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					Acres.
Hyderabad	{	1st period	...	...	15
		2nd „	...	...	...
		3rd „	...	...	5
		4th „	...	...	14
		1892-93	...	...	3
Shikarpur	{	1st period	...	...	164
		2nd „	...	...	175
		3rd „	...	...	143
		4th „	...	...	166
		1892-93	...	...	231
Upper Sind Frontier.	{	1st period	...	...	3
		2nd „	...	...	Fraction.
		3rd „	...	...	„
		4th „	...	...	„
		1892-93	...	...	...
Khairpur...	{	1st period	...	...	156
		2nd „	...	...	151
		3rd „	...	...	168
		4th „	...	...	84
		1892-93	...	...	38

There has never been any cultivation in the Thar and Parkar district. The total for the first period is 425 acres as compared with 337 acres for the year 1892-93. There has been a remarkable falling off in recent years in the Karachi district and the Khairpur State, and 350 acres may now be taken as the normal area of cultivation in Sind. The cultivation of isolated plants near houses would appear to be extremely rare. The evidence does not speak of it.

Aden. 131. The hemp plant is not cultivated in Aden at all.

132. The cultivation of the hemp plant was not restricted in Berar until 1875, and in that year a system of granting licenses, subject to a fee of Rs. 8 irrespective of area, was introduced. Berar. The system was modified in 1884, when the license fee was raised to Rs. 10 per acre. The total area cultivated since 1877-78 has been—

Acres.			Acres.		
1877-78	...	85	1885-86	...	106
1878-79	...	94	1886-87	...	58
1879-80	...	241	1887-88	...	38
1880-81	...	139	1888-89	...	67
1881-82	...	143	1889-90	...	60
1882-83	...	84	1890-91	...	35
1883-84	...	87	1891-92	...	46
1884-85	...	80	1892-93	...	86

And it has been confined to three districts in all but the first of these years, the figures for the last year being—

					Acres.
1892-93.	{ Akola	...	...	...	51
	{ Amraoti	...	...	...	22
	{ Buldana	...	...	...	13

Akola has always had the greatest area under the crop, the second place being taken by each of the other districts in different periods. There appears to be a tendency for the cultivation to increase in the last three years, which is probably connected with the fact that in some *talukas* foreign ganja is being imported, showing that the present production is not sufficient for the home market. Illicit cultivation hardly exists at all.

133. The memorandum from Ajmere reports an insignificant amount of cultivation for the production of bhang. In 1886 the total area was reported to be 4 *biswas*. There is no restriction on cultivation, but it is only carried on by *malis* and Hindu ascetics, and the Brahmans of Pushkar. The District Superintendent of Police says that the produce has fallen to 40 maunds, and the Abkari Inspector also states that the cultivation is on the decrease. The extent of it would appear to depend a great deal on the character of the season.

134. In Coorg cultivation is allowed under license, but no one undertakes it openly. The spontaneous growth that springs up near the huts of coolies and wild tribes, the Yeravas and Kurubs, is sometimes fostered and tended. From the account of cultivation given by witnesses (1) and (2), it would appear that the plant is sometimes sown deliberately, and treated with some care. The extent of the whole cultivation must, however, be very trifling. It is reported that there have been eight prosecutions for illicit cultivation in the last two years.

135. The Political Agent and Deputy Commissioner of Quetta and Pishin reports that the hemp plant is cultivated to a very small extent in one or two villages of the Quetta Sub-division, and that the produce, which is sold to the contractor, amounted last year to 12 sérs. In his evidence the Deputy Commissioner mentions the cultivating village Ahmed Khanzai. The small quantity of the drug produced would seem to indicate that it is charas. The Political Agent, Kalat, states that the plant is not cultivated on land under the administration of the Political Agent, and that an insignificant amount is grown in the territory of the Khan of Kalat. These facts are corroborated by one witness.

