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inferior but smokable ganja may occasionally be obtained from the spontaneous growth. The great majority of witnesses nevertheless state that ganja is not procured from the wild plants, and undoubtedly what is ordinarily accepted as ganja cannot be so obtained. There is no evidence that it undergoes any process after being gathered but simple drying.

229. The methods followed in the homestead cultivation of Bengal and the Tributary States of Orissa and Chota Nagpur have been described. Regarding the possibility of preparing ganja from the homestead cultivation of Bengal, the Sub-divisional Officer of Jangipur may be quoted. He writes: "I have seen ganja plants detected in Bhagalpur and Jangipur. From their twigs ganja as good in appearance as in Naogaon (the particular sub-division where ganja is cultivated under Government supervision) can be prepared, but it is alleged that the flavour is not so good as those grown in Naogaon." This cultivation is of course illegal in British territory, and it is probable that but little ganja is obtained from it. No information has been gathered as to any special care being taken in the preparation of it, and it is probable that the usual practice is simply to dry it.

230. In the Tributary States of Chota Nagpur and Orissa ganja is said to be obtained from the wild as well as the cultivated plants, but the evidence points generally to the plant being more or less cultivated in all cases. There is evidence also that some care is taken in preparing the drug (ganja), and it is probable that the same or very similar practices prevail in both groups of States. Mr. Grimley's inquiry of 1890 gives some information on this subject. Sirguja reports: "The first leaves are plucked away, and from the second leaves the ganja and bhang are made;" and again—"When the leaves grow intertwined, they are used as ganja." Udaipur—"It is exposed to the dew during the night, and afterwards the plants are bundled and dried in the sun. After two or three days they become fit for use." Gangpur—"When the plants mature they are broken off with all their leaves and branches, and are kept wrapped up for some days in the leaves of a tree called *khair* under straw." Bonai—"When the plants are ready, those that are intertwined are cut and dried and preserved, and while still soft are wrapped round with the bark of the plantain tree."

The present evidence furnishes no addition to this information from the Chota Nagpur States. But the District Officer of Angul in Orissa states that "when the tree is ripe and the leaves assume a yellowish colour, the plants are cut, tied into bundles, or rolled in a mat or gunny bag, and then placed under heavy weights for two or three days. Then it is taken out, exposed to dew, leaves and seeds are shaken off, and then it is dried and tied into bundles and stored. This makes flat ganja." It seems clear that by the use of the word "flat" the witness is not referring to the Rajshahi drug, but to that of the country of which he is speaking. Mr. Taylor (36), who has had a long experience of Orissa, but admits that his information on the particular point has been recently acquired, says that "the hemp heads are cut on the seeds ripening in November. The heads are tied in small bundles and sprinkled with lime water, and then alternately buried and exposed to the sun for two or three months, when the ganja is fit for use." He says in his oral examination: "The plants are buried for a week at a time without anything to protect them from contact with the earth."

These processes amount after all to little more than simple drying and removal of the coarser leaves. It is difficult to understand what purpose is served by the process of burying which Mr. Taylor describes, and it may be doubted if the description is accurate. The resulting product is far inferior to Rajshahi ganja. This has been amply proved by inquiries made in past years, in course of which the drugs were compared. The leaf bhang is prepared by simple drying, as in Bengal proper; but it will be seen that the weak ganja of the Garhjat is largely consumed as drink.

231. The preparation of the drugs in Hill Tippera is certainly not more elaborate than that just described; but no information on the subject has been furnished.

Hill Tippera.

232. There is no evidence of charas being made in Bengal, though the resin is available in plenty in the cultivated plant of the Ganja Mahal, and in a less degree in other growth. This form of the drug is not appreciated in the province, and the absence of demand, no doubt accounts for the art of manufacture not having grown up. An infinitesimal amount may be collected from the feet and hands of the operators in the ganja manufacture, but it is doubtful if this small supply is utilized.

Preparation of charas.

233. The preparation of ganja and bhang is carried out by the cultivators and the servants of the bhang contractors respectively. The preponderance of Musalmans in the cultivation of ganja in the Ganja Mahal has been noticed. Beyond this it cannot be said that the preparation of the raw drugs is the business of any special class, unless it be that the Hindus from Behar and the North-Western Provinces, being in large proportion confirmed bhang drinkers, are those who also most commonly collect that drug for home consumption.

Classes engaged in preparation of the drugs.

234. The dried tops of the wild hemp plant are used to some extent for smoking. But there is nothing to show that the article is prepared in any other way than by simple drying.

Assam.

The extermination of the male plant in connection with the wild growth does not seem to be practised either in the valley or on the hills within and on the borders of the province. This is an essential preliminary to the preparation of the superior form of ganja. The dried tops make bhang which may be used for smoking or drinking. Excise ganja is known among the consumers as *mohini* bhang. The epithet *mohini* or fascinating is never applied to the wild product. There is no evidence that charas is prepared or even known in the province.

235. Mr. Stoker made special enquiries regarding the local production and preparation of ganja, and, as regards the extent of the practice, the results are given in a concise form in his memorandum. The evidence furnishes but few details of interest to add to his account. The cultivation of hemp for the production of ganja is not carried on openly. "The whole of the ganja offered for public sale is imported. At the same time it would be incorrect to say that ganja is nowhere grown or manufactured. Careful enquiry has elicited reports from several districts that a small amount of ganja is surreptitiously made." These are Mr. Stoker's words, and they exactly express the impression

North-Western Provinces.
Preparation of ganja from plant cultivated secretly.

left by the evidence which the Commission have collected. No witness has given a detailed description of the method of preparation. Mr. Stoker received a report of the process in vogue in Ghazipur, which he says "closely resembles that employed in Bengal." This is only corroborated by two or three witnesses to the extent that the ganja is put under pressure. Specimens of ganja from Ghazipur and Sultanpur were forwarded to the Commission, and Mr. Stoker's opinion is that the Ghazipur specimen was superior to the ordinary *pathar* ganja, and not much inferior to Bengal *baluchar* (flat). The other was much the same as *pathar*.

