

REPORT

ON

LEATHER INDUSTRIES



OF THE

BOMBAY PRESIDENCY.



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CHAPTER I.

PREFACE.

This report is a result of a six months' investigation of the different branches of the Leather Industries, and the conditions affecting them in the Bombay Presidency, including Sind, undertaken by me under Government Resolution No. 53, General Department, dated January 7th, 1910. To all officers and other Government officials, as also to tanners and other gentlemen connected with the trade, with whom I came in contact whilst I was making my investigation, I wish to thank most sincerely for their great courtesy and for the aid they so kindly rendered.

2. In Gujarát, to which I went first, I visited every class of tannery, from that at Vejalpur, which turns out almost every class of leather required in India, and those in Ahmedabad tanning skins for export, to the numerous settlements of Chámhárs who make a speciality in leather for ginning rollers, and to those of Kalpas and Kathis whose trade is purely a home industry, and whose methods are often extremely crude.

3. In Sind, which I next visited, Káráchi and Hyderabad are the only two centres of any importance, the village industries being of a most irregular and backward nature.

4. In the extreme south of the Presidency, to which I went from Sind, there is no organised trade, except in the collection of raw material by the Madras and Bombay tanners and exporters, but each other branch exists as a home industry.

5. In Belgaum, Sátára and Poona the trade is more organised and there are one or two factories tanning for export, and local requirements, whilst several large settlements of Dhors manufacture a most useful class of leather and in a few cases make some attempt to curry and finish the same.

6. The districts to the extreme east are similar to those on the south except that two small factories have lately been opened in Ahmednagar and Sholápur, which are making certain classes of finished leather and are thus catering for the small demand at present arising for leather for European styles of boots and shoes.

7. In Bombay I saw several of the most important of the export tanneries and some of those in which leather for the local demand is manufactured and prepared.

8. I trust that the report will be found to fulfil the objects for which it has been prepared.

CHAPTER II.

RAW HIDES AND SKINS.

9. The raw materials for leather manufactures in the Bombay Presidency are as elsewhere in India chiefly the hides of buffaloes and cows, and the skins of sheep and goats. Besides these, small quantities of other skins are used, as camel, sámhur, neilghái, etc.

10. These skins are received in various conditions by the tanners, but may be first of all divided into two chief classes:—

- (1) Hides and skins from animals slaughtered for food.
- (2) Those from animals that die a natural death, or die from the result of some accident.

Generally speaking the former of these two classes are the most valuable, and are used by the larger and more advanced tanners and bought for export, whilst those from "dead" animals are often used by the local tanners, the balance being either tanned in the larger tanneries or exported.

11. The number of animals slaughtered in the Presidency, especially in the case of horned cattle, is, however, very small as can be seen from Table No. XIII which shows the number of animals slaughtered in various Municipal areas in different parts of the Presidency.

that the whole world is searched for raw material. Unfortunately all attempts at the manufacture of glacé goat in this country have been either failures or only partial success.

24. Early this year the American import tax on raw hides and skins was removed, and when figures become available it will be found that the export of raw sheep skins which up to the present have been comparatively small will have increased very greatly.

25. In most parts of the Presidency (excluding Sind) the number of "dead" hides available is only sufficient for the local demand, whilst in Gujarát the demand is very much greater than the supply, which has to be augmented, especially during the ginning season, by imports from Rájputána and the Central India Agency. In Sind the demand for leather is much less than elsewhere, and consequently many more hides are available for export. There is practically no export of tanned hides from Sind (Table VII).

26. The total number of hides available from slaughtered animals is estimated by the author at from 100—120 thousand per annum, of which the greater number are of cow and bullock. The number of skins is much more difficult to estimate, as each village slaughters a few sheep or goats, whereas the slaughter of horned cattle is confined almost entirely to the larger towns and cities.

27. The flaying of both hides and skins by the butchers leaves much to be desired, and it seems almost hopeless to get them to do better work, as in several cases tanners have offered a higher price for hides or skins free from "butcher cuts," but even then no improvement has been made. The amount lost to the tanner on account of these cuts is very great, as hides with any number of them must be classed as seconds or thirds instead of firsts, and consequently have to be sold at a less price. In Bándra slaughter-houses the butchers have a peculiar method of cutting the hide, causing the shoulder to be one-sided and ugly.

The best of the Bombay goat skins are those from the Deccan, the Gujarát ones being of a much inferior quality.

28. Of hides and skins imported (Tables I and III) from foreign countries the greater part come from Aden and Persia with smaller quantities from other parts of Arabia and East Africa.

29. The most noticeable feature of the export figures is the tremendous rise in exports to America. In 1898-1899 no raw skins were exported from Bombay to America, whilst in 1904-1905 only 5 per cent. of the total value of skins exported went there. Within ten years from the time when the exports to America commenced they have risen to the high amount of Rs. 24,51,132 or 88 per cent. of the total exported in 1908-1909.

CHAPTER IV.

TANNING MATERIALS.

30. In almost all parts of the Presidency tanning material of some class is abundant and speaking generally the amount used is only a tithe of that available.

31. *Bábul* (*acacia arabica*).—The bark of the *bábul* is the only material which is used throughout the whole of the Presidency. In the greater part of Gujarát it is the only material used, whilst in Sind and the Deccan it is the chief material, although always mixed with other materials. The supply of *bábul* bark is at the present moment very much greater than the demand, in almost all parts of the Presidency. In many of the larger cities, and even in Bombay itself, large stocks of *bábul* firewood may be seen, and of this only quite a small proportion is stripped. The larger the tree the greater the tannin contents of the bark becomes, and it also becomes a little darker in colour, and consequently in some districts where *bábul* is very plentiful, the local tanners only use the bark of the larger branches as they get a better coloured leather from this than from the trunk bark. Samples of trunk bark examined by the author have yielded as high as 20 per cent. of tannin, whilst from the smaller branches and twigs only 10 per cent. has been obtained. *Bábul* bark in many ways resembles oak bark, and is, considering all things, the most useful of all the local tanning materials, and may be used for all classes of leather, except that tanned for export, for which it gives too red a colour.

The pods also contain tannin, but as an infusion of them quickly becomes putrid they are unsuitable for use as a tanning material, but are used as a bate by certain Sindi Mochis; for this purpose they act admirably as they contain a tannin that is not precipitated by lime.

The cost of the bark varies very much, being reported most expensive in parts of Sind, although it is very plentiful there. The exact cost as a rule is very difficult to discover, as the tanners buy by bargaining for the cart-load, and as these vary very much in weight, only approximate valuation can be made. In certain districts it is obtained for as little as 8 to 10 annas per maund (82 lbs.) whilst in others as much as Re. 1-8-0 is paid.

Bábul is found most abundantly on the "Black Cotton Soil," but grows from end to end of the Presidency and Sind, except in some of the forest areas.

32. *Tarwar* (*Cassia auriculata*), *Tarwad*, *Tarawad*, *Awal*, *Aval*, etc.—The bark of this shrub is the basis of all export tannages, and is also generally used for skins for local requirements except in Sind, where, due to the distance it has to be brought, it is only known to and used by the export tanners. It is collected chiefly between the months of November and March but in some cases as late as June. The chief supplies come from—

- (1) Hyderabad (Deccan).
- (2) Deccan.
- (3) Kutch.
- (4) Márwár.

Bombay, Poona and Belgaum depend almost entirely on the Deccan and Hyderabad supply, whilst Ahmedabad, Hyderabad (Sind) and Karáchi get their supplies from Márwár and Kutch.

Tarwar is one of the lightest coloured tannin known, but unfortunately leather tanned with it turns very dark when exposed to light. This darkening in colour is accompanied by deterioration in strength, and on this account a Committee, appointed by the Societies of Arts in London to report on the deterioration of leather bindings on books in various libraries, declared that leather tanned with this material was absolutely unsuitable for book-binding. As a rule the larger the bark is the stronger it becomes, but at the same time the colour obtained from "heavy" bark is not so good as that from the smaller, and consequently the bark of small shrubs is preferred to tan skins for export where colour is the first consideration.

The cost of this bark varies in the same way as *bábul*, and is reported to cost from Re. 1 to Rs. 3-8-0 per maund, although the lower price is only where it is obtained and used locally in districts well away from the railway.

33. *Myrabolans* (*Hurra*, *Hurdas*—fruit of *Terminalia chebula*).—Myrabolans are perhaps the most important of Indian tanning materials and one of the most suitable for export. Locally they are used to a large extent in the Central and Southern Divisions and are also used as a kind of bleaching and fixing agent to all export tannages. As has been pointed out, leather tanned with *Cassia auriculata* bark very quickly becomes red on exposure to light, but it has been found that if the leather has a final bath of myrabolan liquor that this property is very much reduced. Details of the methods in which myrabolans are used will be found in the chapter dealing with methods of tanning. The exports of myrabolans which in 1908-1909 totalled over fifty thousand tons valued over forty lacs of rupees, of which the United Kingdom took well over half, shows what an extensive trade may be formed if tanning materials can be obtained in a form suitable for export. Owing to its containing such a large quantity of tannin it has up to the present been found more suitable to export in the natural condition than as an extract.

The tannin in this material is of the pyrogallic class, and therefore leather tanned with it does not become red on exposure to light. It is for this reason that it is used as a final bath for all export tannages. Unfortunately it does not, when used alone, give a leather suitable for any trade purpose, and consequently is always used with other materials.

34. *Gottahar* (fruit of *Zizyphus xylopyrus*) (*Got Bhor*, *Gotti*).—In the Panch Maháls District there are a number of tanneries using this material for both hides and skins. The colour of the leather is excellent and very much liked by the local Mochis.

This material is, however, not suitable for use, where European methods are used, as due to its mucilaginous properties it would be almost certain to choke the leaches. For the same reason it is a most difficult material to analyse, but samples examined by the author yielded 10—12 per cent. of tannin with 10—16 per cent. soluble non-tannins.

When used in the Indian fashion there seems to be no difficulty about its use.

Leather tanned with *gottahar* is considered one of the least suitable for gins.

35. *Sein* (*Terminalia tomentosa*) (*Matti, Ain, etc.*).—The bark of this tree is used chiefly in the forest areas of the Southern Division by the Dhors and Chámhbárs. It is never used by itself but almost always with myrabolans with which it combines to give a fairly good looking leather. The Chámhbárs of Kárwár and other places used to strip the bark from living trees, and have an idea that this is better than if taken from those which have been felled. This bark is also the chief tanning agent used by the fishermen on the west coast for their nets.

Unlike *bábul*, the larger the tree becomes the weaker becomes the tannin strength of the bark. To a great extent this is due to the growth of ross (rough outside bark) which contains no tannin, and if this be removed from the old bark the remainder is very similar in strength to the bark from younger trees. In certain places where this bark has been used for generations it is not now procurable, and other materials are being substituted for it, *jámbul* amongst others and imported mangrove.

In many parts the Chámhbárs obtain the bark for collecting it and in other places pay about 0-6-0 per maund for it.

A sample of bark of a large tree analysed by the author yielded only 10·1 per cent. of tannin with 4·6 per cent. of soluble non-tannins.

36. *Sachu*.—This material is used in Sind in combination with *bábul* bark and seems a very useful material. A sample obtained in the Lárkhána Bázár by the author yielded

32·3 per cent. tannin.
18·9 per cent. soluble non-tannin.
5·4 per cent. moisture.
43·4 per cent. insoluble.

The tannin is purely of the pyrogallic class and might prove a very suitable material to use for tanning leather suitable for book-binding. (See note on *Tarwar*.)

37. *Jámbul*.—This bark is used in small quantities in districts where *sein* was formerly used, but now is not procurable. It contains a red colouring matter with very little affinity for hide fibre besides the tannin which is of a similar colour to *sein*.

A sample from Panvel examined by the author gave on analysis only 8·2 per cent. tannin with 15·5 per cent. of soluble non-tannin. It will be seen from this that it is only a weak tannin.

38. *Famba* (*Xylia dolabriformis*).—Both the wood and bark of this tree contain a considerable amount of tannin, but as far as the author knows they are seldom if ever used for tanning leather, but occasionally by fishermen for their nets. Although dark in colour it seems a material the investigation of which should be undertaken as the proportion of soluble non-tannin to tannin is much lower than in almost any of the better known Indian tanning material and should therefore be very suitable for export manufacture.

Samples of wood and bark examined by the author gave liquors of a dark red colour, and yielded the following results:—

		Wood.	Bark.
Tannin	...	7·8 per cent.	18·5 per cent.
Soluble non-tannin	...	1·7 per cent.	5·1 per cent.
Moisture	...	5·9 per cent.	6·7 per cent.
Insoluble	...	84·6 per cent.	69·7 per cent.