136. It has already been seen from the evidence of Mr. Lewis (19) that the hemp plant was formerly cultivated in Upper Burma. And it would appear to have been cultivated on a considerable scale, for it was the sole source of supply to the shops in Lower Burma. The information collected by Mr. Bridges, Commissioner, Eastern Division, though it shows that under Burmese rule the plant was not uncommonly reared in yards and gardens, does not convey any idea of the extent of the cultivation in the days before prohibition, when the crop must have been worth grow-

ing on the frontier of Lower Burma. The Deputy Commissioner of Mergui states that in those days the plant was cultivated in parts of the Tenasserim township, and some other localities in that division of the province. The Deputy Commissioner of Pegu also writes that before the prohibition the hemp plant is reported to have been abundantly cultivated in Bassein district, and in small quantities in Pegu.

137. It does not appear that the Burmans proper were ever given to the hemp drugs, and it is not therefore surprising that the more extensive cultivation in Upper Burma should have ceased with that of Lower Burma directly the prohibition was passed and the market in Lower Burma was closed. Some survival of the practice which supplied the shops is, however, indicated in the evidence of Mr. Tarleton, District Superintendent of Police of Thayetmyo (29), who says that "certain villages round Tindau and Thetngaibyin in the Allanmyo Sub-division are in the habit of trading in ganja, which they bring into Allanmyo and Thayetmyo and sell to natives of India." Unfortunately this witness was unable to attend in answer to the invitation of the Commission, and they are therefore left in doubt as to the precise value of the statement. Mr. Bridges states that he has frequently noticed in the diaries of excise officers in Upper Burma references to the cultivation of ganja; and again—"In Upper Burma the growth of the plant in a small way by consumers for their own use is general, but the consumers are few." Mr. Fowle, Sub-divisional Officer, Kyauktau, in the Pegu district, reports that the hemp plant is grown in back gardens in the Wuntho township at the base of the spurs of hills radiating from the Maingthong peak. Other official witnesses state that a few plants are still occasionally cultivated in secret, and that prosecutions are sometimes instituted on this account. This testimony comes from Lower as well as Upper Burma. But it appears on the whole that the practice is efficiently checked in the settled districts. The districts of Thayetmyo, Meiktila, Kyauksé, and Mandalay are perhaps indicated as those in which it is most prevalent. It is of course impossible under the circumstances to form any estimate of the extent of this cultivation.

138. The Deputy Commissioner of Mergui mentions the cultivation of the plant in Siam beyond the frontier of Burma. The Commissioner, Eastern Division, and the Inspector-General of Police speak of cultivation in the Danu country which lies between Burma and the Shan States proper, and part of which is British territory. A former chief of the Shan State of Nyaungwe describes the cultivation in his own country, which is probably typical of the practice of the Shans over a much larger area. At this point the Kachin tribes appear to be mingled with the Shans, and their habit of growing the hemp on a considerable scale for fibre is described by Mr. Bridges and the ex-Sawbwa of Nyaungwe. This habit probably adheres to the Kachin race in their own country to the north, and there is no apparent reason why it should not be found over the continuous mountain tract which stretches up to the Province of Assam. In the Danu and Shan country the cultivation is of the homestead kind; a few plants only are reared in each case for home consumption. The practice is more common among the Danus than the Shans, and the produce would appear to be more than sufficient for home consumption, for some quantity

is smuggled into Burma. In the Upper Chindwin district there is a small amount of secret cultivation.

139. In the civil and military station of Bangalore the cultivation of the hemp plant is prohibited, and in the last seven years there have been two or three prosecutions for breach of the regulation. There can be no cultivation except a stray plant here and there. The Mysore laws provide that hemp may be cultivated under license. Cultivators appear to have made two or three unsuccessful experiments, and to have abandoned the idea of growing the plant as a regular crop. This information is furnished in the memorandum of the Excise Commissioner. Mr. McDonnell, the Special Assistant Excise Commissioner, who seems to have made a study of the whole subject of the hemp drugs, describes the method by which a superior quality of ganja is produced locally, and he thinks that its great value in the market as compared with imported ganja must be a strong inducement to clandestine cultivation in yards and gardens. He is evidently of opinion that this is not at all unfrequent, especially in towns and large villages where concealment is more easy. He is corroborated in some degree by other information. The Excise Assistant Supervisor, Tumkur district, says, however, that the hemp plant "is cultivated for the production of ganja, but to a very small extent, all over the province. The extent of cultivation has considerably decreased since the introduction of the rules.....for regulating and restricting the cultivation, possession, sale, import, and export of ganja;" and this must be clandestine cultivation, for it seems certain that no licenses have been taken out. The Sub-divisional Officer, Chick Ballapur, says: "The local cultivation and preparation of ganja are at present confined to the Chintamony taluk." On the whole, however, it would appear that the cultivation is inconsiderable, and the local production quite insignificant.