236. Regarding the preparation of ganja from the wild growth, Mr. Stoker has ascertained that the produce of the female plant is smoked in the Kheri and Bara Banki districts, and he says that there are indications of similar use in other districts. The evidence on this point is rather strong, and leads to the belief that wherever the plant is common as a wild growth, the poorer classes of consumers make use of it for smoking. The distinction between the male and female plants is well known, as Mr. Stoker states; and some of the witnesses say that the plants are operated upon by twisting the stems to prevent flowering. The plants so treated must be the ganja or females, though that is not expressly stated in all cases. But witness (155) may be referred to, who states that bhang is the natural plant; when it is twisted it is called ganja. A Deputy Collector (46) states that ganja can be prepared from wild female hemp plants if all the males are uprooted from their neighbourhood, and he is a witness who does not appear to be drawing on information he may have picked up regarding other provinces. It has been seen in connection with the cultivation that the advantage of isolating the females is known to some persons, the knowledge having been handed down from a time when ganja was openly cultivated, and it is difficult to believe that it should be confined to a very small number. The fakirs all over the country, who are mentioned as the principal secret cultivators, are certainly not ignorant on this point, and would disseminate the knowledge. The report of the Deputy Commissioner of Kheri, quoted by Mr. Stoker, that this art is not known, appears therefore to be open to doubt, or, if true, to be true only of the locality reported upon. The subject is probably one on which people are inclined to be reticent for the same reasons as actuated those of whom the Assistant to the Director of Land Records and Agriculture in Bengal made his enquiries. The rearing and tending of the hemp plant in the North-Western Provinces may not be illegal; but there is plenty of evidence that the people think it to be so, and that would be sufficient to make them cautious in giving information. There is no evidence that the ganja gathered from the wild plant is prepared by any other process than mere drying. Witness (202), a raiyat of the Kheri district, and (48), a Deputy Collector of Lucknow, state that the ganja plants are gathered in November and December. This would seem to refer to the higher lands. The season of growth on the low lands appears to be from December to June. It may be noted that Mr. Wall, a late Commissioner of Excise, does not believe that ganja is produced by the wild plant, and that many other witnesses take the same view. The local production of ganja does not appear to have ever been so considerable, at least in recent years, as to attract the attention of Government in the Excise Department, and there is no reason to suppose that it has increased since it was suppressed in Oudh. The subject therefore is only of secondary importance.

237. Bhang is prepared by cutting and drying the plants, cultivated or wild, and shaking or beating out the leaves. This is done either by the contractors themselves, or by "residents of jungly tracts for sale to licensed vendors" (38). The districts where the cultivated bhang is produced have been named. The supply of wild bhang is drawn from various places in the belt of wild growth below the Himalayas. The gathering goes on from March to June. The zamindars on whose lands the plant grows appear to make some money by selling it to the contractors (247). Bhang is sometimes dried under straw or other covering, when it turns yellow, instead of retaining the green colour, which it does if dried in the sun (21, 248, 203). The object of this is not clear.

238. In these provinces charas is prepared to a small extent from the crops grown for fibre in the Himalayas, to a less extent from the Himalayan wild growth, and to a still smaller extent from the wild growth of the plains. A very small amount may even be prepared from the plants cultivated in a desultory way. The methods of preparing charas from the fibre plants are described by witness (49). The *sujango* or female plants, having been cut in November, are spread out to dry for twenty-four hours. The people then sit round in the heat of the day, and pluck off the flower heads, which are now full of seed, discarding the coarser leaves. Each handful is rubbed between the palms for about ten minutes and thrown aside. In course of time a quantity of juice accumulates on the palms, which is scraped off and rolled into balls. These are charas. Sometimes the plants are trodden instead of handled, and the feet scraped. A more uncommon method, by which a choice kind of charas called *chahar mulhi* is obtained, is to pass the hands up the ripe plants while they are still standing in the field. This plan is not approved, the witness says, because it is supposed to damage the fibre. Other witnesses (21, 43) mention the practice of running through the crop or growth on a dewy morning, and scraping off the resin which adheres to the body. Witness (248) states that the resin, having been collected, is kneaded on hot stones; but the account of witness (49) that the process of manufacture ordinarily ceases with the making of the resin as scraped from the hands into balls is probably reliable.

There is a considerable amount of evidence and opinion that charas is prepared from wild plants. Witness (49) states that in a small area at an elevation of 8,000 feet called Urgum in Palli Talla Pamkhanda, which appears to be a pargana of Garhwal, the wild hemp is of superior quality. It grows near a temple of Siva, to which fact the people attribute its superiority. Charas is made from it by the common process of rubbing with the hands, and is given to fakirs and pilgrims to Kedarnath and Badrinath. Witness (232) speaks of the manufacture from the wild plants, and states that the leaves after the rubbing form ganja or bhang, which is used for drinking. Witness (43) deposes to the production of charas from the wild growth in the Bhabar and Terai. Witness (109) has seen it made apparently in the Almora country. Witness (38) has seen the process on the banks of the Gogra which bounds the Nepal and British territories. And so we are brought down to the plains. Mr. Stoker writes that "in Garhwal a substance is produced which might be classed with either ganja or charas. After the charas has been extracted from the female flower, the powdered or broken

flowers are mixed with hemp seed and smoked in a *chillum*. This seems akin to the *garda* of the Punjab."

