REPORT

UPON

THE OILS

OF

SOUTHERN INDIA.

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The following Report upon the oils of Southern India has been drawn up from notes taken during the formation of a collection of oils for the Madras Government. The statistics have been furnished by the Civil and Military authorities throughout the Presidency.*

The subject may be conveniently arranged under the following sections.

Sect. 1. Oil considered as an article of export trade.
2. Abstract of oil cultivation in the several districts of the Presidency.
3. A descriptive list of the oils of South India.
4. Remarks on the economical uses of oil in India.

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* NOTE.—It will be observed that in many parts, especially in Section 3, this report is almost identical with that in Class IV. of the Jury Reports of the Madras Exhibition of 1855. This arises from the writer of the present paper having been requested to perform the duties of reporter in that section, and from his having embodied in that report all the information on this subject collected up to that

SECTION. I.

Oil considered as an article of export trade.

Although the *number* of oil producing plants in Southern India, is very large, yet upon examination it will be observed, that of these but few are *cultivated* to any great extent; the larger proportion consisting of trees, shrubs, &c. growing in a wild state, the fruits of which are gathered by the poorer classes, and the oils expressed as necessity requires. These latter (with some exceptions) do not form articles of trade, nor are they usually procurable in the native bazaars.

Of animal oils, that extracted from the liver and other parts of various species of fish, chiefly on the Malabar Coast, now forms a source of considerable trade; whilst Petroleum is largely exported from our Burmese possessions to the manufacturing towns of Liverpool and Glasgow.

In taking a general view of these substances it seems advantageous to consider them under the following classes.

1*st Class.*—Those plants which are *cultivated* for the sake of their products.—Of these, the oil and cake form in some cases the only valuable part, whilst in others, as the Poppy, the plant serves many other purposes. This class includes the bulk of the oils exported from, and consumed in India, and comprises the following—Cocoanut, Gingely and its varieties, Lamp and Castor,* Ground nut, Linseed, Ramtill, Mustard erroneously called Rape, and Poppy; the essential oils of Cinnamon (from the bark and leaf,) and Cassia, Cloves and Sandalwood.† Fish oil and Petroleum being also valuable commercial products will be considered in this Section.

First in importance is Cocoanut oil which is yearly exported to a large extent from Malabar and the Western Coast, and in smaller

* Note.—Throughout this report the word "Lamp oil" will be used to denote the oil obtained from the large seeded variety of the Ricinus communis used almost exclusively for burning in lamps, whilst the term "Castor oil" will be understood to refer to the medicinal product extracted from the Ricinus communis fructibus minoribus.

† For the Botanical names of these plants, see [illegible]

quantities from Rajahmundry and Tanjore. During the last five years (from 1850-51 to 54-5) not less than 70,09,818 gallons, valued at 15,73,528 Rupees (according to the custom house valuation) have been exported from this Presidency, the demand having in the same time increased from 6½ to 21¾ lacs of gallons. In addition to this, dried kernels have been exported from Malabar alone to the value of 23,78,888 Rupees, and the fresh nut to the extent of Rupees 20,43,669, thus presenting a total of Rupees 59,96,085 in five years, or an average of nearly 12 lacs per annum on this one commodity alone. This is exclusive of the dried kernels and fresh nuts exported from Rajahmundry, Tanjore and Vizagapatam, which appear to be sent chiefly to other Indian ports.

Gingeley oil and its varieties are next in value as articles of commerce. They are very generally grown in all parts of the country, and enter more largely than any other oil into the home consumption of every class of natives.

They are exported in large quantities chiefly in the shape of seed. The quantity and value of oil and seed exported from the Madras territories for the last five years is as follows:—

Oil, gallons..	332,384	Rs.	2,05,290
Seed, cwt..	..19,54,209	Rs.	23,96,894
		Rupees..	26,02,184

making an average of 5 lacs of Rupees per annum. Of this a very large portion is sent to France as will be seen by the following abstract of the quantity exported in 1852-53.

United Kingdom....	Seed. Cwt.	12,713	Oil. gall.	42,043
Ceylon.....	,,	590	,,	2,968
France.....	,,	2,87,225	,,	
Pegu.....	,,	741	,,	19,698
Bombay.....	,,	113	,,	
Malacca.....	,,	33	,,	3,593
Travancore.....	,,	148	,,	
Bengal.....	,,	0	,,	46
French Indian Ports. ..	,,	0	,,	27
Mauritius and Bourbon..	,,	0	,,	4,232

"Lamp oil" is grown very generally throughout the country. It was exported from Rajahmundry to the value of 32,607 Rupees in 1854-55; and from Guntoor, Nellore and Tanjore to the value of from 10 to 15,000 Rupees each yearly. Little, if any, is sent to England.

The total exports for the last five years are as follows:

Oil. Gall. 1,97,977 Rs. 98,875 | Seed. Cwt. 99,471 Rs. 1,13,370 making an average of about 42,349 Rupees per annum.

Castor oil, extracted from the small seeded variety of *Ricinus* is exported to a small extent for medicinal purposes.

Ground nut oil is exported chiefly from South Arcot and Madras. In 1850-51, the demand arose to no less than 1,10,566 gallons, but with the exception of the year 1853-54 the export has never subsequently much exceeded half that amount.

The abovementioned oils and seeds, until within the last few years comprised the bulk of the exports from this Presidency. Now however the following begin to be exported.

Mustard seed, to the amount of Cwt. 50,746, Rupees 11,5,477 has been shipped during the last five years, from the Ganjam and Vizagapatam Districts.

The cultivation and export of Linseed is on the increase. It is sent from the Guntoor, Nellore and Masulipatam Districts to the value of from 2 to 9,000 Rupees per annum.

The manufacture of Fish oil has lately become a very valuable source of industry. The trade is chiefly confined to the Western coasts, although small quantities for home consumption are made in the Northern Circars. Omitting the year 1854-55 which is unfavorable on account of the failure of fish, the average value of this export for the last five years, is Rs. 78,126.

Petroleum is sent from our Burmese possessions, but no correct statistics are at present available.

The oils of Cassia, Cinnamon and Sandalwood are chiefly exported from the Western Coast, the wood from which much of the latter is extracted, is obtained from Mysore.

2nd Class.—Those plants, &c. which *grow spontaneously* and are found in sufficient quantities to admit of the produce becoming an article of inland trade.

These are generally to be procured in large bazaars and include Margosa, Illoopoo, Pinnacottay, Kurunj, Coorookoo, Cat amunak, Piney tallow, Gamboge butter, the various Wood oils, the essential oils of Lemon grass, Roosa grass, Cageput and Camphorwood.

The increasing attention which has been given to this subject has resulted in the manufacture and export of the following oils, which were previously unknown to the market.

Piney tallow exported to the value of Rupees 4,350 in 1854-55 from Canara.

Lemon grass and Roosa grass oil exported from Malabar and Travancore (sometimes under the fictitious name of Oil of Geranium or Verbena.)

Gamboge butter, employed successfully as a lubricating agent for Railway carriages.

Illoopoo, Margosa and Pinnacottay exported to a limited extent for household purposes.

3rd Class.—Those plants &c. which *grow spontaneously* but *to a limited extent* in many parts of the country, the oils from which are sometimes extracted by the poorer classess for home consumption and are seldom procurable in the bazaar.

This class comprises the oils of Safflower, Belgaum wallnut, Poovana, Neeradimootoo, Addale (*J. Glauca*), Country-cress, Cheeronjie, Cucumber, Melon and Pumpkin, Coorgapilly, Sterculia, Wild olive, Cheeroo pinnacottay (*Cal. colaba,*) Sandal seed, Mooroogana tallow, Naga Sumpaghy and Caat Urraloo.*

4th Class.—Those plants &c. from which small quantities of oil are extracted chiefly for medicinal purposes and perfumery, including Soap nut, Cashew nut, Ben nut, Cotton seed, Silk Cotton seed, Sweet Fennel, Rosebay, Malkunganee, Hemp Seed, Portia nut, Vis-

* For the Botanical names of these plants, see Section 3.

cid Cleome, Thortay, Fænugreek, Abelmoschus seed, Gutta Percha seed, Croton, Bryony, Colocynth, Wild cummin, Bonduc nut, Mimusops, Moodooga, Thevetia, Oodul, Garlic, Sunflower, Wild almond, Star arise, Gayapa, Nutmeg (wild), Thorny Trichilia, Cyperus, Thorn apple, Condamminee, Sand box tree, Saul seed, Eugenia, Belleric Myrobalan, Chebulic Myrobalan, Kikuel, Bergera Kœnigii, Balanites Ægyptiaca, Radish seed, Cabbage seed, Cardamom, Poondy, Cordia, Girghitly, Jogyhulloo, Nux Vomica, Marking nut, Cashew husk, Oleum nigrum, Tobacco seed, Alligator pear oil, Cinnamon tallow, Cocculus oil, &c. &c. This class will also include, Neat's foot oil and oil of wax.

Excepting Croton oil which is manufactured for medicinal purposes to a small extent, none of the oils of the last two classes form articles of trade.

A reference to the table of exports will give a good idea of the extent of the trade in these commodities, the total value of oils and seeds exported for the last five years is as follows: (For the items vide Appendix A.)

Year	1850-1	Rupees	8,11,057	duty	24,331
,,	1851-2		6,42,439		19,273
,,	1852-3		11,31,578		33,947
,,	1853-4		15,58,222		46,746
,,	1854-5		11,41,617		34,248

A duty of 3 per cent. is levied on oils and oil seeds of all sorts, yielding an average annual revenue (for last 5 years) of 31,709 Rupees.

The quantity of the four principal oils annually imported into Great Britain is as under.

	Palm oil.	Cocoanut oil.	Castor oil.	Olive oil.
1848	Cwts. 510,218	Cwts. 85,163	Cwts. 4,588	Tons. 10,086
1849	493,331	64,452	9,681	16,964
1850	448,589	98,040	,,	20,738
1851	608,550	55,995	,,	11,503
1852	523,231	101,863	,,	8,898

The total value of oils exported from India exhibits an annual increase, the demand however for the various items of which the whole export is composed, fluctuates considerably.

In 1848-49 the quantity of oil shipped was less than in the preceding year, but Linseed and Ground nuts first formed regular articles of export.

In 1849-50 the demand for Cocoanut oil was doubled, that for Ground nuts trebled, and that for Gingely much increased.

In 1850-51 Gingely was exported to twice the amount of the previous year, and Ground nut continued to be largely shipped. Fish oil, was also made in large quantities.

In 1851-52 there was an increase of one-third in demand for Cocoanut, and of 100 per cent. for Fish oil, but Ground nut declined to one-third of its former export, Gingeley oil and seed also decreased, the latter to the extent of nearly one half of the former demand. This was on the whole a bad year for this branch of trade.

In 1852-53 there was a further increase in demand for Cocoanut oil which now more than doubled its export for 1850-51, also an immense increase in the export of Fish oil of upwards of 300 per cent. Mustard was exported to five times its former figure and Lamp oil and Ground nut advanced, Gingeley oil and seed remained the same as in 1850-51.

In 1853-54 the demand for oils of all sorts consequent on the war rose to an enormous extent, the quantity of all oils exported and especially of Fish, Ground nut and Gingeley, increased largely.

In 1854-55 the demand decreased considerably in consequence of the large supplies sent the previous year.

A remarkable specimen of the rise and progress of a new branch of industry is to be seen in that of the manufacture of Fish oil, the export of which has increased from 3,500 gallons in 1847-48, to 7,21,095 gallons in 1853-54.

From the above summary it will, I think, be sufficiently evident that the discovery or introduction of *new* articles of produce however desirable, is by no means so indispensable as is so often supposed. Efforts should rather be made to extend and improve the

cultivation of those oil seeds for which there is already a steady demand. The oil cultivation seems in a remarkable manner to accommodate itself to the demand, and there is but little fear of a deficiency of supply as long as remunerative prices are offered.

SECTION II.

Abstract of oil cultivation in the several districts of the Presidency.*

NORTH ARCOT.

The principal oils of this Collectorate are Gingeley and Lamp, both of which are cultivated very generally throughout the District. Castor, Cocoanut and Ground nut are produced to a limited extent.

The plants yielding Kurunj and Brumadundo also grow sparingly, the latter from its cheapness being frequently used in this and other collectorates to adulterate more expensive oils.

Exports, none.

SOUTH ARCOT.

Ground nut is the chief oil produced and exported in this District. Gingeley oil is also sent in tolerably large quantities to Europe, but the demand for both appears to fluctuate considerably. Mustard oil and seed have been lately exported, and the cultivation is on the increase. Cotton is grown on from 15 to 20,000 cawnies of land, but the oil of the seed is not extracted. Illoopoo oil is prepared to a limited extent and sold at Rupees 25 per Candy, and oil is obtained from both kinds of Physic nut and burned by the poorer classes.

* Note.—The difficulty of obtaining accurate statistics of Agricultural Produce in India is very great; the system of sowing several crops in one field also tends to augment the labour. Although therefore the following returns are believed to represent a very fair approximation to the average amount of cultivation and export, yet too much reliance should not be placed upon these figures. As regards prices also some idea may be formed of their fluctuation and of the impossibility of basing any calculations on such data, by a return received from North Arcot, in which the prices of the same oil are shown to vary to the extent of one-third in different towns of the district.

Exports.