140. The official memorandum of the Hyderabad State reports that no license is required for cultivation, but it is understood that the produce must be sold to the farmer of the monopoly. Only enough is grown for local wants: the cultivators are few because special knowledge and skill are required for the cultivation. No statistics are supplied. The Director of Agriculture and Commerce states that the land under ganja in the whole dominion may be roughly estimated at about 300 or 400 acres. The cultivation is carried on in a small tract immediately south of Hyderabad and in the Aurangabad and Nandair districts, which lie on the north bordering Khandesh and Berar. By another informant the Indore district lying between Nandair and Hyderabad is mentioned, and another states that in Mahrattwada and the Canarese districts, which latter must lie on the south and south-west of the dominion, it is grown to about the same extent as tobacco. The information gives the impression that only small plots are sown by each man. Besides this regular cultivation, a few plants may occasionally be reared in yards and gardens, but the produce from unskilful cultivation is said to be very inferior. About 350 acres may be taken as a fair figure for the whole State. One informant speaks of fluctuation in the extent of cultivation, and attributes a slight increase to the class of fakirs and gosains becoming more numerous.

141. The memoranda from the marginally noted States show that, except in

Rajputana.	
Kotah.	Jhallawar.
Jeypore.	Kishengarh.
Bikanir.	Kerowli.
Alwar.	Dholpur.
Serohi.	Jaisalmir.
Jodhpur.	Bundi.
Shahpura.	Tonk.

Dholpur, no attempt is made to regulate the cultivation of hemp. In Dholpur permission is required to cultivate, and it appears that no one asks for it, and that there is consequently no cultivation. In all the other States cultivation for the production of bhang only is reported. Only five States furnish figures from which to judge of its extent—*viz.*, Jhallawar 30 acres, Jaisalmir 11 acres, Jeypore 10,000 maunds, Bikanir 3 bighas, and Shahpura 25 bighas. The Jeypore figure, if not a clerical mistake or error of calculation, indicates a large rural consumption, for the following quantities only are accounted for as being exported or sent to the capital:—27 maunds exported, 50 maunds transported, and 300 maunds imported from districts into the city: total 377 maunds. The statistical table at the same time shows an import of 354 maunds of bhang and no exports. In the first four States here named the cultivation would appear to be of the more systematic kind. In Shahpura and the rest of Rajputana the plant is sown in gardens either in small patches or in favourable positions, such as the sides of water-channels, or scattered among and around other vegetables. The figure given for Shahpura is an estimate of the aggregate quantity of this kind of cultivation. It appears that in Serohi a contribution is levied in kind from the cultivators and presented to the temples of Mahadeo. The average of these contributions for ten years was one maund of ganja and forty maunds of bhang. A witness from Bhartpur states that the plant was formerly cultivated, but is not now, and the official return shows no cultivation. Here only and in Bikanir is there any evidence of fluctuation in the practice, and in both instances decrease is indicated. The plants seems to require irrigation everywhere, and over a great part of the Agency water is scarce. This must operate as a check to cultivation. As a broad general description, it may be said that the plant is cultivated for the production of bhang all over Rajputana where irrigation is possible, and that, except in Jhallawar, Jaisalmir, and Jeypore, it is never sown in large patches, but appears as scattered plants in vegetable gardens.

142. The information from the Central India Agency is scanty. The return

Central India.	from the Indore State shows that from 1873-74 to
Extent of cultivation in Indore.	1878-79 the area of cultivation exceeded 300 bighas.

It then fell suddenly to below 100 bighas, and never reached that figure again until 1888-89. The average of that and the following four years is 180 bighas ( $\frac{5}{8}$  acre). The cultivation has during this period been about stationary. It is confined to the few mahals in the Nemad district bordering on the Narbada, and to a small tract north of Indore. The State puts no restriction on the cultivation whatever.

