures in various degrees—sometimes due to the settlement staff, sometimes to misapprehension of some matter by the people, sometimes to ignorance even amongst the nearest neighbours of the assessee concerned of the true value of the land they classified. But there is no reason to suppose that more errors have been made than under the ordinary system by which an ill-educated inspector with no agricultural experience classifies according to his own views by rules of thumb which are never tested and

have been derived from localities in which entirely different agricultural conditions prevail. A strong objection at the present is the large demand the method makes upon the nervous energy of the Assistant Settlement Officers but that diminishes as they learn the work and will diminish still further when the time allowed for settlements is increased—as for other reasons must be done—and when it will begin to happen after a few years, the settlements under revision show a classification which requires only detailed amendment and not such radical changes as were often needed in the present case.

## CHAPTER X—THE PRICE OF PADDY

273 The relation of local prices to the nominal price at Rangoon was determined at the same time as price-tracts were formed and the relation of the prices in adjacent tracts determined. The price for every tract will therefore be determined by fixing a standard price for Rangoon. According to the Settlement Instructions the price of each year is to be taken as the average of the prices of its first thirteen weeks, and the settlement price is to be the arithmetic mean of these averages for the last twenty years. Statement 4 at the end of this report shows for the first thirteen weeks of each of a series of years the average of the prices at Rangoon of the new crop of the year as recorded in the *Burma Gazette* in the first three months. The price of the year 1912 was enhanced by a peculiarly large demand from China, Japan and Java, coupled with small supplies in both Burma and Siam, to be 50 per cent above the average of the other years of the series, it is clearly improper to allow so exceptional a price to have any influence upon the price adopted for settlement purposes. The cultivators get far less advantage from an exceptionally high price than from an exceptionally low price, not only for psychological reasons relating to the spending of the windfall but also on account of the interest paid year by year on the debts incurred in bad years. It will be understood, therefore, that the year 1912 is struck out from every series of prices used in this discussion. (The effect of ignoring 1912 is a reduction of about Rs 2.5 in all the twenty-year averages.) With this understanding the average of the annual figures shown for the twenty years 1900 to 1919 in Statement 4 is the figure which seems to comply literally with the Settlement Instructions. But as no part of the settlement area sells in January, and in most tracts the harvest is disposed of by the middle of March, the average of prices from the fifth to the tenth weeks is appropriate to the greater part of the area. The southernmost tracts do, it is true, sell later than other tracts, and so get the advantage of the higher prices which generally rule in April, but the comparative method of relating their price to that of other tracts has allowed for this already. Annual averages for the busy six weeks of selling season are given in Statement 4 and only these figures will be used in the rest of this discussion. It so happens that in the present case the twenty years' averages are in no case changed by a rupee by thus restricting the number of weeks but that is no reason for ignoring the principle and it would not occur in districts which sold earlier or later than Myaungmya. The average based on the figures for six weeks each year from 1900 to 1919 given for Rangoon in the *Burma Gazette* is Rs 104. But there are other difficulties. In the first place the *Burma Gazette* figures are a mean between the prices of "boat" and "rail" paddy and the latter have now no relation to any part of the settlement area. Messrs Morrison's prices have therefore been tabulated too, and give an average of 106.6 for six weeks and 107.0 for thirteen weeks for the "best boat paddy" which corresponds to the paddy sold by several important tracts of the district. Then there are obvious objections to including in the period considered the war years succeeding 1914, as the price in Rangoon was affected so clearly by the world-conditions in 1915 to 1917, by the Wheat Controller's policy in 1918 and by the controlled price of 1919. But essentially all these factors, except perhaps the last, are a reduction of the normal demand, and if the twenty years 1895 to 1914 were taken instead there would be the same essential objection for the years 1895 to 1899, in which,

as the normal demand of the twentieth century had not yet developed, the conditions would bear no more relation to the new settlement than those of the war years. The objection is of the same nature and equally strong though less spectacular. In the Myaungmya District this contention has particular force because the Season and Crop Report of 1902-03 declares that since 1897-98 "Myaungmya has had a series of poor markets, supply exceeding demand, it is doubtful if the high prices (of Rangoon) this year benefitted the (Myaungmya) cultivators." Moreover, there must be some systematic way of dealing with wide variations of price when calculating the average. The one justifiable way is to represent the prices of successive years by a curve, to smooth that curve by the ordinary methods devised by statisticians for the purpose, and to fix the price according to the tendency then disclosed. But the Settlement Instructions ignore the important element of time and the corresponding quality of sequence in the figures, and ask for an arithmetical average. Following this method the annual figures are a mere jumble to be averaged; but even so the process of averaging must be suited to the purpose for which the average is to be used. The present purpose is to discover, on the assumption that the world-causes affecting the Rangoon price will tend to have the same average effect in the next as in the last twenty years, a price representing the normal condition of the market, the level to which after all variations it tends to return. Variations in the series outside a reasonable range must therefore be rejected. The high price of 1913 cannot be included merely as a set-off against the low price of 1915. Figures in the series varying from the average by over 20 per cent might reasonably be excluded, but it is proper to fix the range within which figures are retained by some property of the series. I have adopted for each series its standard deviation\* (S.D. in the table below) and calculated a corrected average for each series on the basis of years in which the variation in either direction from the crude average was less than this. The figures retained for averaging thus lie within a range of about Rs. 30 to Rs. 38 in each case, and the meaning of so wide a range as this to the cultivator is sufficient justification for not using a wider range. The table inserted in this paragraph shows the result of the process. The war years 1915, 1916, 1917 are included in each case, 1918 is excluded only in the mixed figures of the *Burma*

	Period Averaged.	Crude average †		S. D.	Corrected Average		Assumed price.
		Years.	Average.		Years retained for Basis	Average.	
Rangoon ( <i>Burma Gazette</i> ) ...	{ 1895-1914	19	101.5	14.5	11	97.0	} ...
	{ 1900-1914	14	104.3	15.6	9	101.7	
	{ 1900-1919	19	104.0	14.7	11	100.0	
Rangoon (Messrs. Morrison) ...	{ 1900-1914	14	107.0†	16.0	9	104.3	} 102
	{ 1900-1919	19	106.6	15.2	12	101.7	
Bassein ‡ ( <i>Burma Gazette</i> ) ..	{ 1895-1914	19	99.1	18.1	12	93.9	} 101
	{ 1900-1914	14	103.4	19.2	9	90	
	{ 1900-1919	19	102.9	17.6	13	98.2	

*Gazette*, and 1919 is included only at Bassein. I have, on this basis, adopted Rs. 102 as the standard price for "boat" paddy at Rangoon, and thence determined by the established relations the prices of all tracts selling to Rangoon as shown in Map IV.

274. The determination for the standard price for Bassein on the basis of recorded prices is an unsatisfactory proceeding because of the vaguenesses attached to the records (Appendix A). The averages shown in Statement 4 and the table of the last paragraph were obtained by assuming that a genuine nine-gallon basket was used in

\* The square root of the average of the squares of the deviations of the terms from their average. The year 1912 is still struck out in every case before any average is taken.

† The year 1912 is omitted all through.

‡ Recorded prices from 1895 to 1907 have been reduced by one-eleventh before averaging.

1895 to 1907 and that the average weight was truly fifty pounds, so that the figures recorded for that period if diminished by one-eleventh could be associated with the figures of the succeeding years. A standard nominal price of Rs 98 is indicated under these conditions, but the prices adopted in Statement 4 and Map IV correspond rather to a standard price of Rs 101, nearly equal to that at Rangoon, and this is supported by the fact that for 1908 to 1914, when conditions were normal and the Bassein price had a definite meaning, the average for Rangoon is only 1·7 above that for Bassein. The differences in local price of adjacent tracts applied to the Rangoon standard price establish consistent prices for the tracts which sell to Bassein and connote a price of Rs 101 there. The figures given by Messrs Morrison at Rangoon are so much more reliable than those of Bassein that one prefers to adopt them, particularly as the "basket" of the earlier Bassein records probably differed a little from nine gallons in capacity or from fifty pounds in the weight of the paddy it held. The eastern side of Tract 10 exports to Rangoon and its price is determined by the Rangoon price, while local people say that occasionally the east and occasionally the west side exporting to Bassein has the advantage in price. From this the prices of Tracts 8 and 9 also can be based upon those in Rangoon although they actually export to Bassein.

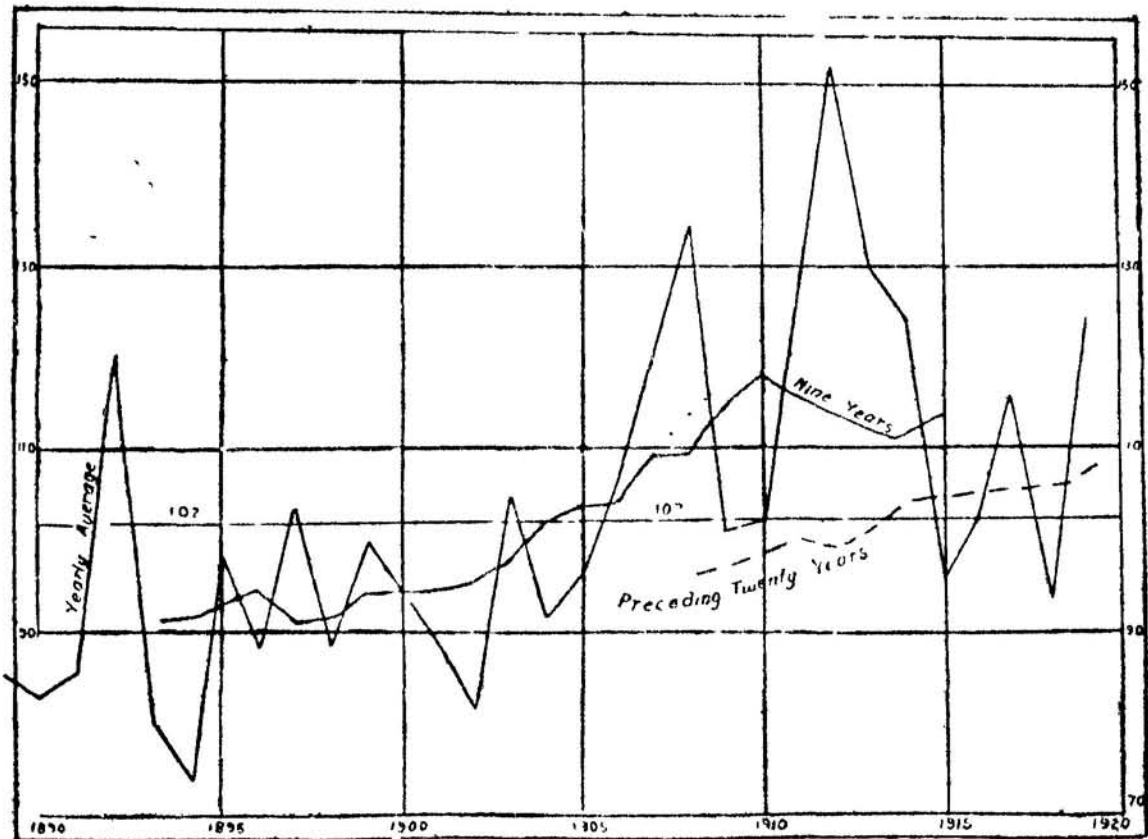
275. In 1910 Mr Duffin took Rs 99 as representing the average normal price at Bassein for paddy from Bassein District while Mr Arbuthnot took Rs 96 as the price at Rangoon for the Hanthwaddy District. In 1912 Mr Duffin took Rs 96 as the Bassein price for the paddy from a different area and, allowing Rs. 12 for all deductions, he found Rs 94 as the price of fifty-pound paddy along the bank of the Myaungmya *chaung* where the present proposal is for Rs 100. Mr. Jamieson in 1914 took Rs 102 where Rs 101 is now proposed as the average price at Bassein, but I am unable to accept either the records on which his estimate was based (Appendix A, paragraph 2) or his treatment of the year 1912. In 1902-03 Mr. MacKenna stated that he assumed Rs 90 as the nominal Rangoon price and Rs 80 per 100 local baskets,\* probably equivalent to Rs 77 for 100 Government baskets, for Tract 12 where Rs. 107 is now proposed, the increase proposed in other parts of his area is of similar magnitude. In 1903-04 Mr. Lowry took Rs. 82 as the price in Wakèma where Rs 97 and Rs 102 are now proposed, and Rs. 78 in Myaungmya Township where prices ranging from Rs. 89 to Rs 100 are now proposed. In 1905-06 Lieutenant-Colonel Ormiston took Rs 89·5 and Rs. 85 in the area settled by him on the east where it is now proposed to take Rs 95, Rs. 97 and Rs 102. The absolute increases in assumed prices in the three areas now to be resettled are therefore about Rs 27, Rs. 18 and Rs. 12 respectively. But at the time of those settlements the cost of transport and marketing was much higher and was not covered, as it is now in so many tracts, by the allowance for the weight of the paddy, which also in some tracts was less than now. The detailed comparison of the prices assumed for the current settlements with those now proposed is best shown by a comparison of Maps I and IV.

276. For comparison with the level of prices adopted in other settlements a sample calculation of Dealers' Costs. sample calculation may be given, based upon the statements and accounts of an agent at Mawlamyaingyum of a large European milling firm in Rangoon. Cargo boats of 2,000 to 2,200 baskets burthen are hired at Rs. 8 per day inclusive. Commonly two journeys per month are achieved, so the boats cost about Rs. 6 per 100 baskets. Add Rs. 1·25 for Twante Canal charges, Re. 1·0 for loading, Re. 0·50 for measuring at Rangoon, and it will be seen that the recognised allowance of Rs. 11 per 100 baskets to cover all expenses with a narrow margin leaves Rs. 2·25 to meet the cost of the jungle-broker, the clerk, watchman, lamps and other incidentals. The miller pays Rs. 3 brokerage to an "outside broker," but as the latter will then spend Rs. 20 or Rs. 30 on *douceurs* he is no better off than an "inside broker" who receives Rs. 2. Suppose the Rangoon price for *ngasein* is Rs. 102,

\* Mr. MacKenna, however, actually used Rs. 80 in his calculations as the price in Government baskets (or the outturns assumed by him were expressed in terms of local baskets).

and for *kaukgyi* is Rs 3 higher. Add Rs. 16 for 52½ pounds weight and brokerage, and deduct Rs. 11 expenses, and a remainder of Rs. 112 represents the working basis for buying *kaukgyi* paddy at the river bank. "We always try to get Rs. 2 or Rs 3 off that," says the broker, so the price actually received by the cultivator allowing Rs. 2 to Rs 3 on an average for cart hire from the threshing-floor to the river-bank would be Rs 107 within one or two rupees either way according as the paddy was nearer 52 or 53 pounds and other circumstances. Other dealers manage the transport more chiefly by hiring a boat and a crew separately and get a larger rate of profit, but owing to the extra details thus claiming their attention they deal with a smaller bulk the average price they give to the cultivator would of course be the same. At places near Wakòma the average weight allowance is 13 per cent. and the paddy gets the *ngasein* price. At the river-bank the price is 5 per cent above the nominal price in Rangoon, *i.e.*, is Rs 107, but this is in village baskets and is equivalent to about Rs. 102—the same as the nominal Rangoon figure—for 100 Government baskets at a threshing floor in the *kwin* or Rs. 104 at the river-bank. Add Rs 10 as a slightly generous estimate for the cost of transport and incidental expenses and the dealer will be seen to have a little above one rupee and the brokerage paid by the miller for his profit.