NAMES.		1850-1		1851-2		1852-3		1853-4.		1854-5.	
		No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.
Cuddalore.											
Cocoanut Oil..	Candies.	0	0	0	0	0	0	0	0	35	1,860
Cocoanut Kernels	Do.	0	0	0	0	0	0	0	0	10	368
Gingely Oil....	Do.	311	12,154	10	391	1	41	331	14,332	13	728
Gingely Seed...	Garces	0	109	0	92	0	0	0	0	0	0
Lamp Oil....	Do.	0	0	0	0	0	0	0	67	0	0
Ground nut Oil	Candies.	1,428	12,831	382	11,120	1,028	28,754	640	2,759	2,393	18,572
Ground nuts..	Garce.	0	109	0	92	0	0	0	0	0	0
Mustard Oil...	Candies.	0	0	0	0	0	0	0	21	0	0
Mustard Seed..	Garce.	0	0	0	0	58	667	62	823	0	0
Pinnacotay Oil	Candies.	0	0	0	0	0	26	0	0	0	0
Porto Novo.											
Gingely Oil...	Candies.	3	11	5	354	8	320	0	0	0	0
Gingely Seed..	Garce.	0	0	0	12	0	0	0	0	0	0
Lamp Oil	Candies	0	0	0	0	0	24	0	28	0	0
Ground nuts..	Garce.	0	0	0	3	0	140	1	154	0	0
Margosa Oil..	Candies.	0	9	1	37	0	24	0	0	0	69
	Total...	..	55,253	..	12,912	..	30,004	..	18,411	..	21,658

BELLARY.

The cultivation of Lamp and Gingely seeds extends over 88,950 and 7,177 acres respectively. Linseed, Safflower and Illoopoo oils are obtainable in small quantities. The Cocoanut oil consumed in this district is chiefly made from imported nuts.

CANARA.

Cocoanut oil and kernels, Gingely seed, Fish oil, Cassia and Sandalwood oils form the staple oil products of this district. Piney tallow has of late risen rapidly in demand. Fish oil is largely made and exported.

This district is moreover rich in oil bearing trees, many of the oils of which if obtainable in sufficient quantities, appear likely to become valuable. A list of some of these is subjoined.

TABLE OF EXPORTS.

NAMES.		1850-1		1851-2		1852-3		1853-4		1854-5	
		No.	Rs.	No.	Rs	No.	Rs.	No.	Rs.	No.	Rs.
Cocoanut oil...	Candies.	6	311	18	838	20	914	22	1,082	103	5,932
Cocoanut kernels.....	Do.	82	2,295	182	4,085	60	1,345	29	857	83	3,117
Gingely oil.....	Do.	½	19	½	15	2	129	2	86	48	2,671
Gingely seed...	In. Mds.	2,375	4,397	1,908	3,584	2,282	3,581	4,052	5,382	3,778	9,045
Castor oil.....	Candies	¼	13	3	217	4	195	2	113	6	356
Castor seed.....	In. Mds	0	0	0	0	19	19	0	0	0	0
Fish oil.....	Candies	82	1,632	53	1,137	1,111	18,211	2,996	61,284	*75	1,988
Linseed.....	In. Mds.	0	0	0	0	0	0	0	0	189	4,202
Cassia oil.....	Candies.	11	2,445	1	1,127	8	2,159	3	961	5	1,599
Sandalwood oil.	Do.	14	38,946	13	56,722	16	42,552	23	65,203	28	81,495
Pinnacotay oil	Do.	2	101	½	18	¼	7	3	115	3	112
Piney tallow...	Do.	6	6	0	6	0	7	½	25	71	4,350
TOTAL...		..	50,159	..	47,739	..	69,126	..	135,109	..	114,858

* Consequent on the failure of the fish the quantity of oil exported this year was small.

List of Medicinal and other oils, &c. produced in Canara.

VERNACULAR NAMES.	BOTANICAL NAMES.	REMARKS.
Mooroogana oil.....	.....	? Used as a cure for cattle wounded by Tigers.
Arasinagoorghy oil.....	Garcinia pictoria.	Lamps and Food.
Thoronaguloo oil.	Dalbergia.....	For skin diseases
Kungun.....	Celastrus paniculata.	For ulcers and wounds.
Cât Ghairoo.....	.....	? For sores in cattle.
Girghitly.....	.....	? Extracted from the pulp of the tree and considered valuable in Rheumatism.
Nagasumpaghy.....	Mesua ferrea...	? For Lamps, sold at 4 Rs. per maund.
Thortay.....	.....	? For sores.
Jogyhulloo.....	.....	? For skin diseases.
Poondy oil.....	Myristica Malabarica.	Of two sorts, extracted from the seed and fruit. For burning in lamps
Sahe t'ay.....	.....	? For skin diseases.
Mahnaloo.....	.....	? For lamps.
Sôorty (or Neeradimoo-too).	Hydnocarpus inebrians.	For cutaneous diseases.
CâtUrraloo(wildCastor)	.....	? For lamps and in medicine.

CHINGLEPUT.

As there are no exports from this district, the oils in most general request for local consumption are those chiefly grown. Gingeley is sown to the extent of about 3,700 acres, Lamp oil 830 acres, and Illoopoo is produced over about 890 acres of ground. In addition to the above, small quantities of Ground nut, Castor, Pinnacotay, Brumadundeo, Cât amunak and Neeradimootoo are produced, but not to a sufficient extent to form articles of trade.

COIMBATORE.

The Cocoanut oil used in this Collectorate is imported from Paulghaut. Gingeley and Lamp are grown for home consumption, Kurunj, Neem and Illoopoo trees grow wild, and the oils of the seed are extracted by the poorer classes.

CUDDAPAH.

Lamp oil seed is cultivated to the extent of about 75,000 acres, yielding 120 measures per acre, and Gingeley to the amount of about 10,000 acres, yielding 150 measures per acre. The Cocoanuts grown in the district are sold for culinary purposes, and the Cocoanut oil consumed on the spot is extracted from kernels imported from Canara.

Kurunj, Linseed, Safflower, Illoopoo and Cât amunak oils are prepared in small quantities.

GANJAM.

The relative proportion of land under cultivation in this district, with the following oils, appears to stand thus.

Cocoanut.....	12,093 acres.
Gingeley.....	6,738
Mustard	2,006
Ramtill	2,700

For some years past, large exportations of Gingeley oil have been made by French merchants.

The Ramtill is said to be chiefly used (on account of its cheapness) to adulterate the Gingeley and Castor oils, for this purpose it is mixed with those seeds before being put into the oil press.

Cocoanut oil is largely made at two places in the district, but little is exported except to Moulmein.

Kurunj oil, though rarely made, is sometimes exported to Madras. Mustard oil is extracted to a small extent, the seeds however are exported largely

TABLE OF EXPORTS.

NAMES.	1850-1.		1851-2.		1852-3		1853-4.		1854-5.	
	Mds.	Rs	Mds.	Rs	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.
Cocoanut oil..	6	45	0	0	26	26	31	273	31	261
Cocoanut kernels	0	0	0	0	10	15	*289	1,269	0	0
Gingeley oil..	46	348	36	0	4	34	11	87	150	187
Gingeley seed	41,659	51,433	60,257	100,430	145,537	242,561	107,295	174,982	92,592	150,431
Rape seed....	0	0	0	0	2,663	2,229	4,764	3,977	4,228	3,519
Lamp oil.. ..	3	12	0	0	60	300	7	50	58	216
Lamp oilseeds	125	135	0	0	1,947	1,947	42	44	116	119
Ieamtil.....	651	551	54	28	2,25[illegible]	1,857	75[illegible]	642	1,014	845
Mustard oil..	6	0	0	0	0	0	0	0	0	0
Mustard seed.	8,697	13,045	5,311	7,966	19,110	28,658	3,462	5,248	7,874	11,812
Illoopoo oil..	516	2,123	0	0	0	0	12	82	48	323
Illoopoo seed.	0	0	0	0	24	12	0	0	0	0
Wood oil....	0	0	0	0	2	10	0	0	0	0
TOTAL..	51,578	67,697	65,639	108,923	170,732	277,274	116,588	187,209	106,121	168,892

* In addition to this, 20,000 dry nuts valued at 3[illegible] Rupees, and large quantities of the fresh nut for edible purposes, are produced annually

GUNTOOR.

With the exception of a little Linseed, Lamp is almost the only oil plant cultivated in this district. The quantity of land under cultivation with this latter is 31,242 acres, the produce being about 4,100 candies, of which 1,400 candies have been annually exported by sea and land.

Linseed is sown rather extensively in furrows on the borders of fields in the Western Talooks.

Other oils, such as Cocoanut and Gingeley, are imported from Rajahmundry and other districts.

TABLE OF EXPORTS.

NAMES.	1850-1.		1851-2.		1852-3.		1853-4.		1854-5.	
	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.
Lamp and Castor oil..	47	316	78	520	73	490	47	314	40	270
Lamp and Castor seeds	8,326	13,136	17,858	27,29[illegible]	16,554	25,695	28,171	38,891	21,133	28,672
Linseed.....	1,462	1,594	1,649	1,777	3,414	3,583	2,956	3,208	583	659
TOTAL..	9,835	15,046	19,545	29,5[illegible]9	19,851	29,768	31,177	42,413	21,756	29,610

KURNOOL.

Lamp oil is most largely produced in this district The extent of cultivation is 26,200 acres, and the average crop (at 140 measures per acre) is 36,68,000 measures. Gingeley covers about 8,050 acres, the average produce is estimated at 80 measures per acre. Castor oil (medicinal variety) does not thrive well, and is therefore but little cultivated, Illoopoo and Safflower oils are produced in small quantities.

MADURA.

Gingeley and Lamp are the chief oil products of this district, the cultivation of each being 14,653 and 11,546 acres respectively. Illoopoo, Neem and Kurunj are extracted to the extent of from one to three thousand gallons annually, and Brumadundoo and Cât amunak in smaller quantities.

TABLE OF EXPORTS.

NAMES.		1850-1		1851-2		1852-3		1853-4		1854-5.	
		No.	Rs	No.	Rs.	No.	Rs.	No.	R.	No.	Rs.
Gingeley oil..	Cwt.	18	102	5	55	7	72	0	0	1	13
Gingeley seed	Cwt.	0	0	0	0	0	0	26	70	0	0
Lamp oil.....	Cwt.	29	165	15	145	50	363	120	861	0	6
Lamp oil seed	Cwt.	1[illegible]	19	0	0	0	0	5	13	0	0
Margosa oil..	Cwt.	9	90	0	0	0	0	22	0	0	0
Total..		67	456	24	199	57	435	167	947	1	13

MALABAR.

This district, so rich in natural productions of every sort, yields a great variety of substances from which oils may be derived. Up to this time sufficient data as to the extent of cultivation,

&c. has not been obtainable, but the interest which has been evinced in elucidating this subject, will doubtless result in making known those oils which are likely to become valuable articles of trade.

The subjoined table will give the best idea of the ordinary products of the district.

TABLE OF EXPORTS.

NAMES.		1850-1.		1851-2.		1852-3.		1853-4.		1854-5.	
		No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.
Cocoanut oil	Cwt.	47,726	147,983	68,931	213,948	104,388	322,671	132,176	406,347	158,100	549,701
Cocoanuts fresh	No.	2,937,712	5,310,493	37,676,345	192,735	38,089,806	4,08,096	2,519,977	6,333,49	28,965,500	378,855
Cocoanuts dry	Cwt.	116,500	418,143	131,391	511,133	155,232	513,308	128,356	500,312	95,504	375,992
Gingeley oil	Cwt.	10	123	0	0	40	383	869	6,591	370	2,671
Gingeley seed	Cwt.	671	2,113	0	0	671	1,405	3,068	11,762	617	2,211
Fish oil	Cwt.	3,029	12,461	7,242	29,783	21,046	81,977	47,957	204,657	5,815	81,388
Pimaracday oil	Cwt.	160	457	200	875	506	1,301	922	2,414	651	1,611
Pimaracday seed	Cwt.	0	0	0	0	0	0	724	2,282	45	141
Cassia oil	Cwt.	0	0	0	0	0	49	21	290	0	0
Lemon grass oil	Doz.	0	0	25	111	11	252	254	459	13	253
Sandalwood oil	Cwt.	12	6,005	19	9,283	21	16,145	6	3,496	12	7,139
Croton oil	Cwt.	0	0	0	0	0	0	0	147	0	0
Croton seed	Cwt.	0	0	0	0	0	0	157	1,411	160	1,964
TOTAL		2,805,610	5,957,909	37,885,211	1,250,079	38,371,697	1,47,287	2,863,905	7,502,202	29,226,887	1,402,267

MASULIPATAM.

Gingeley and Lamp oils are the staple products of this district, the former is said to be cultivated to the extent of about 10,000, and the latter about 15,000 acres. There are but few cocoanut plantations, this oil is therefore chiefly imported, but there is ample room for the introduction of this productive cultivation.

Fish oil is made for local consumption from fish caught on the Colar lake and on the coast, it is chiefly burnt in lamps by the lower classes, but the manufacture appears deserving of encouragement. Small quantities of Castor, Kurunj, Margosa and Bramadundoo are also made.

TABLE OF EXPORTS.

NAMES.		1850-1.		1851-2.		1852-3.		1853-4		1854-5.	
		No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.
Cocoanut oil	Candy	0	0	0	0	0	0	20	0	1	0
Cocoanuts...	Do.	0	0	0	0	0	0	0	0	0	0
Gingeley oil..	Do.	0	0	7	0	8	0	77	0	39	0
Gingeley seeds.....	Garee.	0	0	0	0	0	0	0	0	5	0
Lamp oil....	Candy.	0	0	8	0	7	0	37	0	46	0
Lamp seeds..	Garee.	0	0	12	0	20	0	41	0	48	0
Linseed oil..	Candy.	0	0	1	0	0	0	3	0	6	0
Ghee.....	Candy.	57	0	30	0	1,2	0	427	0	130	0
	Total..	69	..	58	..	1,454	..	606	..	275	

NELLORE.