143. Enquiry made by the Commission shows that in the Antri pargana of the Gwalior State the cultivation amounts to 265 bighas, and that there is cultivation in other parts of the State as well, extensive in Ujjain and Sipri. The average rent of land fit for the growth of hemp is Rs. 5 per bigha, and an additional tax of Rs. 6 per bigha is levied on the cultivation. There seems to be no other restriction on the cultivation, which has a slight tendency to increase. It is stated in a report attached

to the North-Western Provinces memorandum that ganja is grown in three tahsils of the Gwalior State—Antri, Sipri, and Kalaras,—and that the areas cultivated last season were respectively 250 bighas, 253 bighas, and 300 bighas, a bigha being one-half of an acre. The total comes to about 400 acres.

144. In Dewas the cultivation for ganja amounts to 39 bighas and for bhang to 9 bighas. In Baghelkhand and Bhopawar the cultivation is reported to be limited; in the latter division it serves for home consumption only. Dr. Caldecott, Agency Surgeon, Western Malwa, states that cultivation occurs all over Malwa, *i.e.*, the south-western portion of the Central India Agency, for the production of charas, bhang, and ganja, and that it is commonly grown along with tobacco. The reference to charas suggests that this wide statement must be accepted with caution, for charas is certainly a rare product in these parts.

145. In the correspondence of the last few years relating to the production of the hemp drugs and in Dr. Watt's dictionary, the cultivation of Indore and Gwalior is more prominently mentioned than that of other States. It may be inferred that in comparison with the production of these States that of other States in Central India and Rajputana is unimportant, though it is possible that ganja may have been exported from Central India as the product of Indore and Gwalior when it was really cultivated in some other State. But this does not appear likely. It is probable that the production of other States is not much more than enough to supply local wants. But in the Central Provinces evidence from the Saugor district mention is made of smuggling from the Central India States. The Excise Commissioner of the Central Provinces also writes (in his memorandum) that in one village of the Panna State ganja is freely grown, and that it is also grown in Rewah. The cultivation in Rewah is also mentioned by witnesses from the North-Western Provinces, the Joint Magistrate of Jhansi (32), and a mafidar of Banda (215). Besides Rewah, the states of Panna, Chattarpur, Ajaigarh, and Charkhari are indicated. Mr. Wall, Excise Commissioner of the North-Western Provinces, stated in his report No. 273-E., dated 22nd November 1883, that the Jhansi and Lalitpur districts drew their supply of bhang from the Native States of Dattia, Tehri, Gwalior, and Chattarpur. But there is not sufficient information to enable any estimate to be formed of the extent of cultivation in any but the States for which figures have been given. There is neither report nor evidence regarding the important State of Bhopal on this point.

146. The area of regular cultivation ascertained with some certainty is therefore—Gwalior 400, Indore 115, Dewas 25: total 540 acres. In the other States there may be small areas of regular cultivation, but the most of it is probably scattered and of the desultory sort, a few plants here and there in fields, gardens, and home enclosures.

147. The Baroda report states that "it is said that this plant was sown largely in various places. But the restriction placed by the British Government on exportation obliged the cultivators to give up cultivation. It is now cultivated in one village,

Bhadran, where bhang is made for home consumption. No narcotic hemp is cultivated either for the production of charas or its flowers or seeds." The area is about 10 to 12 bighas. It is also found in the compounds of sadhus, fakirs, and other people who consume ganja or bhang. There is no reason to suppose that this latter kind of cultivation is very common.

148. The Governor of Kashmir and Jammu and the Member of Kashmir State Council report that the plant is not cultivated. It appears that the wild growth is abundant enough, and develops the narcotic properties in sufficient degree to satisfy the wants of the people.

149. The answers to questions received from the Nepal State through the Resident, while alleging that no one cultivates ganja, describe how the wild plant is nurtured and treated, sometimes, it would appear, after being transplanted. This treatment is said to require special skill (questions 2 and 10), and the inference is that the industry is not followed by any large number of persons. The Bengal evidence shows that Nepal charas used formerly to be consumed in that province, but has now given way to that from the Punjab. But it is reported from the North-Western Provinces that 25 to 50 maunds are still imported into Lucknow. It would seem, therefore, that the industry is not inconsiderable. In Royle's *Fibrous Plants of India* will be found quoted a report from Mr. Hodgson, which shows that in the northern districts of Nepal the plant is pretty extensively grown for fibre.