39. *Amti leaves* (*Phyllanthus emblica*) (*Amti, Avala, etc.*).—The leaves of this tree contain a large amount of tannin as may be seen from the following analysis made by the author:—

Tannin	...	...	...	20·3
Soluble non-tannin	...	...	...	19·4
Moisture	...	...	...	4·4
Insoluble	...	...	...	55·9

These leaves are used by the Chámbhárs in one village near Párdi in the Surat District amongst others. The leather tanned there with a mixture of this and *bábul* is noted throughout the district for hard wear, but in the opinion of the author this is due more to the leather being more thoroughly tanned by these Chámbhárs than by any of the Kalpas in the same neighbourhood than to the use of this material. The bark could be used for tanning and has been reported as being used in large quantities in Bombay and elsewhere, but in all cases where enquiry was made it was found that this material was not being used. This report may have originally risen from the similarity of the name "*avala*," and "*aval*," the Bombay name for *tarwar* (*Cassia auriculata*) and the similarity in the appearance of the bark.

No price can be given for this material as it is usually collected by the tanners themselves.

40. *Behara* (fruit of *Terminalia belerica*).—This fruit although common in many parts of the Presidency is only used in a very few villages. In Dohad (Panch Maháls) it is used by a few Katiks who tan sheep and goat skins for local use, and is usually used by them in the green condition, the pulp being pounded up before it becomes dry. The leather tanned with it has a peculiar greenish tint. Owing to its containing much less tannin than myrabolan which it resembles in many ways it is of very little value. Samples examined by the author gave from 7.5 to 14.0 per cent. tannin with 13 to 19 per cent. of soluble non-tannin. It would be a most unsuitable material for extract manufacture owing to the high ratio of soluble non-tannins to tannins.

41. *Pomegranate Rind and Flower*.—These are used by the Sindi Mochis, and give the leather the peculiar yellow shade which leather from Sind and Baluchistan shows.

42. *Mangrove*.—A small amount of mangrove bark is imported into Bombay from Zanzibar and used by a few Chámbhárs in Kolába and Thána as a substitute for *sein* which they are unable to obtain.

In use it is not put into the bags but soaked in a "*khánd*" and the liquor thus obtained soaked through the bag.

43. *Lime* (*Chunam*).—Lime is available in most parts of the Presidency and Sind and in only a few cases has it to be imported any distance.

On the coast tanners often collect shells and burn them themselves, by this means getting a very white and suitable lime for leather work. In the larger tanneries stone lime is more often employed, and is in some cases burnt by the tanner himself, as if burnt elsewhere coal may be used and this may contain iron which may settle on the hides and skins and cause stains in a later stage; when it is burnt with charcoal this difficulty does not arise. The cost varies from 8 annas per maund upwards.

44. *Oils*.—The oils that are used in the softening and dressing of leathers are always oils that may be obtained locally. For leather for export *til* oil (*jingili*) is generally used although in other cases groundnut and safflower seed oils are also used.

CHAPTER V.

METHODS.

45. In all cases of leather manufacture the process may be divided into three chief stages as under:—

- (1) The treatment of the hide or skin to free it from hair and flesh and to leave it in a suitable condition to receive the tannage.
- (2) The tannage proper by means of which the putrifiable skin is turned into leather.
- (3) The dressing and finishing of the leather.

There is one large factory in Bombay working on European lines with European overseers and machinery, some account of which may be found in the monograph "*Tanning and Working in Leather in the Bombay Presidency, 1903*," but of which the author of the present report cannot give any details.

46. *Soaking*.—As has been pointed out in the last chapter, hides and skins are received by the tanners in various conditions, and consequently the first process which they

undergo varies. Whatever condition the skins are received in the first process is that of bringing it to as near the condition in which it is removed from the animal as possible. Fresh skins need only be rinsed to clean the adhering blood, dung and dirt, whereas wet and dry salted hides are soaked in several changes of water to remove the salt, whilst dried hides are left in water till they are thoroughly softened. As a rule the soaking of dried hides is carried out in fresh water but in a few districts it is usual to throw the hides into a hole in ground at the side of a tank, in which the water is never changed. The water in these places naturally becomes putrid, and in this condition softens the dried hides with great rapidity, but also with loss of substance, and often causes the hide to decompose badly in places causing holes and other damages. As a rule 24—48 hours is sufficient to soak a dried hide in fresh water but this varies according to the nature and class of hide.

47. *Unhairing*.—Hides and skins are unhaired by various methods. These methods may be classed under three headings as below, although almost every village shows some slight peculiarity in the process:—

- (a) The use of alkaline depilants.
- (b) The use of saline acid depilants.
- (c) Sweating.

(a) This is by far the most usual method of unhairing, and usually consists in soaking the hides or skins in an infusion of lime and water, to which in some cases *khār* (potash) is added. Most of the village tanners put the hides into fresh lime and water but others use the lime liquor over and over again and often previously rub a thick milk of lime on to the hide and leave it in pile a short time and then put it into the vat, or *khānd*, in which the solution is. In other cases a thick milk of lime is spread on the flesh side of skins, and the skins rolled up till the wool or hair will “run” when it is removed, and the skin then thrown into lime liquor. The liming process lasts for from a few days to a month.

(b) This method of unhairing is almost confined to skins for which it is general throughout the province, but in certain parts of Gujarāt hides are also unhaired by it.

The skins or hides to be treated by this method are put into a fairly strong solution of salt, and some material or mixture of materials, which will give an acid on fermentation, are added and the hide is then handled in this solution till the hair has become loose when it is removed. The chief acid-forming material is the “*dood*” of the milk plant (*akara* = *Calatropis gigantea*) which is collected by breaking off the tips of the plant and collecting the milk which runs out. Several other plants which contain a juice of a similar nature are used, but where it is impossible to obtain the “milk” separately the whole plant is dried and then pounded up and added to the saline solution in this condition. *Fowāri* or *bājra* flour is often boiled up and added, and if this is done a very much smaller quantity of the “*dood*” is required, and in some cases the flour paste is used alone, although the unhairing then takes a very much longer time.

(c) Where sheep skins are long woolled, and are consequently of more value for the wool than for the pelt, the wool is sometimes removed by soaking the skins in water till thoroughly soft and then spreading flesh up on the ground, keeping them wet if necessary, until a slight putrefaction sets in and the wool becomes loose enough to pull. By this means the wool is obtained in a much better condition than by either of the above methods and is of very much greater value. After the wool is pulled the skins are then treated by either process (a) or (b) according to district or class of goods being made.

The unhairing is carried out with various tools and by various means. The only method, however, used in tanneries of any size or importance is that of throwing the hides or skins over a curved beam called the tanner’s beam and scraping it with a knife similarly curved. The Indian tanner’s beam consists of a section of the trunk of the Palmyra palm and is much more curved than the European beam and hence the knife used is also more curved. Where tanning is carried out in the villages the unhairing usually takes place either on the ground, or on a board laid on the ground, and the tool used is generally the fleshing “*rampi*,” the tool being pulled over the surface and not pushed so as not to damage the grain. In other places a long sleeker-like tool called “*shimpi*” and in others again an ordinary knife or piece of broken earthenware is used.

48. *Fleshing*.—After unhairing, the hides or skins are as a rule put back into the depilant and either next day or after a few days taken out and fleshed. The flesh is

almost invariably removed from the hides with the *rampi*, although this is used in different ways, and is very different in shape and size in different districts. In the larger tanneries it is a thin half-moon shaped tool (see illustration) with cutting edge the whole way round the circumference and wooden handle in the centre of the back, whilst some of the Kalpas and Chámbhárs use a piece of metal with a cutting edge of only $1\frac{1}{2}$ — $1\frac{3}{4}$ inches. A few of the most expert "*rampi*" fleshers work with their slab at an angle of about 75° , but most of them work on a horizontal surface of either wood or stone. In the few places where hides have been unhaired in the saline acid solution the "*rampi*" cannot be used for fleshing, as the hide is in too flacid a condition, and so a sickle-like knife called "*vakal*" is used, the hide being first thrown over a pole and the flesh taken off by working down the folds of the hide. Only very unsatisfactory work is performed by this tool. Skins have any excessive flesh removed by scraping rather than cutting, the usual method being the use of the same beam and knife that is used for unhairing.

49. *Scudding*.—After fleshing, the hide or skin has to be freed from the depilant, which is usually accomplished by washing in several changes of water, working the pelt on flesh and grain over the beam and by trampling them in water. In a few cases an acid bath of some kind is given to remove the last traces of lime but this is not often the case.

Tanning.—After this treatment the pelts are ready to be tanned and are thrown into water with a certain amount of the tanning agent used and left in this for from 1—8 days, being moved every day. The liquor after this time is usually thrown away and the pelts treated in another similar liquor. Hides are then usually sewn into bags and the tannage completed by filling these bags with tanning materials and water so that the liquor forces its way through the hides and so quickens the process. After the leather is supposed to be tanned, the bags are cut open and the leather thrown into the liquor for a day or two to brighten the colour, etc., and then dried out, by spreading grain down on dry spent bark.

The dressing or finishing of the leather varies so much for different classes that no general methods may be mentioned.

PARTICULAR METHODS.

50. By far the most important branch of the tanning trade is that of the tannage of hides and skins for export. The head-quarters of this trade is centred at the extreme north of the Bombay Island, but there are also important tanneries in the neighbourhood of Ahmedabad, Karáchi, Hyderabad (Sind), Belgaum and Poona.

The methods in use in all these tanneries are so similar that if that of one establishment is described it will practically give an account of all.

51. Sheep skins if received fresh are first washed in clear water and then painted on the flesh with a thick lime paste and are folded up so that the wool does not come in contact with the lime, and left till the wool is loose enough to be removed, when it is removed by working on the beam. This wool is kept separate from that which has been limed as it is of greater value. Salted sheep and goat skins are washed in several changes of water, whilst fresh goat skins are only rinsed, then thrown into pits with water and lime and handled every day for about 8 days, after which they are unhaired and then put back into the lime to plump for 5 or 6 days more. They are then scudded (worked on the grain with unhairing knife to remove hair roots, lime soap, etc.) and washed in water, scudded again and washed and then trodden (*khandal*) in water till they become quite flacid and finally again scudded.

52. The skins are now thrown into tubs and *Cassia auriculata* bark spread between each skin, 20·28 lbs. per 20 skins being given. The skins are left in this for about 8 days, being handled daily, taken out, squeezed and worked on the flesh over the beam and again put into another tub with the same amount of bark and handled daily for 8 days. After this second bark the skins are again squeezed and worked on flesh and then put into a myrabolan liquor made by steeping $1\frac{1}{2}$ —3 lbs. myrabolans per "*chori*" in a little boiling water overnight and then diluting with cold water to the requisite amount. The skins are left in this 2 or 3 days and are then taken out and squeezed free from excess liquor and worked well on the beam. They are afterwards coated with *til* oil,* and after standing some time for the oil to absorb they are hung up to dry. When the oil has been absorbed, but the skins are still slightly damp, they are taken down and set out with brass sleekers on a wood table and then finally dried off.

* In a few cases safflower or groundnut oils are used.

53. Within the last few months a great change has taken place in this drying. The skins used always to be dried by throwing them grain down on ropes, and consequently if the rope by any chance got dirty the skins were damaged (rope-marked) to a greater or less extent. This "rope-marking" which was due to dirt and moulds from the rope has now become a thing of the past in the larger of the export tanneries as the skins are now hung on hooks.

When the skins are dry they are removed from the hooks (or ropes) and are ready to be softened and finished. The skins are first laid in a pile and beaten with heavy iron bars and are then taken and folded flesh out and battered on to a large stone in exactly the same way as a Dhobie "washes" clothes. They are then "staked," that is, pulled (flesh down) over a vertical stake on which a more or less semi-circular steel blade is fixed. Some of the tanners now class and trim the skins but others beat and stake them a second and even a third time before finally classing and bailing them for export to the London sales.

54. The method of tanning kips (cow hides) for export is similar, except that on account of the greater thickness and weight of the hide larger quantities of bark and more "changes" are necessary. On account of the similarity of the process there is no necessity to describe it fully.

55. Roughly speaking the Tápti divides the tanners of the Presidency (excluding Sind) into two divisions. Those of the districts south of this river almost always tan by means of the "bag" process, whilst those of north rarely if ever do so.

56. Bag tanning is carried out in a most characteristic way in Belgaum, Sátára, Poona and Bombay districts where it varies very little in detail.

The hides are as a rule received in the sun-dried condition and are first soaked in clear water for about 24 hours after which they are latied or coated with a thin lime paste and left some time in pile, then thrown into a pit with fresh water and lime and handled every day or every second day for from 12—20 days. After this they are unhaired with the "*shimpi*" and then put back into the lime liquor for from 5—15 days and fleshed with the "*rampi*." They are then washed with one or two changes of water and the grain cleaned by scudding.