239. The evidence from this province contains information about the manufacture of charas in Nepal, Yarkand, Peshawar, and Kandahar, which may be noted, though it is not all direct evidence. The Bhutias of Nepal scatter ashes on the plants in the evening. In the morning they enter and walk through the crop or jungle clothed in leather, to which the resin adheres. This is scraped off and makes a strong kind of charas. It may be noted that Dr. Gimlette, Residency Surgeon, Katmandu, was unable to verify the accounts he had heard of this process, but found that in the country 50 miles round the capital the drug was collected by rubbing the young flowering tops between the hands *in situ* (Watt). In Yarkand, according to witness (62), the dried plants are beaten over a cloth, and the greyish powder, which falls upon it, is collected and packed in bags, where it agglutinates by some process, of which exposure to the sun forms part. Witness (192) has "seen charas prepared near Peshawar and Kandahar. People go into the fields with leather leggings on, and the charas sticks to them, and is scraped off." The same witness has seen bhang prepared in great quantities at Hardwar, Lahore, Kabul, and Kandahar.

240. Regarding the Native States in the North-Western Provinces, there is nothing to be added to the information collected for the province generally.

241. Though some witnesses make mention of the smoking of bhang leaves, there is no evidence of the preparation of the flower head either of the uncultivated or cultivated plant for use as ganja. The smoking of the produce of the plant in any form except charas is evidently extremely rare. According to witness (59), "the word 'ganja' is sometimes applied to charas."

242. Bhang is prepared both from the uncultivated plant and from the small quantity of cultivated plant in the ordinary way, *viz.*, by simple drying. Mr. Drummond (13) says that the flowering tops are preferred. The zamindars do not generally take any payment for the bhang gathered from their lands. The plant grows from December to June-July. The usual time for gathering appears to be May. No. (73) says May or June. Lala Kesho Das, Extra Assistant Commissioner, reports that in June-July "the hemp plant acquires peculiarly noxious qualities, and hence it is during that fortnight that bhang intended to be used as a drug is cut." The bhang of some localities is regarded as superior, such as that of Ambota and Gagret, of Bhimbar in Kashmir, and of Gurdaspur. The cultivated plant may yield a superior quality of drug, but there is not much evidence of any preference for it over the wild drug.

243. There is practically no evidence of charas being prepared below the mountains. The method of preparation followed in Kulu and the Hill States is that of rubbing the flower heads between the hands and scraping off the resin accumulated on the palms or

on the feet if the operation consisted in treading the plants. The solitary piece of definite information supplied about preparation in the plains is given by Mr. Kirthi Singh (14): "Sometimes a cultivator may want a little charas for private use, in which case he beats the flowering twigs over a piece of cloth laid on the ground, and then collects the greyish white powder which falls. This requires only to be dried a little in the sun, and it is ready for use."

244. In the "Punjab Products" the manufacture of this sort of charas called Charas in "Punjab Products." *garda* is described. The finest quality is when the dust is of a reddish colour. This is called *surkha*. When it is green, it is called *bhangra*. The most inferior is that which adheres to the cloth after shaking, and has to be scraped off or shaken off with more violence. This is called *khaki*. In each case the dust has to be kneaded with a small quantity of water into a cake, and then forms charas. It is stated that this drug is much in use. The specimens which formed the basis of the article were none of them from the plain districts of the Punjab, except possibly one from Dera Ghazi Khan. They came from Lahoul, Spiti, Bokhara, Yarkand, Dera Ghazi Khan, and Kashmir.

245. It will be of interest to quote other descriptions of foreign manufacture. Preparation of charas in Yarkand. Witness (86) has been in the habit of visiting Ladakh for purposes of trade, and has there learnt the following details from Ladakh merchants: "In Yarkand bhang is cultivated in the month of Baisakh in waste lands and round the fields of other crops for the manufacture of charas. It remains standing for seven months, and is then reaped in the month of Katik, when the blossom is ripe, and then stored on the roofs of houses. It remains there for one month and gets dried in the meantime. The zamindars then thrash the plants after separating the larger leaves by night within their houses. The smaller petals and flowers then fall on the ground and are reduced to powder. It is then sifted thrice, put in bags, and sold to the traders. The merchants go on storing it up until the month of Jeth comes, when they place it in the sun, and a kind of oleaginous substance oozes out of the powder. It is then kneaded like tobacco and put in bags made of cloth. The following three or four kinds of charas are prepared from it—*mu-shak*, *bahara*, *pai*, and *kuppi*. They are then closed up in leather." Mr. Dalgleish is quoted by Dr. Watt as giving a description of the preparation similar to the above. The Deputy Commissioner of Bannu says that honey is mixed in the powder of the flowering tops, after which the stuff is packed in leather bags and kept for a year in the sun. Hari Chand, Assistant to the Commissioner of Excise, reported in 1890 of the Yarkand manufacture that "the leaves are ground in December. The flower is kept in bags of five sérs each till June. The bags are then put in the sun, and the flower rubbed with hands and feet till it gives oil. It is then put in leather bags and hammered till it becomes one block. The blocks are of 54 sérs each." There is a certain similarity in all these methods, and they probably give with fair accuracy the general outline of the important manufacture of Yarkand. *Garda*, as described in the "Punjab Products," would appear to be the Kashmir preparation. The word seems to mean merely dust in its common use.

Punjab States.

246. The memorandum on the province contains all available information regarding the Punjab States.

247. The method of preparing Khandwa ganja is described by the Deputy
 Central Provinces. Commissioner of Nimar and the Excise Commission-
 Preparation of ganja. er. The harvest begins in the first or second week of
 November. The flower heads, which the cultivators call *mal* or produce, are
 broken off with about twelve inches of twig, carried in baskets to the threshing-
 floor, and spread out on it in a layer nine to twelve inches thick. Mr. Robertson
 states that on the first day a heavy roller is passed over them, but this detail is
 not contained in Mr. Drake-Brockman's report. The crop is exposed to the
 dew for the night. The next day the twigs are formed into heaps, and each
 heap is trodden in turn, and when not being trodden is turned over and exposed
 to the sun to dry. This goes on for four or five days, and results in the twigs
 being pressed flat and deprived of a great portion of their leaves and thoroughly
 dried. The produce is then removed to the cultivator's house, where it is built
 into a stack five or six feet high, and has heavy weights placed upon it. In
 about a week it is packed in gunny bags and removed to the storehouse at
 Khandwa.