277 The object of adopting a twenty years' average of prices is to avoid the Suitability of the Adopted Price. adoption of a price which, by the accident of the time of calculation, has been enhanced or depressed by a temporary deviation in the market, and would differ from the price actually received by the assesses during the settlement by so much as would make the revenue rates based upon it unsuitable. In the graph is shown the variation in the price of



— Nine year's average shown at *middle* year of the nine — — — Average price for 20 years shown at last year of the period..... shows the effect of including 1912 prices when averaging. *N.B.*— The base-line of the graph is 3½ inches below the 70 horizontal.



paddy at Rangoon from 1889 to 1919 based on the figures given by Messrs Morrison for "boat paddy" for the six weeks of the present selling season of the settlement area.\* The average price for each year and the four preceding and four following years is also shown, and indicates the general trend of prices in the period considered. The average price for each year and the nineteen preceding years (always omitting 1912) is also represented by a curve which shows at once that, owing to the general upward trend of prices, the value of that average is an accident of the year in which the period ends. Moreover, owing to the ignorance of the element of time in calculating it, this average for any period is the same as it would have been if the curve of prices had been the reflection of the actual curve in the vertical representing the middle of the period for the period 1900 to 1919 this reflection would have shown a general trend downwards instead of upwards. It appears therefore that the order of occurrence of the recorded prices ought to play some part in determining the settlement price. It is true that as the assessment rates are not adjusted solely according to the change in price since the last settlement but depend upon a variety of considerations, especially upon changes in soil-classification, there is a tendency for the total demand from a settlement area to be so adjusted by the assessment-fraction as to be largely independent of the assumed price. But the effect upon the distribution of that demand over the various soil-classes is of importance. Where the cost of cultivation is chiefly disbursed in cash the effect of reducing the settlement price while maintaining the total demand is to diminish the rates on good soils at the expense of raising the rates on poor soils. But in the present settlement the part of the cost of cultivation met in cash is so small that its equivalent in paddy at any reasonable price may be substituted for it without serious error. The change in net produce then is in the same proportion as the change in price in every soil-class. The total demand being kept unchanged a change of price under this condition has no effect on the rates if there is only one price-tract, but if there are several price-tracts the result of depressing the general level of price is to increase the differences between the calculated rates in the tract of mean price and those of high or low price. The increases caused by small variations of the price would generally not be enough to affect the actual rates which proceed by grades of not less than four annas, and the principal effect of choosing one price rather than another for the present settlement is the subconscious influence it has upon the consideration of the general conditions. It is desirable therefore to choose a price for the calculation of assessment by the same method as was used in neighbouring settlement areas, and Rs. 102 in Rangoon then seems to be a reasonable figure. This happens also to be the equivalent to the price of Rs. 105 adopted on a twenty years' basis for purchases by the Wheat Controller in 1918 of "first quality Europe paddy."

278. But for some purposes a different figure must be used. That part of the cost of living, for instance, which is met by grain taken from the harvest must be valued according to the level of price prevailing in recent years, and rents would be better converted to cash at that price to prevent a mistaken impression as to their relation to sale-prices. An important reason for distinguishing the price used to convert paddy payments to cash in some of the statistics will appear also in the discussion of the cost of cultivation in Chapter XII. As inspection of the graphs shown suggests that the equivalent in each tract of Rs. 112 to Rs. 115 in Rangoon is a reasonable figure to use for this purpose, a price Rs. 12 higher than the settlement price was taken in each tract in valuing all quantities of grain entering into Statement 13 in which the income and cost of living of agriculturists are shown.

## CHAPTER XI.—OUTTURNS OF PADDY LANDS.

279. Particular attention was drawn in Chapter VII, when describing the basis and method of the classification of soils to the two principles that not the rate of gross produce but with certain limitations—and not otherwise—the rate of net

\* Messrs. Morrison's figures for 1889 to 1899 are not available. But in the five years 1900 to 1904 they averaged Rs. 2 above the *Burma Gazette* figures. It has been assumed that the same difference held uniformly from 1889 to 1899 for the purpose of drawing the graphs.

produce, that is, gross produce diminished by the cost of cultivation, is uniform throughout a soil-class of a tract, and that no assumptions as to the absolute amount of either the gross or the net produce were used in effecting the classification. But since continuous comparison was at the basis of all the work there was necessarily some discussion of relative outturns. It would not be possible to proceed merely by asking whether equal assessments in two kwins would be equitable, the reasons for a decision on that question must be examined, and this examination involves a discussion of price and relative gross and net productivity in the kwins of the neighbourhood. At some time during the examination by the assesses of the Inspector's proposals for classification, the Assistant Settlement Officer calling a halt for a rest would discuss the outturns of representative land in each of the classes which were being formed in the kwin. The relation between the outturn and the costs, difficulty and risk of cultivation of the kind of land upon which the company was actually standing with the outturn and the cost, difficulty and risk of cultivation in similarly situated land in the neighbouring kwins was discussed by the assesses of the kwin under examination, and their opinion was confirmed or criticised by any representatives of the neighbouring kwins who were present, or at least was compared by the Assistant Settlement Officer with the statements about the same matters which had been made in the previously classified neighbouring kwins. Moving then to land of a different soil-class the process was repeated, the company always standing upon the kind of land which was under discussion. If the conditions and profit of cultivation in the two kwins were identical, no introduction of unit areas was necessary to decide that they should be associated in the same tract, but if the idea of the unit area was introduced the difference between the outturns of the different soil-classes could be estimated. The *kwet* of forty fathoms square is universally understood because it is in such frequent use to calculate payments for labour, and most cultivators are able to mark off a *kwet* of land with the eye with fair accuracy. In each village there is a tradition as to the outturn obtained from a *kwet* of good land and the defect from this in the outturn of inferior grades. In two adjacent kwins of a tract the cultivators might give slightly different estimates of outturns for a particular soil-class although they agreed that the conditions in the two kwins were identical. But the discrepancies were small and certainly not such as to invalidate the estimates of such an elusive and uncertain quantity as the outturn of land with the constant variations which result from the chance of the seasons and from differences in the industry, health and resources of the cultivators, the size of holdings, and the differing methods of cultivation or apportionment of time and energy to different fields according to the differing proportions of the soil-classes associated in the several holdings. In some cases the numerical estimates of outturn were clearly erroneous when considered in relation to those of neighbouring areas admitted to be of equal quality, but a general consensus of opinion always emerged quite easily when the comparison and discussion was continued day by day in a continuous progress across the country. Moreover differences were naturally more easily estimated than absolute values, and the estimates of the difference in outturn of first and second-class land in successive kwins never differed seriously; one kwin might estimate sixty baskets for first class land and the other sixty-five, but both would give "fifteen to twenty" as the representative difference between the first and second classes. So too in pairs of kwins along a tract boundary the outturns in different pairs might be stated in slightly different numbers, but the defect of one tract below the other would be given in practically the same terms everywhere. It is important to note that identical numerical estimates of outturns were never taken as evidence of equality of fertility, nor differences of such estimates as proving a difference of fertility, the similarity or difference of two localities was the primary fact established without reference to the numbers, which were a secondary matter for subsequent discussion.

280 Seasonal variations had always to be discussed. The usual procedure was to ask the people first to tell about the outturns and let them say as much as they cared. They generally contented themselves with stating simply a rate of outturn per *kwet*, and were then asked whether that was an outturn which they

could rely upon getting. Then followed a discussion of the variation of seasons and the outturns of bad years in which the wife's jewellery must be pawned, of good years in which it could be redeemed and of middling years when ends would just meet. The frequency of each kind of season was the most difficult subject to discuss because memories are so short. But it was generally possible to learn such facts as the following. An outturn of 70 to 75 baskets per *kwet* is a matter for rejoicing and very occasionally something near 80 can be had. In bad years the yield falls to 50 or 55, but usually 60 to 65 can be expected and with this outturn, though it gives no reason for elation, one ought to be content. In the same way care had to be exercised with regard to the matters represented in the soil-development curves so that the temporary enhancement of outturn in a neighbourhood in which much land was near the culminating point of the curve should not lead to an exaggerated estimate of the normal yield.

281. By the continuation of this process over the whole settlement area the estimates of every tract were checked in some degree by the estimates of every other tract, and a system of assumptions for outturns in terms of village-baskets and *kwets* was reached which might err by placing the general pitch a little too high or too low but could not err seriously in the comparative fertility it ascribed to the various tracts. Even the general pitch, however, has some protection against error because the small outturn of third-class land leaves little room for error and is much the same in all the tracts. In the poorest tracts the differences between the classes are small and liable to little error, and the risk of error in the richer tracts, in spite of the larger numbers, is thus reduced too, because directly or at a small number of removes they are compared with the poorest tracts. The results obtained are not quite precise definite integers, there is always and necessarily a small range of uncertainty in a set of numbers in which accuracy within five or even ten per cent. cannot be spoken of. But given that three tracts in sequence differ at each step by eight to ten baskets, that the outturn for the first is estimated as between 60 and 65 and rather towards 65, the second between 55 and 60, and the third between 45 and 50, it is clear that 64, 56 and 47 are not greatly in error, and by tracing the relationship with other tracts on each side, and in many cases by returning to the original tract again after passing through a cycle of tracts, further support for these figures or reasons for varying by one or two units will be found, and thus at last a consistent set of assumptions is constructed for the whole settlement area. About four per cent. must be added to translate these numbers to measurements in Government baskets and then, as a *kwet* is 1.32 acres, three-fourths of the numbers are the acre outturns. The assumptions so developed are shown in the first three columns of Statement 10.

282. As a check upon assumptions formed in this way figures were collected to represent the outturns actually obtained in a large number of holdings. Every piece of land which entered into any statistical form had its bounds beaten so that its correct area should be known, and it was convenient to enquire in every such case about outturns. The system of recording was such that the outturn of a holding which had already been recorded in any one statistical form could not exercise undue weight in the outturn statistics by being recorded in a second form and tabulated twice. Thus the majority of the records relate to land which was rented but some relate to other land, only in the west of Myaungmya Township were outturns recorded for holdings which did not enter into the statistics on some other account, but there it was necessary to make a special record for outturns because otherwise so few records would have been obtained. In every case the outturn of the year of enquiry was first recorded, the bounds of the land being beaten then and there and a note made of the fallow fields included; then the outturns of the previous year and of the year before that were recorded in this order. As much care as possible was taken to verify that the land concerned in these two previous years was the same as that in the current year and to reject forthwith all cases in which this was not so; but errors arising on this account are inevitable, and it is so difficult to get a correct statement of the fallowed area in previous years that, on account of the number of

other matters requiring attention, this was ignored. The real object was not so much to get the figures for three particular years—which are not a sufficient basis for an average of outturns—but to lead up to the cultivator's estimate of the outturn in a middling year. Thus he would be asked of each of three years whether he considered it good or bad, and would perhaps make an estimate for a middling year in which he would be neither depressed nor elated and bracelets would neither be bought nor pawned. Whether he did or not the figures indicated such an estimate, and two figures could be taken and enquiry made whether they would be good or bad outturns. By continued enquiry the range between these was narrowed until it was reduced to such a small percentage of the outturn that its middle point could be taken with sufficient accuracy. The total of the outturns recorded for each of three years and for normal year (N) is shown in column 8 of Statement 10. The latest year is the settlement year in which soil classification was effected and the bounds of the holdings beaten and the enquiries made and is shown first, the worked area corresponding to the outturn of that year is shown in column 4, while the outturn of that area calculated at the assumed acre rates is shown in the upper line of column 8. In column 5 is shown the fallowed area associated in the same holdings in the settlement year, and in column 8 the lower figures in italics show the outturn corresponding to this area at the assumed rates, for years in which the outturn in column 7 exceeds that of settlement year this outturn for the fallow area gives some indication of what part of the excess outturn might be due to a diminished fallow area.

283 Unfortunately, besides the errors due to changing areas in the earlier years of the record there are errors in the outturns due to the forgetfulness of the cultivators, and both are emphasised where the land is cultivated by different tenants each year. Landlords are apt to overstate outturns and even to give estimates of outturns without having the slightest knowledge of what the tenant actually obtained, tenants often speak without much sense of responsibility where, as is usually the case, revenue is paid by the landlord, and are liable to a temptation to understate if the landlord is present listening for an excuse to raise the rent. Further, all estimates are very rough, not only does the undeveloped memory fail to carry the figures but as a matter of fact the outturn is rarely measured. The rent, cattle-hire, wages of labour and debts are measured out in the local basket; the provision for home-consumption (if this can be made) is made by guess, the portion sold is measured with the broker's basket and after selling a round number of baskets there may be a small balance to throw into the food store. Errors in estimating the unmeasured part are not serious although for the part consumed during harvest time, taken away a little at a time, only a very rough guess is possible, the chief errors arise because the total outturn is learned only by the addition of several items and this addition may be incorrectly performed either by purely arithmetical errors or by omitting or counting twice some items or by a clerical error in writing them down. Enquiry into outturns often involves reconstructing these calculations unless one is prepared to accept any statement made off-hand in the hope of staving off enquiry. As far as possible the figures were checked by the Inspectors and Assistant Settlement Officers, but the latter have so many matters claiming their attention that they cannot check very completely and the former are not always as critical as one could wish. Moreover, owing to the general lateness of threshing some records could not be made by the Assistant Settlement Officer while he was in the kwin but had to be made afterwards by the most trustworthy clerk that could be sent; in 1918 and 1919 owing to the rain at harvest and the bad markets under war and armistice conditions the threshing was so late in parts that outturns for areas classified at the beginning of the season could only be recorded in mid-April when some of the cultivators had probably forgotten some small early disbursements of grain and an unusually large part had been consumed in small daily portions of which the total must be estimated. The total used for food can be reckoned fairly well according to the uniform daily rate which is the custom of the family, but of that used for miscellaneous purchases no safe account can be made. It may be opined that the errors of recording average out in extensive tracts, but there is no guarantee that they will be completely eradicated, there may be a residual bias in either direction in any tract.