In a few districts they are then washed in an old tan liquor, but usually are put into a vat with a certain amount of *bábul* bark and myrabolans and left in this for about 6—8 days. The quantities of bark and myrabolans vary very much in different villages, but as a rule is between 7 and 14 lbs. bark and $3\frac{1}{2}$ and 10 lbs. myrabolans per hide. After these are taken out they are given a second liquor with a similar amount of bark, etc., for the same number of days. When taken out from this second "liquor" the hides are sewn up into bags, usually buffaloes in sides and cows whole and are there partially filled with bark and myrabolans and the hides hung up on poles by the neck and water poured in. As this water extracts the tannin from the material it percolates through the hide and is again and again poured back into the "bag" for up to 4 days when the bag is reversed, the opening through which the liquor has been added being sewn up and an opening made at the butt end from which it is now hung and the liquor again percolates through the hide. Finally the tanning material is lifted to about the centre of the hide or side and the bag tied a little below this line so that the centre portions of the bag will now get the full benefit of the liquor. After this the leather is considered "pucca," but after the sewing has been cut it is thrown into the liquor and left in this from 12 hours to 4—5 days to take out the air stains and generally brightens the colour. Finally the leather is dried out grain down on the ground which is covered with a layer of spent material to keep the leather from damage.

57. In Sind a similar method is used but the hides are usually bated to free from lime and the myrabolans are replaced by other materials and finally salt, and in some cases oil, is rubbed into the hide before drying.

58. North of the Tápti the preparatory work is similar to that described for the bag tannage but the tannage is only done in vats. As a rule *bábul* bark is the sole tanning material used. The hides are put into vats and about 10 lbs. bark added per hide, then handled for from 4—9 days, and this process repeated either 3 or 4 times. The leather is then taken out, spread on the ground, and as much salt as it will absorb is rubbed in, and is then left to dry. In some cases, especially in the Ahmedabad District, the unhairing is done by means of *akara* "dood" and salt.

59. Sheep and goat skins are tanned in small quantities in every district visited by the author. As a rule the goat are wanted finished as red Morocco, for the many classes of red shoes worn, whilst the sheep skins are only used for linings.

60. This red Morocco leather when manufactured by the traditionary methods has a wonderfully fast colour, and will look well long after a leather tanned by more modern methods and dyed with coal-tar dyes has faded. The chief peculiarities of these historic methods are (i) the unhairing is done by the acid saline method and (ii) the skin is dyed in the raw state, with the red dye formed by boiling *peepul* lac with some tannin containing leaf and *khár*, and the colour fixed by the tanning processes which follow.

61. Only in a few cases is leather dressed or curried, and except in the few factories given up to preparing stained hides and skins and harness leather the preparation, given to any leather after tanning, is of the simplest.

62. When hides are being stained for local sale, the method employed varies only slightly in detail in the various districts. The hides on being taken from the tan tubs are squeezed to free from excess moisture and then oiled and dried. They are next damped back and shaved to the necessary substance, and are then treated in *tarwar* bark in order to complete the tannage in any place that they are at all green.

From this *tarwar* bark the hides are taken out and scoured and then dipped into a solution of the dye and handled in this for some time. From this bath they are sammed (partially dried) and set out (or flattened and stretched) by working with a brass sleeker on a wood or marble table and again oiled slightly and then hung up till dry. When dry the hides are spread on a table and a stronger solution of the dye brushed on to the grain and worked in by means of the sleeker, and the hide is again dried and this process repeated again till the right depth of shade is obtained. When the necessary colour has been obtained the hides are softened by staking and the flesh surface made smooth and clean by taking off a very thin shaving by means of the whitening sleeker.

Finally the grain of the hide is glassed, and polished by rubbing with a cloth.

63. Harness leather is oiled off and shaved and scoured in a similar method, then set out and coated with dubbin (a mixture of tallow and oil) on flesh and grain and hung up till dry, after which it is left in pile to mellow and then cleaned on flesh and grain.

DISPOSAL OF LEATHER.

64. Hides and skins tanned for export are almost all despatched directly to the London auction sales. The value and numbers exported during the last five years may be seen in Tables VI and VII. The analysis of these figures show that 98 per cent. of the tanned skins exported go to the United Kingdom whilst the average for hides during the last five years has been 89 per cent.

65. Much of the leather tanned by the Dhors, Chámbhárs and Kalpas is used by them in the manufacture of *móts*, *pakháls*, etc., and the balance is usually disposed of by the piece to the local Mochis. Where large settlements of Dhors or Chámbhárs exist the leather is usually sold to a Mohammedan or Mochi middleman, who often advances money to the tanners, and who retails the leather to Mochis after sorting it and putting aside any suitable for harness and staining work. These middlemen are often raw hide merchants as well as leather dealers, and consequently the part value of the leather is often taken in raw goods.

CHAPTER VI.

MANUFACTURE OF LEATHER ARTICLES.

66. *Footwear.*—Amongst all classes of Indians the tendency is to forsake their own picturesque shoes and to wear shoes of European style, either of local make or imported. The cheaper qualities of these are manufactured of local leather, or that from certain tanners who are now making a speciality of "Russian Leather" to meet this demand. The author spent some considerable time in the heart of Bombay city, studying the classes of shoes worn by the people there. Amongst those who do wear any shoes one-third wear

European styles, one-third sandals and one-third shoes of native pattern of which about half are of the heelless type and the remainder Gulgabi, Punjābi, Mundah, etc., etc.

Throughout the Central and Southern Divisions the red Morocco Brāhmani *juta* and sandals are supreme, whereas in the Northern Division and Sind shoes of the Gulgabi and similar types are much more common.

The illustration shows the different classes of boots and shoes made in one shop in Poona city.

67. *Sandals*.—"Chappāls" are worn to a much greater extent than any other class of footwear, especially in the Central and Southern Divisions. They vary very much in shape and style as well as in price, which varies from as little as six annas for a pair made from old *mōt* leather by Mahār cobblers to Rs. 3 for those made in Ahmednagar for the police. In Dhārwar the ring through which the great toe passes and the straps across the instep are often embroidered with thin brass wire, but generally the only decoration consists in a slight embossing of the straps and ring. The cheaper qualities always have the sole portion "filled" with leather that has been used before either in shoes, *mōts*, or ginning rollers.

68. *Shoes*.—In the Deccan the Brāhmani *juta* is worn in very large numbers, and varies slightly in shape in different districts, being divided into two classes by the shape of the toe, which in some districts is divided into two points and in others has only one. In the illustration of Poona boots and shoes the fourth line are all of this class. The Poona, Kolhāpur and Wāi shoes have the single-ended toe, whilst the Marāthi, Nagar and Miraj styles have the two. The best of these shoes have the uppers made of red Morocco leather, but due to the great increase in the value of goat skins, cow hide is now often used. When they are made with goat skin uppers the back portion which is turned down is usually made of either sheep skin or cow hide dyed to resemble the red of the goat skin. In some cases these shoes are padded and have a soft sheep skin sock, as may be seen in the 8th and 9th samples in the row mentioned above. These shoes are often embroidered with red thread round the edge of the uppers, and cost from Re. 1 to Rs. 3.

69. In the Deccan several classes of shoes known as "*cherau*" are used by Mohammedans, that known as the Ahmedabad "*cherau*" being almost like a European slipper (No. 6—bottom row), whilst the Poona style has a turned up toe (No. 7), as also the Punjābi and Hindustāni (Nos. 10 and 11); the Brāhmani "*cherau*" is very similar to the Brāhmani *juta* except that the heel is not turned down (No. 8), whilst the Memon and Cutchi (Nos. 8, 9 and 10—row No. 2) are very similar to the Ahmedabad. The prices of all these classes vary from Re. 1-4-0—Rs. 3.

70. Half shoes or "*sapāt*" used by Mohammedan and Pārsi ladies cost from a few annas upwards.

71. In Gujarāt and Sind the greater number of shoes worn are of the Mundah type, and are altogether a more substantial class than those worn in the Deccan; the heelless shoe is almost unknown except the long-pointed style worn by Borāhs which cost from Rs. 2. The embroidery of the Gujarāt and Sind shoes is often very artistic and is much more usual than in other districts.

72. The different classes of shoes of the Mundah type vary so little in detail that it is impossible to describe each separately. Amongst the better known classes are the Punjābi, Mooltāni, Mārwarī, Kāthiāwarī, Pathāni and Sindi, all of which vary very much in price according to the materials used and the amount of embroidery. Most of them may be bought for as low a price as Re. 1-8-0 whereas in other cases as high as Rs. 6 is paid.

73. In Hyderabad (Sind), the Sarazis make a heelless Zanāni *juta* of red leather, decorated with yellow and red silk and sometimes silver wire and spangles. The prices of these are from Re. 1—Rs. 3 per pair.

74. All classes of boots and shoes of European style are made; in Bombay and Karāchi several firms make boots of best imported materials, for which the prices may be as high as Rs. 15 per pair, whereas in most places the chief demand is for those costing from Rs. 2—Rs. 3, which are generally made from local leather, which the Mochi stains himself, whilst for those of a slightly higher value leather dressed in one of the factories mentioned elsewhere in the report or in Cawnpore is usually used.

12. In cases where there are slaughter-houses and tanneries in the same districts the hides and skins are often taken direct by the tanners in the fresh condition, but elsewhere they are usually bought by dealers, who cure them in some way before despatching them to the tanners or exporters.

CHAPTER III.

CURING OF SLAUGHTERED HIDES AND SKINS.

13. *Salt (Natrium chloride)* is here almost universally employed as cure, frame drying and arsenicating being hardly ever resorted to. Hides are usually spread out on the ground with the flesh side up, and salt, which has been ground fine in a hand-mill, is rubbed in. If the hides are only to be kept for a short time, and to be sent no very great distance, they are usually rolled up after receiving the salt and after the excess of brine has drained off, are packed in gunny bags and sent in this condition to the tanners. This is known as the wet salted condition. Where hides have to be kept for a considerable time, they are usually dried after being salted by leaving them spread out flesh side up on the ground, a second coat of salt being applied in some cases.

14. The skins of almost all the sheep and goats slaughtered throughout the Presidency find their way eventually to either Bombay, Ahmedabad, Hyderabad (Sind), Karáchi or Belgaum or to certain places in the Madras Presidency, and are there either tanned for export or exported in raw condition.

15. Many tanners have their own agents in several of the most important centres for skins, but often the skin dealers, who are almost always Mohammedans, are their own masters, and sell to either the tanners or exporters as they find best. These local dealers usually buy the skins in the fresh condition and salt them and despatch them packed in bags in the wet salted condition to the buyers, who then deal with them according to the use to which they are to be put.

16. Most of the skins exported are despatched in the dry salted condition, but besides these, numbers are packed in barrels with saturated brine solution.

17. A few slaughtered hides are frame dried, but these are so few that they are hardly worth mentioning.

18. In the greater part of the Presidency when an animal dies its body becomes the property of certain of the submerged classes, and is by them carried away to some suitable spot and there skinned. In the Southern and Central Divisions the Mahárs usually skin the animal and claim the skin, whilst in the Northern the Kalpas and Chámhárs often do this.

19. In places where the caste that skin the dead animals is also the tanner caste, as in parts of Gujarát, the skin is usually taken straight from the animal and immediately put into lime or other depilant, whereas if one caste does the flaying and another the tanning, the skin is always dried on the ground and then sold to the local tanners or hide and skin dealers. In a very few cases a little salt or wood ash is rubbed in before drying.

20. A great number of hides are spoiled by the careless way in which this drying and flaying is done; if the hides are cleanly flayed and spread out on level ground, in not too hot a position, no great harm is done, but where a hide is thrown on to very uneven ground in the heat of the summer sun, the hide becomes badly damaged, especially in places where the hide or skin is folded or has adhering flesh.

21. Besides the raw hides and skins produced in Presidency large numbers are imported from elsewhere, both from foreign countries and other parts of India as may be seen from Tables I, II and III.

22. Raw hides and skins are exported in very large quantities, both from Bombay and Karáchi, as can be seen from the Tables IV and V.

23. This export trade in raw skin has been, and is becoming still more so, the chief disquieting factor in the Indian Tanning Industries. It is due to this the prices of hides and skins have risen enormously within the last few years. This is especially the case with goat skins, as the demand for these, especially for glacé goat, has become so great

and turn them, making the rollers ready for use. Others again are simply cut and the Ginning Companies themselves press and turn them.

82. *III.—Pakháls, etc.*—These large leather water bags carried by bullocks or buffaloes are one of the most noticeable features of most of the towns of Bombay and Sind. These are as a rule made by the same class that make the *môts* but sometimes the shoemakers make the *pakháls* whilst the tanners make *môts*. The cost of these varies from Rs. 12—Rs. 18 per pair. *Bábul* tanned leather is again here considered the best, as has been pointed out is the case with *môts*. Besides *pakháls* the Bhisti usually carries a leather bucket with which he fills the *pakháls* and uses it for watering.

83. *IV.—Account Book Covers.*—In several places leather is dressed for covering account books. For this use sheep skins are usually bought from the local Kathis or Saltangers, set out and nailed on boards to keep them stiff, then when dry taken off and cut to the larger square or oblong possible and then stained with two or three coats of a red lac solution. For the larger and heavier classes cow hide is similarly treated.

84. *V.—Saddlery and Harness.*—In Bombay and Poona and some of the larger places in the Presidency harness of European style is chiefly used, of which much is imported (see Table X), but a great amount of the cheaper qualities is also made locally. Single sets of harness cost from Rs. 30 upwards.