248. In outward appearance the Khandwa ganja or *pathar* differs from that
 of Bengal or *baluchar* in being green in colour, and
 Khandwa ganja inferior to that of Bengal. having a much larger quantity of leaf left in it. It
 does not bear any comparison in the appreciation of smokers with *baluchar*.
 The latter is a very special article, and no ganja will be found to compare with
 it in any province. Bhang is not produced in the Central Provinces. Khandwa
 ganja is used instead for drinking purposes by the commoner sort of consumers.
 Well-to-do people import their bhang from Central India. It is, however, difficult
 to believe that the leaf and fragments resulting from the manufacture of Khandwa
 ganja do not pass into consumption at all. There is some evidence that they do.
 In Bengal the ganja cultivators could afford to throw away the leaves, for the
 wild bhang was to be got for nothing within a reasonable distance, and made
 better bhang than the cultivated leaf, which was consequently of no value. In the
 Central Provinces the case is different, and it may be doubted if the people are
 altogether careless of the leaf as a secondary product. There is no evidence of
 charas being prepared in the Central Provinces. The ganja, having passed into
 the Khandwa godown, is picked before issue to contractors, and again picked
 before issue from the tahsils, so that about 45 per cent. only finds its way into
 the retail shop.

Feudatory States, Central Prov-
 inces.

249. The Feudatory States prepare no drugs.

250. In the Madras Presidency, especially towards the south, the name
 Madras. bhang is applied almost exclusively to the prepared
 Bhang not known as distinct from ganja. drink, which may be made from the pure leaves, but
 is generally made from the material which is known
 and sold as ganja. Bhang as a distinct form of the raw drug is not known.
 It is even doubtful if the plant itself in the part of the country indicated is
 called bhang. It would seem that as the region of wild growth is left behind,
 the name by which the cultivated plant is known, *viz.*, ganja, comes more into
 general use. It will not, therefore, be necessary to mention bhang in this
 chapter except where it comes into the description of ganja preparation. Charas
 is not manufactured at all in the Madras Presidency.

251. Mr. Benson has given a description of the preparation of ganja in connection with the regular cultivation in the North Arcot and Kistna districts. The methods differ materially. Preparation of ganja in North Arcot. "In the Javadi Hills the plants are cut and carried bodily to the village threshing floor. They are there sorted, the flower spikes and upper leaves being retained and the sticks thrown away. The selected heads are spread out for three to five hours in the heat of the day to dry, and are then loosely rolled in the hand to work out such seed as may have been formed and to break up the leaf that remains. This working also causes the spikes to stick to one another to some extent. The broken leaf is then winnowed out, collected, and powdered." The flower heads are then placed in a thin layer in a basket which has been dusted within with leaf powder, and are trodden by one or two men according to the size of the basket. After the operator has passed over the layer four or five times, it is dusted with leaf powder, and a fresh layer of spikes is put into the basket on the top of the other, and the treading is repeated. This process goes on till the basket is full. The contents are then turned out on to flat hard ground, and a stone is placed on the pile with other stones to add to the weight. The material is left thus for the night. Next morning each layer is taken off separately, broken up, and spread in the sun. Each piece is trodden and turned over from time to time. In the evening the pieces are again re-piled and weighted for the night, and the next day the process of exposure is repeated until the material is thoroughly dry. "Great importance is attached to the thoroughness of the treading, the sufficiency of the pressing, and the completeness of the drying; the quality of the drug being said to depend on the manner in which those processes are carried out. If the latter are not dried sufficiently, they appear green and are of inferior quality, good ganja being brown." When fully cured, the drug is stored in the raiyats' houses under pressure till sold.

252. In the Kistna district, if Mr. Benson is correct, the pressing is entirely neglected. The plants are cut bodily and laid out in the field for three days to dry. On the fourth day they are tied by bundles of ten and piled head and tail. "The heaps are opened and the bundles re-piled next day, the process being repeated over several days." If the quantity is small, the drying is done at the raiyat's house, but in all cases the crop is finally carried to the house. A month later the spikes are removed one by one, and spread out in the open for one night to soften and become pliable. In the morning the spikes are collected and put into large gunny bags, being packed closely therein by a man treading them down. The produce is then ready for sale. Preparations of ganja in the Kistna district.

253. The process has been described shortly by other witnesses. They nearly all mention pressing as a part of it, though the methods may be different. Alternate exposure to sun and dew seems also to be generally practised. The drug is usually stored by consumers in earthen vessels. One witness (106) from Ganjam, after giving a careful description of the manufacture of ganja, proceeds to say that the dried leaves which have fallen out in the process are used as bhang or patti. "After carefully removing the stalks, the dried leaves are boiled in water for some time; and the boiled leaves are carefully squeezed with the hands to purge them of all filth and dirt, and then dried in the sun. The dried leaves are next boiled Peculiar method of preparing bhang.

either in milk or cocoanut water. The quantity of milk or cocoanut water must be proportionate to the quantity of leaves boiled, so that the milk or cocoanut water might be entirely absorbed by the leaves. They are again kept in the hot sun for about three or four days. After they are well dried, they are preserved in earthen vessels for use." Similar processes were mentioned in the Bengal evidence, but they require so much care and time that they can hardly be common.

254. The following information seems to point to the preparation of ganja from the spontaneous growth in Travancore. It is said that *poo* ganja, or flowering ganja, is pressed together while still green so as to get matted, and when the mass begins to show signs of rotting, "it is dried in the shade and passed off in the market as *chada* ganja." *Chada—jheda* in Sanskrit—means tangled or braided, and *chadu* ganja is the name of the imported article. *Poo* ganja is the local stuff, which from the description would appear to be little, if at all, cultivated. There is no other information of interest from the Madras States.