284. Apart from errors of the record there are fundamental difficulties in the interpretation of the figures obtained. In the first place assessments and therefore classification are not based upon gross produce but upon net produce. Land which has the outturn of one class of soils may be and often is placed in a lower class on account of special expenses or difficulties or risk of cultivation. Strictly all such land should be excluded from the statistics or tabulated according to the class which its productivity would warrant if its conditions of cultivation were normal, but neither of these courses is practicable when settlement work proceeds at the speed required. As no land is placed above the class its productivity warrants this effect cannot average out, it must persist as a bias towards a higher total outturn from the holdings considered than would be calculated from the rates assumed for each soil-class. In such an area as is treated in the present report this effect is apt to be stronger than usual, especially in the more southerly and newer parts where much land is still in process of clearing and reclamation. A similar effect is caused where patches of superior land are too small to be distinguished on the maps; the contrary case of patches of inferior land is of course much rarer because these cannot be overlooked in the same way. Then again there are the effects of the phenomena which stand behind the soil-development curve, in the oldest tracts most land is near the asymptote, but in the newer tracts excessive outturns will again be recorded on this account. Exclusion of these statistics is generally impossible because parts of every holding treated may be affected. A further consideration is the range of quality in each soil-class, the outturn to be assumed is the representative outturn of the great body of the normal land in the class, but in the selection of holdings for which statistics are obtained the average in any class may differ slightly from that figure. When multiplied by the large number of acres tabulated even a fraction of a basket may make a large difference in the total. Outturns moreover cannot be pinned down at a definite figure, one can only claim to suggest a figure that does not differ by more than two or three baskets from that strictly correct.

285. If now the left-hand portion of Statement 10 is examined with all these considerations borne in mind it will be found to give good support to the proposed assumptions for outturns. The harvest in the years 1915 to 1919, taking the settlement area as a whole, were bad, fair, good, bad, fair, respectively, but there were local variations from these descriptions. Comparison of the four outturns recorded in column 7 for some tracts shows that the "normal" outturn has been frequently misunderstood, as for instance in Tracts 24, 25, 29. Partly this is probably due to local difficulties of interpretation, particularly in holdings which are on the ascending portion of the development curve—it was frequently found that particular care was needed to prevent the outturn at the highest point of that curve being regarded as the normal, this being a natural result of the comparative slowness of change at that stage of the development. Partly, no doubt it is due to a failure of the clerks to whom the idea of a normal outturn was new; they should do better in a subsequent settlement. Partly it is due to the frequent changes of tenants and the consequent uncertainty of the outturn. To protect the figures from some errors the reputed outturn of the land was also recorded in cases in which this was the recognised measure of the land, and it was found by separating the figures for such holdings from those for holdings defined by a real units that figures in better agreement with the assumptions were

4	5	6	7	8	9
1,620	.	1919	199.4	...	..
3,521	13	1918	211.9	213.7	...
.	.	1917	217.4	2.3	245
1,473	105	N	216.7	..	...

obtained. For Tract 21, to take an example, columns 4 to 9 for these holdings alone would read as in this margin. The percentage difference of the calculated outturn from the normal is 1.4 instead of the 7.6 of the figures in Statement 10. The difference is due to the greater care with which the outturns

of such holdings are noted and recorded by tenants who compare them with the outturns alleged at the time of letting. The sum of the latter for the holdings of the marginal statement was 258,090 baskets or 21 per cent. above the figure of

column 8. It is thus clear that a narrow insistence upon a matter of one or two baskets in the assumptions on account of differences in the figures of columns 7 and 8 is not to be made. The correct interpretation of Statement 10 is comparative. For Tracts 12, 13, 14, 15; 21 the assumed outturns appear harsh; for Tracts 18 to 20 and 22 to 27 they appear lenient. But Tract 12 has numerous non-resident tenants and the apparently harsh assumptions must be compared with the apparently lenient assumptions of Tract 19. On Map III these tracts are contiguous and in the mouths of people on both sides of the mutual boundary there is no doubt about the small difference in quality being in favour of Tract 12. At last settlement 60 baskets was suggested by the Financial Commissioner as a fair assumption for the first class in both Tracts 12 and 19. In Tract 13 there is apparent harshness if the 1918 outturn is considered, but that was a bad year and the difference from Tract 12 is not doubtful. A further note on this tract will be found too in the next section in which comparison is made with the assumptions of the current settlement. In Tract 21 the harshness again appears in the comparison with the 1919 figures, but the figures of earlier years suggest rather leniency and the special figures given for this tract earlier in this paragraph rouse no suspicion of either fault. In Tracts 14 and 15 the harshness must be considered in comparison with the apparent fairness of Tracts 16 and 17 which touch them in Map III in so many places and the apparent leniency of Tract 18 which could be compared with Tract 16, though not so well as comparison is made in most other cases because of the width of the river between them. Note, too, for Tract 18 that the years 1916, 1917, 1918 were fair, good, and bad respectively, and the "normal" is placed almost equal to "good." Tract 19 has already been discussed in relation to Tract 12; its low figures in column 8 are partly due to reduction of classification on account of the heavy growth of *baw* grass which occurs in some parts of it and increases the cost of tillage. Tract 20 presents peculiar difficulty because it has lately become subject to increased flooding of which the "normal" figures take no account as the cause is the change in the embanking near Yandoon the effect of which at Kyaikpi is only now becoming pronounced. In Tract 22 the "normal" appears to have been interpreted as the nominal in many instances, the tract is a small one of only five kwins, and the exaggeration of the normal figures escaped my attention because the field work of this tract was completed while I was suddenly called away to take the place in another tract of an Assistant Settlement Officer who had suffered sunstroke. Comparison with the assumptions of the expiring settlement, however, indicates the danger of raising the assumptions which agree moreover fairly well with the actual outturns of 1917 to 1919. In Tracts 23 to 27 inclusive there is much uncertainty of area owing to incorrect surveys; holdings which could not be exactly delineated on the map were struck out of the statistics, but there are doubtlessly many errors in the survey and area estimation of those which remain because these are new tracts and most holdings are being steadily extended. In Tract 27, which consists of a few isolated kwins, the areas are so certainly quite wrong that I was in doubt whether to show any statistics for the tract at all, it was proposed to resurvey all these kwins for the settlement but the Land Records Department could not compass the work. Newness of these tracts with much land in the dome of the soil-development curve also leads to abnormally high present outturns which could not be made the basis of a twenty years' settlement. Moreover there can be no doubt about the steady decrease of fertility along a line drawn from Tract 12 towards the south-west. Tract 12 was one of those which appeared to be treated harshly by the proposed assumed outturns, and if the leniency suggested by the cultivators' statements in Tracts 23, 24, 25 were allowed to cause those assumptions to be raised, this gradation of fertility would require the assumptions of Tract 12 to be raised still higher, while if the assumptions for Tract 12 are accepted the apparent leniency in these southerly tracts is clearly shown to be due to such causes as those enumerated in this connection earlier in this chapter.

286. Examined thus comparatively, with a clear recognition of the inherent limitations of the statistics, it appears that the proposed figures in column 3 of Statement 10 form a consistent set of assumptions with a general collective

support from the statistics of outturns as a whole. This basis is very wide; it extends to 11,180 \* holdings and 224,431 acres or 49 per cent. of the whole area of paddy-land classified. The relationship of each tract to its neighbours is determined by the general consensus of local opinion, and receives some additional support from the figures. The general pitch of the assumptions is firmly established by the figures when they are examined collectively in spite of their limitations when examined individually, and, even if it were not, a small error in it would be of no importance whatsoever in fixing revenue rates provided the relative treatment of the tracts is equitable.

287. If a comparison of the assumptions with those of the expiring settlements is made the latter may be taken to be represented fairly by the figures in the last two columns of Statement 10, where in the cases in which new tracts include parts of more than one old tract the old outturn for the major part is given. The effect of using three soil-classes instead of two should be to permit a raising of the assumptions. Tract 13 still appears to be somewhat harshly treated, but in 1902-03 Mr. MacKenna in assigning 40 and 30 baskets to his Tract II stated his opinion that the whole tract would be combined with Tract I at the revision of his work, the greater part of Tract II has been included in new Tract 12 as he anticipated, and Tract 13 is the inferior balance. In Tract 20 which appeared to be leniently treated the new assumptions are considerably higher than the old, as they are also in Tract 21 in which the assumptions seem lenient when compared with the alleged "normal" outturn. In Tracts 24 and 25 the increase of the assumptions is due partly to the disappearance of jungle and partly to the extension of cultivation into *kanaso* land instead of being confined the more easily cleared higher land as in earlier days.

288. The prescribed method of obtaining evidence relating to the outturns of each category of soils by reaping selected representative fields and comparing the outturn and the area of each was also followed, and details of the results of these experiments in each tract are given in columns 10 to 22 of Statement 10. The marginal statement shows

	1916-17	1917-18	1918-19
Number of experiments ...	1,883	1,515	448
Number of acres reaped	1,040	814	219
Number of experiments per thousand acres represented.	4.0	3.3	2.8

the total number of experiments made and of acres reaped each year, omitting those which were rejected because of some error in procedure. The number is small in 1919 because the work of soil-classification in 1918 had been so curtailed through the

rain which delayed the harvest in that year that it was necessary, in order to complete the operations in the time allotted, to confine these experiments to the area of comparatively early harvest which still remained for classification. In the first year the Land Records Department assisted by selecting and marking over 600 fields and superintending the reaping of half of them; but this proceeding was unsatisfactory to the Land Records Officers because it interfered with the regular work of the surveyors, and to the Settlement Officer because he found the work of the surveyors even less reliable than that of the settlement staff. Superficially regarded the process of reaping these fields should yield with ease reliable results on which assumptions for outturns could forthwith be based, and many have even gone so far as to base the soil-classification and tracting of each *kwin* upon the outturns obtained in these experiments in the one *kwin*. But the variability in the outturn of a given field from season to season according to the thousand and one chances of the season and especially to the luck experienced on the day when it was transplanted—the luck of cool cloudy weather enabling the roots to get firmly established before being called upon to withstand scorching sun or swirling flood—and the

\* Statistics were recorded for many more even than this, but several hundred cases were rejected because three years' figures could not be had to check the "normal" and some because the records were erroneous or doubtful.

variability of outturn from field to field in the same year in a block of uniform quality must be recognized. The latter was shown very clearly in paragraph 112 of the Tharrawaddy Settlement Report, 1913—15, in which the rates of outturn per acre of first-class fields in one uniform block ranged from 20 to 41 and of second class fields from 13 to 38. Pressure of other duties forbade carrying out my intention to make similar experiments in the wet soils of Myaungmya, but there can be no doubt that a similar result would have been reached, and evidence supporting this view will appear later in this chapter. Whatever use is made of these observations they must be interpreted statistically, that is by the tendencies of large groups and not as individuals, and there are numerous difficulties discovered as soon as the examination of the problem goes below its surface.

289. It is impossible to make a sufficient number of experiments to justify taking fields at random. It is equally impossible to justify the procedure of letting seventy or more settlement clerks loose upon a district to reap such fields as meet their fancies. An attempt must be made to select fields which are near the average or mode of fertility of the category to be represented, and two methods offer themselves. One is to select for reaping fields in each of which the general appearance of the standing crop suggests that it is of about the average quality of the crop in an average year of fields in that soil-class in the locality. The other is to ignore other seasons and select for average quality in the particular year. The latter is the easier and was therefore adopted in this settlement. It should also have the advantage of assisting to some extent in the interpretation of the statistics of outturns by holdings, though—as is shown by a comparison of column 6 of Statement 10 with the headings of columns 10 to 21—its usefulness in this direction is limited in the tracts classified before the last year of the operations. Unfortunately even this simpler basis of selection is beyond the capacity of a staff which has such inferior conditions of service that it attracts few besides men who have failed to obtain (or have so little education that they could not even try to obtain) an appointment elsewhere, and includes a considerable proportion whose capacity at recruitment was limited to playing in the football team, and commonly believes that its first duty is to show reasons for enhancing the revenue. The tendency of the staff to select the best fields is well known to all Settlement Officers. The orders in this settlement were that the local cultivators should select what they considered representative fields in each grade of land after the object of the experiment had been explained. But just as it was difficult to persuade the Assistant Settlement Officers of the importance of the discussion of objects and reasons before proceeding to action in soil-classification, so it was impossible to get many clerks to comprehend the importance of this explanation before selecting fields for reaping—or at any rate to convince them so thoroughly as to affect their action. Often the villagers informed me when inspecting that the selecting clerk had chosen the fields for himself or that he had chosen the best fields—the practical meaning was the same—and the difficulties of travelling made it impossible for supervising officer to correct all these. It is not generally possible to go across country from one village to another in December; a long *détour* by boat is required and time is lost in hiring boats or waiting for tides. Supervision of crop-reaping is thus immensely weaker than in such a district as Prome where the supervisor can walk or ride anywhere he pleases. It is exceedingly unpleasant, too, to go down into the low-lying fields in December, and the inferior clerks, avoiding the mud and water as much as possible, placed their selections in second class land as near the first class land as possible and therefore raised unduly the average second-class outturn. The better clerks and inspectors have also contributed to this effect because, in the reaction from their former methods of selecting best fields which resulted from the teaching they received, they tended to choose excessively poor first-class fields and in many cases overstepped the boundary so that what they intended for a first-class field became an excessively good second-class field. These selectors will do better in future, but the effect could not be eliminated from the present settlement. The current classification also had an effect in Tract 12 in which little land was placed in second class at last settlement and all selections were made before the classification had been revised; a fair average field from the first-class so defined would



tend to be on the border of true first and second class and so depress the first-class and elevate the second-class average. All reaped fields were specially surveyed and their areas calculated accordingly to avoid suffering errors in identifying the field on the map and errors in the Land Records Department's area statements—the latter may be correct enough to determine holding-areas without being correct in every field. To prevent guesses at the outturn being recorded by dishonest clerks so as to save the trouble of reaping or threshing, the straw was heaped in the threshing-place and protected from cattle till an officer of the party had seen it. But one clerk (since dismissed) obtained straw from elsewhere with the connivance of villagers only too glad to escape laborious work—all his records were of course destroyed, but possibly others whose records were not rejected did the same. Measurements of the paddy were ordered to be made by pouring into the standard measure in the manner practised when selling paddy—it is of great importance that uniformity on this point should be observed, as a very much larger quantity of grain will enter a measure if it is poured in slowly so that the interstices between the grains are reduced.

290. Of all the sources of error treated so far the errors of selection are the most important, but just as in the case of holding-outturns there are difficulties which have no relation to the agency employed. The soil-class depends upon net-produce and not upon gross-produce, many fields therefore, owing to special risk or expense involved in cultivation, have been placed in a soil-class lower than their gross outturn at first sight seems to warrant. Every such field occurring in the experiments ought to be tabulated not in its actual soil-class but in that class to which it would belong if it produced its actual outturn under the normal conditions of its tract. An attempt was made during the soil-classification to mark reaped fields in which this consideration applied, but it was not successful because my agents were so fully occupied with other matters and did not appreciate the importance of this. A somewhat similar difficulty is caused by fields which are above the asymptote of their fertility-curve, in the majority of cases the clerks learned not to select these in the first class where the special luxuriance of the crop would be apparent; but they were apt to select them in the second-class soils, especially as in many cases they intended the selection to represent the first class in areas which had not yet been reclassified. Again a field may be placed in a low class on account of some disadvantage which was not operative in the year in which it was reaped by the settlement party—for instance, liability to inroads of animals or damage by waves or liability to flooding in a tract in which flooding is unusual, as in the preceding case there are no fields correcting the average again by the opposite tendency. Still another source of error in tabulation arises in the case of fields which had to be placed in a class lower than that usually corresponding to the measure of their gross outturn because they grow a large crop of grain of inferior price. Such are those which grow *ngasein* in a *kaukgyi* tract or are so situated that their produce is particularly liable to be chaffy or to suffer damping and the consequent heating and depreciation.