150. The following table shows the total area of hemp cultivation in India as far as it has been possible to state definite figures:—

*Extent either ascertained or estimated of cultivation in the various Provinces and States.*

Province or State.	Area in acres.	For what product.	REMARKS.
Bengal ... ..	824	Ganja ...	Average, five years.
North-Western Provinces— Farakhabad and Hardoi ...	190	Bhang ...	Average, do.
British Kumaon and Garhwal	830	Fibre ...	Reported.
Punjab ... ..	100	Bhang ...	Reported.
Central Provinces ... ..	950	Ganja ...	Average, ten years.
Madras ... ..	350	Do. ...	Reported.
Bombay— British Territory... ..	1,000	Do.	Average, five years.
Native States ... ..	157	Do.	Reported.
Sind and Khairpur ... ..	345	Bhang ...	Average, five years.
Berar ... ..	58	Ganja ...	Average, do.
Ajmere ... ..	5	Bhang ...	Estimated.
Hyderabad ... ..	350	Ganja ...	Estimated.
Rajutana— Jhallawar ... ..	30	Bhang ...	Reported.
Jaisalmir ... ..	10	Do.	Reported.
Shahpura ... ..	25	Do.	Reported.
Central India— Indore ... ..	112	Ganja ...	Average, five years.
Gwalior ... ..	400	Do.	Reported.
Dewas ... ..	25	Do.	Reported.
Baroda ... ..	8	Bhang ...	Reported.
Total ... ..	5,769		



The only cultivation of any moment which has been omitted is that of those States in Rajputana and Central India which have not been mentioned in the table, and the irregular kind of cultivation which is carried on in the Madras Presidency, the Garhjat States of Bengal, and the plains of the North-Western Provinces. There is also a considerable area of fibre cultivation in the Native States and British territory in the Himalayas which has not been taken into account, and probably amounts to some hundreds of acres. Deducting the fibre cultivation, which yields but little of the drugs, from the total area given in the table, and making allowance for the narcotic cultivation which has been omitted, the total area of cultivation in India for the drugs can hardly exceed 6,000 acres. The total Himalayan cultivation for fibre of the Punjab and North-Western Provinces in the region extending from the borders of Nepal to those of Kashmir may be taken on a liberal estimate at nearly double that of Kumaon and British Garhwal, or 1,500 acres. It cannot be said that the regular cultivation either of the mountains or the plains is shown to be increasing or decreasing. In British territory the desultory kind of cultivation has either been suppressed, as in Bengal, Assam, the Central Provinces, and Berar, or has disappeared, as in Bombay, or is being abandoned as in Madras, the North-Western Provinces, and the Punjab.

## CHAPTER V.

### METHODS OF CULTIVATION AND MATTERS CONNECTED THEREWITH.

151. Before describing the cultivation of the hemp plant, it will be proper to mention the products which are got from it. It has been shown that the plant which yields the true hemp fibre is the same as that which produces the narcotics. The seed is the familiar hemp seed which is given to cage birds. It is also occasionally eaten by the natives of India, especially in the Himalayas, and an useful oil is expressed from it. The fibre and seeds only come incidentally within the scope of the present inquiry. The narcotic products of the plant are ganja, charas, and bhang. Dr. Prain has described very fully the physiological processes by which the narcotic principle is secreted in the various parts of the plant. For the purposes of the Commission it is sufficient to state plainly and briefly what the three articles are in the simple forms in which they first enter the market. The definitions with which the Commission's list of questions is introduced are as follows. They are borrowed from Dr. Prain :—

“Ganja consists of the dried flowering tops of cultivated female hemp plants which have become coated with resin in consequence of having been unable to set seeds freely.”

“Charas is the name applied to the resinous matter which forms the active principle when collected separately.”

“Siddhi, bhang, subzi, or patti are different names applied to the dry leaves of the hemp plant, whether male or female, and whether cultivated or uncultivated.”