Lamp-oil is grown in this Collectorate to the extent of 12,500 acres.

The cultivature of the Gingeley seed covers on an average about 1,000 acres. Margosa oil is made to the extent of about 1,600 Maunds, and Illoopoo about 5,000. Brumadundoo, Cucumber and Linseed are all produced to a limited extent in the Ongole Talook.

TABLE OF EXPORTS.

NAMES.	1850-1.		1851-2		1852-3.		1853-4.		1854-5.	
	Cwt.	Rs.	Cwt.	Rs.	Cwt.	Rs.	Cwt.	Rs.	Cwt.	Rs.
Gingeley oil..	243	849	55	313	18	121	59	458	51	450
Gingeley seed.	11,411	120,445	8,123	74,569	2,685	17,233	1 869	7,209	895	978
Lamp oil.....	197	1,549	233	1,897	187	1,479	158	1,275	163	1,196
Lamp seed....	15,121	113,550	240,961	76,660	23,942	169,784	15,076	90,450	3,564	0
Linseed.	0	732	117	689	242	1,426	127	741	17	25
Cucumberseed	0	0	0	8	14	59	11	44	0	4
Total.	26,972	237,122	249,457	153,936	26,188	190,095	17,299	100,157	3,990	2,653

RAJAHMUNDRY.

In this district the oil seeds principally grown appear to be those of Gingeley, Cocoanut and Lamp.

Of Lamp and Gingeley upwards of 14,000 acres each are said to be cultivated, and considerable quantities of the latter seed have within the last few years been exported to France. Cocoanuts are grown in various talooks, and might be planted to a large extent if necessary. Castor, Kurunj, and Margosa oils are also prepared for local consumption.

TABLE OF EXPORTS.

NAMES.		1850-1.		1851-2.		1852-3.		1853-4		1854-5	
		No.	Rs	No.	Rs.	No,	Rs.	No.	Rs.	No.	Rs.
Cocoanut oil...	Mds.	1,673	3,330	2,420	5,094	2,139	5,108	5,132	10,602	1,758	6,631
Cocoanuts-fresh	No.	995,308	13,699	420,768	5,495	495,560	6,491	1,521,369	19,907	917,474	11,770
Cocoanutsdried	Mds.	718	532	105	115	267	222	1,618	1,618	147	227
Gingeley oil...	Mds.	1,088	2,092	1,248	2,510	4,087	7,862	3,508	7,574	928	2,914
Gingeley seed..	Parahs.	52,599	110,884	42,279	98,564	72,274	163,215	107,612	312,978	40,922	183,461
Lamp oil.....	Mds.	2,599	4,142	2,012	2,853	10,705	119,725	1,885	3,265	3,917	8,203
Lamp seed.....	Parah.	2,598	4,960	8,766	7,824	39,985	62,785	2,871	5,801	9,778	84,401
Castor oil.....	Doz.	794	410	10	45	0	0	2	5	0	0
Linseed oil.....	Mds.	2	6	3	9	0	21	0	0	1	3
Wood oil.....	Mds.	38	132	14	42	28	84	0	0	105	217
Mustard seed..	Mds.	1,694	541	1,571	1,175	1,035	623	190	68	0	0
Cotton seed...	Mds.		0	0	0	1,009	259	2,703	666	1,093	873
Cinnamon seed	Mds.	16	24	30	100	0	0	36	105	2	9
	Total..	..	140,155	..	123,806	..	386,291	..	362,599	..	297,762

SALEM.

Lamp and Gingeley are cultivated throughout the district, the former to the extent of 39,300 acres, yielding on an average 160 measures per acre, and of the latter 18,525 acres yielding 150 measures per acre. Ramtill is also cultivated in the Oosoor, Denkencotta and Tripatore talooks. Illoopoo, Cât amunak, Kurunj, Neem and Brumadundoo grow spontaneously, and the latter is said to be also cultivated to a small extent.

TANJORE.

Cocoanuts form the chief oil product of this fertile district, the quantity of ground under cultivation being estimated at 4,369 acres, producing on an average 5,447 nuts per acre.

Next in importance are Illoopoo grown over 6,000 acres, Castor occupying 1,193 acres, and Gingely cultivated to the extent of 1,207 acres. Pinnacotay and Ground nut oils are produced to a limited extent. A great variety of Medicinal oils &c. are obtainable in this district.

TABLE OF EXPORTS.

NAMES.		1850-1.		1851-2.		1852-3.		1853-4		1854-5	
		No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.
Cocoanut oil...	Cwt.	54	549	169	1,712	125	1,264	64	647	18,104	19,194
Cocoanuts	No.	41,375	580	29,375	384	0	0	0	0	0	0
Gingeley oil..	Cwt.	623	6,288	455	4,588	556	5,609	1,085	10,966	202	2,765
Gingeley seed..	Cwt.	67	175	81	226	265	691	7,654	20,925	0	0
Lamp oil.	Cwt	796	5,707	1,175	8,429	1,366	9,797	448	16,124	2,268	16,264
Lamp seed	Cwt.	1	3	0	0	0	0	0	0	0	0
Illoopoo oil....	Cwt.	3	27	4	36	12	111	0	0	3	35
Margosa oil. ...	Cwt.	109	857	1,207	1,092	85	1,689	46	362	197	1,546
Pinnacotay oil..	Cwt.	12	84	22	240	156	866	0	6	4	30
Pinnacotay seed	Cwt.	10	19	46	138	83	153	10	30	12	21
Ground nuts...	Cwt.	72	165	42	96	366	1,002	90	299	15	60
	Total..	..	14,451	..	16,791	..	21,182	..	49,358	..	39,915

TINNEVELLY.

The oils in general demand for local consumption are here largely cultivated. Lamp to the amount of 34,785 acres and Gingeley 18,222 acres.

Illoopoo oil is procurable in large quantities (about 16,000 [illegible] lons,) and if advances are made to the manufacturers of Wood oil, good supply is obtainable, the quantity however at present extra[illegible] ed for home consumption is very small.

Castor, Safflower, Margosa, Pinnacotay, Kurunj, Brumadund[illegible] Cât amunak and Poovana oils are all procurable in quantities var[illegible] ing from 5 to 250 Gallons.

TABLE OF EXPORTS.

NAMES.		1850-1.		1851-2.		1852-3.		1853-4.		1854-5.	
		No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	
By Sea.											
Gingeley oil.	Mercal	40	107	18	67	69	180	435	1,143	135	
Gingeley seed.....	Do.	0	0	0	0	50	36	365	268	2,575	1
Lamp oil....	Do.	0	0	0	0	44	115	15	40	41	
Lamp oil seed.....	Do.	6	3	0	0	2	1	30	40	56	
Margosa oil..	Do.	5	12	43	107	94	236	21	52	68	1
To Travancore.											
Gingeley oil.	Mercal	1,094	2,872	591	1,553	1427	3,747	2,020	5,303	1,171	3,0
Gingeley seed.....	Do.	14,462	9,900	6,043	3,708	19,751	14,524	17,333	14,217	7,584	5,8
Lamp oil....	Do.	72	189	14	37	0	0	0	0	0	
Lamp seed..	Do.	363	148	190	94	0	0	0	0	0	
Margosa oil..	Do.	19	48	0	0	0	0	0	0	0	
Margosa seed	Do.	402	474	0	0	0	0	0	0	0	
TOTAL..		..	13,713	..	5,566	..	18,833	..	21,063	..	11,17

TRICHINOPOLY.

Most of the oils usually grown are produced in this district. The supply however being insufficient to meet the local demand, the deficiency is imported from Salem, Coimbatore and the neighbouring Collectorates.

VIZAGAPATAM.

According to the returns furnished from this district the following appears to be the proportion in which the several oils therein mentioned are cultivated. Owing however to the great difficulty of obtaining correct information, these numbers must be considered only as an approximation.

Lamp oil 40,000 acres, Gingeley 27,000 acres.
Mustard, 25,000 acres, Putty Gingaloo 10,000 acres.
Ramtill, 3,500 acres.

Illoopoo, Margosa, Brumadundoo, and Cât amunak oils are also procurable in quantities of from 200 to 1,000 maunds.

TABLE OF EXPORTS.

NAMES.		1850-1.		1851-2.		1852-3.		1853-4.		1854-5.	
		No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.	No.	Rs.
Coconut oil.	Mds.	0	0	0	0	14	42	0	0	7	27
Cocoanuts...	No.	664,455	2,681	0	0	466,860	6,091	270,000	3,530	0	0
Gingeley oil.	Mds.	4,702	9,405	218	437	1,020	2,040	666	1,133	124	248
Gingeley seed.....	Parahs	70,319	109,858	49,422	77,224	86,111	132,986	103,424	161,469	50,192	78,426
	Mds.	0	0	800	1,200	487	731	0	0	0	0
Rapo.....	Parahs	1,845	1,504	1,046	1,054	3,016	2,262	16,066	12,049	10,338	793
Rape seed...											
Lamp and Castor....	Mds.	57	115	1,063	2,126	917	1,834	738	1,477	16	33
Lamp seed..	Parahs	2,930	4,945	50	84	3,396	5,734	12,663	21,370	2,551	4,310
Mustard seed	Do.	6,821	14,474	7,869	16,709	11,722	24,911	4,099	8,710	6,164	10,978
Avesa oil....	Mds.	0	0	0	0	0	0	0	0	20	30
Lemon grass.	Mds.	0	0	0	0	1	14	0	0	0	0
Croton oil...	Mds	0	0	0	0	28	128	0	0	0	0
TOTAL...		..	142,982	..	98,834	..	176,773	..	209,727	..	94,840

MALWA.

Opium being the staple product of this province, Poppy oil and seed (the former at 9 seers, and the latter at 25 seers per Rupee) are procurable to a very large extent. Poppy oil is here more generally used than any other both in Lamps and as food.

Mahowa oil selling at 1 anna 6 pie per seer, and a little Mustard oil are the only other oils made in this province, excepting two very inferior ones extracted from the seeds of the Ramayen and the Kunjee (*Dalbergia ?*) and burnt in lamps by the poorer classes.

MYSORE.

Lamp and Castor, Gingeley and Ramtill appear to be the chief oil products of Mysore.

Most of the oils however in Classes 2 and 3 are procurable. Of these the Kurunj, Brumadundoo (largely used for lamps), Cât amunak and Neem are the principal, the latter is said to grow most plentifully in the Chittledroog Division.

The Poppy is cultivated in the Chickmugaloor talook, and Linseed, Safflower and Mustard in various parts of the country. Sandalwood oil is largely made. Cassia, nutmegs and pepper grow wild in the jungles.

The *Garcinia pictoria* is plentiful in the jungles in the West of Mysore, and yields a valuable solid oil. A very sweet tasted edible oil is also obtainable from the seeds of the *Chirongia sapida*.

SECTION III.

Descriptive list of the Oils of the Madras Presidency.

Class 1.

No. 1. *Cocoanut oil.* (*Cocos nucifera.*)

The Cocoanut Palm grows almost every where within the tropics. It is plentifully cultivated in the districts of Malabar and Canara, Ganjam and Rajahmundry.

The oil is generally prepared from the dried kernel of the nut, by expression in the ordinary Native mills. When carefully made it is colorless, solid at low temperatures but possesses a rancid disagreeable smell.

When required for edible purposes, the kernel of the fresh nut is taken, rasped and mixed with a little boiling water. This yields

by pressure a milky fluid which, on being boiled until all the water has evaporated, produces a clear edible oil. Only just sufficient water to moisten the pulp should be added, as a larger proportion prolongs the operation and deteriorates the product. When fresh prepared, this oil is comparatively free from smell, but it speedily acquires an unpleasant odour; many attempts have been made to divest the oil of this smell, which renders it inapplicable for the perfumers' use, but only with partial success.

The prices of this oil vary most considerably in different parts of the country. For the quarter ending 31st October 1854, the maximum and minimum prices at nineteen large stations in all parts of the Presidency were Rs. 8-5-4 at Jubbulpore, and Rs. 2-14-0 at Bangalore, per maund. The average of twenty-one large stations in the Madras Presidency gives Rs. 4-9-5 per maund or about £41-2 per ton. The market value of "Cochin oil" in London in January 1855 was £46-10 per ton, the average being from £46 to £48.

It is used very largely in England in the manufacture of candles and soap. For the candle maker the stearine is separated from the olein, the former product being used for candles, for which it is most applicable on account of the high temperature required to fuse it. The olein is then made over to the soap boiler for conversion into soap. Soap made from Cocoanut oil is lighter than water, and consequently floats in that medium, whilst from its being the only soap which will dissolve freely in salt water it is usually called "Marine soap."

In India this oil is made into soap by boiling with a proper proportion of dhobies' earth, salt, saltpetre, quicklime, and water. It is also burnt in lamps by the higher classes, used for anointing the body, and in cookery.

The best oil is exported from Cochin and the neighbouring ports on the Malabar coast. It usually fetches 20*s*. per ton more than the Ceylon or Coromandel coast article. The average annual quantity exported from this Presidency from 1850-1 to 1854-5 is about 14,10,963 gallons. Of this by far the largest portion is sent to the United Kingdom and France, the remainder finding its way to Arabia, Mauritius, Bombay and the French (Indian) Ports.