291. An attempt was made to meet the variations of the seasons by recording the local opinion of the quality of the standing crop in each field just before it was reaped with its quality in an average year. It is a matter of the utmost importance that the discussion of this matter should take place before the crop is threshed and measured, otherwise the estimate given would represent rather the disappointment or surprise of the owner of the grain at the particular number of baskets measured and might be due rather to an erroneous estimation of the area or to alarm at the apparent intention of Government to record the measure of the freshly-threshed uncured grain as representing the proper outturn than to anything else. The intention was that the general body of villagers assembled to reap the field should have their attention drawn to the tillering and general growth of the plants, the length of the ears and the quality of the grain, and then estimate whether the crop was of about average quality for land of that grade in the vicinity or was one-tenth or one-fifth or, as the case might be, better or worse than usual. This enquiry is not difficult but it was too much for the settlement staff. The cultivators always want to compare not with a normal year but with the last preceding year, and many of the

settlement party constantly made the same mistake in spite of every endeavour to teach them not only in the field when errors were discovered but in lectures in the office during the recess. Frequently the comparison was made with the supposed recollection of the same field in the previous year—but this of course was mere empty talk really, and would have been of little interest even if accurately stated. No subsequent revision of the reaping clerk's record by the officers of the party was possible because of the psychological effect on the villagers' estimates of the knowledge of the actual numerical outturn. Given the relation of the observed outturn to that of a normal year it would be a simple matter to calculate the normal outturns for each field. In columns 16 to 22 of Statement 10 italic figures represent the average of these calculated normal outturns corresponding to the averages from actual observations which is shown in ordinary type immediately above. If the work had been done at all well there ought to be little variation in the italic averages from year to year, but unfortunately this is not the case in the statement. Examination of the detailed records also shows that the range of each group of outturns is nearly as wide in the case of the normal as of the measured outturns. It has been suggested that the seasonal variation would be met by reaping the same fields each year. The usual objection is that then the fields would not receive normal treatment at the hands of the cultivators. But the real difficulty is that fields vary so much from year to year that a particular field is unlikely to be truly representative in two or three successive years; and it is more than doubtful whether even the average result would be so, because the number of experiments in each category of soils is so limited. The identity of each field should be of no importance; in a quest for a mode of fertility the requirement is rather a mass of statistics varying as little as possible from the representative figure. It rarely happens moreover that the average of the particular harvests reaped is a normal harvest. The crop-reapings performed by district officers ought perhaps to be confined to particular fields year after year, fields belonging to reliable cultivators being selected for the purpose, but the same arguments do not apply to the settlement reapings.

292. The staff did achieve one piece of success, it managed to get its fields of fairly uniform size so that they might fairly be given equal weight in the averaging. Statement 10 shows that the average in every tract was about half an acre and the detailed records show that most fields lay between 0.40 and 0.60 acres. The averages were obtained by averaging acre-rates of outturn, and a reduction of ten per cent. was made in the average for shrinkage of the grain in drying. The wide range of the acre-outturns in each group averaged was remarkable, but observations are in every case distributed throughout the range. Ranges taken from the records at random as I write are 19 to 89, 22 to 65, 28 to 80 for actual outturns and 27 to 81, 16 to 51, 26 to 80 for the corresponding normal outturns. This recalls the Tharrawaddy observation and so far as actual outturns go is probably a fair presentation of the truth relating to paddy outturns; it shows the urgent need of careful selection of representative fields. On account of the wide range the median of each group was also found and recorded in Statement 10, this having the advantage of reducing the effect of abnormal fields. The detailed figures show that in most tracts the frequency curves would be very flat with no well-defined mode. No observations were rejected on any ground save that of an error or doubt in the record or procedure of the reaping clerk. The nett variations of outturn from the normal arise from a large number of small variations due to the experience of the plants from day to day as they grow; some of these variations are positive and some negative, and it is impossible to decide whether a large total variation from the normal in a particular observed outturn is due to an error in the figures or to the chance occurrence of a large number of small variation with the same sign. As all astronomers have recognized in dealing with an exactly parallel problem, if the latter alternative is true the large variation is in accordance with the law of error and the rejection of the apparently abnormal observation will diminish rather than augment the accuracy of the final result.

293. The general results in columns 16 to 22 of Statement 10 are generally passable in first classes, but nobody can be more sensible of their defects than

myself. It is useless to pick out cases of large variation from the assumptions and from the indications of the records of holding outturns because there is no more doubt attached to these than to the cases of small variation or of agreements; the latter are merely the nett result of opposing influences. The investigation by sample reapings of fertility of lands cultivated by different persons of different capacity and with different resources is in truth quite a different matter from reapings under expert supervision on an experimental farm; it is by no means a simple matter, and if representative figures are to be obtained the agency must be improved. No doubt more concordant result are obtained when classifiers are allowed to treat the records of each of these experiments as the basis of classification in its neighbourhood, and all Settlement Officers know how the boundaries of soil class blocks are always stretched then to include a field in which the recorded outturn was thought to require it to be in a particular class. This is equivalent to selecting the divergent figures in each of my categories and moving them to a category in which they are not divergent: in this way convergent results can be obtained with ease. But the convergence is a delusion; and the classification and the assessment of the next twenty years in the neighbourhood of many of the experiments would be erroneous. Even, however, if convergent figures for acre-outturns are obtained there arises the question of their relationship to the holding-outturn. This is probably a specific quality of each soil-class of each tract: its effect in second and third class lands is a very large reduction in the holding-outturns owing to the uncultivated or inferior patches which are so common under the conditions of flooding and water logging which obtain in these classes, and thus it accounts in part for the general excess of recorded acre-outturns in these classes above those assumed. The best selection would probably still leave an error on this account. Moreover, the yield of a particular field is not a matter only of the intrinsic qualities of that field but depends upon the fields associated with it in the holding: because the extent of these, both on the whole and at each level, determines the share of the total time and labour which can be given it and fixes the time in the season when it shall be ploughed or planted not at the date most favourable for that field but at the time which best fits in with the general demand of the holding. For this reason, and taking into consideration the other influences already recounted which affect the records of these experiments, the holding-outturns in spite of all their difficulties are to be taken as a more reliable criterion of the justness of the assumptions than the experimental results. No doubt the experimental method will be valuable when its difficulties have been met. A determined attempt has indeed been made to meet them squarely in this settlement, but a severe handicap lay in the fact that I was called away from the party for military duty in the recess of 1917 and the work of that year could not be tabulated till 1918. I returned to the party just as its members were leaving headquarters to begin a new season's observations, and almost at once I was attacked with a fever which necessitated a journey to Rangoon Hospital. It thus came about that supervision was weakened for the greater part of the time when fields were being selected and that the results of even the first year's experiments could not be tabulated till the third year's reapings were half-finished. I was unable therefore in the second and third years to profit by any lessons from the first.

294. As the conditions of crop-reaping experiments demand immediate threshing if various sources of error are to be avoided a deduction must be made from the measured bulk to

Dryage of Paddy. make that correspond to the measure which would have been observed if the grain had been treated in the same manner as the remainder of the harvest is treated up to the time of its sale by the cultivator.

Shrinkage in first drying.	Tracts 8, 9, 10.	All other tracts.
1. Greatest observed ...	9	14
2. Least observed ...	1	1
3. Normal ...	3 to 5	5 to 7
4. Number of experiment falling within normal range.	72	202
5. Total number of experiments.	110	337

The methods described in the report of the settlement operations in Prome, 1914—16, were followed. The results of the drying in the sun for some hours immediately after threshing are shown in the marginal statement, the shrinkage in each case being expressed in sixty-fourth parts of the original bulk. All tracts except 8, 9 and 10 gave congruent results. The second step of observing subsequent changes in the grain thus dried was also made. The

experiments of 1917 were spoiled by rats. In 1918 thirteen samples (each about eight gallons) declined from 590.25 pounds weight on 28th January to 580.50 at the end of April, rose to 584.25 by the beginning of June and remained stationary till September when their bulk was found to have declined by 4.4 per cent., and the weight per nine-gallon basket was 53.4 pounds against 51.6 at the beginning of the experiment. In 1919 four samples each about eight gallons from Tracts 8, 9, 10 alone were taken in December and weighed altogether 179 pounds. On the 6th January Nos. 1, 2, 4 had each fallen a quarter pound and on 1st February there was a further fall of a quarter pound in Nos. 2 and 3 and three-quarters in No. 4 making a total weight of 177 pounds. A slow steady fall brought the weight to 176.75 on 10th March and to 175.75 on 15th May and a rise in the early rains made it 177 on 16th June, after which a slow steady rise brought the weight to 178.75 on the 1st September. The corresponding figures for

Date.	Pyis.	Sp Grav.
20th December	54.25	52.8
10th March	53.50	52.0
15th May	53.25	52.8
1st September	54.25	52.7

bulk and specific gravity were as in the margin, the latter being given as the weight in pounds per nine-gallon basket, a conclusion of interest to settlement work which the figures suggest is that samples of paddy weighed at different parts of the season may be compared with reference to specific gravity without error, but the experiment needs a much wider basis to establish this and

might even then be true only of paddies of this locality.

295. As the subsequent shrinkage was so small and five to seven *pyis* was the usual shrinkage in the original drying in the sun the usual allowance of 6.4 *pyis* per basket (10 per cent.) was made. The figures for dryage in Tracts 8, 9 and 10 are smaller, but as the allowance is at best rough and many of the low results in these tracts belonged to the third year in which most other tracts were not reaped, it was thought as well to allow ten per cent. there too.

## CHAPTER XII.—THE COST OF CULTIVATION.

296. The general principle observed in enquiring into the cost of cultivation was to record all actual out-of-pocket expenses as accurately as possible for representative cultivators of each tract, and except in the case of cattle owned by the cultivator the record was confined to actual disbursements in the one season of cultivation. In every kwín two, three or more cultivators who cultivated holdings of about the average extent for the locality, followed the usual method of cultivation, and hired auxiliary labour on about the usual scale were selected for examination. Thus, for instance, cultivators who, as they had several full-grown sons still living in the same house and sharing the work, had less than the normal need to hire labour were not examined. Similarly invalids or women or non-agriculturists who work entirely with hired labour were not examined. For every item of expense whatsoever the "year" was defined as ending and beginning when threshing is completed and the wages of labourers and rent are paid and the accounts of a harvest generally cleared up. The averages reached for each primary tract are given in Statement 12B. The cost has been averaged in each primary tract instead of being calculated for each price division of the tract because this gives a wider basis for the averages without introducing any new errors. The costs incurred by Indians are so different from those incurred by Burmans and Karens, and it seemed so probable that the differences between Burmans and Karens would be considerable too, that tabulation was undertaken by races; nearly all the divisions for price occur in the tracts of small cultivated area and population, and further subdivision of these areas would have given too small a basis for any of the results. Even now it is doubtful whether weight should be given to any *small* differences exhibited in the averages for different races and classes. The conditions throughout a primary tract are uniform; and in valuing payments made in kind, which constitute possibly as much as four-fifths of the cost of cultivation. the

price of paddy has been taken at the mean of the prices used for valuing the produce in each price-division in the primary tract, the small groups of kwins in Tract 8A being ignored in determining the average for Tract 8. Thus (as may be verified by a reference to the schedule on Map III) in no case except Tract 8A (where the difference is Rs. 7) does the price used differ by more than Rs. 3 from the assumed price for the tract, and even this is in excess in one part of the tract and in defect in the remainder; such a difference could only make a difference of three or four annas at most in the cost of cultivation and would not affect the deduced rates. But a wider basis is thus obtained for the statistics.

297. Although no allowance was made for the labour of the cultivator and his family, either in the fields or in making implements or building sheds, a record has been made in columns 5 and 6 of the statement to show the number of persons who gave their whole attention to the cultivation and had no other occupation. Of course there is much other labour given besides by women and children and sometimes by men who give only part of their time to the fields as may be seen by a reference to the analysis of cultivators' families in Tract 12 which was given in paragraph 57, but no estimate of the value of this has been made because no allowance is permitted to be made for it now in calculating the "net-produce." In recording the cost of hired labour account was taken of all perquisites such as coats and *lungyis* which are occasionally given to labourers by employers as well as of food, tobacco and betel supplied to them, but nothing has been reckoned for the extra expense of firewood in cooking for them. Whenever a payment was fixed in terms of paddy to be paid at harvest that measure of paddy was reckoned as the expense even if the labourer took his payment as a cash advance. The justification for this is that an employer advancing cash in lieu of a future paddy payment generally borrows the money on the *sabapè* plan and charges the labourer what he has to pay; if the employer does not have to borrow the money, or uses money borrowed on cash interest earlier in the season, the same procedure seems to be reasonable, and such cases certainly form a small minority. Special instructions were given to the staff to enquire for special expenditure incurred in wages for day labourers when the cultivator was unwell, but it is probable that some of these expenses have been accidentally omitted through the failure of the enquirers or the forgetfulness of the persons examined. When one of several labourers gave most of his time to cooking for the others the cost of his employment was counted in, although, in accordance with the general principle, no allowance has been made for cooking done by a member of the cultivator's family.

298. For all expenses incurred in cash the cultivator was asked whether he borrowed money for the purpose, and if he did the rate of interest and date of borrowing were noted, and the interest incurred thereon up to the ordinary month of completing threshing was calculated. It is admitted that this gives only a rough estimate of charges for interest. In fact it gives only a minimum estimate. There is no danger that a man who had some money of his own but not sufficient to meet all his expenses will earmark all his borrowed money for cost of cultivation in this enquiry and claim to have met other expenses with his own money, for him it is only a question of whether the expense was incurred before or after the little hoard left from the previous harvest was exhausted. But this often means that a man whose savings from the previous harvest would have been enough for his house-keeping uses part of them for the next year's cultivation and so ascribes loans taken later in the year to the cost of living and not to cultivation. Again the interest charges involved in sums incurred for food shared by the labourers could not be reckoned; but these perhaps may be set off against the non-agricultural services rendered by labourers such as fuel-cutting and water-carrying. As a rule no allowance could be made for the interest arising from debts incurred to purchase in previous years' articles required for the cultivation, but an exception to this, which could be investigated, appeared in the case of cattle. The interest allowed in connection with the cost of cattle was certainly too small; a cultivator, for instance who bought cattle with the proceeds of the previous harvest would not ascribe to "Cattle" the interest incurred on subsequent borrowings for other

purposes although if he had not had this unusual expense he could have managed with a much smaller loan. A similar consideration applies to the interest recorded in connection with some other expenses too. No allowance is also made for interest on the capital invested in the land itself, but it is doubtful if this ought to be considered. As was mentioned in Chapter II the persons examined with regard to their debts were exactly those examined with regard to the cost of cultivation; it was possible therefore to exercise some check upon the entries for interest charges by comparing the records in these two enquiries, and the supervising officers paid particular attention to this when checking the work of their subordinates.