255. The preparation of ganja in Bombay is described by several witnesses. Mr. Ebdon's (5) description, as coming from the district of largest cultivation in the Presidency, and being the most complete, may be quoted :—

"(a) *Ganja*.—Harvesting methods differ somewhat. In some cases the tops are pulled off by hand; in some they are cut. In some the central largest tops are collected and treated separately as first sort ganja; the central tops of side branches form second sort, and other smaller tops are third sort, and are called *chur*. The further process is much the same in all cases. The tops are heaped according to taste in narrow rows or in large squares about six inches thick, the different qualities when separately collected being separately heaped. The heaps are then trodden under foot. Some manufacturers tread the fresh tops at once; some let them dry first for various periods. After treading, it is turned over by hand and again trodden. The process of turning and treading is repeated at intervals of three or four days, with local variations of treatment in the intervals. In some places it is heaped in round heaps called *chakis*, and weighted at top till midnight, and then opened up and scattered and ventilated till dawn, when it is again laid out and trodden; and so on till it is judged to be ready, when it is packed in bags, and as a rule it is speedily removed by the wholesale purchaser.

"The treading-floor is sometimes prepared like an ordinary threshing-floor with clay and cowdung. I have lately witnessed the operation of treading, and in that case the floor was simple *moorum* soil on a *nalla* bank, and had undergone no preparation beyond cleaning and sweeping. The ganja was spread in squares of fifteen or twenty feet wide and about six inches thick. A line of eight or ten men danced on it to the music of a *tom-tom*. Treading began in the outer edge of the heap, and was continued in a spiral until the centre was approached, when the men fell out one by one as the space grew smaller. They followed close on one another, dancing sideways in the leader's footsteps. The *tom-tom* appeared to be highly necessary, and kept them at it.

"(b) *Charas*.—This is locally a bye-product which is not brought into account, but appears to be the harvesters' perquisite, who probably part with it to friends who smoke, if they don't want it themselves. It is the resinous substance that sticks to the hands or collects on the sickle when cutting or plucking the tops. The hands are now and then rubbed together, and the charas is collected in the shape of a pill, which is naturally half dirt and sweat and half charas. A piece about the size of a marble may perhaps be the reward of a day's work.



Survey of India Offices, Calcutta, August 1894.

TREADING GANJA, AHMEDNAGAR.

27TH NOVEMBER 1893.

"(c) *Bhang*.—This name is given indifferently to the refuse of the treading-floor where ganja is prepared, and to the produce of the seeded plants and of male plants when the crop has been grown for seed. In the latter case the tops are laid on a floor, and the seed is beaten out with sticks or trodden out by foot. The seeds are separated from the mass by means of a sieve, and the balance of broken leaves, etc., is called *bhanga*."

The *bhanga* crop in Gujarat is turned into drug by drying the plants and shaking or beating them so as to detach the leaves, flower, and fruit. The character of the *bhanga* of the Bombay Presidency must be noted. When it comes from the ganja crop, it consists very largely of pieces of the female flower head, and is in fact, as many witnesses have described it, largely composed of what is known in Bengal as *chur*. If the customer asked for *chur*, the shopkeeper would produce what he calls *bhanga*. The preparation of the drugs is generally carried out by the cultivators themselves, sometimes by contractors.

256. The States in the Deccan which cultivate ganja prepare the drugs in the manner already described. In the Northern Agencies there is but little cultivation, and that of scattered plants only. There is no evidence that the flower heads undergo any preparation besides simple drying.

Bombay States.

Aden.

257. The drugs are not prepared in Aden.

258. The cultivation in certain districts of Sind and in Khairpur is said to be for the production of *bhanga* only, and no doubt that is the principal product; but a small amount of superior flower heads is turned out which goes by the name of *ghundi* or *ghundi bhanga*, and is occasionally used for smoking. Mr. Giles (2) states that when the crop is ripening, the upper portions of the plants are cut off and preserved separately. These are regarded as the "tit bits." They are dried with their seed and stalk, and do not appear to be subjected to any special process. They are called *ghundyun*, and are practically no doubt ganja. The rest of the crop is dried and flogged, and the broken leaves, flowers, and seed form *bhanga*. A certain amount of this is winnowed for the seed; but the mass is sold as it is to the contractor, who seems generally to sift it and clean it of seed before retailing it.

Sind with Khairpur.

Preparation of *bhanga*.

259. Witness (5) from the Upper Sind Frontier, while stating that ganja and charas are not prepared in the province, gives in an appendix some information regarding the preparation of these drugs elsewhere, which may be shortly noted. Ganja is prepared, he says, by burying the flower heads in a pit four or five feet deep coated with goats' dung. The pit is filled in for fifteen or twenty days, after which the ganja is taken out and sold. The consumer picks off the smokable part, crushes it, heats it on a cinder, makes it into small lumps or cakes, and smokes it in a *huka*. Charas is collected by people walking to and fro through the *bhanga* plants with greased leather coats on, and also by going clothed only in a loin cloth with their bodies smeared with oil. The latter process is followed, he

Miscellaneous information.

says, in the Native States of India. He also mentions a process resembling that noticed in the Punjab, by which the dust made by beating the plant is collected on cloth. He states that this process is peculiar to Afghanistan: "And the charas imported from there is well known for its pale green colour, and is highly appreciated."

260. It is interesting also to note that two or three witnesses, Mr. Giles being one, report the preparation of fibre from the hemp grown in Sind. Mr. Giles says: "Sometimes, but very rarely, the thick stalks of the plant are placed in water to rot, and with great labour rope or twine is made from them by individual persons for special purposes; but the plant is never grown for the use of its fibre or of its seed only." Witness (14) states that: "The bhang plant stalks are usually buried in soft wet mud for a few days instead of being soaked in water, as in the case of the *sihata* or the *ak*." The fibre production seems to be very limited in amount, but it is worth special notice because this is the only mention of its occurrence below the Himalayas in the evidence collected by the Commission.