The Cocoanut palm thrives best near the sea coast, although it sometimes grows favorably on inland plains, the soil of which contains a large proportion of silex and soda or salt which are the substances chiefly required for its nourishment. In South America salt is largely used as a manure. The tree begins to bear about the 7th or 8th year, the annual produce being from 70 to 100 nuts. At the Tanjore local Exhibition in March 1856, a bunch of Cocoanuts containing no less than 70 nuts on a single stalk was exhibited. Each tree is calculated to yield at least 2½ gallons of oil per annum, and the coir obtained from the nuts is estimated to yield one fourth of the value of the oil, whilst the oil cake is very valuable for cattle and as a manure. The Elephant beetle (Oryctes Rhinoceros) is a great enemy of this tree, it begins by nibbling the leaves into the shape of a fan, and then attacks the main shoot into which it bores, and unless speedily extracted, infallibly destroys the tree.

No. 2. *Gingeley oil.* (*Sesamum orientale.*)

The Sesamum and its varieties are grown throughout the country. So universal is the use of this oil, that its name in almost all the vernacular languages signifies "the oil."

The mode of extraction sometimes adopted is that of throwing the fresh seeds without any cleansing process, into the common mill and expressing in the usual way. The oil thus becomes mixed with a large portion of the coloring matter of the epidermis of the seed, and is neither so pleasant to the eye nor so agreeable to the taste as that obtained by first repeatedly washing the seeds in cold water, or by boiling them for a short time until the whole of the reddish brown coloring matter is removed, and the seeds have become perfectly white; they are then dried in the sun, and the oil extracted as usual.

In expressing this oil, the Natives of the Northern division always add the bark of the Tanghedi (Cassia auriculata), or the Babool gum to the seed to be pressed, this is probably done with a view of enhancing the value of the cake, which is used as an article of food for man and beast.

The value of this oil in England was £47-10 per ton in January 1855, and £49 to £53-10 in January 1856. In different parts of

the Presidency, the price of this oil varies from Rs. 1-5-0 to Rs. 6-0-0 per maund of 25 lbs. In South Arcot it is procurable at Rs. 27-12-5 per candy.

The prices per maund at the undermentioned stations, for the quarter ending 31st October 1854, were as follows:

	R.	A.	P.		R.	A.	P.
Arcot	3	8	0	Madura	5	8	3
Bangalore	3	7	3	Mangalore	4	1	8
Bellary	3	2	0	Nagpore	1	12	0
Berhampore	2	8	0	Palamcottah	4	12	0
Cannanore	6	0	0	Paulghaut	3	7	0
Cuddapah	2	13	0	Samulcottah	2	10	8
Jaulnah	2	6	0	Secunderabad	2	3	11
Jubbulpore	1	5	0	Trichinopoly	4	1	8
Madras	3	14	0	Vellore	3	14	0
Masulipatam	3	0	0	Vizagapatam	3	2	0

In England this oil is chiefly used for the manufacture of soap, and for burning in Table lamps, for which it is better suited than Cocoanut oil, owing to the lower temperature at which it congeals, although the light it gives is not so bright. In India it is chiefly used in cooking, for anointing the body, for making soap, for burning in lamps, &c. by the dyer to brighten and fix his colors.

The following tables will show the quantity and the destinations of the exports of this oil.

Year 1847-8.		Year 1848-9.	
Oil	Gals. 19,520 Rs. 14,776	Oil	Gals. 52,721 Rs. 36,294
Seed	Qr. 17,518 Rs. 160,134	Seed	Cwt. 1,44,125 Rs. 299,412
Year 1852-4.		Year 1854-5.	
Gals	119,180 Rs. 73,635	Gals	17,139 Rs. 12,720
Cwt	1,198,079 Rs. 693,760	Cwt	167,324 Rs. 431,726

	Seed.	Oil.
Exported to the United Kingdom	Cwt. 12,713	Gals. 42,043
Ceylon	590 —	2,968
France	2,87,225	
Pegue	741 —	19,698
Bombay	113	
Malacca	33 —	3,593
Travancore	148	
Mauritius and Bourbon	.. —	4,232

No. 3. *Bastard Gingeley oil.* (*Sesamum orientale var.*)

The "second sort Gingeley" sometimes called "bastard Gingeley" is extracted from a variety of the Sesamum above mentioned. It differs but little from the true Gingeley; the quantity of oil yielded by an equal amount of seed is somewhat less, but there appears to be no difference in the quality of the product.

The following remarks upon the cultivation of the true Gingeley, and its varieties in the Rajahmundry district, have been furnished by. F. Coplestone, Esq.

Gingeley, or first sort Gingeley. (The black seed.) This is the produce of the Hill-country called Reddyseema in the Rajahmundry district. It is generally sown at the commencement of the monsoon (June) and ripens in four months, 160 seers of seed yield 50 seers of oil which is clear and sweet. The current value of the seed is Rupees 50 per candy of 500lbs.

Bastard Gingeley, or second sort Gingeley, is the worst variety of this plant, the seeds are of mixed colors, white, red and black. It is usually sown in the month of Chyteari (April) and ripens in three months, 160 seers of seed yield 35 seers of oil, which is of a brown color and bitter. The current value of this seed is 35 Rupees per candy of 500lbs.

White Gingeley, is sown in the month of Myglam (January, February) and ripens in three months and a half. The oil is clean and sweet, 160 seers of seed yield 44 seers of oil, the current value of the seed is 44 Rupees per candy.

Pyroo Nocvooloo is the red seed sown generally on the islands called Lunkaloo. It ripens in three months, 160 seers of seed yield 45 seers of oil. The current price of the seed is Rupees 42 per candy. The term "*Pyroo*" is applied to the season after the general harvest in January, viz. February, March, and April, and has no reference to these seeds except as indicating the time of their sowing.

The exports of this oil and seed are included in those of Gingeley.

No. 4. *Lamp oil.* (*Ricinus communis fructibus majoribus*)

The oil obtained from the large seeded variety of the Ricinus

communis has obtained the above name from the fact of its being used almost solely for burning in the commonest lamps and for feeding torches.

For this purpose the seeds are sometimes partially roasted to coagulate the albumen and liquify the oil, and then pressed in the ordinary mill, or boiled with water, or the roasting process is omitted; in either case the coloring matter of the husks of the seed and other impurities gives the oil a dark color, and if the roasting process is carried too far, a slightly empyreumatic odour is communicated.

By carefully shelling the seed and rejecting all impurities, the Natives prepare a clear oil for medicinal purposes (by boiling) nearly equal to that extracted from the small seeded variety.

The price of this oil varies in different parts of the country from Rupees 1-10-0 to Rupees 3-13-6 per maund of 25 lbs. The average of nineteen large stations in all parts of the Presidency for the Quarter ending 31st October 1854, was Rupees 2-8-6 per maund.

It is chiefly used for burning in lamps, and from its viscidity and drying qualities only in those of the simplest description.

The average export of this oil for the last 6 years has been 97,561 Gallons per annum.

Lamp oil made into a kind of *palmine* by agitation with nitric acid, is largely used as a lubricating agent for Railway locomotives in India.

No. 5. *Castor oil.* (*Ricinus communis, fructibus minoribus.*)

The small seeded variety of the Ricinus communis is supposed to yield the best product, and is therefore universally employed in preparing the oil exported to Europe for medicinal purposes.

The fresh seeds after having been sifted and cleaned from dust, stones, and all extraneous matters, are slightly crushed between two rollers, freed by hand from husks and colored grains, and enclosed in squares of clean gunny or canvass. The packets of seed then receive a slight pressure in an oblong mould which gives an uniform shape and density to them. The "bricks" as they are

technically called, are then placed alternately with plates of sh iron in the ordinary Screw or Hydraulic press. On the applicat of a gradually increasing pressure, the oil exudes through the pore the gunny and is received into clean tins. Water in the proport of a pint to a gallon of oil being added, the whole is boiled u the water has evaporated, the mucilage will be found to have s sided and encrusted, the bottom of the pan whilst the albumen s dified by the heat forms a thin layer between the oil and the wa Great care must be taken to remove the pan from the fire instant the whole of the water has evaporated, which may be kn by the bubbles having ceased, for if allowed to remain longer, oil which has hitherto been of the temperature of boiling wate 212°, suddenly rises to that of oil or nearly 600°, thereby heighter the color and communicating an empyreumatic taste and od The oil is then filtered through blanket, flannel or American d and put into cans for exportation. It is usually of a light st color, sometimes approaching a greenish tinge.

The cleansed seeds yield from 47 to 50 per cent. of oil. The lowing is the result of experiments made at Madras and Calc to ascertain the per-centage of oil in Castor seed (January 2/th, 1853.)

Calcutta—1,400lbs. of seed yielded kernels and raw oil as follows:

	Kernels.	Oil.
1st sort	632lbs.	..... 324lbs.
2nd sort	184lbs.	..... 87½lbs.
3rd sort	164lbs.	..... 76½lbs.

Making a total of 980lbs. of Kernels and 483lbs. of Raw oil from 1,400lbs. of seed.

Madras—1,400lbs. of seed yield raw oil as follows:

1st sort. 318lbs.
2nd sort. 88lbs.
3rd sort. 74lbs.

Making a total of 480lbs. of oil from 1,400lbs. of seed.

The cost of the Madras oil is as follows:—

1,400lbs. of seed at Rs. 3-5-0 per bag of 164lbs. Rs.	27	3	4
Husking and selecting Kernels and cooly hire.....	3	11	9
Crushing, moulding, pressing, boiling.....	2	7	1
Filtering and Sundries.....	2	8	0
Overseer's pay, Godown rent.....	1	6	2
300 Empty Quart bottles, Corks, &c.....	34	4	8
Cleaning and Packing Charges.....	4	8	0
Total Rs...	76	1	0

Deducting the price of the bottles, this gives an average of annas 1 pies $4\frac{17}{24}$ per quart of first, second, and third sort oil.

This oil is chiefly used as a mild purgative, and by Natives for anointing the head. Soap of good quality may be made from it, but the cost and disagreeable smell which it communicates, preclude its general use.

The average export from the year 1849-50 to 1852-3 was 11,325 gallons per annum.

The method of extracting this oil by the boiling process is thus given by Ainslie. "The seeds are boiled for two hours in water, dried for 3 days in the sun, husked and pounded. They are then boiled in fresh water until the whole of the oil has risen to the surface."

Castor oil being entirely soluble in highly rectified alcohol of sp. grav. ·825, any adulteration of it with other fixed oils may be ascertained by dissolving a sample in 8 times its weight of spirit, the fixed oil is not dissolved but floats on the surface. This however is not an infallible test.

No. 6. *Ground nut oil.* (*Arachis hypogæa.*)

The Ground nut or "Manilla" nut, and the oil extracted therefrom, has of late years been exported to a considerable extent. It is now grown in all parts of the Peninsula. The oil is seldom used by the Natives, although large quantities of the nut are eaten after being slightly roasted over a charcoal fire. The cleaned seeds yield about 43 per cent. of a clear straw colored edible oil possessing a

slight bean-like taste and smell, which makes a good soap, indeed it is a perfect substitute for olive oil in all its uses.

Its value in London in January 1855 was £47-10 per ton. In North Arcot, where it is largely cultivated, the oil is procurable at from Rs. 1-8-0 to 2-12-0 per maund. In the Nellore district the seed costs 1-8-0 per maund, and in Tanjore about 200 acres are cultivated with this plant yielding annually 75 candies of oil at Rs. 2-6-0 per maund. In the year 1848-49, 37,000 gallons of this oil were shipped, but in the two following years the exports exceeded 1,00,000 gallons. It however fell to 75,207 gallons in 1852-3.

According to Simmonds, 1,950 parts of seed give 1,405 of blanched kernels and 703 of oil, by cold pressure. It is produced to a very large extent in Africa, from whence England and France draw large supplies.

No. 7. *Linseed oil.* (*Linum usitatissimum.*)

The seed from which this oil is expressed has long been cultivated to a limited extent at Nagpore, Bellary, Guntoor and other parts of the Presidency. It is usually sown in furrows on the borders of fields, and the extent of cultivation is consequently difficult to ascertain.

The oil is seldom used for painting in India perhaps from an impression which seems to be general, that the oil obtained from Indian seed is inferior to that imported from England. It will however be found on experiment, that this arises from the former having been imperfectly freed from the mucilage which prevents its drying, or from some admixture of a non-drying oil.

In the year 1852-3 English Linseed oil to the amount of gallons 4,552 valued at Rs. 8,763 was imported into Madras, whilst at the same time 1,045 cwt. of the seed was exported hence, mostly to England. The fact that it can be made on the spot equal in quality and considerably less in price than the English article, needs only to be known to be taken advantage of. It would be necessary to guard against its adulteration with any of the greasy oils, which would of course infallibly destroy its drying properties.

The value of this oil in England was from £61 to £66 in January 1856. It is said to be procurable in Bellary at Rs. 3-8-0 per

maund. It was imported into England in 1851 to the amount of 608,986 Quarters.

Some energetic efforts have been made to improve the cultivation of Linseed in the Punjab chiefly for the sake of fibre. The Agri-Horticultural Society having obtained a grant of money from Government offered rewards for its cultivation, and a considerable increase immediately took place.

In 1853-4 there were 3,435 acres under cultivation in eight districts, whereas in the next year no less than 19,039 acres were so taken up, and it is estimated that the whole cultivation throughout the Punjab during that season was 50,135 acres producing 146,508 mds. of fibre, and the increased produce of seed is estimated at 130,000 mds. valued at 160,000 Rs. The seed sold by auction at an average rate of Rs 4-6 per maund of 80lbs." (*Spectator, Oct.* 14, 1856.)