299 In accordance with the Settlement Instructions the figures shown under "Cattle" in Statement 12B include the actual cost of feeding and tending cattle, the wages of a labourer being reckoned in this column if he was engaged primarily as a herdsman even if he helped in other work, while the wages of labourers engaged primarily for other work are included under "Labour," although they necessarily have often to do something for cattle too. The figures also include the actual hire paid for cattle which were borrowed and an allowance of Rs. 8 per head for the year for the cost of replacement of cattle which were owned by the cultivators examined. The calculation of this last allowance is a matter of some difficulty and demands a special section for its consideration.

300. The Settlement Instructions direct that besides the cost of all new cattle bought there shall be reckoned only the "value of plough-cattle which died and were replaced otherwise than by purchase or exchange during the year of enquiry and the three years previous." It is believed that the averaging over four years is meant to apply to the cost of new cattle as well as to this value. But whether "died" covers the case of dying at the hands of the butcher or only a natural death, and whether the "value of plough-cattle which died" from natural causes is to be the value before or after death is not stated; and it appears that no allowance is to be made for the loss by death in the case in which the cultivator does not replace the cattle which die but proceeds to hire the animals he requires. Yet in the case in which the cultivator bought and sold any cattle during the four years but before he began to hire there would be (under the Settlement Instructions) an allowance for the hire of cattle in the year of enquiry and also an addition for the cost of the cattle purchased although these had nothing to do with the land cultivated in the year of enquiry. On the other hand, no reckoning is suggested for cattle sold by a cultivator. Thus, for instance, in the case just noted, the addition for the irrelevant cost of purchasing cattle would be made even if the cattle were afterwards sold at a profit. Further, the Settlement Instructions proceed to relate the cost determined to the area cultivated in the year of enquiry but there is no justification for this whatsoever, the figures of the three previous years may relate to quite different areas either because the particular group of men examined hired a different proportion of their cattle in other years or because they have been extending or diminishing their holdings. Thus the cost calculated according to the Instructions may cover the cost of increasing the stock as well as that of replacements or the cost of maintaining for part of the period a larger or smaller stock than is used in the year of enquiry. In particular the effect of the constant change of holding by tenants must not be overlooked, this leads not only to a change of area worked but to a change in the stock of cattle when a change is made from a landlord who lends cattle with the land to one who does not. Again when men use only a part of their stock of cattle for cultivating their own land and hire out the others it is not possible to associate any particular losses or replacements with either part of the stock. So soon indeed as one gives a little thought to the matter obedience to the Instruction becomes frankly impossible. In devising a more correct procedure two principles are to be borne in mind. One which is an immediate deduction from the foregoing considerations is that the problem must be attacked on lines dealing with head of cattle and not directly with acres. The other is that only a rough approximation is either necessary or possible. Roughness

is tolerable because a yoke of cattle usually plough about seventeen acres, and therefore as one-fourth of the cattle are hired an error of Rs. 11 per head per annum in the estimate will be necessary to make an error of one rupee in the calculated cost of cultivation per acre; and, owing to the adoption of round numbers for the assumed figure for this cost, the error in the calculated net produce will generally be even less, and this again is divided by five or six or a larger number in determining deduced rates which themselves only indicate and do not determine actual new rates. Only roughness is possible because the results obtained will evidently vary with the year of enquiry, according as the last four years have seen much or little cattle disease; in years of bad disease the ordinary cost of replacement may easily be more than doubled. Moreover, even considered as representing only the particular years for which a record is made, the figures must be considered to be liable to a large margin of error because the value of each animal is so large that an error of one or two head in the record for losses may affect the result very gravely. It would perhaps be possible to get reliable figures for the particular period discussed if elaborate arrangements were made to meet all sources of error. But the settlement party wants not academic accuracy but only figures which can safely be used for a particular purpose, the expense of obtaining more accurate figures would be unjustifiable, especially as they would have such a temporal character.

301. With these principles in mind every cultivator examined for the cost of cultivation was asked to state how many cattle he had owned or employed in each of the last four years and to distinguish the owned and the hired. The number of hired cattle was not directly relevant, but it assisted in getting a correct number for owned cattle because the cultivator was asked to correlate the total cattle of each year with the land he worked and the number of cattle he let out to other persons. Both changes of land without change of stock and changes of stock without change of land were discussed with him to correct all errors of his memory. (In this particular the work was an improvement upon the similar procedure adopted in the Prome Settlement Report, 1916). The definition of a "year" given near the beginning of this chapter was still retained for this enquiry; and, beginning with the year just ending at the time of enquiry a record was next made of the number and cost of cattle bought or sold in each of the last four years and of the value obtained after death of cattle which died. If home-bred cattle were first brought into systematic use for ploughing (as distinct from doing a little work by way of training) during the four years their number and value at the time of so beginning were recorded. Animals purchased as calves too young to plough were similarly treated. If money was borrowed to buy cattle—or enough to cover the difference of price of cattle sold and those bought to replace them—the point was compared in the record of indebtedness to secure accuracy in both records, and the amount of interest incurred in the year of enquiry was added to other interest charges and included in the column of Statement 12B headed "Interest." The amount so included was certainly too small. The additions and subtractions to stock were naturally checked with the record of total owned cattle for each of the years of enquiry and discrepancies were investigated.

302. The records have been compiled in Statement 12A which is largely self-explanatory. Figures are given by the races of the owners as well as for the total of each tract. The year numbered 4 is the year of soil-classification in each tract, and that numbered 1 is the earliest year of the enquiry; the period is not therefore the same for all tracts but covers three groups for four successive years between 1913-14 and 1918-19. The initial stock was calculated from the increases and decreases, and the number employed in the year 1, and represents the stock at the very beginning of that year diminished probably by some head sold very shortly after the preceding harvest and forgotten by the cultivator at the time of enquiry. Column 21 gives the total net expenditure on replacing and increasing stock. Column 22, which gives one-quarter of the quotient of this sum by the number of cattle employed in the year 4, is the nearest approximation in the table to the figure which would be found by the method of the Settlement

Instructions ; but it differs in being reduced by the value received for cattle sold and reckons the value of dying cattle as the value obtained for horns, skin, etc., after death. Column 16 shows how important is the reckoning of the value of cattle which are sold. Column 23 shows the excess of the stock in the fourth year above the initial stock and in column 24 this excess is valued at the average rate shown in column 17 for cattle sold. The suitability of this rate is an arguable matter, and it was adopted because it seems reasonable to treat the oldest as the excess cattle, because this column usually gives a lower price than columns 11 and 14 and therefore raises the final estimate of the cultivator's expenses, and because the differences involved would be very small compared with the range of error permissible. In four cases (Tracts 9, 20, 23, 29) which gave abnormal final results a departure from this principle was made because the average selling prices were abnormally low compared with buying prices and probably represented injured or sick animals, and in one case (Tract 15) a departure was similarly made because the price was abnormally high, in each case a probable figure based on the average of the cost of animals bought and the value of animals bred at home was adopted. Deducting now from the total net expenditure in column 21 the value in column 24 of the increase of stock the figure of column 26 showing the total cost of replacements necessary to maintain the initial stock for four years without increases is obtained, and thence by division is derived the figure given in column 27 for the average cost of replacement per head. It is necessary here to pause for a moment to consider the effect of the possible error in the estimate of the initial stock of which the chance has already been noted. It is exceedingly improbable that cases of cattle which died have been forgotten, that calamity impresses itself upon the cultivator's mind. But the sale of a yoke when the money went at once to pay a debt is not so easily remembered. The effect of an omission of such a sale at the very beginning of the year 1 would make the same alteration in columns 21 and 24 and therefore would leave column 25 unchanged, but it would alter column 4 and therefore increase column 26 in the proportion which the omitted animals bore to the initial stock recorded. There may also be omissions of sales in the year 4 at the very end of the season owing to the necessity of beginning the enquiries before the harvesting accounts are complete ; but these would affect columns 18 and 21 alike and have no effect on the final result. On the whole, sales of this kind should be roughly balanced by purchases so far as cultivating animals are concerned, but the balance is disturbed by sales to the butcher or to Indians who graze for sale to the butcher, most of which take place naturally at the end of a season. Probably the only error in the final result arising from the year 4 would be that due to cattle dying in the short period between the enquiry and the end of the "year" in the cases examined early in the season. It is perhaps desirable here to emphasise that the cattle represented in Statement 12A even for the last of the four years are not exactly the same as the owned cattle represented in Statement 12B, the latter are those employed in that year by the persons examined on the land they cultivated, while the former are those they owned and include animals lent to others. The grand total of Statement 12A shows a large increase in the total stock of cattle in the four years, part of this is due to the omission of the cases here noted, but much is probably due to the increasing age of many of the holdings, and to the extension of cultivation into adjacent jungle. It would be better either to enquire directly for the figure of column 4 or perhaps to use the figure of column 1 as the initial stock and calculate on the basis of three years' sales and purchases and deaths ; but the former method can only be applied if pursued from the beginning of field-work and the recalculation corresponding to the latter seemed unnecessary. As the error involved is less than the figure in column 27 it is certainly well within the permissible range. (If three-quarters of column 18 is assumed to be due to the last three years the average cost per head during those years worked out on the same lines yields, as it happens, exactly the same cost per head as is actually obtained.)

303. Averaged over the whole settlement area the annual cost per head of stock maintained works out to Rs. 5'8. There are a few abnormal entries in



column 27 but most entries for Burmans and Karens lie within a range of Rs. 3.5 to Rs. 8.5. The figures for Indians are more irregular, but taken by themselves yield an average of Rs. 5.6, practically equal to the general average, the irregularity is due on the one hand to numbers of Indian immigrants ploughing with very young cattle in low flooded land and on the other hand to the valuable cattle owned by the piece-goods sellers who have become land-owners. The general average for the whole area is better to take than the average in each tract because the basis is not broad enough in single tracts (except Tract 12) to give a reliable figure when each separate head of cattle represents so large a sum. As the Indian average is equal to the general average of Rs. 5.8 the latter can be adopted without excluding the Indian figures. But as noted in Chapter III, the years of the enquiry were particularly free from cattle disease, and the same enquiry repeated in other years would probably give a higher figure. Instead, therefore, of using the precise figure calculated an allowance has been made at Rs. 8 per head throughout for all the cattle owned by the cultivators examined for their cost of cultivation of the land to which the other recorded expenses related.

304. It may be restated in passing that the figures of Statement 12A aim only at the discovery of a suitable figure for use in constructing Statement 12B. they do not give such a complete and accurate account of the whole matter as would justify quoting the result obtained for use in other connections. They could not, for instance, have been used in the discussion of "Cattle" in Chapter III of this report. But the mere fact that the results commonly presented in settlement in which the false basis of the Settlement Instructions has been adopted differ from the figure now calculated is no ground for impeaching the latter but rather lends it support.

305. It is possible that except in the case of the largest tracts the figures given for the cost of farming implements are erroneous for the same reasons as those of owned cattle would be if only the actual disbursements of the year of the enquiry were recorded. But the total amount in question when reduced to an acre-rate is small, and even a large percentage error in it would be negligible in the total cost of cultivation. Moreover, because many of the expenses included under this head are for articles which last a short time, and again because of the very multiplicity of the articles, the error is probably quite small unless expensive articles like carts and disc-harrows are in general use. In the present settlement area the actual disbursements for the year give a reliable result if the expenses are recorded completely. The attainment of this end was facilitated by supplying to the enquirers a list of implements used and articles consumed by cultivators, by which, after the person examined had stated all the expenses he could remember, his memory could be helped to recall all the other expenses. It will be noted in Statement 12A that tenants usually spend less on this head than owners, this is due partly to their practice of avoiding expense by using inconvenient makeshifts spurred by an owner and to the saving by borrowing from the landlord when he is also an agriculturist, but some small part is probably due to a failure to record some of the expenses incurred for the hire of implements.

306. It is not customary for tenants to pay for any considerable piece of earthwork required by the land they hire; the custom is to ask the landlord to make any required changes in field-bunds or to construct dams. The tenant only does petty pieces of earthwork here and there. Consequently the record in Statement 12B shows less expense under this head for tenants than for owners. The difference is not marked in the older tracts; but in the new tracts of the south such as Tracts 28 and 29, where much land is just being got into order for cultivation, the difference is large. The record for earthwork is in no case quite as large as it would ordinarily be, because the conditions of credit during the war forbade owners from embarking on any expensive work of this kind.

307. The average total cost of cultivation determined for each tract in the manner of the foregoing paragraphs is shown in column 16 of Statement 12B. In most tracts owners spent more than tenants but there are exceptions these however are possibly due to the accidents of sampling. Far more constant is the relation between the costs of Burmans Karens and Indians. Karens almost invariably spend considerably less than Burmans, one reason is that Karens tend to live in the more jungly parts where more free gifts of nature are available, and another reason is the Karen habit of keeping children in the household after they marry and thereby reducing the proportion of hired labour. It must not be overlooked, however, that these children take shares in the harvest, and it would be in many ways better—if only practicable—to treat them as employees on a profit-sharing basis. But the most striking feature of column 16 is the series of figures obtained for Indians. The costs of Indians are invariably much higher than the costs of Karens or Burmans, often twice as large. The reason is of course that the Indian figures cover so much hired labour much of which is employed in doing work done by the families of Burmans and Karens. A few years ago some settlements were made in which an allowance for the cost of cultivation was calculated on the assumption that all the labour had been hired. The estimates in Statement 12B for Indians are nearly the same as if calculated on these lines, the principal distinction being that Burman and Karen labourers demand a higher standard of living and their services are not retained for the whole year. In order to bring out clearly the relation between the costs of Indians and of others the figures of Statement 12B have been so arranged that the averages for all Burmans and Karens taken together are shown immediately below the averages for all Indians. It is at once apparent on comparing the figures that one could not logically use for the purposes of the settlement an average of the costs of Burmans Karens and Indians. The series of figures for Indians represents really an entirely different concept from that for Burmans and Karens, the two are not miscible. In any case one could not allow the Indian figure to have in each tract just that accidental weight which would result from the accidental proportion of Indians amongst the persons examined. The Indian community was shown in Chapter II to be very small compared with Burmans and Karens they number only about one in thirty. Indian costs have therefore been entirely discarded in calculating assessments. The average for all Burmans and Karens in the tract also depends upon the proportion of each examined, but generally the number examined in these races is large enough to be probably in proportion to the frequency of each race amongst the cultivators. When studying Statement 12B a list was compiled of averages in which Burmans were given twice the weight of Karens, that being roughly the usual proportion of the races, but little or no difference in the relative treatment of the tracts would result from using such figures.