261. The official memorandum gives the following description of the preparation of ganja in Berar. It is very imperfect, and the process probably resembles closely that followed in the Deccan or Khandwa: "The small outer branches are stripped off and put in towards the centre of the plant, which is then pressed with the foot (to flatten the heads), made up into sheaves, and stacked in a shed under pressure, the heaps being opened and the sheaves moved now and then to prevent their getting too hot. The leaves fall off when the plants are tied into bundles. They are collected and called bhang. The bare stalks remain with the heads in them." One witness (23) mentions the preparation by burying, which has been mentioned elsewhere. Witnesses (10) and (9) say that the crop is trodden by bullocks, which seems very improbable. It is clear that the bhang locally prepared is simply the refuse from the manufacture of ganja.

262. There is nothing to show that the plant in Ajmere is subjected to anything more than a process of drying to produce bhang.

263. From Coorg it is stated that the female plants are cut down and exposed to the sun for a day. They are then collected into bundles and exposed to the sun by day and dew by night for three days, after which they are wrapped up in coarse cloths or *kambliis*, and so preserved. It is to be remembered that the cultivation consists only of the surreptitious rearing of plants on a small scale.

Baluchistan. 264. There is no information from Baluchistan.

265. There is no information that the ganja of the Shan country is prepared by any other process than drying. A specimen of Kachin ganja was forwarded to the Commission, and consisted of bundles of flower tops and leaves loosely rolled together. It looked like the produce of the wild plant.

266. The details of information describing the preparation of ganja in Mysore are limited to drying in the sun and tying into bundles. Mr. McDonnell's memorandum does not give a description of the Mysore practice. What he says about the Vellore and Cocanada samples agrees with what has been learnt from Mr. Benson's bulletin.

267. The Director of Agriculture and Commerce gives a description of the preparation of ganja which does not differ from the method pursued in the Bombay Deccan. Bhang is the leaf and other litter which falls away in the manufacture of ganja.

268. Such cultivation as exists in Rajputana, both regular and scattered, seems to be chiefly directed to the production of bhang. Jhallawar, however, reports a production of 165 maunds of ganja, and some of the superior drug appears to be turned out in Serohi also. An inferior sort, called *makuria* ganja, is spoken of in Marwar, but appears to be little better than the female flowers of a bhang crop of the ordinary kind. It is stated in the Jaisalmir report that the ganja produced there is never prepared by treading, and from other places that the drug, whatever it may be, undergoes no process but drying. One informant states that charas is supposed to be prepared chiefly by the Bhils in Jodhpur. No foundation for this statement can be discovered. Fakirs may rub the heads of the plants they have grown in their lands and get a little charas occasionally; but even that seems improbable, as it requires a great deal of flower head to make a reasonable quantity of charas.

269. Mr. Gunion's memorandum furnishes an account of the manufacture of ganja in Indore and Dewas. The processes comprise the same three principal features as elsewhere, *viz.*, drying, kneading with the feet, and removal of leaf. They occupy three or four days. In Indore the manufactured produce is kept under pressure till sold. From the description of the preparation of bhang in these States, it would seem that it is made from a crop grown for seed or bhang and not from the ganja crop. The plants are bodily dried and threshed, and the seeds are separated from "the crushed leaves and tender twigs, which are called bhang." It seems that "no charas is prepared in Central India except a little in the Bhopawar Agency for the personal use of the cultivators, or for presents from them to religious mendicants." The method of preparation is thus described by the Political Agent of Bhopawar: "Charas is prepared by rubbing ganja (sometimes mixed with bhang) violently for several hours on rough woollen blankets, which afterwards are scraped with a knife. The substance thus scraped off is first class charas. An inferior kind is then obtained by washing the blanket with the least possible amount of water, and then evaporating the liquid." The report of Gopal Ram at the close of the North-Western Provinces memorandum contains no information of special interest regarding the preparation of the drugs in Gwalior except that relating to charas as a bye-product of ganja cultivation.

"A certain amount of charas is obtained in this (Gwalior) State by scraping off the resin which adheres to the hands in cutting the ganja plant. In tahsil Antri cultivators do not care much about the charas. In tahsil Kolarus, district Narwar, I hear charas is obtained in small quantities by the same process as in Kumaon and Garhwal."

270. Bhang alone is prepared in the Baroda State. It is of the same kind and prepared by the same processes as are found in the Gujarat Division of the Bombay Presidency.

Baroda.

271. The Governor of Jammu reports that neither ganja nor charas are made there, but only bhang. The Governor of Kashmir gives an account in which the names of the three drugs are confused. He says first: "Almost all wild hemp, which is called *talia* in the Punjab, and is generally female plant in the above-mentioned tahsils, is used for the preparation of ganja locally known by name *gard bhang* (*chura charas*)."
And further on—"The leaves of the hemp plant are trodden under foot, and cleaned by sieves to prepare *gard bhang*, and the process is continued until the leaves are reduced to powder and seed separated."

Kashmir.

This describes the preparation of bhang, pure and simple; but apparently this article is known by the three names—ganja, *gard bhang*, or *chura charas*. And "it would appear that this is the stuff which is occasionally smoked. Fakirs and a few Muhammadans and Pandits of the Srinagar city and towns smoke *gard bhang* (*chura charas*)..... The total number of persons who do smoke ganja is, etc". Another informant says: "Charas is prepared in the capital cities and is termed *garda*," and he does not know if bhang is prepared. The preparation of *garda* is described, and finishes with the reduction of the material to a "resinous powder." The manufacture of *garda* or charas by the method given in the "Punjab Products" is not described by either of the only three informants. It is probable that charas is made by a further elaboration from the *garda* charas spoken of above, which is practically bhang powdered to a state of more than common fineness, and that ganja is a name borrowed from India without any correct idea of its meaning beyond that it signifies the female plant. It may be noted that the price of *garda bhang*, three pice per tola, given in the Governor of Kashmir's report, is very high for simple bhang, and seems to indicate that the article is more like charas.

272. The manner of preparing ganja in Nepal is somewhat peculiar. The

Nepal.