The following extract from a late number of the "*Sindian*" newspaper, will give some idea of the progress made in Linseed cultivation in Scinde.

"We are glad to observe that the growth of Linseed in Scinde is attracting the attention of the authorities. Major Wormald tried an experiment at Jemadar-ka-Landee, and gives a very favorable report, which has been placed by the Commissioner in Scinde at the disposal of the Press. We have seen a specimen of the Linseed, and the following is a description of its culture and growth.

"At Landee, the quantity of land prepared for seed was 4,658 square yards, on which was sown 126lbs. of Linseed, part on the 28th October, and the rest on the 1st November 1856. In four months the crop was pulled up and stacked; and the produce was one thousand pounds of Linseed, being as far as may be judged, much above the average yield of flax crops in different parts of Europe, and certainly finer Linseed than any yet seen here. A sample of this Linseed has been forwarded to Mr. Warwick, a merchant in Kurrachee, who pronounces it to be very fine. It is intended that the sample be forwarded to Bombay, when an opinion will be formed on it by competent judges.

"The stalks of this seed grew strong, and ranged from two to three feet. No opportunity has as yet been afforded of converting the stems into flax, and as the stackage will not deteriorate from their quality, opportunity may be found to complete the experiment.

"Major Wormald, from past experience, considers the soil in the Mulleer Valley particularly suited for the growth of Linseed and Flax, and feels confident that if cultivated on a large scale a fortune might soon be realized.

"The ten-fold yielding of this valuable seed in the Mulleer valley, owing to rich soil, should operate as an inducement to the Commissioner to promote the growth of an article, that bids fair to make so respectable a figure in the revenue of the Province. The sample we have seen appears to possess the properties of the best kind. The seeds are small, bright, grayish-brown, slippery, elongated bodies, containing a full amount of that mealy, oleaginous albumen, which yields the oil in such abundance. In short we consider the specimen we have seen as well worthy the attention of those whose hearts are with the prosperity of Scinde."

No. 8. *Ramtill oil.* (*Verbesima sativa or Guizotia oleifera.*)

This sweet tasted edible oil is plentiful in the Mysore, Vizagapatam, Nagpore and Ganjam districts. It is used for nearly the same purposes as the Gingeley oil, and from its inferior quality and low price is frequently used to adulterate both this and Castor oil. It is exported from Ganjam.

The oil is said to mix with colors as well as linseed and to dry *without* litharge, although a little improves it.

No. 9. *Mustard oil.* (*Sinapis varieties.*) *Improperly called "Rape" in India.*

Five or six kinds of Sinapis are cultivated in various parts of Southern India. The seed is chiefly used as a condiment, but the oil which is sometimes extracted is much prized by the Natives, and apart from its edible qualities is supposed to possess many virtues. The different kinds of seed yield from 28 to 36 per cent. of a bright yellow edible oil, having a strong smell and a slight taste of mustard. The average price of Mustard seed in eighteen large stations, in all parts of the Presidency for the quarter ending 31st October 1854, was Rs. 1-2-8 per maund of 25lbs., the maximum being Rs. 1-11-6 at Cannanore, and the minimum As. 10-6 at Nagpore. In Vizagapatam it costs Rs. 208 per sicca garce.

The oil is not exported, but the seeds have been annually shipped as follows:

Years	1847-8.	1848-9.	1849-50.	1850-1.	1851-2.	1853-4.	1854-5.
Cwt..	5,828	6,767	9,435	9,909	16,075	—	—

Although seldom procurable in the market, this oil is nevertheless generally made, and used in cooking and in the manufacture of pickles, condiments, &c. It is considered by the Natives superior to all other oils for anointing the body which it is supposed to invigorate.

In medicine it is sometimes given internally as a remedy for flatulent colic, but is more frequently applied as a rubefacient, and as a cure for burns and wounds.

Rape oil (*Brassica*) properly so called, was imported into England in 1851 to the amount of 107,029 Qrs. or 21,606 tons from France and Germany, the oil is valued at £34 per ton.

No. 10. *Poppy oil.* (*Papaver somniferum.*)

The Poppy is largely cultivated throughout Malwa and the Opium districts, where the drying oil obtained from the seed is more extensively used than any other, both in lamps and as food. The following statistics regarding the cultivation of the Poppy plant, are furnished by C. Timmins, Esq., Sehore.

"There are three lacs of beegahs under Poppy cultivation in Malwa, the average produce of seed per beegah being two maunds,* each of 40 seers, or 82lbs, which gives a total of 6,00,000 maunds of seed worth from Rs. 1 to $1\frac{3}{4}$ per maund. From these six lacs, deduct $1\frac{1}{2}$ seer per beegah required for seed, and there remains 5,90,623 maunds of seed for oil. The oil extracted from 1 maund of seed being about 13 seers, the above quantity of seed would yield a total of 1,91,952

* NOTE.—The seer in use here is more than three times the weight of the Madras seer. It weighs $32\frac{1}{2}$ ounces, that of Bombay being $11\frac{1}{5}$ oz., and Madras 10 ounces.

maunds of oil, which sells at from Rs. 4-8-0 to 5 Rs. per maund or £40-6 per ton. The whole of the oil at present made here appears to be consumed in Malwa. Mr. Anson, the first Assistant to the Governor General and Superintendent of the Opium department at Indore, concludes that 5,000 maunds might be available for export at Indore alone.

"The hire of a cart from Indore to Bombay would be about 20 or 25 Rupees. The carts are much smaller than those used in the Madras territory, and will carry from 20 to 24 maunds. There would appear to be no difficulty in establishing an export of this oil, provided there were a remunerating demand for it; the extent of supply must however be regulated by the demand for Opium, the high price obtainable for which alone supports this expensive and hazardous cultivation.

"Perhaps Calcutta presents greater facilities for the export of the seed or oil from the advantage of the water carriage afforded by the Ganges and other rivers of Bengal; but the railway now progressing from Bombay will materially facilitate the transit of goods from this part of India, but as before remarked the production of Poppy oil must ever be dependent on the demand for opium which may possibly be extensively affected by the extraordinary revolution now progressing in China.

By simple exposure to the rays of the sun, in shallow vessels, this oil is rendered perfectly colorless. It is supposed by the Natives to produce sleep and strengthen the brain. Poppy oil is peculiarly suitable for mixing with paints; "with white lead it leaves a beautiful surface which does not afterwards change by the action of light into a dirty yellow."

CLASS 2.

No. 11. *Margosa or Neem oil.* (*Azadirachta Indica* and *Melia azadirach.*

Two species of the Neem grow in Southern India. The Azadirachta Indica, or white flowered Neem, is exceedingly graceful, and forms an excellent avenue tree. The Melia azadirach or Persian lilac, is a tall wide-spreading tree, of quick growth, the branches of which are very brittle and liable to be broken in high winds. The blossoms are of a lilac color, possessing a very sweet smell, and the fruits as well as the extracted oil of both varieties are much alike.

A bitter principle prevails in all parts of the tree, and is present in the oil, which is much used by Native practitioners as an anthelmintic and vermifuge, and externally as a liniment in rheumatism, headache, &c. it is of a deep yellow color, unpleasant smell, and bitter taste; it forms an article of export, although the demand fluctuates considerably. Besides the uses above mentioned, it is also burnt in lamps, and is known in the market by the name of the "bitter oil."

No. 12. *Illoopoo and Mahowa oils.* (*Bassia longifolia et species.*)

Several varieties of the *Bassia* yield semi-solid oils known by these names. The *B: longifolia* is the most common in Southern India, and although the oil is seldom to be met with in the bazaar, yet large quantities of the seeds are gathered, and the oil extracted for private consumption. Excellent candles and soap may be made from it, and as a substitute for butter and for burning in lamps, it is much employed by the poorer classes. It is sometimes exported in small quantities.

The *Bassia butyracea* is abundant in the hills of Kumaon, and produces an oil known by the names of Fulwah, Phulwarah, Chooree fooliel and Phooliel ka tael. This solid oil dissolves readily in alcohol, and is said to keep an indefinite time without becoming rancid.

No. 13. *Pinnacotay oil.* (*Calophyllum inophyllum.*)

The fresh seeds of the "Alexandrian laurel" when shelled and subjected to pressure, yield a dark green oil of a peculiar odour. Old seeds yield a higher colored and thicker product. It is occasionally shipped in small quantities to Ceylon, but cannot be considered a regular article of export. It is burnt in lamps.

No. 14. *Kurunj oil.* (*Dalbergia arborea.*)

This oil, which in some parts of the country is used to a large extent in adulterating lamp oil, is expressed from the seeds of a

tree common in most parts of India. Its fluidity at ordinary (Indian) temperatures renders it very suitable for burning in lamps, whilst its comparative cheapness leads to its use as an adulteration with other more expensive oils.

No. 15. *Coorookoo or Brumadundoo oil.* (*Argemone mexicana.*)

This pale yellow limpid oil may be obtained from the round corrugated seeds of the "prickly poppy" which was originally introduced from Mexico in ballast, but now flourishes luxuriantly in all parts of Southern India. It is especially suited for lamps, and is also employed in the process dying red thread, and as an external application in cutaneous diseases. The seeds yield 12½ per cent. of oil.

W. Hamilton, Esq. M. D. remarks of this oil, "that the Materia Medica hardly presents a more valuable purgative, or one which answers so many apparently conflicting circumstances at one and the same time. In that excruciating complaint, so common in all climates, colic arising from constipation of the bowels, 30 drops of the oil taken upon a lump of sugar allay the pain as if by magic, throw the patient into a profound sleep, and after a little time produces a copious and unpainful evacuation of the bowels. The minuteness of the requisite dose, the instantaneousness of the relief, and the mild and gentle though effectual action it produces upon the intestinal canal, seem peculiarly to adapt it for cases of Cholera, superseding the use of Chloroform and Opium for subduing the cramps and mitigating the more urgent symptoms."

No. 16. *Cât amunak oil.* (*Curcas purgans.*)

This oil has of late been exported to Europe as a substitute for Linseed oil, but the results of the experiment have not as yet transpired. The shrub is plentiful all over the Presidency, and the oil can be obtained in some parts of the country for little more than the expense of the collection of the seeds and cost of extraction. It is used by the Natives in lamps, &c.

"Under the name of "seed oil" it has been imported into England to the amount of nearly 1000 tons per annum from Lisbon, where it was first used by the contractor in lighting the public streets, and so useful was it found, that it soon usurped the place of all other oils. It has been found to answer in England for cloth dressing,

which in consequence of the irregular supply of olive oil makes it a valuable acquisition, the only objection to its employment being its highly drastic property." (*Simmonds.*)

No. 17. *Piney tallow.* (*Vateria Indica.*)

The *Vateria Indica* or Doopada tree, grows plentifully in the jungles of the western coasts, and besides the product under consideration yields a resin nearly equal to copal, and a valuable building wood. The oil which is perfectly solid even in hot climates, is prepared by cleaning the seeds, then roasting and grinding them into a mass. To five seers of seed 12 seers of water are added, and the whole is boiled until the oil rises to the surface. Remove the oil, stir the contents of the vessel and allow it to stand until the following day, when a further portion of oil will be found on the surface.

This substance has been pronounced by the Railway Agent very suitable for the lubrication of the wheels and axles of Railway carriages, it is not however at present procurable in sufficient quantity to be used for that purpose, except to order. It is equally applicable to the manufacture of soap and candles. The next mentioned oil is very similar in quality to the above.

No. 18. *Gamboge Butter.* (*Garcinia pictoria.*)

A semi solid oil obtained from the seeds of the Garcinia pictoria, growing abundantly in certain parts of Mysore and in the Western coast jungles, especially near Cooly Droog. The oil which is procurable in moderate quantities, is prepared by pounding the seed in a stone mortar, and boiling the mass until the butter or oil rises to the surface; or by first roasting the seeds, and then proceeding as above. Two and a half measures of seed should yield one and a half seers of butter.

In the Nugger division of Mysore it is sold at the rate of As. 1-4 per seer of 24 Rs. weight, or £36-6 per ton, it is used as a lamp oil, and by the poorer classes as a substitue for ghee. The butter thus prepared does not seem to possess any of the purgative properties of the Gamboge resin.

Class 3.

No. 19. *Safflower oil.* (*Carthamus tinctorius.*)

The Carthamus is principally grown for the sake of the dye yielded by the petals of the flower, oil is however plentiful in the seeds and is expressed to a small extent. In Europe it is in demand for the manufacture of fancy soaps, &c. It grows plentifully in black cotton soil in Mysore and Tinnevelly. The oil which is of a clear yellow color, is edible.

No. 20. *Belgaum Walnut oil.* (*Aleurites triloba.*)

The tree which produces the Lumbang or "candle nut" grows plentifully in Hyderabad, Mysore and other parts, also in Ceylon where the oil is called "Kekune," and in the Sandwich Islands where it is named "Kickui." (*Simmonds.*)

The tree is very prolific, and the nuts yield so large a per-centage of oil, that when strung upon a thin strip of bamboo and lighted, they burn like a candle. (*Riddle.*)

No. 21. *Poovana oil.* (*Sarcostigma Kleinii.*)

This oil is as yet known only in Tinnevelly, Travancore and the Western coast. It has a very peculiar but not disagreeable odour, is burnt in lamps, and sold in the Tencausy talook of Tinnevelly, at Rs. 4 per maund. It is known in Travancore under the name of Poovengah.