308. The costs assumed for calculating assessments are shown in column 17 of Statement 12B and are based upon the averages of Burmans and Karens taken together. This average in most tracts is slightly reduced by depending partly on figures for tenants who spend nothing on earthwork, and it is not fair to allow such reduced figures to influence the averages upon which the assessments of owners are to be calculated, strictly the landlord's expenditure on earthwork should be added in the tenant's costs, but as the acre-rate involved is small it is enough to allow a small increase upon the average calculated for owners and tenants together. Similarly, as has been pointed out, a small increase should be allowed on account of the sub-normal expenditure on earthwork in war-time and the definitely insufficient allowance for "Interest". Consequently the assumed figure in column 17 is generally about eight to twelve annas above the B.K. average in column 16. There are some exceptions. For instance in Tract 11 the assumption is a trifle below that average. But it will be observed that practically no weight is given to the costs of Karens in this tract in the B.K. average; both Burmans and Karens are found in the tract and it would not lead to an equitable system of assessments if the low costs of Karens were allowed to reduce the general average in other tracts and not in this. In Tract 28 again a similar effect occurs, the number of Karens examined being too small. For Tracts 20 and 22 there is a difficulty. The average found for

Tract 22 is rather high because Karens are not included and also the basis is too small as there are only five kwins; its expenses do not differ much from those of Tract 21 which enfolds it, save that having a lower price for its paddy the valuation of payments in kind should be lower. Similarly for Tract 20 in which the Karens have too little weight in the average, and the cost of cattle appears to have been increased by temporary unusual mortality of owned cattle leading to more hiring. Conditions are like those of Tract 21 save that by having more broadcasted land the average cost ought to be a little lower. The average for Tract 21 is Rs. 15.4 and for all three Tracts 20, 21 and 22 it is Rs. 16 with 19 Karens examined amongst 74; the assumption of Rs. 16 for all three appears therefore to be justified. For Tract 8A the cost is taken at Rs. 10 instead of Rs. 9.5 as in 8B and 8C on account of the higher value of payments in kind.

309. Comparison between the allowances of the current settlements exhibited in paragraph 208 and those now proposed show a considerable general increase; in the Wakoma portion of Mr. Lowry's area the allowance is more than doubled, and in newest tracts in the south the increase is much greater still. Generally very little of the total cost is incurred in cash. The cost of replacing owned cattle is a cash expense much of the cost of labourers' food other than rice is also met in cash but even that cash expense may be met by a *sabape* loan and altogether possibly only about one-fifth or less of the total cost allowed for cultivation is met in direct cash payments. Some of the increase in the allowance is due therefore to the rise in the value of paddy but the greater part seems to be due to differences in statistical methods in the new settlement.

310. The system recognized in England for the scientific costing of agricultural operations values all articles used which are produced in the farm at the cost of production and not at their market-value. Equivalent to this for the purposes of a settlement is the principle used in this report by which payments made in kind (for labour and commodities used in cultivation) are valued at the same price as is used for valuing the gross produce. But it is important to note that in no sense can the figures so determine for the cost of cultivation be described as the actual expense borne by the cultivator; they are purely conventional. The actual expense is perhaps best described as the part disbursed in cash, leaving the part disbursed in kind to be treated as a reduction of the yield. If, however, an estimate of the cash equivalent for the total received by every person who supplied services or commodities to the cultivator is required, the payments in kind should be valued at the rate at which the paddy would have been sold if not paid away. In that case the price used must not be that assumed for the settlement on the basis of a twenty years' average, but should be a price representing the particular year of discussion. If a representative value is required such a price as that described at the end of Chapter X must be used, embodying the tendency of prices in the last few years. The importance of this distinction has been emphasised recently by discussions, sometimes a little acrimonious, in the newspapers. Writers have compared the value of the cultivators' actual disbursements (in both money and paddy) with the allowance used in determining the assessments and have suggested that the latter was generally insufficient, much of the difficulty arises out of this matter of price.

### CHAPTER XIII.—THE ASSESSMENT-FRACTION

311. As noted in paragraph 238 of Chapter VII the aim of all the work described in Chapters VII to XII was the determination for each of the categories into which the paddy land of the settlement area has been divided of the quantity known as the *net produce*. It is necessary now to determine what fraction of the net produce shall be taken as the standard of the assessments. The exclusion from the cost of cultivation of all except out-of-pocket expenses demands that a small fraction shall be chosen. The effects of applying the fractions of one-sixth and one-seventh, when considered in the light of the knowledge gained of the general

circumstances of these tracts, indicated that something between these but rather nearer one-sixth would be appropriate for the area of Mr. Lowry's settlement of 1903-04. In order to express this intermediate value the fractions of one-sixth and one-seventh were converted into the percentages 16·7 and 14·3 and it was then apparent that approximately 16 per cent. would give a suitable general pitch of rates. In considering this pitch due regard must be given to the physical conditions. In the west of this area the soil is sterile and difficult to work, and the uncertainty of the outturn cannot be expressed completely in its average value. In the east there is generally the risk due to flood. If the kwin is protected by a bund the lower lands are flooded by water coming up from below, and the higher protected lands have the risk of shortness of water owing to the slope of the edge of the saucer. The tide-irrigated kwins of this area have a more sluggish drainage than those of the kwins farther south. I cannot pretend to ignorance of the terms of Mr. Duffin's settlement of the Einné Township; but at the time of discussing this question my attention had been concentrated for a long time upon the present settlement and I had temporarily forgotten them, and I was in no conscious way influenced by them in determining this fraction. Mr. Duffin's proposal of 16 per cent. was covered by the Local Government to one-sixth; but in the present case there has been a much more severe examination of prices, and the valuation of the produce has been raised wherever it was possible to do so, while Mr. Duffin applied the price of Rs. 94 not only to the tracts far away in the south but also to those in the north from which the paddy has a much shorter journey to Bassein uncontrolled by rough water. It was to these northern tracts where it thought the price Rs. 3 too low, that the Local Government applied the higher fraction the effect of which has already been imported into the net-produce in the present settlement through the prices. I have therefore adopted with additional confidence sixteen-hundredths as the standard assessment fraction for the area of Mr. Lowry's settlement, with minor modifications which will be described in dealing with the tracts in detail in Chapter XIV and in particular with the modification to two-thirteenths (15·4 per cent.) in the poor and backward tracts in the west of Myaungmya Township where also the allowance for the cost of cultivation is particularly low.

312. For the southerly parts of the area of Mr. MacKenna's area, roughly his Tract IV, and also for the area of original settlement, the rather higher fraction of one-sixth is more appropriate in spite of the general newness of the land in consideration of the higher allowance for the cost of cultivation which in fact includes itself some allowance for the newness because extra expenses for dealing with stumps, making bunds and similar purposes are included in it. For the main block of Mr. MacKenna's area, constituting his Tracts I and II there is a higher cost of cultivation partly due to less work being done by the family, and in the better parts where tidal irrigation with good drainage gives fair security to the crop and there is not the same claim for consideration of the cost of developing the land, a slightly higher fraction is appropriate. One-fifth is distinctly too high and the slightly lower nineteen-hundredths has been adopted. Some parts of this area do not enjoy the same advantages and a lower fraction would have been appropriate if there had been no past history to consider, but as even this fraction leads to a diminution of the demand it has not been possible to use a lower fraction. The proposals will go some way to give equality of treatment to the various tracts; but the effects of sudden reductions of revenue must be considered, and, while harsh treatment under current conditions must be ameliorated, it is not always possible to give complete relief. Similarly, going still further east into the area formerly settled by Lieutenant-Colonel Ormiston in 1905-06 the fraction has to be raised to one-fifth in consideration of the current revenue.

313. In all cases, however, the rates calculated with these fractions are to be regarded as guides and not as fetters. The factors upon which they depend cannot be so precisely calculated that the rates can be held to be determined to within a few annas; and, further, just as the assessment-fraction applicable to a tract must be varied sometimes according to the current revenue demand so too the rate upon a particular soil-class must sometimes be varied. Neither of these variations,

however, should as a rule be made upon a consideration of the circumstances of the one tract, but, groups of related tracts being formed, there should be constructed a system of rates graduated consistently with the qualities of the various tracts and with a view to their financial effect as a whole. It will be the aim of Chapter XIV to deal with each assessment-tract in numerical order on these lines and to propose for it specific rates of assessment.

314. For third-class land it will not be possible to take a fraction of the net-produce as the basis of proposals for assessment. There are the same difficulties in determining special rates for the cost of cultivation in each soil-class as for determining similar rates for rents and outturns. The rate allowed for the cost of cultivation is not applicable to third-class soils in which the conditions of cultivation are not the same as in other classes. Quite commonly the addition of a small proportion of third-class land to a holding would add nothing whatsoever besides the cost of seed to the cost of cultivation, both men and oxen being employed on it only when they would otherwise stand idle.

#### CHAPTER XIV.—THE NEW ASSESSMENTS ON PADDY LAND.

315. In accordance with the promise made in the last chapter each tract will now be dealt with separately. To avoid some repetition it may be noted here that the new assessment-tracts are shown on Map III in which all those which are parts of one primary tract have the same colouring modified only by hatching or speckling. Statement 19 gives for each tract the total area under both the current and the proposed settlements at each rate of assessment and the corresponding revenue demand; and the important facts standing behind the figures of Statement 19 are given in Statements 20 and 21. Statement 20 shows for each new tract the area transferred from each assessment-category under the current settlement to each category under the classification made for the new settlement; the explanation of Chapter VI may be recalled that A and B represent the first and second soil-classes under the current settlement, while 1, 2, 3 represent the new classes, so that 2A represents land transferred from the first class to the second. Statement 21 read horizontally gives the current tracting of every kwin in each new assessment tract; read vertically it gives the new tracting of every kwin in each old tract. At the end of this chapter will be found a summary of the results of the proposals by groups of tracts.

316. Some explanation must be given of the discrepancy of the areas shown under the current and the proposed settlements in Statement 19. In some cases there has been a transfer in resettlement from garden to paddy-land or the reverse but in no case has the settlement party estimated revenue for plots of land not represented in the figures for the current settlement. In tracts 8 and 9 an area of 1,075 acres of occupied land omitted from assessment was pointed out to the Land Records Department in Errata Statements, and further areas in other tracts; but in Statement 19 this land has been ignored. The figures for the proposed settlement have been compiled field by field for the same land as is represented in the figures for the current settlement which were compiled by the addition of the totals kwin by kwin of the areas shown in the assessment-rolls. Many holding-areas in these rolls, however, have been wrongly calculated and in every kwin slight differences in the total areas appeared. Some of these were investigated holding by holding and the inaccuracy of the current holding-areas demonstrated. In some cases the discrepancy was due to correction of the areas permanently recorded for each plot in the survey register (No. VI). The settlement party compiling areas field by field demanded recalculation by the Land Records Department of the area of each field for which the recorded area appeared inaccurate, and numerous corrections were necessary. In some cases, however, there had been a new survey of the kwin since the last assessment-roll had been compiled. It was obviously necessary to use the newest maps for settlement purposes, but such large changes appeared in some maps that it was not possible to represent the current settlement

by the assessment-roll for purposes of comparison with the new. One *kwin* on resurvey gave 1,825 occupied acres, but the assessment-roll covered only 576: in this case it is believed the new survey has included unoccupied land in the holdings and the attention of the Deputy Commissioner was drawn to the necessity for scrutinising this matter before the new assessments are made. In the cases of resurveyed *kwins* the current settlement has been represented by the areas which would have been shown in the last assessment-roll if the new maps had been used, the area under each of the old soil-classes being the totals shown as A or B in the settlement compilations. In the tracts numbered 24, 25, 26, the greater part of the *kwins* were resurveyed in 1919 and the settlement work had to be arranged to take up each *kwin* as the new map was ready. With so many new surveys the principle was adopted of showing the current settlement for the whole tract on the supposition that the assessment-rolls had been correctly compiled from the corrected maps and area statements; and this principle was applied then for one reason or another to all the tracts subsequently compiled, that is to all that part of Statement 19 which begins at Tract 24W. It has not however seemed necessary to change all the figures of the preceding tracts by applying the same principle to them: the principle adopted in their case is the more correct from one standpoint as it exhibits all the changes made by resettlement besides reclassification, and changes would have involved numerous changes in figures used or quoted in the text of the report and much labour for no adequate return. Some discrepancies were excesses and some defects, and in the tract-totals the net result is not large. In the individual holdings the division of the area by soil-classes seemed to be more inaccurate than the total areas.

#### PRIMARY TRACT 8.—ASSESSMENT TRACTS 8A, 8B AND 8C.

317. Primary Tract 8 including 78 *kwins* in the extreme west of the settlement area occupies the broken land around the two smaller domes of Myaungmya Township and is the lineal descendant of Mr. Lowry's barren Tract E in the current settlement. Nineteen *kwins* of Mr. Lowry's Tract D lying on the southern bank of the Myaungmya River and along the Polaung *chaung* in the west have been taken into this tract besides three others between Myaungmya and Kôntha, while the three Tagundaing *kwins* near Kôntha have been cut off and put into Tract 9. The three Assessment Tracts 8A, 8B and 8C are the result of a difference in price in parts of the tract which are similar agriculturally but differ in facility of marketing.