Darbar answers report that "when the plant is in the *lata* state, it is cut down and kept in the dew for about a week, and after that each *lata* is separately wrapped in a piece of fine plantain bark, and, being tightly tied with string, is put by. Some people flatten it by pressing it under a piece of *tât* (gunny). Two or three days after this it becomes fit for use." The manufacture of charas is thus described: "The ganja plant exudes a thin gummy water. That plant is squeezed between the palms of both hands, and the gummy substance which sticks to the hands is scraped into a vessel, and is called charas." Nepal ganja, Mr. Stoker states, is introduced in small quantity into the North-Western Provinces. Nepal charas is, on the same authority, of superior quality, though the Darbar answers say that Yarkand charas is preferred in Nepal. The Deputy Commissioner of Bahraich in the report attached to Mr. Stoker's memorandum states that the export of charas from Nipalganj is about 50 maunds, and that some years ago a very much larger quantity was imported into British territory. The latter statement is confirmed by evidence from Bengal, which shows that Nepal charas is now almost superseded by the drug which comes

through the Punjab. Mr. Stoker reports that some of it passes into British Kumaon and Garhwal.

273. It will be seen from the above detailed description that bhang, whether
 Summary. produced by the cultivated or wild plant, is prepared by simple drying. The processes by which ganja is prepared consist of pressing, drying, and removal of leaf. The manufacture is most perfect in Bengal. In other provinces it is not characterized by the same degree of care, and one or other of the three essential features of the manufacture is more or less neglected. Ganja collected from the wild plant and from the bhang crops of Sind, and probably also that yielded by stray cultivation, is simply dried. There are only two methods of preparing charas which appear to be used when the drug is produced on any considerable scale, *viz.*, that by rubbing the flower heads with the hands as in Kumaon and Nepal, and that described as being practised in Yarkand, which may be called the *garda* method, and consists in beating the plant over cloth, and manipulating the dust that is thus deposited. The collection of the resin adhering to hands and implements in the course of harvesting ganja is worth remembering, for it is proved in Gwalior and Bombay. The practice of the Malwa Bhils is perhaps established. Other methods are unimportant, and the common report that charas is collected by men dressed in leather moving about in the hemp crops has not been definitely located. It is doubtful if this device is employed anywhere in India.

The results of the analyses of various samples of the drugs, which have been prepared at the request of the Commission, are shown in Vol. III Appendices.

274. Regarding the question whether hemp drugs deteriorate or not by keeping,
 Deterioration of hemp drugs. the Commission, for reasons which will be explained later, are unable to state definitely the precise period for which the drugs will retain unimpaired their full narcotic power under ordinary conditions of storage. A large number of witnesses have tendered evidence relative to the question whether hemp drugs deteriorate or not by keeping. The general tenor of the evidence is to the effect that the fresher the drugs, the better. Regarding ganja, Mr. K. G. Gupta, Excise Commissioner, Bengal, states that the drug is "much valued during the first year; less so in two years—in fact, is not sold after the first year if new ganja is available; absolutely unsaleable after two years." Two years may perhaps be assigned as the limit during which the drug is popularly believed to retain its narcotic properties without any very material impairment. Some witnesses, however, give a longer period. The retention of properties without deterioration of course very largely depends on the care exercised in storage.

Bhang being relatively far cheaper than the other hemp drugs, and owing to its being easily procurable for the mere plucking in a large number of districts, is probably not stored to the same extent as ganja. Mr. Gupta appears to place the limit for retention of properties between three and four years; and he makes an interesting remark to the effect that the value of bhang as a *medicine* is enhanced by age. Salig Ram, Punjab Witness No. 88, a drug contractor, states that freshly cut bhang produces great heat and is very intoxicating, while in the third year its intoxicating properties are lessened, and it goes bad.

Regarding the keeping properties of charas, the information must necessarily be inexact, as it is an imported article, and it is practically impossible for the real age of any particular sample to be known. From its physical properties charas admits of being readily adulterated, and the strikingly marked differences in the physiological value of charas resin as determined by Dr. Evans would also appear to support this view. From the various modes which appear to be adopted for the preparation of commercial charas, it must always be a drug of more or less uncertain composition, and not undeserving of the appellation—"A foul and crude drug, the use of which is properly excluded from civilized medicine," which was applied to it by the famous pharmacologists Flückiger and Hanbury. Some witnesses appear to consider that charas is perhaps more stable than ganja. Gujar Mal, Punjab Witness No. 93, a drug vendor for twenty years, states that charas is very strong during the first year; after that it gradually loses its strength until the fourth year, when it becomes quite useless. Some witnesses refer to the deterioration being more rapid in the plains than at hill stations. A witness refers to charas produced in Bokhara which can be kept for six years in India without going bad.

275. The causes of the deterioration of ganja and bhang are usually ascribed to (a) damp and natural decay; (b) ravages of insects, and also popularly (c) to volatilization of the narcotic principle. Regarding the two first causes of deterioration, they are common to all vegetable substances; but the third cause is not tenable because hemp resin on which the narcotic property of the drug depends is non-volatile. There is no doubt, however, that by prolonged exposure to air the aroma of the drug is dissipated to a considerable extent, the aroma being due to the presence of a volatile oil. The popular view of the value of ganja is based on its physical appearance, and very largely also on its aroma; but it does not necessarily follow that because the aroma has been lost, the drug is therefore weaker in narcotic property; but it may be less pleasant to smoke than ganja which has retained its bouquet. The mere effluxion of time without other disturbing factors, such as damp, as a cause of the impairment in the narcotic value of the drug is a point of some interest. In medical circles there is a fairly general idea that the extract of *Cannabis indica* is an uncertain drug, and this is believed to be due to variations in age of the preparations which have been prescribed. This assumption may or may not be correct. Dr. Evans' experiments indicate that the physiological values of similar doses of all alcoholic resinous extracts from various ganjas are not the same, and, moreover, individual idiosyncrasy on the part of the patients as influencing the action of the drug has perhaps not been always recollected. The alleged diminution in power of the drug by effluxion of time might be ascribed as being really due to a slow oxidation process, and that this might readily occur in ganja is explicable. But as regards the extract of *Cannabis indica*, direct oxidation would only occur superficially in the stratum exposed to air. But there is no evidence of any value to prove that ganja, which has been carefully protected from damp, and say five years old, is not as active physiologically as the fresh drug. The value of ganja for use has always hitherto been determined solely by its physical appearances. With evidence of mould and the effects of continued damp, the physical appearances are sufficient for an opinion to be arrived at; but when those signs of deterioration are absent, mere loss of aroma,