These definitions have been generally accepted by the witnesses, but the result of the inquiries is to show that they require some explanation. First, with regard to ganja.

152. Over nearly the whole of India distinction is recognised between the ganja and the bhang plant. Though the natives may mistake the sexes, it is clear that the female plant is the one which is called ganja and the male plant bhang. The plants are distinguishable even in the wild state, the loose flowering panicle of the male from the comparatively stiff and apparently blossomless spike of the female. The hill ganja of Assam, and the wild ganja that seems to be occasionally found and used throughout Eastern Bengal and the Sub-Himalayan region, and even in Kashmir, must be the female flower spike which has often been quite innocent of any tending. In examining the evidence, therefore, the definition of ganja given above must often be read as with the word *cultivated* omitted.

153. Then as regards bhang, the witnesses often use the word to include the female flower head as well as the leaves of the plant, and the green leaves as well as the dry. The male flower head must also enter into it in consequence of the rude method of preparing the drug, *viz.*, by drying the plants and beating out the leaves. But the male flowers are not more narcotic than the leaves; the point to be noted is the inclusion of the female flower head in bhang. The confusion arises from the name of the product bhang being used also for the liquid form in which the hemp drugs are consumed. Ganja pounded up and made into drink becomes bhang. This is the way in which Garhjat ganja is used at Puri. In the west and south of India the distinction between the products bhang and ganja is frequently

lost. Bhang is cultivated in Sind with similar precautions to prevent the fertilization of the female plant as in Bengal, and the product is called nothing but bhang, and is rarely used for anything but concocting drink and sweetmeats, the smoking ganja being imported. Bhang is the ancient name of the plant. It is also the name of the form of narcotic product which was earliest discovered, for it must have taken time to learn the art of isolating the female plant and so producing ganja. Bhang is also the name of the most simple style of consumption, *viz.*, by pounding and drinking, which must have preceded smoking. Naturally, therefore, bhang is a more comprehensive term than ganja, and often includes it, especially where the production of ganja has not become a recognised industry. In the Madras Presidency ganja is the more general term, so much so that in some places the word bhang is hardly understood. This is probably due to the hemp plant being only known to the people as cultivated for the production of ganja.

154. Charas may not always be the pure resinous matter. It generally contains leaf dust and other impurities picked up in the process of manufacture. But it is hardly ever confounded with ganja or bhang. Its appearance, that of dark green or brown paste, is distinct from that of both the other drugs. In Kashmir and the Punjab only is the name ganja sometimes applied to charas, probably because charas is prepared from the female or ganja plant (Governor of Kashmir). There is reason to think that in some parts of Rajputana the distinction between charas and ganja is not very strictly observed, and that the former name is occasionally given to the latter drug.

155. In Bengal the hemp plant is grown solely for the production of ganja in the area of regular and licensed cultivation. The Bengal illicit cultivation which is to be found in insignificant quantity all over the province, and the character of which has been described, yields for the most part bhang and not ganja fit for smoking. Ganja of inferior quality is produced in the Tributary States of Orissa in considerable quantity. In the Tributary States of the Chota Nagpur Division ganja of the same quality is produced, but in less quantity. The cultivated product of Hill Tippera appears to be still lower in the scale as regards quality, and very little in quantity. It is proposed now to describe the skilled cultivation of the Ganja Mahal, where the agricultural processes for the growth and preparation of ganja have undoubtedly been brought to greater perfection than in any other part of India, and, as far as information will allow, the more homely practices prevailing outside that tract. Babu Hem Chunder Kerr's report contains a detailed account of the Rajshahi cultivation; Dr. Prain has given a brief outline of the mode of culture; and Mr. Price, Collector of the district of Rajshahi, has submitted a sketch of the cultivators' business during each month of the year. Babu Hem Chunder Kerr's report is the basis of the information furnished by most witnesses. Endeavour will be made to compile a succinct account from these materials.