Tonga harness may be divided into two classes, according to whether traces are used or not; in Sátára, Sholápur, Ahmednagar, etc., the class with traces is used, whilst in Thána and Khándesh traces are unknown.

A set of *tonga* harness of the former type may be obtained for from Rs. 35 and consists in saddle built on a wood and iron tree to the top of which the *tonga* pole is fixed, the hauling power is obtained by means of a breast strap and traces.

The Thána *tonga* harness, the following description of which is taken from the "Monograph on Tanning and Working Leather in the Bombay Presidency, 1903," costs from Rs. 10 the set upwards:—

"These saddles are made of leather stuffed inside with cocoanut fibre covered with jute and cotton. They are 26 inches broad and 14 in length, but have a projection fitting against the pony's neck. Just below the projection a piece of leather with straps and buckles is stitched to hold the yoke pole. A brass ring is attached to the back of the saddle to which is attached a strap passing along the pony's back with a loop passing under the tail. The saddle is attached by two girths fastened to straps on either side. The hauling power is chiefly obtained from a leather band 16 by 4 inches on the pony's chest, with rings at either end, through which rings are passed and tied to the yoke pole. No traces are used."

Khándesh *tonga* harness is similar in principle to the Thána type but is much more elaborate. The stuffing is usually of country *numdah* and the lining of serge whilst the pads are usually decorated by sewing with coloured twine. Girths are made either of leather or *newár*. The cost of a set varies from Rs. 15 upwards but the more usual price is about Rs. 30.

85. *VI.—Miscellaneous.*—There are a large number of agricultural requisites made of leather, consisting of such things as whips, bell belts for cattle, straps for yoking oxen, ropes for strapping up the carts, etc., etc., all of which are almost everywhere manufactured for local requirements by the Dhors, Chámbhárs or Sindi Mochis.

In certain places bags, portmanteaux, purses, bedstraps and numerous fancy articles are manufactured on a small scale. In Bombay a large amount of leather is also used for the hoods of the victorias and other conveyances.

CHAPTER VII.

DISTRICT CLASSIFICATION.

SIND.

86. *Hyderabad.*—The manufacture of leather and leather goods is one of the chief industries of Hyderabad city. The head-quarter of the trade is situated in the Fuleli

quarter, which is the largest and most important centre of the tanning industry, when considered as a home industry, in the entire Presidency. Not only is there a very important tanning trade here, but in Hyderabad city the Sochis are very numerous and manufacture both large quantities and good qualities of all classes of native shoes, and leather articles generally.

87. Besides the "Home Industries" there are, on a somewhat larger scale, three small tanneries, where skins are tanned for export and hides for local use.

88. The hide tanning is carried out by the Jatias, of whom there are about 100 houses engaged in the trade. They tan by the bag method but do not use myrabolans, and dry out the leather without addition of salt or oil. For laying away with the hides, the *bábul* bark used is chopped very fine, whereas for putting into the bags it is left in pieces of several inches in length.

89. Skins are tanned by another Márwari caste called Caláls, of whom 50 or 60 houses are at present working. Most of the sheep skins they tan are of the long woolled sheep and consequently the wool is of great value, and hence these people do not damage it by steeping the skins in any depilant, but remove it by letting the skins putrify to a very small extent and then pulling off the wool. After the wool has been pulled the skins are treated in a solution of "*akara dood*," *bájra* flour and salt till all the short hair is loosened and are then taken out and the grain cleaned with a piece of broken earthenware. The skins then swollen and cleaned in a *bájra* drench and salt added to reduce the swelling and afterwards tanned in *bábul* bark—about 30 lbs. of bark per *chori* of skins is given in each of the two liquors. Besides sheep and cheaper qualities of goat skins these people tan quite a number of hog-deer skin which they sell chiefly to the Sochis in Hyderabad for making *nats*, etc.

90. The Sochis here are the principal makers of boots, etc., and are noted perhaps more for their camel saddle covers than for anything else. These *nats* are always decorated with embroidery and some samples seen by the author were most artistic. In order to get exact symmetry the leather is folded, and holes pierced at the most important points of the design, and the shaped pieces of coloured leather which usually help the design are always cut altogether.

91. The manufacture of *dabás* used to be an important one in several parts of this district, but is now of very little consequence owing to kerosine oil tins taking their place for the carriage and storage of oils.

92. The shoes made here are chiefly of the Sindí and Punjábí classes and are sometimes very artistically embroidered. Amongst other things peculiar to Hyderabad is that of the manufacture of *Zanána juta* by the Sarazi class.

93. Hindustani Mochis make all classes of European styles of shoes, and also a "Patent" leather *Zanána juta* which is now competing against those made by the Sarazis.

In the district there is very little to report.

94. *Karáchi*.—The chief trade of *Karáchi* is situated in or near *Karáchi* city and cantonments. In the tannery area and the neighbouring wool washing area at *Lyari* are situated three fairly large tanneries besides the godowns of hide and skin exporters and a number of small huts in which tanning is carried on.

95. The three tanneries situated in this area are all tanning for export and are greatly hindered in their work by one of the octroi rules of the Municipality. Hides and skins on being brought into *Karáchi* are subject to an octroi duty of 8 annas per maund for which a rebate is made if the skins or hides are exported in the raw condition, but when exported as leather no drawback is obtainable and hence all tanning is subject to a tax of up to two per cent. Besides this difficulty there are others to face the *Karáchi* tanners. The tannery area is so congested that there is no room for further extension, and one tannery that has been built on the neighbouring wool washing area, the plots of which are mostly vacant, is subject to such rules that the owner although willing to improve his methods by putting down machinery, etc., is unable to do so. He is only allowed to build on 30 per cent. of his land, and as he has done this would be unable to cover the various machines he requires. Besides this, before he was allowed to build at all on the wool washing plots, he had to sign an agreement to close the tannery if notice were given to him to do so, and hence has no security of tenure. Unless the *Karáchi* Municipality wish to entirely kill the tanning trade in their area they must make some changes in their bye-laws.

96. A certain amount of tanning also takes place in the cantonments near the Soldier Bazaar, where are situated a colony of Chámbhárs who are tanning buffalo and cow hides. The home tanning trade in the tannery area consists chiefly in the tannage of heads and other pieces rejected by the exporters.

97. The shoe trade of Karáchi is almost confined to European styles, the leather used being chiefly of local, Bombay and European tannages. The harness trade is chiefly in imported goods and repair work.

Most of the camel harness, etc., used here is imported from Hyderabad.

98. *Lárxhána*.—Here the trade is again almost confined to head-quarters of the district and consists chiefly in the export of raw hides and skins to Karáchi. Scattered throughout the district there are a few Sindi Mochis who make Sindi shoes and articles used by the agriculturists. In Lárxhána itself are a few Hindustáni Mochis who are tanners and the only members of this caste known to the author who do tan. They tan cow and buffalo hides for local sale using lime and *khár* for unhairing, and bating with *ata* and *akara* leaves before tanning in *bábul* bark and "*goola*" (the flower of the pomegranate) and in the bag with *bábul* bark and *sachu*. One Jatia does similar work, and a few Caláls tan sheep skins. The manufacture of native shoes, etc., is as elsewhere in Sind chiefly in the hands of the Sochis who use local and Hyderabad leather, whilst the Hindustáni Mochis make European pattern footwear from Karáchi, Bombay and imported leather. The Sindi Mochis make a few country shoes and any country harness that is required.

99. *Sukkur*.—There is very little of note to report in this district. Sochis make native shoes as elsewhere and one family make harness, but otherwise the Sindi Mochi has to supply the local demands which consist of Sindi shoes and leather for agricultural use. One interesting method used by some of the Sindi Mochis is the use of *bábul* pods as a final bate to relieve the hides of the last traces of lime. There is no tanning in any organised scale in this district although raw hides and tanning materials are both plentiful.

100. *Thar and Párkar*.—In this district there is practically no trade of note except the collection and export of raw hides and skins. Scattered throughout the district are a few Sochis and Sindi Mochis who work on usual lines.

101. *Upper Sind Frontier*.—In Jacobabad there are a few Katiks, Chámbhárs and Sindi Mochis, the former two tanning skins and hides respectively and the Sindi Mochis who tan hides and skins besides camel and horse hides during the hot months, using *sachu*, *bábul* and pomegranate rind and flower. A few Sochis here make enough Sindi shoes for local requirements.

In the district the trade does not flourish, a few Sindi Mochis being found scattered in the various villages.

NORTHERN DIVISION.

102. *Ahmedabad*.—In the neighbourhood of Ahmedabad city three tanneries are working and exporting tanned skins to London. All these three work on the ordinary "export" method with *tarwar* and myrabolans. In the district generally lime is not used for unhairing but everything is unhaired by the acid saline depilants previously mentioned. Both *akara* "*dood*" and leaves are used, as is also a shrub called "*javasi*." If the hides are to be tanned for boot work they are tanned with *tarwar* which has to be imported either from Káthiáwár or Pálanpur, whereas *bábul* is used for hides to be made into *kós* and *pakháls*. A large number of poor quality of skins are tanned in a Katik tannery by this *akara* "*dood*" method and sold to the Mohammedans in the city who stretch them and cover them with red lac solution for account book covers. There is a very big trade here in all classes of native shoes and the quantity of red Morocco leather used here must be very great and is chiefly brought from the Idar neighbourhood. Many classes of shoes are very carefully embroidered. *Kós* are usually made by the Chámbhárs who tan the hides, but *pakháls* are often made by the Mochis.

103. *Broach*.—By far the most important branch of the leather trade in Broach is the manufacture of the gin rollers. Throughout the district the Chámbhárs and Kalpas tan a great number of hides during the ginning season purely for this work and during the remainder of the year either work as coolies or tan a few hides for local consumption.

The Broach Mochis make a large number of country shoes which they export into the neighbourhood, but during the ginning season shoe work is almost suspended and the cutting out of the washers is the only work noticeable. During the busy time large number of hides have to be imported chiefly from the Márwár direction, but during the remainder of the year the local dead hides are enough for local consumption. In the Broach neighbourhood are several villages and towns where there are considerable numbers of Kalpas. In Broach, Ankleswar, Tankaria, Manuber, Sajod are quite extensive "yards" where this caste carry on their work.

Kós are manufactured by the Kalpas or Chámbhárs.

104. *Kaira*.—As in the rest of Gujarát there is a considerable local trade in leather for gin washers. Amongst the managers of the gins there seems to be an impression that Nadiád leather is better than Broach as the hides are not limed but unhaired in "*dood*." This is, however, not the case, as the Nadiád Chámbhárs do use lime but by giving a longer time and more bark they make the hide more like leather than the Broach material and consequently it is better for the gins.

105. *Panch Maháls*.—Godhra has several tanneries and tans a considerable amount of leather, using *gottahar*. The factories are owned by Mohammedans, chiefly of the Ghanchi class, who are a class of Hindu converts to Mohammedanism. The work in these tanneries is carried out by Chámbhár labour under Chámbhár supervision. Only rejected hides are tanned here, all that can be classed above rejection being exported to Bombay and elsewhere; on the other hand, hides rejected by the Bombay merchants are often returned to Godhra where they are tanned. In many dozen hides, seen in the Godhra tanneries by the author, he only noticed one or two that were not partially rotten.

Most of the buffalo hides tanned here are saturated with salt and sold for washers. The cow and bullock leather is chiefly sold locally and to Broach, Ahmedabad, etc., to the Mochis for boot work. *Kós* are made by the Chámbhárs in these factories.

Shoes and boots are made in fairly large quantities by the Godhra and Dohad Mochis who dye the leather with some scarlet coal dye (often cotton scarlet), when scarlet leather is required.

A small number of red Morocco skins and sheep skins for lining are tanned in Dohad.

106. *Surat*.—In Vejalpur in this district is a factory turning out finished leather of various classes for boot and factory use. Amongst other classes may be mentioned Russian leather, Moroccos, book-binding skins, roller skins, belting and harness leather. At one time they made a small amount of chrome leather, but due to the conservatism of the Mochis could find no sale for it, and have consequently practically given up the manufacture.

The class of work elsewhere in the neighbourhood is of very little importance. Both bag and vat tannage is found throughout this district, the former in the south and the latter in the north.

The use of *amli* leaves by the Chámbhárs of Sookis has been mentioned in a previous chapter, but otherwise there is little to report.

Surat city has an important Mochi trade both in native and European shoes and boots and the harness for the local conveyances is manufactured locally.

Bábul bark is very plentiful in the greater part of this district.

107. *Thána*.—The leather made in Thána is as a rule very backward. Most of the agricultural necessities are manufactured locally as are sandals. The author found some of the Chámbhárs in this district using mangrove bark liquor, as they cannot obtain the "*sein*" which they formerly used.

CENTRAL DIVISION.