No. 22. *Neeradimootoo oil.* (*Hydnocarpus inebrians.*)

This tree is produced abundantly in Travancore, and is met with on the Eastern side of the Ghats, especially near Shencotta at the entrance to the pass leading to Quilon. The oil is also known under the various names of Jungle almond, Maroty, Tamana, Maravettie, Neervittie and Soorty. It is in great repute amongst Native medical practitioners, and the oil appears somewhat drastic. The kernel has much the taste of the Brazil nut, and the shell, although differing from it in other particulars, has the same corrugated surface. It might probably be found very useful in the arts, as it much resembles Almond oil, but is much thicker. The seed yields 44 per cent. of oil, and cost As. 2-6 per seer at Madras.

No. 23. *Addale oil.* (*Jatropha glauca.*)

This seed is somewhat smaller than that of the *ricinus*, which however it much resembles. It grows wild on waste lands in South Arcot, and is cultivated in Tinnevelly, where the oil sells at Rs. 2-8 per maund. It is limpid, of a light straw color, and if procurable in sufficient quantities, would prove a very serviceable lamp oil.

No. 24. *Cress seed oil.* (*Lepidium sativum.*)

The Tamil name of the seeds of this plant, is the same as that of the Linseed, probably from its being like it of a mucilagenous nature. Its qualities and uses have yet to be ascertained.

25. *Cheeronjee oil.* (*Chirongia sapida vel Buchanania latifolia.*)

The kernels of this nut mixed with milk are eaten by the higher classes of Natives to promote fatness. They abound in a straw-colored, sweet tasted and limpid oil, which, although edible, is seldom extracted. The tree grows plentifully in Mysore, Cuddapah and other parts. Dr. Riddle states the method of separating the kernel from its shell to be as follows:

"The fruit, when ripe in May, is gathered and soaked in water to soften the outer pulp which is then rubbed off by the hand. The little nut, after being dried in the sun, is broken between a common 'chuckee' or mill, such as is used for grinding wheat, it is then shifted and winnowed."

No. 26. *Cucumber seed oil.* (*Cucumis sativa.*)

No. 27. *Melon seed oil.* (*Cucumis melo.*)

No. 28. *Pumpkin seed oil.* (*Cucurbita pepo.*)

The various species of the Cucurbitaceæ are extensively cultivated in the dry beds of rivers, or on sand banks in their vicinity, in all parts of India. The seed is sown in the hot weather, and the fruit perfected before the rains. Oil is made from the seeds in the Masulipatam and Guntoor districts, but the bulk of the fruit is sold and eaten before it arrives at maturity.

No. 29. *Coorgapilly oil.* (*Inga dulcis.*)

The "Manilla tamarind" is extensivly used in all parts of the

Presidency as a hedge plant. If permitted however, it grows to a small sized tree, the pods of which contain several flattened black seeds, from which an oil of the consistence of castor oil may be extracted.

No. 30. *Sterculia oil.* (*Sterculia fetida.*)

The seeds of this forest tree yield by expression a clear oil containing much stearine.

No. 31. *Wild Olive oil.* (*Pootrunjiva Roxburghii.*)

This tree grows plentifully in Mysore and Canara, the fruit much resembles an Olive, and the kernel contains an olive brown oil.

No. 32. *Cherroo Pinnacotay oil.* (*Calophyllum colaba.*)

A clear yellow oil obtained from this tree was forwarded to the Madras Exhibition of 1855 from Cochin.

No. 33. *Sandal seed oil.* (*Santalum album.*)

The kernel of the nut of the Sandal wood tree, yields by expression, a viscid oil, which does not give much promise of usefulness.

No. 34. *Moorgána tallow.* (?)

This valuable substance, which, even at high temperatures, is perhaps the most solid oil with which we are acquainted, is produced in Canara. If procurable in sufficient quantity and at a moderate cost, it would be doubtless an excellent material for the manufacture of candles, &c.

On the Western coast it is used medicinally as a cure for cattle wounded by tigers.

No. 35. *Naga sumpaghee oil.* (*Mesua ferrea.*)

This oil is procurable in Canara, at Rs. 4 per maund. It is chiefly used as a Lamp oil, and as a healing application to sores.

No. 36. *Cât urraloo oil.* (?)

An oblong, flattened and corrugated seed sent from Canara under the names of "Wild Castor seed" has not yet been identified. It yields a lamp oil.

CLASS 4.

No. 37. *Soapnut oil.* (*Sapindus emarginatus.*)

This oil is extracted from the kernels of the seed, and is used medicinally.

No. 38. *Cashew nut oil.* (*Anacardium occidentale.*)

The nuts of this tree yield by expression a very sweet tasted edible oil, much superior to European Olive oil, but not so cheap as the Ground nut oil. The nuts however being generally roasted and eaten, the oil is seldom expressed.

No. 39. *Ben nut oil.* (*Moringa pterygosperma.*)

This oil has long been considered valuable on account of the long period which it may be kept without contracting rancidity. This quality, as well as the very low temperature required to freeze it, renders it exceedingly useful to the watch maker and perfumer.

The tree grows in all parts of the country, and flowers at all seasons, the blossoms, green and ripe fruit being often seen on the same tree at the same time. The young leaves and green legumes are eaten both by Natives and Europeans, and the rasped root forms an excellent substitute for horse-radish, to which circumstance it owes its common name of "horse-radish tree." The oil is seldom manufactured in India.

No. 40. *Cotton seed oil.* (*Gossypium species.*)

The seeds of the various varieties of Gossypium contain a large proportion of oil, but the remains of the fibre adhere with such tenacity to the seed of almost all the varieties at present generally cultivated in India, that it is found to absorb the whole of the oil expressed, from which it cannot be separated without much difficulty. The oil is consequently never made in India, although the seed is a nourishing food for cattle. Should however, any of the varieties of Cotton with loose seeds, such as the *G. acuminatum* come into general cultivation, the oil would then become of much importance.

At present this oil is manufactured at Marsellies from seed imported from Africa, and could some cheap and easy method of ridding the ordinary cotton seed from the adherent fibre be de-

vised, thousands of maunds of seed which are now comparatively useless, could be worked up.

No. 41. *Silk Cotton seed oil.* (*Bombax.*)

A dark brown but clear oil, is obtained by expression from the seeds of the silk cotton tree, the pappus of which is sometimes used as a stuffing for pillows, although it is by some supposed to produce deafness.

No. 42. *Sweet Fennel oil.* (*Nigella sativa.*)

The black aromatic seeds generally known by the name of "Siah Danah" yield by expression a dark colored fragrant oil.

No. 43. *Rosebay oil.* (*Wrightia antidysenterica.*)

Various parts of this plant are reputed to possess medicinal virtues. The oil obtained by expression from the seeds, is of a deep red color and viscid consistence, probably possessing some of the medicinal properties of the seed.

No. 44. *Malkungunee oil.* (*Celastrus paniculata.*)

The oil expressed from the seeds of this shrub is of a bright scarlet color, and when mixed with other ingredients and subjected to destructive distillation, yields an empyreumatic product useful in Beri-beri.

No. 45. *Hemp seed oil.* (*Cannabis sativa.*)

Obtained by expression from the seed of the common hemp which is cultivated in several parts of the country for the sake of the intoxicating drugs it yields. In Russia the oil is much used for lamps but it is comparatively unknown to the Natives of India.

No. 46. *Portia nut oil.* (*Thespesia populnea.*)

From 8 to 10 per cent. of a deep red and somewhat thick oil is obtained by expression from the seeds of this tree, which grows in great abundance in the vicinity of Madras and other parts of the Presidency. It is extensively planted as an avenue tree for which its quick growth and the beauty of its flowers render it a general favorite, it is however very liable to injury from high winds (as may

be seen on reference to the Journal of the *Madras Literary Society. No. 1. New Series.*) The greater injury almost invariably suffered by trees grown from cuttings, has been frequently remarked. The wood is said to be capable of being worked, when fresh cut. The juice is used on the western coast as a remedy for various cutaneous affections.

No. 47. *Viscid Cleome oil.* (*Cleome viscosa.*)*

This warm and pungent little seed when subjected to a very powerful pressure, yields 13 per cent. of a light olive, green limpid oil.

No. 48. *Thortay oil.* (?)

Is obtainable in small quantities in Canara, it is a solid oil and used as a native remedy for sores.

No. 49. *Fænugreck oil.* (*Trigonella fœnum græcum.*)

The fresh seeds of this plant are said to yield a small per-centage of oil.

No. 50. *Abelmoschus oil.* (*Abelmoschus ficulneus.*)

In addition to its fibre, for which the plant is used, the seeds yield a small quantity of oil.

No. 51. *Gutta percha seed oil.* (*Isonandra gutta.*)

Yielded by expression. Oil but little known.

No. 52. *Croton oil.* (*Croton tiglium.*)

This well-known medicinal oil, the use of which as a drastic purgative appears to be on the decline, is seldom extracted in India, the powdered seed, being usually administered by native practitioners. It is also used in veterinary medicine.

Nos. 53 and 54. *Bryony and Colocynth oils.*

These plants grow wild in most parts of the country. The seeds are collected by shepherd boys, and boiled to obtain the oil, which is only used for lighting purposes.

* Now *Polanisia icosandra, W. and A.*—Ed.

No. 55. *Wild Cummin oil.* (*Vernonia anthelmintica.*)

This black seed grows plentifully in Mysore, and yields an oil, which however is never prepared for sale.

The following oils being used only in Native medicine, an enumeration of their names will be sufficient.

No. 56. *Bonduc nut oil.* (*Guilandina bonduc.*)
No. 57. *Mimusops oil.* (*Mimusops elengi.*)
No. 58. *Moodooga oil.* (*Butea frondosa.*)
No. 59. *Thevetia oil.* (*Thevetia neriifolia.*)
No. 60. *Oodul oil.* (*Sarcostigma Kleinii.*)
No. 61. *Garlic oil.* (*Allium sativum.*)
No. 62. *Sunflower oil.* (*Helianthus annuus.*)
No. 63. *Wild almond oil.* (*Terminalia catappa.*)
No. 64. *Star anise oil.* (*Illicium anisatum.*)
No. 65. *Gayapa oil.* ———————— ?
No. 66. *Wild nutmeg oil.* (*Myristica malabarica.*)
No. 67. *Thorny trichilia oil.* (*Trichilia spinosa.*) Empyreumatic.
No. 68. *Cyperus or Mat grass oil.* (*Cyperus juncifolius.*)
No. 69. *Thorn apple oil.* (*Datura stramonium.*) Empyreumatic.
No. 70. *Condamunnee oil.* (*Abrus precatorius.*)

No. 71. *Sand box tree oil. Hura crepitans.* The seeds of this tree (which has been introduced from Jamaica,) yield by expression, a clear oil. The whole tree, abounds in poisonous matter, but it has not yet been ascertained whether the oil possesses similar properties, the tree grows in the Horticultural gardens.

No. 72. *Saul seed oil.* (*Shorea robusta.*)

In places where this tree abounds, the oil is expressed from the ripe seed, vulgarly called the "dammer tree nut."

91 *to* 100. *Wood oils.*

The class of substances called "Wood oils" form the connecting link between the oils and resins of the natural kingdom. They consist of a volatile oil, holding in solution a resin, and are generally classed under the head of Balsams. They are obtained from various trees of the order Dipterocarpeæ, some of which also yield the dammers of commerce.

The mode of extracting the oil, is similar to that adopted for obtaining the solid resin. It is best described, in the words of a contributor to the Madras Exhibition of 1855, who says "About the end of the dry season, that is in March or April, several deep incisions are made with an axe into the trunk of the tree, and a good sized piece, scooped out. Into these holes, fire is placed and kept burning until the oil begins to run, when it is received into a bamboo, and allowed to run slowly drop by drop."

The oil, when freshly obtained from the tree and allowed to rest, separates into two layers, the upper consisting of a clear chesnut colored liquid balsam, and the lower being a flocculent deposit of the more solid resin, of a light ash color.

They are much used as natural varnishes for in-door work, but are very brittle, and require constant renewal. Perhaps the admixture of a certain proportion of some drying oil, would remedy this defect. They are said to be used also in the manufacture of Lithographic inks.

These oils are chiefly imported from our Burmese possessions and the Islands in the Straits of Malacca, and are usually known by the name of the districts, from whence they are brought.

The Camphor wood oil is a purely volatile substance, without any admixture of resin. It is the produce of the *Dryobalanops Camphora.* It is used in the Straits as a substitute for turpentine, and sells at 15 to 20 cents a bottle.

Many substances called „ wood oil" by Native doctors, are little else than varieties of tar obtained by the destructive distillation

of chips of various woods. For the names of these see Index to Section 3.

Mineral Oil.

101 *Petroleum or naptha.*

Naphtha is a limpid colorless oil, which is collected in wells, or pits dug into certain clay soils in Media and Persia. It is also found in the European state of Parma, and is used to illuminate the city of Genoa.

A substance similar to this product is obtained during the process of making coal gas, and is called coal naphtha. It is a solvent of India rubber and is extensively used in the arts.

Petroleum is a more solid product, produced largely in our Burmese possessions near Rainanghong. It is burnt in lamps, and used instead of tar for shipping.

Animal Oils.

102 *and* 103. ***Fish oils.***

The only oil of any importance which comes under the head of animal oils, is fish oil, which is largely prepared on the Western Coast. For the mode of preparation, see "*Jury Reports Madras Exhibition of* 1855, page 39.

104 *and* 105. *Neats foot oil* and *oil of wax.*

These two oils are seldom prepared, the former is, however, sometimes used for softening leather, and the latter, which is an empyreumatic product, obtained by the destructive distillation of wax, is used in Native medicine.