156. Hemp is an exhausting crop, and requires a light, well-drained soil. It appears that there is but a limited quantity of thoroughly suitable ground in the Ganja Mahal, and that there is a tendency to abandon the outlying lands and concentrate the

cultivation about Naogaon. The ganja plant is reared in a seed bed or nursery and planted out into the field. The field is selected between January and the middle of March, and must be one which has lain fallow, or has borne nothing but light crops, such as pulses or mustard, during the two previous years. It must not be overshadowed by trees. It is first ploughed to remove weeds and stubble as thoroughly as the cultivators' means will allow. In April and May the field is liberally dressed with fresh surface earth from surrounding lands, the quantity used depending on the quality of the field. The turf and weeds on the sides of the field are next dug up in clods and thrown on to the field, the holes thus made being filled up with earth from the ditches. The field is thus cleaned to its extreme boundaries, and the weeds utilised as dressing for the land. In this process a small bank about nine inches high is raised round the field. The fresh earth added to the field becomes desiccated in a week or so, and then cow-dung manure is added and the field well ploughed again. From this time till September ploughing, followed by harrowing with the bamboo ladder, is carried out from time to time, the belief being, as Babu Hem Chunder Kerr says, that the oftener the land is ploughed the better is the crop. A channel is made to keep the field well drained.

157. The details given by Babu Hem Chunder Kerr regarding the selection of the seed bed have special interest in connection with the subject of the spontaneous growth. He writes : " A plot of land near the homestead of the cultivator is generally made available for a nursery, and the people in order to make themselves sure of its dryness always make a point of using those lands only in which a tuberous-rooted, grass-like vegetable called *matha* (*Cyperus rotundus*, L.) grows. The growth of *matha* is, in their opinion, a sure sign of the land being quite dry." In another place Babu Hem Chunder Kerr says : " The nursery or seed bed consists of a plot of high, light, sandy loam." The selection of this plot is made in May, and as soon as one or two showers have fallen it is ploughed. The ploughing is repeated three or four times each month till August. The object is complete pulverisation of the soil, and, if necessary, the bamboo ladder in addition to the plough is passed over the land for this purpose. Manure is not used, and the land must be quite free of shade of any kind. The seeds are sown broadcast on a fine day after a ploughing, and the sowing is followed by harrowing to cover the seed. The bed is carefully drained. The following remarks from Babu Hem Chunder Kerr's report are quoted to show certain idiosyncrasies of the plant for the same reason that the previous *verbatim* extracts were made : " Seeds are not sown on either a rainy or even a cloudy day when rain is apprehended, as the wet ground rots them. Even if it rains three or four days after the seeds have been sown, most of the seeds are destroyed, as the earth gets hardened into a cake after the rain, and the germs cannot force their way through it. In such a case fresh seed has to be sown in another nursery again..... Nor is the grass weeded out at any time after the sowing of the seeds. They are also never irrigated. The cultivators are of opinion that the growth of grass in the seed beds is beneficial to the young plants, inasmuch as it protects the latter from the action of the wind."

158. Towards the end of August or beginning of September the field is again dressed with cow-dung, refuse, and house-sweepings. About a week or ten days after this comes the day

Transplanting.

for planting out. The field is ploughed and harrowed, and made into ridges "well smoothed and beaten down with the hand," and the seedlings are planted out. All this is done on the one day for fear that the soil which has been so thoroughly pulverised should get too dry.

159. It is necessary to again quote *verbatim* from Babu Hem Chunder Kerr for the same reason as before : "The number of ploughings is regulated by the nature of the soil, *khear* or clayey lands, in which hemp is occasionally grown, requiring more frequent ploughing than fields of *poli* soil or light, sandy loam, which form the majority of the ganja beds. The seedlings at the time of transplantation are from four to five weeks old and from six to twelve inches high. The smaller ones are collected for higher and drier fields, in which they are enabled to throw out their roots much quicker and easier, and grow up much faster than in low fields, the soil of which is somewhat heavy owing to the existence in it of a greater amount of moisture, which retards the growth of very tender plants..... If rain falls within three or four days after the transplantation, it proves injurious to the young plants, the roots of which, not having taken any hold upon the soil, rot and die away."