108. *Ahmednagar*.—In Nagar city are two small factories—one manufacturing stained leather and harness, whilst the other confines itself to the tannage of buffalo by country methods, and occasionally despatches a few cows for export. Formerly there were also a number of Saltangers engaged in the red Morocco trade but at present these are not working. However, in the district there may be found a number of Dhors who tan by the usual bag process and make the necessary *môts* (*sundia*) and other

agricultural implements. In Nagar city may be found Mārwar Mochis making Indian shoes of the patterns more often found in Gujarát than in this district; besides there are a number of Chámbhárs who make the usual Bráhmāni *juti*, and others who confine themselves to European styles. There are also one or two families manufacturing the *tonga* harness used locally.

109. *Khándesh (East)*.—Very little of interest is to be reported in this district; the local trade is as a rule confined to *móts* and agricultural requirements and in comparison to other districts very few of these seem used; in some of the larger towns both Gujaráti Mochis and Maráthi Chámbhárs may be found making the usual classes of footwear. *Tonga* harness is manufactured here.

110. *Khándesh (West)*.—The most noticeable trade in this district is that of saddles. The Khándesh saddle is similar in principle to the Thána article, but is much more elaborate and artistic. Usually the Chámbhárs who manufacture these saddles tan the necessary leather themselves, and have a most interesting method of preparing it. After liming the hides as usual they tan in two baths of *gottahar* and finally in *tarwar* bark, the tannage being completed in the vats, the hides not being sewn into bags. When the hides are tanned through, they are removed from the liquor and dried as usual. At this stage the leather is a very nice looking leather, of a very good light colour, but as they want it a tan shade for their saddles they expose it to the sun which darkens it to almost a "London" shade of tan. They then oil the leather with cocoanut oil and work it with the *rampi* till it becomes very soft and pliable.

111. *Násik*.—In Násik there are no centres with more than local importance. Chámbhárs, Dhors and Saltangers, however, are settled in different places and tan enough leather for local requirements, but in the case of the latter export to the surrounding districts the shoe trade is of purely local interest.

112. *Poona*.—The major portion of the trade of this district is centred in Poona city and cantonments. There are two settlements of Dhors and one of Saltangers besides a factory tanning kips and skins for export. There is, however, nothing peculiar about their processes, which are as usual in the Deccan. The skins tanned by the Saltangers are chiefly sold to be dressed for account books and are dressed as is usual for the work, by first stretching, nailing on to boards and then coating with a red lac solution. In the city some of the leather tanned by the Dhors is dressed for harness and other uses.

The shoe trade of Poona is very important; all classes of shoes may be found here, and the accompanying illustrations show the number of classes of shoes made in and stocked by one shop owned by a family of Maráthi Chámbhárs in the city. Here all classes of Bráhmāni *juti* may be seen besides Cheraus, Punjábis, etc.

Harness for local requirements is also made here.

113. *Satara*.—Throughout this district the work of the Dhors may be seen at its best; large quantities of hides are tanned here and sold to Bombay dealers. The *mót* is also here seen in the largest and heaviest form and as high a price as Rs. 25 is paid for these articles. Other articles used in agriculture are also manufactured.

The Chámbhárs manufacture Bráhmāni and European shoes, sometimes tanning the red Morocco used for the former themselves, and where this is done their manufacturers have a better name than when ordinary leather is dyed by means of aniline dyes. In Sátára a small quantity of *tonga* harness is manufactured.

114. *Sholápur*.—At Sholápur there is a small factory, manufacturing stained hides and skins, and harness leather, owned as is usual by a Mussalmán.

A settlement of Dhors tan chiefly by the usual bag method, but for certain work tan in a method similar to that used by exporters, which process was most likely learnt by some of the men who acted as labourers at some time in one of the export factories. Four families of Dhors in the city make brief and hand bags, dressing cases, etc., and articles of their manufacture have more than a local demand.

Shoes and sandals are manufactured as usual by the Chámbhárs and in Sholápur itself there are a few Mochis who make European styles of boots and shoes.

SOUTHERN DIVISION.

115. *Belgaum*.—In Belgaum is situated an "export" tannery owned and overlooked by Pársis. Besides tanning kips and skins for export they tan buffaloes for sale in Bombay and elsewhere. Most of the local Dhors work in this factory or in one in the Kurundvad State and consequently do very little tanning on their own account.

In the district, however, there are several fairly large settlements of Dhors who tan buffalo hides and kips on a fairly extensive scale. They wash the last traces of lime from the hides by soaking overnight in old liquors. In Nipáni in the Chikodi Táluka there are about 40 families engaged in the trade who, besides making the *môts*, *pakháls*, ropes, whips, etc., etc., necessary in the neighbourhood and supplying the local Chámhbárs, export large numbers of hides to Bombay.

Chámhbárs make shoes and sandals in sufficient numbers for local use, and in some cases they tan sheep and goat skins for their own requirements by the usual "Morocco" process, and where this is done their shoes have usually a name for hard wear and good appearance.

A few Dhors make various fancy articles, such as purses, pocket books, and also harness, bedstraps, etc.

116. *Bijápur*.—Raw skins are collected in this district chiefly by the Madras tanners, one firm buying about two thousand skins per month in Bijápur itself; others again buy for Bombay firms.

The Dhors who are found scattered through the district tan by the bag method, using either *bábul* and myrabolans or *tarwar*. Most of the kips tanned by them are used for *môts* and *pakháls* which they make themselves, but the buffalo is sold to the Chámhbárs for shoe-making. Most of the Chámhbárs here tan skins for their own use. The plant they use for unhairing in this district is a creeper known as *khatí bhail* which they gather after the rains, dry and grind up ready for use.

117. *Dhárwár*.—The Dhors of Dhárwár tan about enough leather for local use and make the usual *môt* and agricultural gear. Raw hides and skins are collected by Labbas chiefly for the Madras tanners.

The gins in this neighbourhood are often supplied with local leather, and the manager of one told the author that he found it much better than Broach leather as this became moist and unusable in damp weather.

118. *Kánara*.—The Up-Ghát portion of this district is very similar to Dhárwár except that *matti* bark usually replaces *bábul*, whilst on the coast Dhors are unknown and consequently the Chámhbár is both tanner and sandal maker.

Scattered through the district are a few Dhors and Mochis who understand the tawing (or alum curing) process, and consequently receive numbers of tiger, panther, deer and other skins to be cured.

119. *Kolába and Ratnágiri*.—The Chámhbárs are here as on the Kánara coast both tanners and shoemakers. Certain districts are noted for their sandals, but as a whole the industry is very backward. Throughout both the districts, hides are very scarce and in one place the author was told that it was impossible for the Chámhbárs to get any local hides, as certain Bombay hide dealers had advanced money to all the local Mahárs on condition that they were supplied with all the skins of animals that died.

The materials chiefly used are myrabolans, *sein* and "dhavda" leaves.

BOMBAY.

120. *Bombay* is chief centre both of the export tanning trade and also of the manufacture of leather and leather articles for Indian use.

There is one large factory worked on European lines, which not only tans but also manufactures all classes of boots, shoes, harness, trunks, etc., etc.

In several tanneries here both hides and skins are tanned for export, and most of these, although owned by Memon and Boráh Mohammedans, are worked by Madrasi foremen. Most of the skilled labour is also performed by Madrasis, the coolie portion of

the work being done by Chámbhárs and Dhors. In the tanneries working for local requirements Chámbhár and Dhor labour is more common.

Bombay has a very important trade in sandals, shoes, boots, harness and leather articles generally.

CHAPTER VIII.

LEATHER WORKERS AND TANNERS.

121. The manufacture of leather and leather articles is one of the oldest and most necessary industries of the world, but like many other unpleasant industries it has been left to the least skilful and most degraded classes to practice.

Whatever the reason is, the fact remains that the Indian leather workers are found amongst the lowest and most degraded classes. Some of the workers just escape being classed amongst the "unclean" castes whilst others are counted amongst them.

Generally speaking, there are no great centres where the leather working classes congregate in the Bombay Presidency as there are in certain other provinces, but they may be found as a rule in sufficient numbers in each district to fulfil the local demand for leather and products of leather. Certainly in a few places large numbers of certain castes may be found, as in Ahmedabad, Hyderabad (Sind) and elsewhere, but in these cases they usually are engaged in other pursuits.

In certain parts the local tanner is a village servant and as such he is responsible for supplying and keeping in order the necessary *móts*, etc., for which he receives either payment in kind or holds land at a reduced rental. Generally, however, the village tanner buys his hides and sells his products to the best advantage.

122. In large centres of the trade like Bombay, Ahmedabad, Godhra, etc., the local tanners work in factories for either a monthly wage or on piece-work according to the class of work performed by them. In the small settlements the work is usually carried out on the family principle, each family tanning as many hides as they can obtain, but in certain places there is a peculiar sort of "contract" work to be found. "A" Chámbhár supplies hides, bark, lime and the necessary vats, etc., to "B" Chámbhár who undertakes to tan them at a price previously arranged. For this class of work the price varies, but about 8 annas per hide is paid in certain districts.

123. In many districts the tanner classes are seeking other outlets for their labour, for instance in Ahmedabad many Chámbhárs work in the cotton mills whilst the labour for ginning factories is often almost entirely of the leather working classes.

The only Mussalmáns who can be styled leather workers, as differing from the owners of tanneries worked by Chámbhárs and other labour, are the Sindi Mochis who are both tanners and shoemakers. This class, however, as a rule seems to treat leather work as a hobby, agriculture being their chief occupation.

In Bombay and some of the other large centres of the boot-making trade are large numbers of men engaged by the shop owners who pay them either by the piece or day, but elsewhere each man, or rather each family, works on its own account.

During the last few years the sewing machine has found its way into a great number of Mochi shops, and it is now a rarity to see a shop in which any European styles are manufactured without one. In some cases two or three shops have one machine amongst them.

124. The condition under which leather workers live varies very much in different districts, and even in the same village very great differences may be found. In one small town visited by the author are two Mochis who have very similar trade and who make about the same amount of shoes, etc.; one of these lives in a grass hut and buys his leather in small pieces daily, whilst the other lives in a bungalow, buys several hides at a time, and always has a fair stock of leather, and has two bicycles for his sons' use and pleasure.

125. The chief classes who work in leather and the branch of the industry which they follow are as below:—

Mochis.—Boot and shoe makers, both European and Indian styles. Harness makers, etc. (Gujarát).

Chámbhárs.—Chiefly tanners in Gujarát, shoe and sandal makers in the Deccan and both tanners and shoe makers elsewhere.

Dhors.—Tanners and makers of agricultural gear, as a rule only tan hides (Deccan).

Sochis.—Shoe makers and generally do the same work in Sind as is done by Mochis elsewhere.

Fatiás.—Tanners of hides (Sind).

Calals.— " skins "

Kalpas.— " hides and make *móts*, etc. (Gujarát).

Kasai, Kathi, Saltangers.—Tanners of skins, especially for red Morocco and account book backs (Gujarát and Deccan).

Madrasí Tanners.—Foremen and labourers in " export " tanneries.

Sindhi Mochis.—Agriculturists, tanners, boot makers and harness makers.

Dubgars.—Makers of drums, *dubás*, and other raw hide goods.

126. *Mochis*.—The greatest number of this class are found in Gujarát where they have practically a monopoly of the shoe-making and similar trade.

Many of this class do not work in leather but have taken up other callings, and many of those who still are " leather workers " increase their earnings by other work, especially agriculture.

In the cities they are usually hard-working but drunken, which is the chief cause of their backwardness. As a class they are taking to the manufacture of European styles of boots and shoes in great numbers and by their low charges are keeping almost the whole of the low priced trade to themselves. For much of their work they buy the leather in the " crust " state from the tanners and themselves soften and stain it if necessary with coal-tar dyes. They prefer greatly to work in families to taking service in factories, where good men are always wanted.

In addition to shoes this class make harness, saddles and many other useful and fancy articles.

✓The women usually do any embroidery or other necessary light work, such as staining the leather, when this is done.

Owing to most Mochis being their own masters it is most difficult to make any estimate of their earnings, but these undoubtably vary very greatly. In some villages each man cannot possibly earn much more than the agricultural labourer, as the prices at which they sell the articles does not allow of any greater profit being made. On the other hand, where better class of work is being carried out, as much as a rupee per day is often earned. Perhaps in the cities the Mochi, although earning more than his country brethren, is less comfortable than those in the country who often supplement their earnings by agriculture, and at any rate the latter obtain cheaper food and house accommodation.

The Mochi as a class seldom acts as cobbler, but leaves this work to one of the lower classes.

In Lárkhána there are a few families of this class who are tanners, but this is the only place as far as is known by the author that this is the case.

127. *Chámbhárs*.—The Chámbhárs seem to hold a position both socially and industrially between the Mochi and Dhor.

In Northern Gujarát they are usually the tanners, but may often be found working for Mochis or doing Mochi work on their own account. On the other hand, in the Central and Southern Divisions the Chámbhár is almost always a shoemaker, but as has been pointed out in the district classification he is both tanner and shoemaker in the coast districts, where Dhors are unknown, and elsewhere when necessary he tans any class of leather he is unable to obtain locally.