Volatile and perfumed Oils.

106 to 133.

Of these the only oils, made in any quantity, are those of Lemon grass, Roosa grass, Citronelle, Bishopsweed, Cinnamon, Cassia bark and Cajeput. Their properties and uses are well known. A list of the oils, in this class which are sometimes used to a small extent in Native medicine, will be found in the Index. The oil from the Guava leaf is said to be used in Ceylon.

The exports of Citronelle oil, from Ceylon are as follows:

1850	86,048oz.	£3,344
1851	114,959oz.	£5,742
1852	131,780oz.	£2,806

INDEX TO SECTION III.

VEGETABLE FIXED OILS.

Class. 1.	1 Cocoanut oil.	Cocos nucifera.
	2 Gingeley oil.	Sesamum orientale.
	3 Bastard gingeley oil.	Sesamum orientale. variety.
	4 Lamp oil.	Ricinus communis. fr. maj:
	5 Castor oil.	Ricinus communis. fr. min.
	6 Ground nut oil.	Arachis hypogæa.
	7 Linseed oil.	Linum usitatissimum.
	8 Ramtill oil.	Guizotia oleifera.
	9 Mustard or "rape" oil.	Sinapis species.
	10 Poppy oil.	Papaver somniferum.
Class 2.	11 Margosa or Neem oil.	Melia azadirach, and Azadirachta Indica.
	12 Illoopoo and Mahowa oils.	Bassia species.
	13 Pinnacotay oil.	Calophyllum inophyllum.
	14 Kurunj oil.	Dalbergia arborea.†
	15 Coorookoo or Brumadundoo oil.	Argemone Mexicana.
	16 Cât amunak oil.	Curcas purgans.
	17 Piney tallow.	Vateria Indica.
	18 Gamboge butter.	Garcinia pictoria.
Class. 3.	19 Safflower oil.	Carthamus tinctorius.
	20 Belgaum walnut oil.	Aleurites triloba.
	21 Poovana oil.	——— ?
	22 Neeradimootoo oil.	Hydnocarpus inebrians.
	23 Addale oil.	Jatropha glauca.
	24 Cress seed oil.	Lepidium sativum
	25 Chironjee oil.	Chirongia sapida.*
	26 Cucumber seed oil.	Cucumis sativus.
	27 Melon seed oil.	——— melo.
	28 Pumpkin seed oil.	Cucurbita citrullus.
	29 Coorkapilly oil.	Inga dulcis.
	30 Sterculia oil.	Sterculia fetida.
	31 Wild olive oil.	Putranjiva Roxburghii.
	32 Cherroo pinnacotay oil.	Calophyllum calaba.
	33 Sandal seed oil.	Santalum album.
	34 Mooroogana tallow.	Mesua ferrea.
	35 Naga sumpaghee oil.	Jatropha.———
	36 Cât urraloo oil.	

* Now *Buchanania latifolia*, *W. and A.*—Ed.

† *Pongamia glabra*, *W. and A.*—Ed.

Class. 4.	37 Soap nut oil.	Sapindus emarginatus.
	38 Cashew nut oil.	Anacardium occidentale.
	39 Ben nut oil.	Moringa pterygosperma.
	40 Cotton seed oil.	Gossypium sp.
	41 Silk cotton seed oil.	Bombax malabarica.
	42 Fennel flower oil.	Nigella sativa.
	43 Rosebay oil.	Wrightea antidysenterica.
	44 Malkungunee oil.	Celastrus paniculata.
	45 Hemp seed oil.	Cannabis sativa.
	46 Portia seed oil.	Hibiscus populneus.*
	47 Viscid cleome oil.	Cleome viscosa.
	48 Thortay oil.	———
	49 Fœnugreck oil.	Trigonella fœnum græcum.
	50 Abelmoschus seed oil.	Abelmoschus ficulneus.
	51 Gutta percha seed oil.	Isonandra gutta.
	52 Croton oil.	Croton tiglium.
	53 Bryony oil.	Bryonia callosa.
	54 Colocynth oil.	Cucumis colocynthis.
	55 Wild cummin oil.	Vernonia anthelmintica.
	56 Bonduc nut oil.	Guilandina bonduc.
	57 Mimusops oil.	Mimusops elengi.
	58 Moodooga oil.	Butea frondosa.
	59 Thevetia oil.	Thevetia neriifolia.
	60 Oodul oil.	Sarcostigma Kleinii.
	61 Garlic oil.	Allium sativum.
	62 Sunflower oil.	Helianthus annuus.
	63 Wild almond oil.	Terminalia catappa.
	64 Star anise oil.	Illicium anisatum.
	65 Gayapa oil.	Swietenia ??
	66 Nutmeg (wild) oil.	Myristica malabarica.
	67 Thorny trichilia oil.	Trichilia spinosa.
	68 Cyperus bulb oil.	Cyperus juncifolius.
	69 Thorn apple oil.	Datura stramonium
	70 Condamunnee seed oil.	Abrus precatorius.
	71 Sand-box seed oil.	Hura crepitans
	72 Saul seed oil.	Shorea robusta.
	73 Eugenia oil.	Eugenia.
	74 Belleric myrabolan oil.	Terminalia bellerica.
	75 Chebulic. do. oil.	Terminalia chebula.
	76 Kikuel oil.	Bergera kœnigii
	77 Balanites Ægyytiaca oil.	Balanites Ægyptiaca.
	78 Radish seed oil.	Raphanus sativus.
	79 Cabbage seed oil.	Brassica oleracea.
	80 Cardamom oil (fixed.)	Elettaria cardamomum.
	81 Poondy oil.	———
	82 Cordia or Nochie oil.	Sebestana officinalis.
	83 Girghitly oil.	———
	84 Jogyhulloo oil.	———
	85 Nux vomica oil.	Srychnos nux vomica.
	86 Marking nut oil.	Semecarpus anacardium.
	87 Cashew husk oil.	Anacardium occidentale.
	88 Oleum nigrum oil.	Celastrus &c.
	89 Tobacco seed oil.	Nicotiana tabacum.
	90 Alligator pear oil.	Persea gratissima
	90½ Cinnamon tallow.	Cinnamomum Zeylanicum.

* Now *Thespesia populnea*.—Ed.

	Wood Oils.		
Class. 2.	91 Teakwood oil.		Tectona grandis.
	92 Wood oil from	Pegu.	Dipterocarpus alatus.
	93 do.	Rangoon.	do. ——— ?
	94 do.	Chittagong.	do. ——— ?
	95 do.	Moulmein.	do. ——— ?
	96 Shemanathee wood oil.		Seth ia indica.
	97 Sissoo wood oil.		Dalbergia sissoo.
	98 Camphor wood oil.		Dryobalanops camphora.
	99 Wood oil.		———
	100 Wood oil.		———
	Mineral Oil.		
Class, 1.	101 Petroleum and Naptha.		
	Animal Oils.		
	102 Fish oil.		
	103 Fish liver oil.		
Class, 2.	104 Neats foot oil.		
	105 Oil of wax.		
	Volatile and Perfumed Oils.		
Class, 1.	106 Cinnamon bark oil.		Cinnamomum Zeylanicum.
	107 Cinnamon leaf oil.		do.
	108 Cassia oil.		Cinnamomum cassia.
	109 Clove oil.		Caryophyllus aromaticus.
Class. 2.	110 Lemon grass oil.		Andropogon schœnanthus
	111 Roosa grass oil.		Andropogon iwarancusa.
	112 Cajeput oil.		Melaleuca cajaputi.
	113 Camphor tree oil.		Dryobalanops camphora.
Class. 4.	114 Anise seed oil.		Pimpinella anisum.
	115 Fennel flower oil		Nigella sativa
	116 Nutmeg (wild) oil.		Myristica malabarica.
	117 Sassafras oil.		Sassafras officinale.
	118 Bishop's weed or omum oil.		Ptychotis ajowan.
	119 Cardamom oil.		Elettaria cardamomum.
	120 Cummin seed oil.		Cuminum cyminum.
	121 Spikenard or jatamansi oil.		Valeriana jatamansi.
	122 Cuscus root oil.		Anatherum muricatum.
	123 Tobacco leaf oil.		Nicotiana tabacum.
	124 Sweet flag oil.		Acorus calamus.
	125 Pepper oil.		Piper nigrum.
	126 Cubebs oil.		Piper cubeba.
	127 Lime peel. and leaf oil.		Citrus limonum.
	128 Orange flower, or neroli oil.		Citrus aurantium.
	129 Orange peel, and leaf oil.		do.
	130 Citron peel, and leaf oil.		Citrus medica.
	131 Mustard oil (volatile.)		Sinapis species.
	132 Sandal wood oil.		Santalum album.
	133 Guava leaf oil.		Psidium pyriferum.

N. B.—This list is not to be taken as by any means including the whole of our indigenous oil plants.

SECTION IV.

Remarks on the economical uses of Oils in India.

The value of the *commercial* oils of India, being already so generally known to Merchants and Manufacturers, both at home and in this country, any remarks on this head would be superfluous; it remains, however, to consider in what ways, we may become the *consumers* as well as the *exporters* of oils.

I would more particularly refer to their uses in the raw state for currying leather and making buff, for burning in lamps, for lubricating machinery, for anointing the person, and as an article of food,—to their value in a somewhat modified form, as a vehicle for paints, and varnishes,—and lastly to their employment in the manufacture of candles and soap.

Oil—as used for currying and buffing leather.—Experience has shown that the kinds of oil most suited for the preparation of leather, are those derived from the animal kingdom. Of these, fish oil, neats foot oil, and the solid fats of oxen, sheep and pigs, are those most generally used. Some one of these, or a mixture of several of them as the case may be, is rubbed over the underside of the tanned skin whilst still wet. The leather being then hung up in an airy loft to dry, the evaporation of the moisture enables the composition to penetrate through the substance of the hide until it appears on the surface or grain side. The beef, mutton and pigs fat used in this process are procurable with difficulty and at high prices.

At present, but little leather is curried in India, and the demand for these substances is consequently limited, but should this branch of trade rise into importance (of which there can be no reasonable doubt,) and should hides be tanned and finished on the spot, instead of being sent to Europe in the raw state, and re-imported when dressed, the supply of these substances will become of greater moment, and it will be a question for the practical manufacturer to decide, whether it is more to his interest to pay the current Indian prices, or to import his materials direct from Australia

Fish oil, however, is procurable in abundance at reasonable prices

indeed, the Indian article has entirely superseded the use of English oil, which, until the establishment of this manufacture on the Western coast, was imported at a high price for the use of the Government Buffing establishment at Hoonsoor.

A comparison of the price of the Indian and English article is shown below, and as regards quality, it has been found that the Native oil, if made with care, is fully equal to the English product.

Cost of English oil per gallon Rs. 2 4 0

Cost of Malabar oil per gallon Rs. 1 10 0

The saving thus effected in this one article alone, in this large establishment, is very great.

Oil—as used for burning in lamps.—Almost all the oils procurable in India, are burned to a greater or less extent by the native population in the rude contrivances which serve as lamps. For the finer description of European lamps, however, only the fluid non-drying oils should be used. Of these Cocoanut, Ground nut, Coorookoo, Kurunj, and a few others are to be preferred. The first is decidedly the best, but in cold climates, it requires to be mixed with a due proportion of some other oil to prevent its tendency to congeal at low temperatures. Drying oils, such as Castor, Lamp, and Linseed oil are unsuitable for these lamps, as the oil becoming viscid, clogs the tubes; they may, however, in common with many other sorts of oil, be burned with advantage in open vessels or night lamps. Some of them emit much smoke.

In the preparation of these oils for burning in lamps, much improvement might be effected. Excepting Cocoanut, the generality of oils as sold in the market, are contaminated with mucilage and extraneous substances, which much impair their burning qualities.

The usual mode of purifying oil, is to add to 100 parts of oil one part of Sulphuric acid, and agitate the mixture; the acid immediately attacks and chars the slimy parts of the oil. In half an hour add 50 parts of water with agitation, and allow the whole to settle for some days. Decant the clear oil, and wash with water to get rid of the acid. The same object may be effected in a less degree by keeping the oil for some time in a quiet place, this improves it by

allowing the mucilage to subside ; for this reason, old oil is preferable to new for lamps. The manufacture of oil gas for illuminating purposes must not be passed over in silence. Oil dropped on a red hot surface is instantly converted into gas, (oil gas) and with the aid of very simple machinery, can be made by the most inexperienced person. It was at one time made to some extent in England, but the high cost of the oil and other causes, led to its abandonment in favor of coal gas.

Oil,—as a lubricating agent.—Any of the fluid non-drying oils, may be used as lubricants for machinery. For fine work, the Ben oil (Hyperanthera moringa) being free from any disposition to rancidity, is to be preferred, but for Railway carriages, a more solid substance, such as Piney tallow or Gamboge butter is more suitable. At present, however, a composition prepared by agitating lamp oil with nitric acid, for which the maker holds a patent, is employed successfully. The Gamboge butter, has been reported on favorably, by the Railway agent, as " very clear and free from grit, and suitable for lubricating axles." A more extended experiment with this substance is in contemplation. A locomotive engine is said to consume between eighty and one hundred gallons annually. A mixture of grease and tar is used for Native carts.

Oil—for anointing the person.—As an application for rendering the skin supple, which in tropical climates, is an almost indispensible necessary of life, any of the greasy oils will answer. Those generally preferred by the natives are Cocoanut, Gingeley, and Mustard oils. The former has been sometimes used by the European perfumer in the manufacture of scented oils for the hair, but the difficulty of preventing its acquiring the well known disagreeable odour, or of disguising it with the most powerful scents, is the chief objection to its use. The Moringa or Ben oil, from the great length of time, it keeps without acquiring rancidity, is well suited to the perfumer's use.