160. The operations of the next few weeks are thus described by Dr. Prain : "A month or so after transplantation, about the middle of October, the fields are carefully weeded; a fortnight later, beginning of November, the ridges are hoed down as far as is possible without injuring the roots of the hemp, which are then well manured with oil-cake, or a mixture of cake and cow-dung, and the ridges rebuilt over the manure. About the middle of November the plants are trimmed by the removal of the lower branches; this helps to give the plant the pyramidal shape that ensures the flowering tops being as close together as possible, obviates the formation of ganja close to the ground, where it would certainly get covered with sand and mud, and finally admits of another course of ploughing and harrowing with a narrow ladder between the ridges; this course immediately follows the trimming, and is itself followed by a second course of manuring with powdered cow-dung and oil-cake, after which the ridges are again rebuilt."

161. At about this stage the detection and removal of the male plants is begun. An expert is required for the work, either the professional *poddar* or *parakhdar* or the cultivator himself if he has acquired the necessary skill in distinguishing the male from the female plants. The exact differences by which the plants are distinguished by the experts cannot be described with confidence. The operation takes place before the flowers are developed; and Babu Hem Chunder Kerr says that the inspection is invariably made in the morning so as to have a good light, which shows how fine these differences must be. The *poddar* breaks over the plants which he decides to be male, the cultivator plucks them out, and fills the blank spaces with plants from the parts of the field where they are left in greater number. Then follows the first irrigation, which is regulated so as to moisten the ridges, but leave no water standing in the furrows. The *poddar's* visit may be repeated two or three times, and the field may be irrigated from three to six times in the following few



Survey of India Offices, Calcutta, August 1894.

GANJA PLANT READY FOR CUTTING, SOME OF THE DRIED LEAVES  
STILL ADHERING, NAOGAON.

16TH FEBRUARY 1894.

weeks. The cultivator himself is always on the look-out to detect and remove male plants which may have been overlooked at the regular inspections. Between the first and second irrigations the ridges are hoed and the field manured a third time.

162. Babu Hem Chunder Kerr states that the male plant begins to flower in November and the female plant in the beginning of January, and Dr. Prain adds that from the time the latter flowering begins "the cultivator is on the outlook for those abnormal male flowers on his female plants which the *poddar* could not possibly have foretold." The ganja begins to ripen about the middle of February, "the state of maturity being indicated by a brownish appearance and the falling off of all the larger leaves." The Commission visited Naogaon on the 16th February, when the harvest was in full swing.

163. There are one or two matters in which the ways of the Bengal cultivator are different from those of the people of other provinces. They talk of the ganja-bearing plant as the male and the pollen-bearing plant as the female. In the Central Provinces and the west of India the cultivator seems to have learnt more of the principles of fructification in plants, and generally calls them by their true sexes. The existence of the *khasia* (emasculated) plant, which Babu Hem Chunder Kerr calls hermaphrodite, and Dr. Prain describes as "functionally defective," "useless but innocent," and "collated, as its name implies, with the sex to which it really belongs," has apparently no parallel at Khandwa in the Central Provinces. The plant is left standing at harvest, or rejected from the heap if it has been gathered by mistake. The Bengal cultivator does not grow a crop specially for seed as is done at Khandwa. He uses the grains that fall from his ganja in the processes of manufacture, which are very numerous, notwithstanding all the pains that have been taken to eradicate the male plants.

164. The cultivation of hemp in the Ganja Mahal is a practice that is handed down from father to son in common with so many arts and industries in this country. Beyond this the industry cannot be said to be confined to a class. Musalmans very largely preponderate among the cultivators in about the proportion of 7 to 2 according to Mr. Price. There is no evidence that the occupation is held in contempt, a point which Dr. Prain has discussed at pages 47 and 48 of his report. Babu Hem Chunder Kerr entered fully into the details of cost of cultivation and the profits of the cultivator. He estimated the former at Rs. 50 to Rs. 60 and the latter at Rs. 25 to Rs. 50 per bigha. There is no equally good information of more recent date. Ganja ranks as one of the superior crops.

165. Babu Hem Chunder Kerr notices a fact which appears repeatedly in the evidence from all provinces that "when the plants begin to flower in clusters and the resinous matter is formed, rain spoils the ganja." The quantity and superiority of Central Asian charas is said to be due to the dryness of the climate in that region. This is a point of considerable interest as a possible explanation of the inferiority of the drug when cultivated in the rainy season. There is no evidence of cultivation