In many places different divisions of the Chámbhár class will be found dividing the leather work amongst them, for instance in one city in Deccan the Maráthi Chámbhárs make sandals, *cheraus*, and do any necessary repairing work, whilst the Lingáyat Chámbhárs confine themselves to making Bráhmani shoes for which they tan the necessary "red Morocco" and do no repairing.

Unfortunately this class is often reported to be of a very unsteady disposition; in certain places he is reported to be very drunken but in others he is noted for sobriety and thrift. His earnings are very similar to those of the Mochi except where he is tanner only, and in this case he usually earns less than when acting as a Mochi.

In various factories tanning for export and Indian use he can earn from Rs. 10 to Rs. 20 per month according as to whether he is only a labourer or skilled workman.

As a rule the Chámbhárs who are tanners have the *bábul* bark they use chopped up by their women, in which they differ from the Dhors who break it up with heavy mallets.

Many Chámbhárs are forsaking the leather trade for others where work is easier and better paid. In Ahmedabad very many Chámbhárs work in the different cotton mills.

128. *Dhors*.—Throughout the Central and Southern Divisions the Dhors are the tanners and suppliers of *móts*, *pakhils*, whips, etc., etc. As a class they thoroughly understand the bag tannage of hides which is almost invariably used by them, and as a rule only tan hides, leaving the tannage of skins to Chámbhárs, Saltangers or Kasias. When working in factories they seem to be of rather more regular habits than Chámbhárs, but otherwise differ very little from them in anything except name.

Where small settlements exist they usually only tan enough leather for local requirements, but where large numbers are congregated, as in Sátára, Nipáni, Poona, Karád, etc., they sell their outturn chiefly to dealers from Bombay, who either dress the leather for harness or other use or retail it to Mochis.

129. *Kalpas*.—In Surat and Broach and neighbourhood the tanners are usually Kalpas and are usually found scattered in single families in almost all villages. These are as a class the least expert of the tanning class and except for their agricultural pursuits would generally be very much poorer than they are now. They supply and keep in order the *kós* and other leather articles used by the cultivators.

130. *Sochis*.—Sochis are to be found in all the chief towns of Sind, but as a rule are not to be found in the villages. They are of Márwári descent and their work in many ways is very similar to that of the Gujarát Mochi, whom they also resemble in features and mode of life.

The largest colony of this class is in Hyderabad where their work is noted as artistic and sound. Besides shoes they make camel saddlery and *nats*, etc.

The Sochis work on native classes of shoes and generally leave the manufacture of European patterns to other classes, but where no other Mochis are to be found they are taking up this branch, and in these cases the usual sewing machine immediately points out the shops engaged in this work.

131. *Jatiás*.—The Jatiás may be described as the class in Sind corresponding to the Dhors in the Deccan and are very similar in many ways.

Their largest colony is in Hyderabad where they are very numerous. Besides being the tanners of hides they also are one of the chief labouring classes in this district.

132. *Calals*.—The Calals are very similar to the Jatiás to whom they seem related but from whom they differ by only tanning skins. They also are one of the chief labouring class in Sind.

133. *Kasai, Kathi, Saltangers*.—These classes tan the well known Morocco leather which has been previously mentioned and also skins for other uses, such as book covers, lining, etc., etc. They invariably use one of the acid saline depilants which have previously been mentioned, and are found from Poona northwards, being perhaps most numerous in Násik and Kaira Districts.

134. *Madrasi Tanners*.—Many of the export tanneries have a number of Madrasi workmen and foremen. As a rule the foremen in this class of tannery are of this class. They are considered better workmen and are more regular than local Dhors, Chámbhárs and other classes usually employed.

135. *Sindi Mochis*.—The word Mochi here is somewhat misleading, as this class are Mussalmáns and tan as well do "Mochi" work. Many of them only tan during the seasons when agriculture is at a standstill.

136. *Dubgars*.—These are a sub-division of the Mochi class who work in raw hid making *dabás*, balance pans, etc., of this material. Their trade is becoming less and less important, and hence they are turning to other pursuits.

137. Beside the abovementioned classes a number of other castes such as Mahár Mángs, Dheds, and Mángwars are sometimes classed as leather workers as they occasional work as cobblers, and either skin the animals which have died or deal in raw hides.

CHAPTER IX.

CONCLUSIONS AND RECOMMENDATIONS.

138. The most noticeable feature of the leather industries of Bombay is the recent increase in the export of raw skins which up to 1900 did not reach a value of Rs. 10,000 per annum have now increased as will be seen from Table No. IV to a very large amount.

On analysis the increase is found to be almost entirely due to the export of goat skin to America; the value of sheep skins exported in the raw state till quite recently being quite insignificant.

139. The cause of this great increase in raw goat skins is undoubtedly the great demand in both Europe and America for glacé kid for boots and shoes. A few years ago many boot manufacturers believed that the demand for this class of leather was a temporary one, but the demand goes on steadily increasing instead of diminishing. Unfortunately all attempts at the manufacture of a glacé kid in this country have been either a failure or only a partial success. There is at present only a small demand for this class of leather in India, hence if this branch were taken up the finished articles would have to compete in the open markets of the world with those of America and Europe, and hence would have to be equal to them in quality and appearance. The manufacture of this leather has been brought in America, by the combination of scientific knowledge and mechanical skill and expert labour, to a state bordering perfection. Even if the manufacture of glacé kid were undertaken in this country by anyone with the best practical experience and scientific training, the question of obtaining labour of sufficient intelligence would still have to be overcome, and under present conditions this seems impossible.

140. Very expensive experiments have been made by the Madras Government in the manufacture of chrome leather, but have not proved the great success hoped, except perhaps in the case of rough chrome leather for irrigation purposes. The finer classes of leather that have been manufactured have not been at all comparable to the improved article.

141. Hides and skins tanned in India are only suitable for certain classes of work, and consequently there is only a limited demand for them, whilst those exported in the raw state can be tanned and dressed in any way desired. In almost all countries except the United Kingdom there is an import duty on leather whilst raw hides are admitted either free or with a much lower duty than leather, and hence the demand for leather is almost confined to England, and if much more were exported it is more than likely that the market would become glutted, as has repeatedly happened in the London market.

142. Till within quite recent years very large quantities of Indian tanned sheep and goat skins were used as book-binding leather, but due to report on deterioration of these leathers by a Committee elected by the Society of Arts, this has now to a great extent become a thing of the past, at any rate for the better classes of book-binding, and the demand is now for raw skins for tannage in sumach for that work. This particular branch of the trade might be recovered if some suitable tanning material were used by the export tanners and should certainly be investigated.

143. The raw material for the tanning industries is itself a by-product and therefore the supply cannot be increased by increased demand as does happen in many other cases; in other words it would never be possible to rear cattle for their hides alone. The demand for leather in Europe and America has very much increased during the last few years and consequently the search for raw materials has been extended to other countries, among which India has been most thoroughly exploited.

144. Often amongst local authorities there seems a desire that tanneries be erected in their area or if established already be not improved or enlarged in any way, and consequently if a tanner wishes to improve his process he is often unable to do so due to being unable to make the necessary addition to his tannery.

145. A case in Karáchi has been mentioned and may be examined further but is not the only one brought to the notice of the author during his journeys. The case of the Karáchi tanner previously mentioned who wishes to improve and modernise his method of tanning is as follows:—He wishes to have drums for washing and bating purposes, but as he has no available space inside his present buildings he would have to build another shed, which he is quite willing to do, but is not allowed as he has already built on about 30 per cent. of his land which is the maximum allowed. In another case a tanner told the author that he also wished to add a drum to his outfit but was unable to do so as he was not allowed to add any building whatever to those he had at present.

146. Owing to tanning being a more or less offensive trade certain rules and regulations must undoubtedly be made, but these should be made with care so as to hinder the tanner, as little as possible, in the carrying out of the various processes incidental to his trade. At the same time it may be mentioned that tanning, although objectionable, is not unhealthy, and it was told to the author by several tanners in different centres that during different epidemics of plague the tannery neighbourhood was remarkably free from sickness, and the author believes that several of the large tanners in Cawnpore found that the ravages from plague were very much lower amongst their hide workers and tanners than amongst other classes.

147. The Karáchi Municipal octroi on raw hides and skins is 0-8-0 per maund irrespective of whether these arrive in wet or dry condition; this is returned to the exporters of raw hides and skins but not to the tanners who export leather.

To take a concrete instance, a tanner buys 100 maunds of wet salted raw sheep skins at, say, a value of Rs. 2,500 and on these has to pay an octroi tax of Rs. 50. He tans these and exports the finished skins and also the wool but gets no return of octroi, which is in this case a loss of 2 per cent.

The exporter of the skins on the other hand has 0-8-0 less 10 per cent. per maund returned to him on the weight exported, and therefore loses very little when he exports the skins in the wet condition, and about half the amount if he exports dry. From this it will be seen that this tax must affect the tanners very seriously, and being as it were almost a bonus on the export of raw materials. If the octroi on hides and skins is necessary as a source of revenue it could certainly be arranged that the tax should be more evenly divided and not all thrown on to the shoulders of one class, more particularly when it is remembered that the Indian tanner pays income tax on profits in India, whereas the great majority of hide exporters do not contribute anything to Imperial taxation.

148. Amongst the leather working classes themselves the lack of capital is the chief hindrance to progress. In many places the local tanners are unable to purchase hides locally, as dealers from larger centres have advanced money to the local Mahárs on condition that they get the whole of the hides of the animals skinned by them during the year. In the same way the Mochi often buys from dealers at a higher price than he could get the same material for from the local tanner, and must do this as he cannot pay cash, but must have credit.

149. In a few cases Co-operative Credit Societies have been formed amongst the leather workers, both tanners and shoemakers, and in these cases the author noticed there appeared a better feeling amongst these people than the corresponding classes elsewhere. The co-operators were able to both buy and sell to better advantage than in other cases, as often the leather worker is in debt to the local money-lender and has to buy all materials through him and consequently at his price.

150. Owing to the great number of boots and shoes of European pattern being worn there has lately become a demand for stained hides and Russian leather, and this to a great extent has been met by the increase of currying carried on in Bombay, and the erection of small factories in Sholápur and Ahmednagar and the dressing of hides by the Dhors in certain places as Sátára, Poona, etc.

151. As has been pointed out the Presidency is particularly well provided with tanning materials which in many cases are not being used to their best advantage, and often the most suitable are not being used for the class of leather required.

At the same time the export trade in tanning materials is practically confined to myrabolans, and it seems that considering the magnitude of the trade done in these materials in various parts of the world it seems quite possible that some of the other materials might be either exported or extracted and exported as extract. Most of the Indian

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145. A case in Karáchi has been mentioned and may be examined further but is not the only one brought to the notice of the author during his journeys. The case of the Karáchi tanner previously mentioned who wishes to improve and modernise his method of tanning is as follows:—He wishes to have drums for washing and bating purposes, but as he has no available space inside his present buildings he would have to build another shed, which he is quite willing to do, but is not allowed as he has already built on about 30 per cent. of his land which is the maximum allowed. In another case a tanner told the author that he also wished to add a drum to his outfit but was unable to do so as he was not allowed to add any building whatever to those he had at present.

146. Owing to tanning being a more or less offensive trade certain rules and regulations must undoubtedly be made, but these should be made with care so as to hinder the tanner, as little as possible, in the carrying out of the various processes incidental to his trade. At the same time it may be mentioned that tanning, although objectionable, is not unhealthy, and it was told to the author by several tanners in different centres that during different epidemics of plague the tannery neighbourhood was remarkably free from sickness, and the author believes that several of the large tanners in Cawnpore found that the ravages from plague were very much lower amongst their hide workers and tanners than amongst other classes.

147. The Karáchi Municipal octroi on raw hides and skins is 0-8-0 per maund irrespective of whether these arrive in wet or dry condition; this is returned to the exporters of raw hides and skins but not to the tanners who export leather.

To take a concrete instance, a tanner buys 100 maunds of wet salted raw sheep skins at, say, a value of Rs. 2,500 and on these has to pay an octroi tax of Rs. 50. He tans these and exports the finished skins and also the wool but gets no return of octroi, which is in this case a loss of 2 per cent.

The exporter of the skins on the other hand has 0-8-0 less 10 per cent. per maund returned to him on the weight exported, and therefore loses very little when he exports the skins in the wet condition, and about half the amount if he exports dry. From this it will be seen that this tax must affect the tanners very seriously, and being as it were almost a bonus on the export of raw materials. If the octroi on hides and skins is necessary as a source of revenue it could certainly be arranged that the tax should be more evenly divided and not all thrown on to the shoulders of one class, more particularly when it is remembered that the Indian tanner pays income tax on profits in India, whereas the great majority of hide exporters do not contribute anything to Imperial taxation.