318. The cultivated portions do not form wide continuous stretches intersected by rivers but are patches amongst ridges and bosses too dry or too stony for cultivation. Some of them are small hollows in which water collects during the rains or valleys which are flooded by the rivers; more generally they form parts of a dry sterile plateau broken up by jungle-covered wrinkles and depending for water upon local rainfall, of which however full advantage cannot be taken because the broken contour causes so much to run to waste in channels below the level of the fields. The soil everywhere is a stiff barren clay, which is immediately improved wherever as in Tract 9 it gets a little sand, but in the *kwins* of this tract without the sand is of little use for agriculture, as it forms hard lumps under the plough and a tilth cannot be obtained. With the waste of water goes a waste of the detritus from the hills, which though not of immense value would supply some of the deficiencies of the soil. On the higher lands which form the greater part of the second and third soil-classes the soil is often very thin and must have frequent fallowing to be of any use at all. Twenty-three per cent. of all the land was fallowed in settlement year which was a year of good rain in this locality. Second-class fields are worked five or six years and then fallowed for one or two. Third-class fields are worked only two or three years in succession and then fallowed for two or three years; sometimes the fallow years outnumber the cultivated years. The *shwelanbu* weed is the principal product of these fields, which indeed are really wild heath-land occasionally cultivated. Because such fields form wide stretches of level land the ordinary settlement inspector classifies them as first

class, and considerable reduction of classification has had therefore to be made. In rare places tide-water enters and leaves without harmful flooding, but the soil is too poor to give much response, so that although such places have now been marked first class as a rule—and this frequently means raising the class because formerly the *kanaso* jungle was a hindrance to cultivation—their outturns are not high. Although the tract lies wholly north of the latitude of Mawlamyaingyun it lies on the lower side of the north-eastern limit of dhani, the water in its streams is salt in the hot weather and the tidal lands suffer from this where bunds to keep the water out are expensive or impracticable. In some kwins, such as 441 to 445, nothing can be done in the first month of the rains because time must be given for the salt to be washed out of the soil before ploughing and broadcasting can be successful. The soil is so poor that it does not pay to transplant as a rule except in selected fields, the law of diminishing returns comes into operation at a very early stage. Broadcasting is therefore a common practice. Some holdings are entirely broadcasted, particularly if worked by Karens who are not so ready to use borrowed capital as Burmans, in others the first class is planted and the rest broadcasted. Planted first class land often looks fairly good in the hot weather when judged by the stubble, but this is only due to the tidal water-supply, if inspected at harvest the plants are found to have much straw and little grain. The planted land has an advantage over the broadcasted besides the better development of plants, because the broadcasted seed in this inhospitable soil so often fails to germinate. A holding in which a larger area than usual is transplanted, perhaps because the cultivator's family is large, may give a supernormal yield, but generally this can only be achieved by excessive hiring of labour and it is rarely economical. Planting is commoner towards the north than towards the south, owing probably to a difference of labour supply; in the north are some gardens which supply a small reservoir of casual labour. Because ploughing is so difficult and demands so many cattle and the land repays expenditure so ill and because the culturable area is so small, labour is scarce and more expensive than in other tracts and there is consequently all the less inclination to experiment to see if any given holding will respond to an increased application of labour. There has nevertheless been a large increase in the area of cultivation which has more than doubled since last settlement. Paddy-land has increased by 7,000 acres and the remaining increase has been due chiefly to the *danyin* garden which have been made on the slopes of the domes. Miscellaneous vegetable cultivation is practised in the immediate neighbourhood of Myaungmya which occupies the extreme north-east point of the tract. Small *taungyas* too are found in various parts of the tract which is inhabited largely by a very backward part of the district's population. Many of the people are Karens almost as unsophisticated as those found in the most remote parts of the country, and their standard of living is low, in Statement 13 they are shown to spend Rs. 325 per annum as compared with Rs. 370 for the average Karen of the district, and it is certain that the poorer grades were not examined because they would not submit to the ordeal. There is some employment by the Forest Department in a small part of the tract, but except in the immediate neighbourhood of Myaungmya the whole may be said to be quite undeveloped and devoid of local markets and to have only the minimum of local trade or of communications with the outer world. Export-paddy is sent to Bassein. The rented area has increased from 4 to 19 per cent. since 1902-03, but the latter figure is only that corresponding on an average to ownership by widows and others physically debarred from cultivation, and the former figure is probably incorrect, a considerable area often lies fallow without a tenant because it is of such poor quality. The average rent has moved from 2'6 to 4'0 baskets per acre since 1902-03. Land is of almost no value, selling on an average for Rs. 10 per acre. There is no great indebtedness because there is no credit. The percentage of the paddy land which is under mortgage is now 20, but that is the result of a large increase during the war. Outturns are estimated at 32, 22 and 12 baskets per acre, and prices in the three parts A, B and C at Rs. 100, Rs. 95 and Rs. 89 respectively; the extra price in A is due to the quality of the grain and nearness to Myaungmya Town, while the diminution of price in C is due to the length of the journey to Bassein and smallness of supplies.

The cost of cultivation is low on account of the large amount of broadcasting and is estimated at Rs. 9.5 except in the small portion called 8A where the price is Rs. 100 and Rs. 10 is estimated. The whole circumstances of the tract demand gentle treatment in assessment and the fraction two-thirteenths (or 15.4 per cent.) will therefore be applied.

319. **Tract 8A.**—This portion contains only two kwins of Mr. Lowry's Tract E with rates of Rs. 2.25 and Rs. 1.25. Its price is now placed at Rs. 100 and its cost of cultivation at Rs. 10. The calculation of assessment-standards and the proposed rates are as follows —

*Assessment Tract 8A.*

Soil class.	Assumed gross produce.		Value of net produce.	Assessment standards.			Basic portion of net produce taken.		Rate proposed.
	Government stand-ards.	Value.		One-fifth gross produce.	Half tenant rate.	Quarter net produce.	Fraction	Value.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.
R1	32	32	22	6.4	3.0	5.5	} $\frac{2}{13}$ {	3.38	3.5
R2	22	22	12	4.4	1.5	3.0		1.85	2.0
R3	12	12	...	3.4	0.5	...		...	1.0

The financial effect of this revision of the settlement would be a new revenue of Rs. 2,007 which is Rs. 526 or 35.5 per cent. in excess of the current revenue of Rs. 1,481. The average incidence in rupees per acre (a) occupied and (b) cultivated and assessed at full rates under the current and proposed settlements is shown in the margin. The rate of increase is large but the tract consists of the immediate environs of Myaungmya Town and gets a good price for its grain.

320. **Tract 8B.**—This portion of Tract 8 consists of 11 kwins of Mr. Lowry's Tract D with rates of Rs. 2.75 and Rs. 1.75 and 16 of his Tract E with rates of Rs. 2.25 and Rs. 1.25 lying within easy reach of the main route to Bassein, and securing a price of Rs. 95 which is a little lower than that of Tract 8A because of the quality of the paddy. Taking the cost of cultivation at Rs. 9.5 the calculation of assessment-standards and the proposed rates are as follows:—

*Assessment Tract 8B.*

Soil class.	Assumed gross produce.		Value of net produce.	Assessment standards.			Basic portion of net produce taken.		Rate proposed.
	Government stand-ards.	Value.		One-fifth gross produce.	Half tenant rate.	Quarter net produce.	Fraction	Value	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.
R1	39	30.4	20.9	6.1	3.0	5.2	} $\frac{2}{13}$ {	3.92	3.95
R2	22	20.9	11.4	4.2	1.5	2.8		1.75	1.75
R3	19	11.4	...	2.3	0.5	...		...	1.00

The financial effect of this revision of the settlement would be a new revenue of Rs. 12,688 which is Rs. 107 or 0.81 per cent. in excess of the current revenue of Rs. 12,581. The average incidence in rupees per acre (a) occupied and (b) assessed at full rates in the year of settlement is shown in the margin. Considerable further increase of revenue may be expected on resurvey of the kwins of this tract, many of which badly require it. With the present survey it may be said that the proposed demand is the same as the current demand, the reason being the large sterile area necessarily placed now in the third class and distinctly over-assessed in many kwins under the current



settlement which only recognised two classes. I do not think there are any grounds on which an increase of revenue in this poor and backward tract can be recommended; even now it will be noted that the proposed rates depend upon an addition of two baskets per acre to Mr. Lowry's assumed outturns. If it is considered that the exigencies of the Revenue Department demand a larger contribution from this tract the least inappropriate change would be to fix the second class rate at Rs. 2, thus adding a further Rs. 857 or altogether 7·6 per cent. to the demand; but I should vote against this. An increase is being proposed for garden and miscellaneous cultivation which are largely in the hands of the same people as are assessed for paddy, and an increase of 5 per cent. is thus proposed for the tract as a whole. Moreover the effect on all three parts of Tract 8 taken together of the whole system of rates proposed for them should be considered.

321. **Tract 8C.**—This portion of Tract 8 consists of 11 kwins of Mr. Lowry's Tract D with rates of Rs. 2·75 and Rs. 1·75 and 38 kwins of his Tract E with rates of Rs. 2·25 and Rs. 1·25 per acre. It resembles Tract 8B in every respect save that it is more distant from a market and its price has had to be fixed at Rs. 89, almost the lowest in the settlement area. The cost of cultivation being reckoned at Rs. 9·5, the calculation of assessment standards and the proposed rates are as follows:—

Assessment Tract 8C.

Soil Class.	Assumed gross produce.		Value of net produce.	Assessment Standards.			Basic portion of net produce taken.		Rate proposed.
	Government standards.	Value.		One-fifth gross produce.	Half tenant rate.	Quarter net produce.	Fraction.	Value.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
R-1	32	Rs. 28·5	Rs. 19·0	Rs. 5·7	Rs. 3·0	Rs. 4·7	} $\frac{2}{13}$ {	Rs. 2·92	Rs. 3·00
R-2	22	19·6	10·1	3·9	1·5	2·5		1·55	1·50
R-3	12	10·7	...	2·1	0·5	...		...	0·75

The financial effect of this revision of the settlement would be a new revenue of Rs. 12,556 which is Rs. 633 or 5·3 per cent. in excess of the current revenue of Rs. 11,923. The average incidence in rupees per acre (*a*) occupied and (*b*) assessed at full rates under the current and the proposed settlements is shown in the margin.

	Current.	New.
	Rs.	Rs.
<i>a</i>	1·2	1·3
<i>b</i>	1·6	1·6

322. For the whole of Tract 8 the financial effect would be a new revenue of Rs. 27,251 which is Rs. 1,266 or 4·9 per cent. in excess of the current revenue of Rs. 25,985, an increase which appears to be suitable to the circumstances of this region of sterile soil and salt water with a thin population of backward people who are largely, as already explained, Karens of a very unsophisticated character.

#### PRIMARY TRACT 9.—ASSESSMENT TRACTS 9A AND 9B.

323. Primary Tract 9 which contains 61 kwins is the lineal descendant of Mr. Lowry's Tract D and occupies the middle north-and-south strip of Myaungmya Township, forming an intermediate level plain between the domes and the broken land of Tract 8 on the west and the superior land on the east. Tracts 9, 10 and 11 in fact form successive stages in a progressive development from Tract 8 to the fertile tidal lands of Mawlamyaingyun Township. The three kwins of old Tract D which lay nearest to Myaungmya and nineteen others of the same tract along the Myaungmya and Polaung *chaungs* have been relegated to Tract 8 and one kwin (429) in the south has been promoted to Tract 10; while four kwins along the eastern edge and one isolated kwin (431) formerly in Tract C of which Tract 10 is the new representative, and the three Tagundaing kwins (456 to 458) formerly in Tract E, have been taken into this tract. The last three kwins were formerly included in Tract E presumably because of their hilliness, but the parts

devoted to paddy are on the eastern edge, and though slightly inferior to the fertile valleys of the adjacent kwins 454, 455 in outturn are equal to the ordinary kwins of the tract, these two kwins (454, 455) are really superior to the general quality of the tract but have been considered too small to be given higher rates than their neighbours.

324 The water in the streams of the greater part of the tract is derived from the tides coming up the Kôntha *chaung* which runs through its middle and communicates through the Pinlègale River (running along the south of Tract 8) with the Thetkèthaung River and has no source of water other than the tide after the rain stops. Low fields subject to tidal influence in the dry season are found in many places, corresponding perhaps to strains in the crust due to the elevation of the domes of Tract 8, and these are injured by the salt water. But the greater part of the tract relies upon rainfall for water exactly as does Tract 8, having however the advantage that on its less broken surface a smaller portion of the water runs to waste. Here and there the soil becomes a little sandy and some first-class fields receive silt from the river-water, but generally the soil is a stiff clay only a little less stiff than that of Tract 8 and regarded as extremely poor everywhere along the eastern edge of the tract where the soil of Tract 10 invites comparison. It is interesting, and of some importance as preventing misunderstandings, to note that whereas *pòk* applied to soils ordinarily connotes a large content of humus, in some parts of this tract the soil is called *myè-pòk* "because it yields such poor crops." *Myè-pòk* in fact means here "a rotten soil" in the slangy sense of those words. Second-class soil is rarely fallowed in the northern part of the tract and probably is never fallowed there solely on account of exhaustion, though the advantage of resting it may turn the scale in considering other reasons. But towards the south both second and third-class soils are fallowed nearly as much as in Tract 8. The *Shwelanbu* weed still flourishes and distinguishes from the more friable soil of Tract 10, and the people complain of the heavy expense of good ploughing. At Labutkala and Nyaunggyaung they reckon that a holding of a thousand baskets yield is necessary to maintain a family, and that three or even four yoke are required to plough it. A low standard of ploughing is adopted because the return upon more thorough work does not cover the extra cost, the law of diminishing returns does not come into operation so early as in Tract 8 but still it is not far postponed. Broadcasting is not so common as in Tract 8 but is still practised widely, again more in the south than in the north.

325. There is little grown in the tract besides paddy and the dhani which fringes its creeks and is perhaps better and more plentiful in this tract than in any other. The occupied area appears in Statement 1 to have decreased since 1902-03, but that is due to defects in the records and confusion of kwin boundaries; it has been about stationary. A considerable area of culturable waste remains, but it is mostly *kanaso* land with salt inundation or high plateau suitable only for poor gardens. There are no non-agricultural industries on any scale, no markets and no through lines of communication. The outer world is reached through Myaungmya Town or the Pulu *chaung* which borders the tract on the north-east, or through Pyinywa which is near one part of its eastern boundary. One-third of the land was rented in 1917-18 as compared with 13 per cent. in 1902-03, and the rent moved from 4.5 baskets per acre in 1902-03 to 6.4 in 1912-13 but fell again to 5.7 in 1917-18. Sale prices have risen from Rs. 11 to Rs. 20 per acre for land with much the same proportions of first and second class as in that shown in Statement 5 for Tract 8. Indebtedness is still small because the land is not of great value. The percentage of the paddy land under mortgage was 10 in 1912-13 and 24 in 1917-18. The standard of living is about the normal on the whole, but Karen tenants appear in Statement 13 to have a lower standard than is usual.

326. The tract is divided into two assessment-tracts 9A and 9B according to the price of paddy which is exported solely to Bassein. Ten kwins which are near the Pulu *chaung* on the northern border get a higher price (apart from the further addition they receive on account of their superior winnowing) through being on

the direct route to Bassein. the paddy from the remaining 51 kwins of the tract has either to negotiate the narrow Madama Yegyaw near Myaungmya or to perform a long journey down the Kōntha and Pinlègale Rivers, and in either case loses Rs. 5 per 100 baskets. Outturns are assumed at 35, 24, 14, that is at practicably the same level as by Mr. Lowry in 1903-04 for his Tract D to which these tracts 9A and 9B correspond. The cost of cultivation for both 9A and 9B is assumed to be Rs 10.5.

327. **Tract 9A**—This portion of Tract 9 is comparatively small and consists of only ten kwins from Mr. Lowry's Tract D with current rates of Rs. 2.75 and Rs 1.75. With an assumed price of Rs. 100 and a cost of cultivation Rs. 10.5 the calculation of assessment-standards and the proposed rates are as follows:—

Assessment Tract 9A.

Soil Class.	Assumed gross produce.		Value of net produce.	Assessment Standards.			Basic portion of net produce taken.		Rate proposed.
	Government standards.	Value.		One-fifth gross produce.	Half tenant rate.	Quarter net produce.	Fraction.	Value.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.
R-1	35	35	24.5	7.0		6.1	} $\frac{2}{13}$ {	3.77	3.75
R-2	24	24	13.5	4.8	3.0	3.4		2.08	2.25
R-3	14	14	..	2.8				...	1.25

The rate proposed for second-class land is two and three-quarter annas above that calculated and is really equal to one-sixth of the net produce, but, as has already been pointed out, calculated rates are indicators which depend upon numbers that cannot be determined precisely to a decimal or two, and the balance of the set of rates and their relation to the rates derived for comparable tract must be considered too. The financial effect of this revision of the settlement would be a new revenue of Rs. 18,507 which is Rs. 695 or 3.9 per cent. in excess of the current revenue of Rs 17,812. The average incidence in rupees per acre (a) occupied and (b) cultivated and assessed at full rates under the current and the proposed settlements is shown in the margin

	Current.	New
	Rs.	Rs.
a	2.2	2.25
b	2.3	2.35

328 **Tract 9B**.—The greater portion of Tract 9 falls into this portion which contains 51 of the total of 61 kwins. Of these 51 kwins 43 are taken from Mr. Lowry's Tract D with rates of Rs 2.75 and Rs. 1.75, while 5 are from his Tract C with rates eight annas higher and 3 are from his Tract E with rates eight annas lower. With an assumed price of Rs. 95 and a cost of cultivation Rs 10.5 the calculation of assessment-standards and the proposed rates are as follows:—

Assessment Tract 9B.