in the form of tabloids lessens deterioration by exposing a smaller surface to the action of damp and air. The proposed system would also lessen very materially the bulk to be stored and facilitate transport. It would most certainly prevent to a great extent volatilization of the essential oil on which so much of the popular commercial value of the drug depends, and it would also to a great extent prevent the illicit drug from passing into the market.

CHAPTER VII.

TRADE AND MOVEMENT OF THE HEMP DRUGS.

278. The area cultivated in the Ganja Mahal in the year 1892-93 was much greater than in any one of the preceding 19 years, being 3,540 bighas (Excise Commissioner's Memorandum), equivalent to 1,180 acres. But the estimated outturn of the crop was comparatively small, being only 7,575 maunds, and not much above the average of the five years from 1888-89 to 1892-93, 7,317 maunds (Excise Report for 1892-93, page 36). For the purpose of examining the movements of the produce, therefore, 1892-93 is a fair average year.

279. Bengal exports ganja by land to Assam, Kuch Behar, Nepal, and the North-Western Provinces, and by sea to London, British Indian ports, and places outside India. The figures for 1892-93 are—

						Maunds.
To Assam	...	...	...	...	...	681
Kuch Behar	...	...	...	...	...	89
Nepal	...	...	...	...	...	177
North-Western Provinces	...	...	...	...	...	563
London	...	...	...	...	...	128
British Indian ports	...	...	...	...	...	275
Foreign ports	...	...	...	...	...	89
Total					...	2,002

None of these figures is in a very striking degree abnormal. The exports to Assam and Kuch Behar are taken direct from the head-quarters at Naogaon, and the rest apparently from the local stores most convenient to the trade. The balance left for home consumption is 5,573 maunds, which approximates to the annual consumption. One of the most noticeable points in the information relating to exports is the extraordinary shipment of 774 maunds in the year 1891-92 to other parts than those for which the Commission asked for information by name in the statement. This export was ten times the ordinary quantity, and no explanation is furnished about it.

280. The history of the export trade to the North-Western Provinces is also remarkable. It is sketched at page 38 of the Excise Report for 1892-93. It is there stated that the ganja trade of Rajshahi with the North-Western Provinces dates from the very earliest period of the cultivation, and that the export was very large till the year 1860, when the rate of duty was first increased. "The order requiring payment of duty at Rajshahi may be said to have killed the trade of that district with the North-Western Provinces. The exports which in 1854-55 amounted to 6,036 maunds, and to 4,250 maunds in 1861-62, fell in the following year to 1,014 maunds, to 43 maunds in 1863-64, and ceased altogether in 1869-70." The North-Western Provinces traders have since imported a certain amount of ganja from the golas of the Patna Division, and it is probable that by this arrangement they save in carriage something more than the difference between the cost of the drug at the central and local golas. Their average total purchases for the last three years, *viz.*, 565 maunds, are, however,

very far below the quantity they used to buy in Rajshahi, and it is clear that the North-Western Provinces have found other sources of supply to meet their wants.

281. A certain amount of ganja is imported under license from the Tributary States of Orissa, but the Commissioner of Excise reports that the quantity is not large, as little advantage has yet been taken of the rules passed in March 1892 to legalize the import. For the previous decade the importation had been entirely forbidden under orders of the 21st June 1882. Smuggling from the States is, however, carried on on a considerable scale. This and a small amount of illicit import over the Nepal frontier are practically the only sources of the ganja supply of the province besides the produce of the Ganja Mahal and such material for smoking as the wild growth and illicit cultivation provide. It may be noted that in the year 1878-79 a small amount of ganja was imported from Bombay and the Central Provinces. The experiment has not been repeated.

282. The Excise Commissioner reports that bhang is not as a rule imported from any other province, and no figures are furnished. But the Excise Commissioner, North-Western Provinces, states that a certain amount does pass from his province into Bengal, and there is general corroboration of this statement in the evidence. Charas is imported from the Punjab. Formerly, it seems Nepal charas was generally consumed, but it never could have been largely imported, for the total import for the year 1880-81 was less than half a maund. The trade in charas seems now to be steadily growing. A duty of Rs. 8 a sér has been levied on the drug since 1880, and the import is now 11½ maunds.

283. The Kuch Behar State imported 89 maunds of ganja in the year 1892-93. Though somewhat higher than that of the three preceding years, the figure is not abnormal. It exports none of the hemp drugs, and none are licitly produced.

284. Though the Bengal Government has passed regulations under which the drugs can be exported from the Garhjat States, and though there is considerable demand for them, there is practically no licit trade. The illegal traffic is considerable, but its volume cannot be estimated. Within the States the consumers appear to grow their own drugs, and there is no organised trade.

285. There is no trade worth mention in the Chota Nagpur States. All the States probably import ganja to a certain extent, for cultivation has been more or less restricted in all of them; but there is definite information to this effect from Seraikela and Kharsawan alone. The former State has furnished statistics in the form prescribed by the Commission showing an import of 1½ maunds of ganja. It is nevertheless probable that many consumers grow their own drugs. There are no exports of the drugs except perhaps in the shape of very petty smuggling.

286. There is no trade in the drugs in Hill Tippera. An insignificant amount is imported for consumption, and there is some petty smuggling into British territory towards Bengal and Assam.