148. Amongst the leather working classes themselves the lack of capital is the chief hindrance to progress. In many places the local tanners are unable to purchase hides locally, as dealers from larger centres have advanced money to the local Mahárs on condition that they get the whole of the hides of the animals skinned by them during the year. In the same way the Mochi often buys from dealers at a higher price than he could get the same material for from the local tanner, and must do this as he cannot pay cash, but must have credit.

149. In a few cases Co-operative Credit Societies have been formed amongst the leather workers, both tanners and shoemakers, and in these cases the author noticed there appeared a better feeling amongst these people than the corresponding classes elsewhere. The co-operators were able to both buy and sell to better advantage than in other cases, as often the leather worker is in debt to the local money-lender and has to buy all materials through him and consequently at his price.

150. Owing to the great number of boots and shoes of European pattern being worn there has lately become a demand for stained hides and Russian leather, and this to a great extent has been met by the increase of currying carried on in Bombay, and the erection of small factories in Sholápur and Ahmednagar and the dressing of hides by the Dhors in certain places as Sátára, Poona, etc.

151. As has been pointed out the Presidency is particularly well provided with tanning materials which in many cases are not being used to their best advantage, and often the most suitable are not being used for the class of leather required.

At the same time the export trade in tanning materials is practically confined to myrabolans, and it seems that considering the magnitude of the trade done in these materials in various parts of the world it seems quite possible that some of the other materials might be either exported or extracted and exported as extract. Most of the Indian

materials contain too large a proportion of soluble non-tanning substances and are of too dark a colour to make a suitable extract by ordinary means, but it seems quite within the realms of possibility to discover some method by which this could be overcome and suitable extract manufactured. If no indigenous materials are found suitable for export or extract manufacture experiments might be made in the growth of such materials as valonia quebracho or any of the other materials of proved commercial value.

Experiments in connection with these two matters are somewhat lengthy and costly and therefore are not likely to be undertaken by the tanners, but would quite possibly yield good results if carried out in a thorough and practical method.

152. The author wishes to make the following recommendations:—

- I.—That an investigation of indigenous tanning materials be made, with the object of discovering if possible any materials more suitable than those used at present for tanning skins for export, especially with the idea of preparing a leather suitable for book-binding.
- II.—That a thorough investigation of the indigenous tanning materials be undertaken to discover if any are suitable for export either in their natural condition or as extract.
- III.—That experiments be made in the growth of exotic tanning materials of proved commercial value, such as valonia, Sicilian sumach or quebracho. The first of these materials if available in India would be of great use in helping Indian tanners to produce a first class sole leather, whilst the others have each their peculiar value.
- IV.—Local authorities be recommended to frame their bye-laws in such a manner, as, while causing the minimum of inconvenience to tanners, would at the same time afford them something in the way of substantial security as regards occupancy of the premises necessary for their business, without endangering the health and welfare of the locality.
- V.—That the Karáchi Municipality be asked to re-arrange their octroi on hides and skins and to so arrange it that the tanners are taxed no more than the exporters of raw goods.
- VI.—That wherever possible the local leather workers be helped by the formation of Co-operative Credit Societies.
- VII.—That in schools, where there are large numbers of children of the leather working classes, the elementary principles of the cure of skins and the manufacture of leather be taught, and that for this purpose a small text-book be prepared and translated into the vernaculars.

A. GUTHRIE.

TABLES.

I.

Foreign hides and skins imported into Bombay.

		1904-05.	1905-06.	1906-07.	1907-08.	1908-09.
Hides	... No.	46,108	59,091	13,000	50,910	23,038
Weight	... Cwt.	4,362	5,856	1,223	5,071	2,015
Value	... Rs.	1,30,395	1,73,229	37,767	2,09,336	73,112
Skins	... No.	949,194	991,434	847,297	796,430	760,823
Weight	... Cwt.	13,292	16,597	16,422	10,622	11,305
Value	... Rs.	6,09,523	7,30,502	8,03,886	4,68,175	5,08,977

II.

Indian hides and skins imported into Bombay.

		1904-05.	1905-06.	1906-07.	1907-08.	1908-09.
<i>Hides.</i>						
Weight	... Cwt.	6,767	4,142	5,543	4,762	6,459
Value	... Rs.	2,11,423	1,66,082	2,21,131	1,74,912	2,36,050
<i>Skins.</i>						
Weight	... Cwt.	7,429	6,516	8,108	8,021	5,805
Value	... Rs.	2,51,273	2,34,405	2,84,645	3,21,498	2,21,378

III.

Foreign hides and skins imported into Sind.

		1904-05.	1905-06.	1906-07.	1907-08.	1908-09.
Hides	... No.	5,193	4,206	1,319	1,234	8,625
Weight	... Cwt.	309	270	84	81	604
Value	... Rs.	15,141	12,313	4,271	5,031	30,963
Skins	... No.	136,547	52,469	71,743	77,516	87,879
Weight	... Cwt.	1,241	652	922	1,257	1,102
Value	... Rs.	72,938	35,215	65,923	89,050	82,930

IV.

Raw hides and skins exported from Bombay.

		1904-05.	1905-06.	1906-07.	1907-08.	1908-09.
Hides	... No.	4,798	9,230	30,059	10,925	24,305
Weight	... Cwt.	638	828	3,792	1,026	1,863
Value	... Rs.	25,074	6,430 ✓	2,11,015 ✓	85,599 ✓	1,12,174 ✓
Skins	... No.	45,964	...	...	...	...
Weight	... Cwt.	1,264	...	...	...	...
Value	... Rs.	61,685	...	...	...	...
Goat skins	... No.	80,59	1,464,359	1,779,959	905,379	1,733,192
Weight	... Cwt.	...	39,431	50,151	29,451	69,159
Value	... Rs.	...	21,36,009 ✓	30,58,546 ✓	12,69,624 ✓	27,58,132 ✓
Other skins	... No.	...	25,650	16,878	5,053	49,622
Weight	... Cwt.	...	394	362	80	1,076
Value	... Rs.	...	33,827 ✓	23,119 ✓	7,549 ✓	46,601 ✓

V.

Raw hides and skins exported from Sind.

		1904-05.	1905-06.	1906-07.	1907-08.	1908-09.
Hides	... No.	279,863	464,339	482,112	242,428	139,132
Weight	... Cwt.	29,890	48,834	53,412	21,140	13,260
Value	... Rs.	15,70,964 ✓	26,87,696	30,33,810	13,18,454	7,97,688
Goat skins	... No.	2,249,877*	2,485,150	3,329,089	1,295,109	3,106,150
Weight	... Cwt.	39,306	49,876	53,505	23,720	54,372
Value	... Rs.	27,44,075 ✓	39,93,141	53,91,487	21,46,770	40,76,765
Sheep skins	... No.	...	513,183	1,007,613	279,628	261,464
Weight	... Cwt.	...	6,533	16,043	4,729	4,476
Value	... Rs.	...	4,76,716	✓13,38,924	4,00,813	2,77,327
Other skins	... No.	...	56,322	84,176	14,622	23,943
Weight	... Cwt.	...	2,726	5,866	624	737
Value	... Rs.	...	1,38,532	2,99,615	39,300	38,770

VI.

Quantities of tanned hides and skins exported from Bombay.

		1904-05.	1905-06.	1906-07.	1907-08.	1908-09.
Hides	... No.	101,868	233,332	319,126	200,573	269,491
Weight	... Cwt.	9,783	22,317	20,689	17,241	24,568
Value	... Rs.	7,64,289	20,28,683	19,83,375	16,82,714	26,47,922
Skins	... No.	3,589,843	...	...	...	...
Weight	... Cwt.	36,049	...	...	...	...
Value	... Rs.	55,73,030	...	...	...	...
Goat skins	... No.	...	2,363,228	2,165,195	2,585,327	2,020,857
Weight	... Cwt.	...	21,871	23,154	29,392	18,797
Value	... Rs.	...	36,77,402	36,21,121	44,43,014	31,07,196
Sheep skins	... No.	...	1,431,539	1,130,069	1,331,620	861,288
Weight	... Cwt.	...	12,102	9,262	10,946	7,383
Value	... Rs.	...	17,86,424	15,02,896	17,83,921	11,57,017
Other skins	... No.	...	9	1,671	21,638	483
Weight	... Cwt.	...	...	19	212	29
Value	... Rs.	...	54	3,315	36,631	4,138

VII.

Quantities and value of tanned hides and skins exported from Sind.

		1904-05.	1905-06.	1906-07.	1907-08.	1908-09.
Hides	... No.	...	1,870	13,913	445	125
Weight	... Cwt.	...	35	1,260	42	13
Value	... Rs.	...	2,850	89,024	5,459	1,500
Goat skins	... No.	...	399,395	531,361	333,590	205,675
Weight	... Cwt.	...	3,613	5,182	2,429	1,748
Value	... Rs.	...	5,23,115	8,70,058	4,63,421	2,48,953
Sheep skins	... No.	188,901*	78,865	52,613	39,577	34,515
Weight	... Cwt.	1,56d	572	481	347	319
Value	... Rs.	2,00,336	83,397	75,533	67,845	47,112

* All classes of skins.

VIII.

Quantities and value of myrabolans exported from Bombay.

		1904-05.	1905-06.	1906-07.	1907-08.	1908-09.
Myrabolans	... Cwt.	807,276	696,735	745,538	1,102,657	1,079,449
Value	... Rs.	30,16,777	25,76,885	29,20,163	41,95,098	43,13,514

IX.

Value of leather and leather articles imported into Bombay.

		1904-05.	1905-06.	1906-07.	1907-08.	1908-09.
Boots and shoes	...	10,99,975	11,34,981	11,52,142	14,33,477	11,54,747
Saddlery and harness	...	2,08,796	3,52,703	1,81,379	2,77,487	2,23,216
Other sorts (excluding boots and shoes)	...	9,54,930	13,14,985	15,06,387	15,00,674	13,92,298

X.

Value of leather and leather articles exported from Bombay.

		1904-05.	1905-06.	1906-07.	1907-08.	1908-09.
Boots and shoes	...	1,64,171	1,68,269	1,23,606	86,223	71,746
Leather, unwrought	...	2,749	1,56,677	79,453	35,833	12,385
„ manufactures	...	34,573	49,309	35,546	31,757	16,449

XI.

Value of leather and leather articles imported into Sind.

		1904-05.	1905-06.	1906-07.	1907-08.	1908-09.
Boots and shoes	...	1,70,182	2,44,863	2,35,462	3,45,250	4,47,311
Leather	...	1,48,317	1,40,612	1,42,817	1,38,814	1,73,262

XII.

Value of leather and leather articles exported from Sind.

		1904-05.	1905-06.	1906-07.	1907-08.	1908-09.
Boots and shoes	...	410	1,909	1,278	1,855	2,288
Other articles	...	6,987	5,366	2,737	1,854	2,215

XIII.

*Number of animals slaughtered for food in the slaughter-houses
in various towns in the Bombay Presidency.*

District.	Place.	Buffaloes.	Cows.	Sheep.	Goats.
Bombay	... Bombay	3,842	45,411	...	*627,771
Thána	... Kurla	...	...	...	*7,621
Do.	... Santa Cruz	...	...	...	1,460
Upper Sind Frontier.	Jacobabad	1	656	986	9,876
Hyderabad	... Hyderabad C.	...	†97	3,108	10,582
Do.	... Do. M.	...	...	1,126	52,014
Panch Maháls	... Dohad	500	580	800	2,000
Do.	... Godhra	2,196	2,196	...	...
Surat	... Surat	1,177	1,851	41,993	49,948
Lárhána	... Lárhána	210	160	4,000	17,600
Do.	... Kambar	40	100	180	3,960
Do.	... Rapadero	...	†15	...	*2,496
Do.	... Lehwan	...	...	1,202	2,655
Ahmedabad	... Ahmedabad	3,129	7,971	74,617	45,327
Broach	... Ankleswar	265	183	115	4,560
Do.	... Broach	...	†1,460	...	*14,600
Do.	... Jambosa	25	25	125	200
Karáchi	... Karáchi	496	2,879	34,058	64,506
East Khándesh	... All places	263	4,015	12,349	12,380
Thar and Párkar	... Mirpur Khás	...	...	240	6,870
Do.	... Umarkot	...	†...	156	1,825
Sholápur	... Sholápur	...	†4,269	4,253	55,884
Do.	... Karmála	35	95	200	1,300
Do.	... Panchapur	...	...	...	5,393
Do.	... SÁNGOLA	...	...	...	*6,485
Kaira	... Nadiád	1,583	...	...	*1,756
Do.	... Other places	125	405	801	525
Ahmednagar	... Ahmednagar M.	538	1,348	...	*24,141
Do.	... Do. C.	...	3,069	...	4,244
Do.	... Other places	22	150	...	*4,300

* No separate account of sheep and goats kept/total of both.
† No separate account of buffaloes and cows kept, total of both.

32665-

**Report on the Proposed Establishment of a School
in connection with the Leather Industries
of the Bombay Presidency.**

Report on the Proposed Establishment of a School in connection with the Leather Industries in the Bombay Presidency.