Soil Class	Assumed gross produce.		Value of net produce.	Assessment Standards.			Basic portion of net produce taken.		Rate proposed.
	Government standards.	Value.		One-fifth gross produce.	Half tenant rate.	Quarter net produce.	Fraction.	Value.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.
R-1	35	33.3	22.8	6.6	...	5.7	} $\frac{2}{13}$ {	3.51	3.5
R-2	24	22.8	12.3	4.6	3.0	3.1		1.90	2.0
R-3		13.3	..	2.7		..		...	1.0

The financial effect of this revision of the settlement would be a new revenue of Rs. 44,860 which is Rs. 2,858 or 6·8 per cent. in excess of the current revenue of Rs. 42,002. The average incidence in rupees per acre (*a*) occupied and (*b*) cultivated and assessed at full rates under the current and the proposed settlements is shown in the margin.

	Current	New.
	Rs	Rs.
<i>a</i>	1·6	1·7
<i>b</i>	1·9	2·1

329 For the whole of Tract 9 the financial effect of the proposals is a new revenue of Rs 63,367 which is Rs 3553 or 6 per cent above the current revenue of Rs. 59,814. This area is not so poor and backward as Tract 8 but it is not very different in some of its parts and the proposed increase seems to be as much as it is advisable to impose.

#### PRIMARY TRACT 10.—ASSESSMENT TRACTS 10A AND 10B.

330. Primary Tract 10 includes 40 kwins and represents the greater part of Mr. Lowry's Tract C in the eastern part of Myaungmya Township. Seven kwins (331 to 337) have been shorn from Tract C in the south-east to go into Tract 11 because of a superior water-supply and price, and one kwin (431) formerly isolated in Tract D and four other kwins behind Pyinywa have been transferred to the inferior Tract 9, while one kwin (429) formerly of Tract D has been taken into Tract 10 instead of Tract 9. The tract so formed falls into two separate blocks; but these are really parts of a larger compact tract of which a part was treated by Mr. Duffin in the settlement of 1910-12 and was not for treatment in the present operations. This compact tract represents the third stage in the progressive gradation from the sterile Tract 8 on the west to the fertile tracts of Mawlamyainggyun on the east. The small block of six kwins in the south-west, owing to the narrowness of the channel by which they connect with the Ywe River, and six inland kwins in the two western points of the main block, owing to the cost of transporting their produce to the barges, receive only about the same price as Tracts 8B and 9B and have therefore been formed into a small separate assessment Tract 10B, the greater part forms assessment Tract 10A with the same price as 9A but similar to 10B in other respects. The soil of the first-class though not quite like that of Tract 11 is more friable than that of Tract 9. Generally no water enters the fields in the hot weather so that only fresh water enters at all, but while there are low places which suffer from excessive water the general difficulty is still an insufficient supply requiring a considerable area to be placed in the second class, and *ngakyauk* is the commonest variety of paddy grown. Broadcasting, however, is not generally practised; on the contrary this is perhaps the tract in which the most intensive efforts at high cultivation are made. The use of disc-cultivators which was mentioned in the report of the earliest settlement is still practised here and indeed valiant efforts are made to secure a tilth. The natural conditions are such that the application of much labour will yield a result, in which the tract differs from Tracts 8 and 9 where it pays better to distribute labour over a wider area. The occupied area has increased by 22 per cent. since 1904, but the available waste land appears now to be of small extent, and most of it is high, dry, hard plateau-land resembling the land into which much of the recent extension has been made and all fitted only for the third class in the assessment-scale.

331. There are no large towns in the tract but Pyinywa towards the south-western end of Tract 10A is a village of large size doing a considerable amount of miscellaneous trade and financing a considerable area of paddy, and Sagamya in the north (kwin 325) is also of considerable size. The eastern portion of the tract is enclosed between the Ywe and the Zalètau Rivers and no part of it is far from either. Land near the Ywe River generally sends its paddy to Bassein, that near the Zalètau River to Wakèma; but some parts supply both markets, changing with slight changes in the relative prices obtained. While there are no large industries there is a good deal of non-agricultural occupation in various petty ways. The tract also makes a considerable contribution to the total *dhani* area of the district. Sale prices show a further increase on those of Tract 9 and like

those have risen immensely during the last five years. One-quarter of the land is under mortgage. More than half the land is rented and the average rent is a little over nine baskets per acre. Indebtedness is not great. The standard of living is normal. The differences in the prices of parts A and B have already been explained, the price fixed for Tract 10A is Rs. 100 and for 10B it is Rs. 95. Outturns of 4, 29 and 16 baskets have been assumed instead of the 40 and 30 assumed by Mr. Lowry for Tract C. The cost of cultivation assumed for both parts is Rs. 13. Consideration of the present incidence of revenue requires the assessment fraction to be slightly increased from sixteen per cent to one-sixth (16·7 per cent.).

332. **Tract 10A.**—The part 10A of Tract 10 contains 28 kwins, all from Mr. Lowry's Tract C with rates of Rs. 3·25 and Rs. 2·25. The calculation of assessment-standards with an assumed price of Rs. 100 and a cost of cultivation Rs. 13 and the proposed rates are as follows:—

*Assessment Tract 10A.*

Soil class.	Assumed gross produce.		Value of net produce.	Assessment Standards.			Basic portion of net produce taken.		Rate proposed.
	Government standards.	Value.		One-fifth gross produce.	Half-tenant rate.	Quarter net produce.	Fraction.	Value.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.
R-1	42	42	29	8·4	...	7·2	} $\frac{1}{6}$ {	4·81	4·75
R-2	29	29	16	5·8	5·0	4·0		2·66	2·75
R-3	16	16	...	3·2	3·5	...		...	1·25

The financial effect of this revision of the settlement would be a new revenue of Rs. 48,648 which is Rs. 1,243 or 2·6 per cent. in excess of the current revenue of Rs. 47,405. The average incidence in rupees per acre (a) occupied and (b) cultivated and assessed at full rates under the current and the proposed settlements is shown in the margin. The small increase in revenue is due to the large area of 2,915 acres (over one-sixth of the whole tract) which has had to be placed in the third class, no less than three-eighths of this descending from the first class, showing an anticipation of the increase normally due under a new settlement, this tract must also have suffered originally by the limitation to only two soil-classes under the current settlement with Rs. 2·25 as the lowest rate which could be applied to new land brought under cultivation in high waterless situations.

333. **Tract 10B.**—This smaller part of Tract 10 consists, as already explained, of twelve kwins so situated that they are unable to obtain the full price of Tract 10A. One of these (429) belongs to Mr. Lowry's Tract D with rates of Rs. 2·75 and Rs. 1·75, but all the others—like all the kwins of Tract 10A—belong to Mr. Lowry's Tract C with rates of Rs. 3·25 and Rs. 2·25. The calculation of assessment-standards with an assumed price of Rs. 95 and a cost of cultivation Rs. 13, and the proposed assessment rates are as follows:—

*Assessment Tract 10B.*

Soil class.	Assumed gross produce.		Value of net produce.	Assessment Standards.			Basic portion of net produce taken.		Rate proposed.
	Government standards.	Value.		One-fifth gross produce.	Half-tenant rate.	Quarter net produce.	Fraction.	Value.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.
R-1	42	39·3	26·9	8·0	...	6·7	} $\frac{1}{6}$ {	4·50	4·50
R-2	29	27·6	14·6	5·5	5·0	3·6		2·43	2·50
R-3	16	15·2	...	3·0	3·5	...		...	1·25

The financial effect of this revision of the settlement would be a new revenue of Rs. 9,265 which is Rs. 791 or 9·3 per cent. in excess of the current revenue of Rs. 8,474. The average incidence in rupees per acre (a) occupied and (b) cultivated and assessed at full rates, under the current and the proposed settlements is shown in the margin. The influences which diminished the change of demand in Tract 10A have had the same effect here.

	Current	New
	Rs.	Rs.
a	21	2'3
b	24	2'6

334. For the whole of Tract 10 the proposed demand is Rs. 57,913 which is Rs. 2,034 or 3·6 per cent. in excess of the present demand of Rs. 55,879.

#### PRIMARY TRACT 11.—ASSESSMENT TRACTS 11M AND 11W.

335. Tract 11 lies round about Yanmanaing and consists of two parts 11M and 11W, which are distinguished as lying in different townships and having different current settlements. the former includes seven kwins in Myaungmya Township excluded from Mr. Lowry's Tract C in forming Tract 10 and the latter includes five kwins of Wakèma Township belonging under the current settlement to Mr. MacKenna's Tract II. These twelve kwins are superior in quality to Tract 10 and not suitably accommodated in any other tract. They have much the same soils as Tract 10 but are a little more friable and generally are better watered, having tidal irrigation except in a stretch of high land near Mankale, and an important difference from Tract 10 is indicated by the fact that there was no fallow land in the tract in the year of settlement. Second-class lands are equally divided between high and low land, and the third class is generally land in which water lies heavily. Statement 1 shows only 182 acres of culturable waste left in the tract. Much though not all of the first class land is used to grow *kaukgyi*, *ngasein* being grown on the high second-class. The exported paddy is all sent to Rangoon, and as barges collecting it have only to traverse the narrow Yanmanaing or Mankale *chaungs* for at most a short distance, and the paddy contains a large proportion of *kaukgyi* and averages rather above 51 pounds, a better price is obtained than in Tract 10 though not quite so high as in Tract 12. Yanmanaing is the one village of importance in the tract, and it does a considerable amount of miscellaneous trade besides paddy trading and the financing of agriculture. There is also of course a little fishing in the tract, but there are no other non-agricultural activities and the agriculture is practically limited to paddy cultivation. In the portion in the Wakèma Township there is now in fact nothing besides paddy cultivation but one acre of garden land in assessable house-compounds. The value of land as shown in Statement 6 is distinctly higher than in Tract 10 even allowing for the different proportions of good and bad land covered by the statistics on which that statement is based in the two tracts. Nearly one-half the land is mortgaged and Statement 5 shows no less than 78 per cent. of it let to tenants at an average rent of twelve baskets per acre. The standard of living of the tenants appears to be above normal in Statement 13; but the basis of that statement in this small tract is too small for reliance. The indebtedness shown in Statement 15 is subject to the same criticism. The impression received when working in the tract was that both the standard of living and indebtedness were about the same as in Tracts 12 and 14; but of course only a very vague impression is received in this way. Outturns have been estimated at 45, 30 and 16 baskets per acre, rather above those of Tract 10, instead of the 40 and 30 assumed by Mr. Lowry and Mr. MacKenna respectively for the two parts of the tract. The price of the paddy in both parts of the tract is Rs. 105 and the cost of cultivation has been placed at Rs. 15.

336. Tract 11.—The current rates in the portion of the tract lying in the Myaungmya Township and belonging under the current settlement to Mr. Lowry's Tract C are Rs. 3'25 and Rs. 2'25; those in the portion lying in the Wakèma

Township and belonging to Mr. MacKenna's Tract II are Rs. 4'0 and Rs. 2'25. For these two portions the same outturns were assumed (40 and 30) and the price was assumed at 78 in 1903-04 in the former which received the lower rate as compared with the lower price 72 assumed in 1902-03 in the latter, there can be no doubt that the rates in the latter were excessive at the time they were imposed, especially when regard is had to the small proportion recognised then as second class land. For the present settlement it is proposed to take one-sixth of the net produce as a standard for the assessment, the small increase above the two-thirteenths taken in Tracts 8 and 9 being justified partly by a consideration of the present total revenue-demand and partly by the more generous allowance made for the cost of cultivation. The calculation of assessment-standards and the proposed rates on the basis now set forth is as follows—

Assessment Tracts 11M and 11W.

Soil Class.	Assumed gross produce.		Value of net produce.	Assessment Standards.			Basic portion of net produce taken.		Rate proposed.
	Government standards.	Value.		One-fifth gross produce	Half-tent rate.	Quarter net produce.	Fraction.	Value.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.
R-1	45	47'3	32'3	9'5	8'0	8'1	} $\frac{1}{6}$ {	5'38	{ 5'50 11W 5'25 11M
R-2	30	31'5	16'5	6'3	6'0	4'1		2'75	
R-3	16	16'8	...	3'4	...	...		...	

The calculated rate for the first class comes to Rs. 5-6-0 exactly if the exact value of Rs. 47 25 is written for the gross produce in column 3. I propose to take the next higher multiple of four annas in 11W and the next lower in 11M where a lower system of rates is now in force and a sufficient increase of revenue is obtained by this rate. The financial effect of this revision would be a new revenue of Rs. 25,901 which is Rs. 3,007 or 13 per cent in excess of the present demand of Rs. 22,894. Taking each part separately, the effect for 11W with the higher first-class rate would be a new revenue of Rs. 10,592 which is Rs. 228 or 2'2 per cent. above the present revenue of Rs 10,364, while the average incidence in rupees per acre under the old and the proposed settlements (all being assessed at full rates as there is no fallow) would be Rs 3'66 and Rs. 3'70. The small change is due to the relative over-assessment at last settlement. For the portion 11M with the lower first-class rate the financial effect would be a new revenue of Rs. 15,309 which is Rs. 2,779 or 22'2 per cent in excess of the present revenue of Rs 12 530, while the average incidence in rupees per acre as before would be Rs. 3'0 and Rs. 3'65 respectively. This is a very substantial increase which amply justifies the selection of a first-class rate of Rs 5'25 which lies between the rate of Rs. 5'0 which is indicated if two-thirteenths of the net produce is calculated (Rs. 4 97) and the rate of Rs 5-6-0 suggested when the fraction one-sixth is adopted; Rs. 5 25 would be indicated by the fraction of 16 per cent. applied in Mr. Duffin's settlement to the neighbouring areas. The difference to Government by adopting the lower rate is only Rs. 413, and probably even this would be still further diminished by the reductions due to intermediate assessments.

PRIMARY TRACT 12.—ASSESSMENT TRACTS 12M AND 12W.

337. In some respect it is to be regretted that Tracts 12 and 13 received these numbers as their discussion here interrupts the discussion of the revision of the settlement made by Mr. Lowry in 1903-04; for consecutive reading of this report it will be found better to read the paragraphs dealing with these two tracts after those dealing with Tracts 14 to 17 have been read.