The Honourable Mr. W. H. Sharpe, M.A., in his letter of June 7th, 1909, points out that the various proposals in connection with the formation of a Leather Industries School embrace two entirely different types of school—one for illiterate workers and the other for "Captains of Industry" or peripatetic teachers—and hence this question must be investigated from both these points of view.

2. In December 1903 the Madras Government commenced experimenting on the manufacture of chrome leather in the School of Arts and have since 1904 admitted students to learn this process. During the year 1904-1906, 17 students entered the department, whilst the number in the next two years were 38 and 37. These remained as students in the department from a few weeks to almost a year.

3. According to Resolution Mis. No. 2788, dated 27th June 1908—

The Board regrets to note that none of the chrome tanning concerns hitherto started by private enterprise has proved a success.

4. At the same time the position of these students may be examined, and there is no doubt that the percentage of those who have been unable to obtain any position is very great, as the application files of any of the better known tanners will show. It would be interesting at any rate to find out how many of these students have received any benefit from this instruction, and this must be possible as the names and addresses of most of them must be available.

5. With regard to the type of school to turn out "Captains of Industry" or peripatetic teachers the two chief points to be taken into account are:—

(1) The possibilities and probabilities of obtaining students of a class able to benefit by the tuition.

(2) The possibilities and probabilities of their obtaining suitable employment at the completion of their course.

6. The ideal class of students for this kind of school would be one who not only has a thorough general education but also a very considerable knowledge of chemical and physical science, and at the same time has had some practical experience in the leather trade. Of this class of students few, if any, are to be found. Next in suitability would be those with a sound general education, although with no scientific knowledge, and with some practical experience of the trade. Students of this class would have to spend considerable time studying pure science before becoming able to take full advantage of the more technical classes. Of this class there would again be few, if any, willing to give up the time necessary for any course which could be considered thorough. Last of all would be those with the necessary educational qualifications but with no practical knowledge of the trade. Of this class there would no doubt be many available if the prospects of suitable employment at the completion of their studies were sufficiently alluring.

7. The prospects of students, who had studied in a school of this class, of obtaining employment may be next examined. The number of tanneries in the Presidency of any considerable size are very few, and of these most are engaged in the tanning of skins or hides for export, and in these there is no demand for men with scientific training, but only for good *mistris* to see that each process is carried out in the way which long practice has proved to give the best results. Even if the remainder of the tanneries each took one ex-student of such a school as proposed, which is very doubtful, there would only be enough position for, say, the first batch to complete their studies, and all succeeding batches would be thrown on an already overstocked market.

8. With regard to their employment as peripatetic teachers for some period by Government, it is more than doubtful if they would be of any value to the leather working classes, as it is almost an impossibility to improve their methods, whilst the demand is only for the *cheapest* possible leather, and the appliances at the command of these classes are so few and crude and the necessary capital is not available.

9. Great difficulty has been found by students who have studied in the English leather trade schools in obtaining positions, and there are at present one or more Indians with this training seeking employment, whilst a considerable number more are studying in these schools. Even in Europe many ex-leather school students have had to take up other trades.

10. It may be thought that if suitable managers of factories were available many new concerns would spring up, but this seems most unlikely, as the demand for leather in India is either for the cheapest possible, in the manufacture of which the hereditary workers cannot be beaten, or for the very best article possible, which will always be imported as the Indian raw article is not suitable for first class work, and it is of no use manufacturing an article for which there is no demand.

11. No details have been given as to the lines on which a school for the illiterate workers could be run; if the idea were to teach them the use of the different machines and tools a useful object would be fulfilled, but this class of instruction can only be carried out in a factory the turnover of which is very considerable, and as the amount of material irretrievably damaged in this teaching would be very great, it would be quite impossible to get any commercial firm to undertake it. If the idea were to teach them other methods than those understood by them, their ignorance and inability to absorb such instruction would cause the teaching to be more harmful than beneficial. A sentence in the Madras Revenue Department report No. 2047, dated 15th August 1907, will show that this has happened in the case of the Madras School of Arts classes in chrome tanning. Writing of ex-students the report, page 9, paragraph 15, says:—"In some cases the work done by students after leaving the department has been very prejudicial to the interests of the industry, as without sufficient practical knowledge they have attempted to make chrome leather and have only been able to turn out stuff of a very inferior quality."

12. Any attempt to steer a middle course between these two channels could only result in a failure, or partial failure, as has been the case with the Madras School of chrome tanning.

13. There is, however, one course that seems to promise some success, and the writer knows that one large firm in Cawnpore is carrying experiments on these lines.

14. In all centres where the hereditary tanning classes are numerous, elementary schools for the children might be formed, in which the simple processes of the trade could be taught; preferably on the Kindergarten system, and for this work some text-book might be specially written and translated into the different vernaculars. In this case the children on coming into the factory will have at any rate some knowledge of the general methods employed, and, when taught to carry out a certain process, will understand the reason for, and the result of, this process, and it is hoped will show more interest in their work and hence become more reliable workmen.

A. GUTHRIE.

CHAPTER V.—Hides for Export.



WEIGHING.



REMOVING EXCESSIVE FLESH.



POISONING.

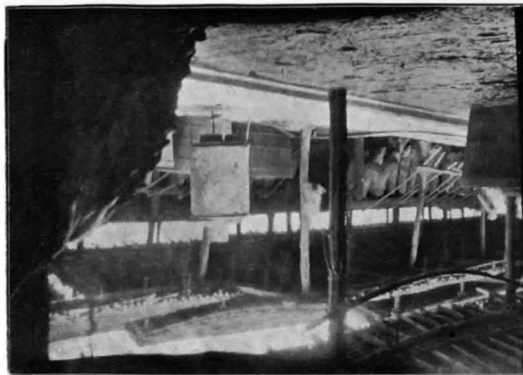


CLEANING AND CLASSING.

CHAPTER V. and VII.



SALTANGER'S TANNERY.



INTERIOR VIEW EXPORT AND LOCAL TANNERY.

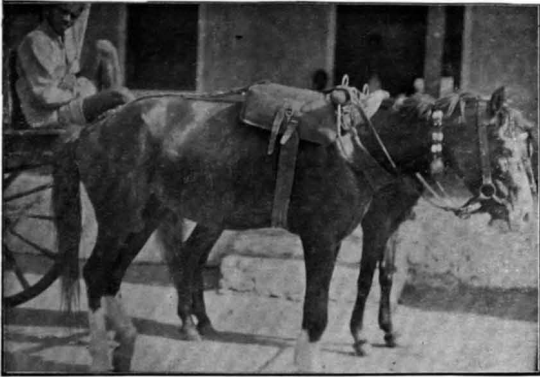


DHORS' BAG TANNAGE.

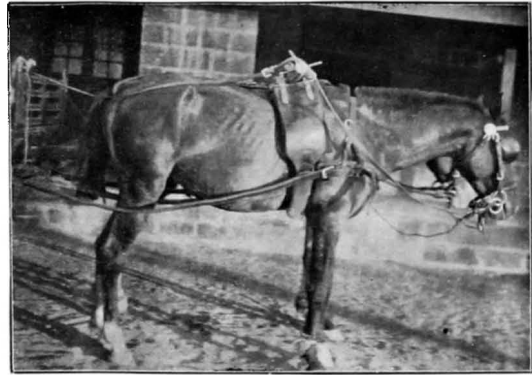


FLESHING.

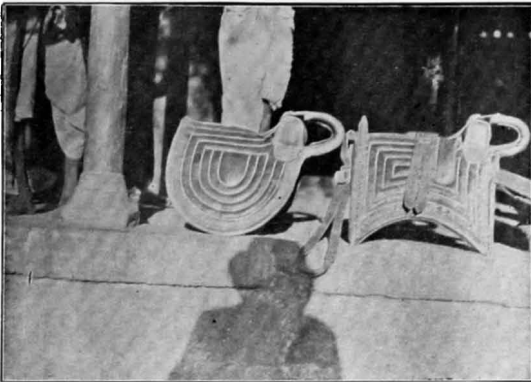
CHAPTER VI.—Para 84, Tanga Harness.



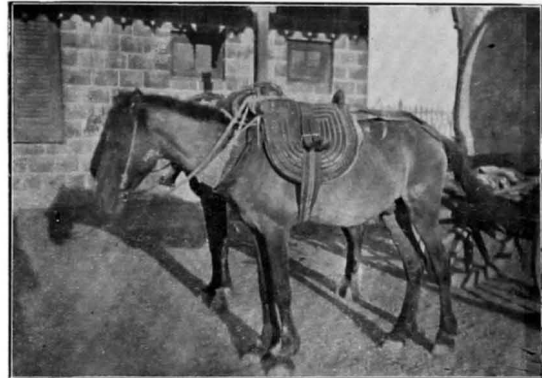
THANA HARNESS.



SATARA HARNESS.



KHANDESH HARNESS.



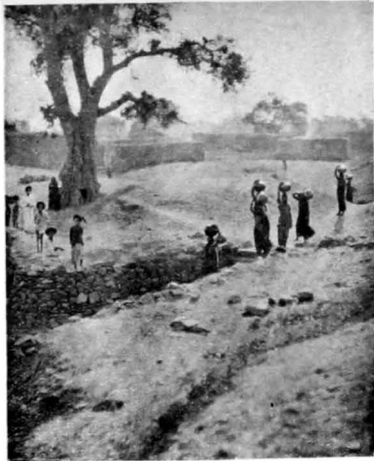
KHANDESH HARNESS.

CHAPTER VI., para 66, and CHAPTER VII., para 112.

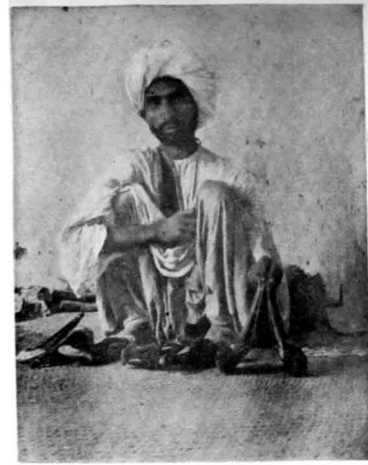
BOOTS AND SHOES MADE IN ONE SHOP IN POONA CITY.



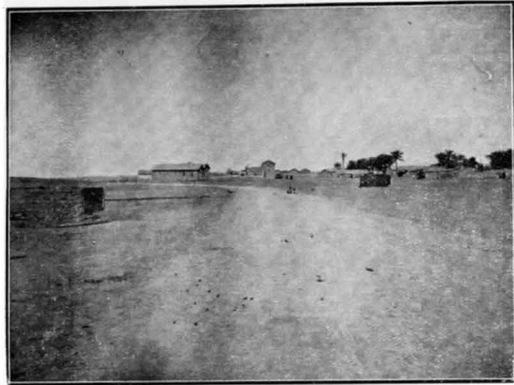
CHAPTER VII.



DHOR-WOMEN CARRYING WATER FROM WELL.



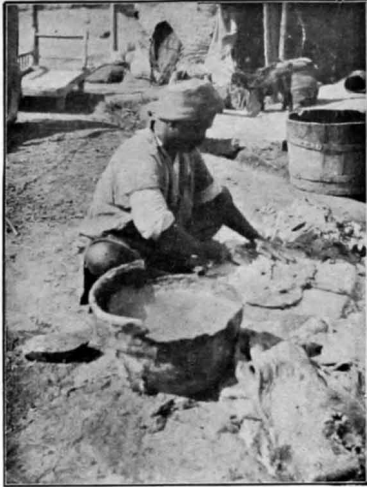
A MAKER OF ZENANA JUTA.



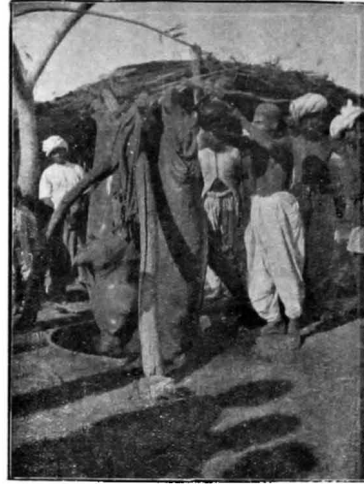
PARA 94. TANNERY AREA LYSARI, KARACHI.



CHAPTER VII.



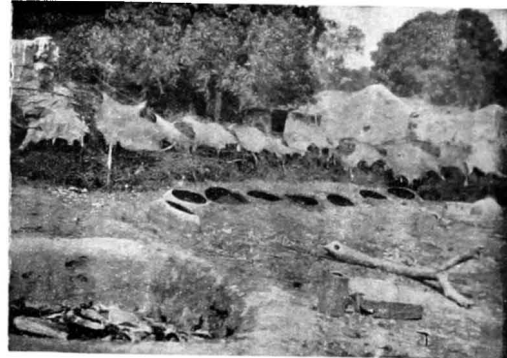
CHAMBHAR FLESHING HEADS, (KARACHI).



SINDHI MOCHI'S BAG TANNAGE.



CALALS' UNWOOLING SHEEP SKINS.



A CALAL TANNERY.