Oils—as articles of food. Oil is largely used as an article of food in all tropical countries, and as the qualities of most edible oils are well known, little need be added on this head further than to recommend greater cleanliness in the expression, and a more profitable use of the oil cake ; which, however, valuable as a manure is

still more useful for fattening cattle. As an ingredient in salads and similar dishes, for which it is used to a limited extent by Europeans in India, there is every reason to hope, that the native product, will ere long entirely supersede the imported article. Numerous indigenous plants such as the Poppy, Mustard, Gingeley, Ground nut, Chironjie, Cucumber, Cashew nut, &c. yield oils fully equal to the best product of Italy, with the advantage of superior freshness. Indeed, they are even now frequently used in preference to the English oil, and the only bar to their general adoption, is the difficulty of getting them extracted, in a pure state by the native press.

It is a well known fact, that a large portion of the oil prepared from seeds yearly exported from India, is consumed as " salad oil" in Europe, and part finds its way back to India, under the same name, although the fresh product is procurable on the spot, at a tenth part of the price of the re-imported article. The amount of Salad oil imported at Madras during two years was as follows :

In 1849-50, Galls. 268, value Rs. 1,139.

In 1850-51, Galls. 399, value Rs. 1,809.

The imports of Olive oil into England in 1851 amounted to 20,783 tons of 252 gallons each.

Oil,—as used in the preparation of woollen cloths, &c.—As a dressing for woollen cloth, oil is seldom if ever used in India, nor indeed is it probable that it ever will be, many of the indigenous oils, are however well suited for this purpose.

Oil,—as a vehicle for paints, varnishes, &c.—Poppy and Linseed oils, are in general repute in Europe for paints and varnishes. The former may be cheaply prepared in the opium districts of India, and from its perfect clearness and limpidity (when bleached) it is most valuable to the portrait and miniature painter, whilst the price at which it can be made renders it available for more common descriptions of work. From the fact, of no vegetable oils, (except wood oils,) being used as ingredients in paints by the Natives of India, it has not yet been ascertained which of the many varieties procurable in various parts are useful for this purpose.

Linseed, as will be seen on reference, to the first part of this

port, is now becoming a large article of produce and export trade, the oil however still continues to be imported from England, for the public service and private use. Trials have been made of the relative value of oil, obtained from seed grown in the country, and of the imported article, the results of which, have established the perfect similarity of the two products, there are however several precautions to be observed, in the preparation of this oil, the neglect of which has caused the country article to be less esteemed. The oil must be obtained perfectly pure, and unadulterated by the admixture of any greasy oil, which would of course destroy its drying qualities and render it useless for paint, it should not therefore be prepared in a press which has been used for other oils, unless it has been first thoroughly cleansed, a matter of some difficulty with the ordinary native press. To render the oil *drying*, the process although very simple, is one which requires some practice to succeed fully. It is generally effected by boiling 100lbs. of Linseed oil with 1lb. litharge, and maintaining the mixture for an hour at a temperature of 100. Cent. Indian oil thus prepared, is perfectly equal to that obtained from England for paints and varnishes. The imports of Linseed oil, and the exports of seed for the last six years, have been as follows.

OIL IMPORTED.

In 1849-50	Gallons.	1,311	value Rs. 2,623	from England
1850-51	,,	2,832	6,358	do.
1851-52	,,	2,823	5,978	do.
1852-53	,,	4,552	8,763	do.
1853-54	,,	6,505	13,060	do.
		237	474	from Indian ports.
1854-55	,,	2,879	5,270	from England.
		668	1,883	from Indian ports.

SEED EXPORTED.

1849-50	Cwt.	401	value Rs.	1,539
1850-51	,,	801		2,271
1851-52	,,	1,067		2,927
1852-53	,,	1,106		3,275
1853-54	,,	2,898		9,588
1854-55	Quarters	293		5,914

The imports of Linseed oil into England in 1851, amounted to Quarters 608,986.

As a great variety of pigments and of resins for varnishes are procurable in India, the present large item of imports under the head of "paints and colors" might be materially diminished.

The wood oils of India are in themselves natural varnishes, being composed of a mixture of a resin and a volatile oil, they are not however so durable as the Linseed oil varnish, being more brittle and liable to scale off, though they answer well for in-door work; the addition of a due proportion of any good drying oil, would perhaps render them more durable.

Oil,—as used in the manufacture of Candles and Soaps. We now proceed to consider oils in a higher state of manufacture, or when converted into candles and soap.

As regards the former article, it is doubtful whether candles can be manufactured in India at a sufficiently remunerating price to enable a local company successfully to compete with the imported article. This question indeed is one for the practical manufacturer to determine. Candles might be made with ease, but to make them cheaply would involve a large outlay for machinery, &c. The imports of wax and candles (almost entirely the latter,) and the exports of bees' wax are as follows.

IMPORTS.

1849-50	lbs.62.720	Rs. 45,953	from England.
1850-51	lbs. ——	Rs. 4,778	from England.
	lbs. ——	Rs. 2,549	from Bengal and Bombay.
1851-52	lbs.52,478	Rs. 28,720	from England.
	lbs. 6,272	Rs. 4,178	from Bengal and Bombay.
1853-52	lbs.35,366	Rs. 18,213	from England.
	lbs. 2,977	Rs. 1,808	from Indian ports.
1853-54	lbs.41,914	Rs. 21,690	from England.
	lbs. 4,255	Rs. 2,369	from Indian ports.
1854-55	lbs.61,386	Rs. 31,523	from England.
	lbs.10,194	Rs. 3,739	from Indian ports.

EXPORTS.

1849-50		lbs.2,64,096	Rs. 1,12,270	
1850-51		lbs.3,13,697	Rs. 86,614	
1851-52		lbs.2,36,378	Rs. 95,286	to England.
		lbs.1,07,260	Rs. 44,726	to Bengal and Bombay.
1852-53		lbs.2,32,000	Rs. 99,713	to England.
		lbs. 65,609	Rs. 27,083	to Bengal and Bombay.
1853-54	Wax.	lbs. 43,000	Rs. 15,434	to England.
		lbs. 10,602	Rs. 3,760	to Indian ports.
	Candles.	lbs.1,89,886	Rs. 76,834	to England.
		lbs. 19,776	Rs. 16,377	to Indian ports.
1854-55	Wax....	lbs. 85,615	Rs. 31,054	to England.
		lbs. 87,010	Rs. 35,646	to Indian ports.

IMPORTS RE-EXPORTED.

1849-50	lbs.	10,976	Rs. 4,048	
1850-51	,,	2,412	,, 1,327	
1851-52	,,	4,482	,, 3,266	
1852-53	,,	6,660	,, 2,623	the larger proportion went to Pegu.

Soap.—The ingredients for making soap are ever at hand, and available to the most humble workman. Although the quantity of this substance used by the native population is, it is to be feared, very small, yet the trade would afford ample employment, to a large establishment. A large quantity of the common chunam or country soap, is imported from Bombay, and sold at 1 anna per lb., and upwards. The amount of hard soap annually manufactured in England is stated to be 53,400 tons, of which about 17,800 tons, are made from palm oil, which is imported for this and other purposes to the extent of 50,000 tons per annum.

We are not, however entirely without soap manufactories in South India; Messrs. Kohlhoff, and Prudhomme at Tanjore; Dr. Flynn, and C. Bauloo Moodelly, at Madras, make soap to a greater or less extent. Mr. Kohlhoff of Tanjore, who manufactures soap on a large scale, (chiefly from Illoopoo oil,) for exportation to the Mauritius, as well as for local sale, at 80 Rs. per candy, of 500 lbs., has kindly placed the following remarks on the relative value of soaps, made of various Indian oils at my disposal. I can also add my testimony, to the superiority of the soap made from Illoopoo oil,

according to his method over all other soaps; for a quantity of this soap, exhibited by Mr. Kohlhoff at the Madras Exhibition of 1855, was purchased and kept in an open place exposed to all weathers till the present time, (June 1857.) It does not appear to have sensibly diminished in weight, or to have been affected by heat or damp, but remains perfectly firm and good, whilst English bar soap, under the same circumstances has shrivelled up to two-thirds of its original size. I prefer it therefore to ordinary English bar soap, which does not stand the test of extremes of temperature, nearly so well.

Mr Kohlhoff observes—"*Cocoanut oil soap* is of inferior quality, if exposed to damp it will melt away, and if allowed to dry it will shrink, wherefore it is the object of the manufacturer to prevent loss by making only such a quantity at a time, as he is likely to sell immediately. *Castor oil soap* is too clammy, and from its offensive smell, is unfit for use. *Gingeley and ground nut oil soap*, are like each other, they are certainly better than the Cocoanut oil soap, but not so good as that made from *Illoopoo oil*, which is decidedly superior to all. *Pinnay oil* soap, may be considered as good as that manufactured from Gingeley and Ground nut oils for washing linen, &c. but it has a dirty brown color which is unfavorable to the seller. *Margosa oil soap* is on a par with the above in utility, but may be classed with the Gingeley and Ground nut soaps in point of color, which will be a pale yellow, but the smell of the Margosa soap is unpleasant."

The process of manufacturing the above mentioned soaps, is as follows: "Two cisterns being built one above another, two-thirds of chunam, mixed with one third of Fuller's earth is pressed very tightly into the upper cistern. Water being poured thereon, the lye will slowly filter through, and be received into the lower reservoir.

About two-thirds or three-quarters of this lye (according to the nature of the oil, employed,) is mixed with the oil, and allowed to remain three days with occasional stirring. The whole is then boiled in a copper cauldron, until the soap separates from the lye water. A small quantity of pure cold water, is then poured in and stirred up to clarify. The soap is then poured into moulds, and cut into bars, when cold. When sufficiently dry, it is smoothened and ready for sale."

APPENDIX A.

Abstract Statement of Exports of Oils and Oil seeds from Madras and the subordinate Ports, from 1850-51, *to* 1854-55.

DESCRIPTION.	1850-51.		1851-52.		1852-53.		1853-54.		1854-55.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Gallons.	Rupees.	Gallons.	Rupees.	Gallons.	Rupees.	Gallons.	Rupees.	Gallons.	Rupees.
Oil Cocoanut	6,56,118	1,44,952	9,56,937	2,11,669	14,57,741	3,18,655	17,97,450	3,89,722	21,41,572	5,08,530
,, Gingeley	77,262	48,605	46,196	26,722	72,607	43,608	1,19,180	73,635	17,139	12,720
,, Lamp	26,093	13,386	24,475	11,979	51,048	20,927	50,770	25,014	45,555	27,069
,, Castor	15,971	25,132	12,600	15,694	8,059	7,818	7,818	8,580	48	144
,, Ground nut	1,10,566	52,840	31,027	14,760	57,207	23,603	82,886	51,760	45,361	31,487
,, Margosa	0	0	1,917	1,048	3,111	1,701	0	0	0	0
,, Pinnacottay	0	0	0	0	0	0	0	2,287	0	1,290
,, Fish	39,489	12,717	77,240	22,157	2,57,217	71,769	7,21,095	2,06,863	2,67,161	77,217
,, Cassia	1,000	3,053	473	1,572	430	1,701	0	0	0	0
,, Other sorts	0	0	0	3,766	0	3,867	0	2,080	0	2,101
Total	9,26,499	3,00,685	11,50,865	3,09,367	19,07,456	4,93,649	27,79,199	7,59,941	25,16,836	6,60,558
Seeds Gingeley	2,27,779	4,37,185	1,09,414	3,02,559	2,51,613	5,31,664	11,98,079	6,93,760	1,67,324	4,31,726
,, Lamp	6,011	12,347	6,125	9,993	73,215	54,228	7,076	17,652	7,044	19,150
,, Castor	14,617	24,096	0	0	2,764	4,247	15,475	24,379	0	0
,, Ground nut	795	1,728	0	0	0	0	0	0	357	1,107
,, Linseed	801	2,271	1,067	2,927	1,106	3,257	2,898	9,588	1,308	5,914
,, Mustard	9,908	22,097	3,636	9,319	16,057	34,048	18,028	39,359	3,698	10,654
,, Pinnacottay	0	0	0	0	360	1,167	0	0	0	0
,, Croton	0	0	0	0	0	0	0	0	143	1,453
,, Other sorts	0	10,648	0	8,874	0	9,300	0	13,543	.....	11,055
Total	2,60,625	510,372	121,511	3,33,072	3,46,584	6,37,929	12,42,930	798,281	1,80,394	4,81,059
Total value of oil and seed	..	811,057	..	6,42,439	..	11,31,578	..	15,58,222	..	16,41,617

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APPENDIX B.

Statement showing the total value of Oil and Oil Seeds, exported for the last 5 *years, ending* 30*th June,* 1855.

	1850-51.			1851-52.			1852-53.			1853-54.			1854-55.			TOTAL.			AVERAGE.		
	Value of oil.	Value of oil seeds.	Total.	Value of oil.	Value of oil seeds.	Total.	Value of oil.	Value of oil seeds.	Total.	Value of oil.	Value of oil seeds.	Total.	Value of oil.	Value of oil seeds.	Total.	Value of oil.	Value of oil seeds.	Total.	Value of oil.	Value of oil seeds.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs	Rs	Rs.	Rs.	Rs.
Ganjam	2,536	65,167	67,697	7	[illegible]	[illegible]	594	276,682	277,276	489	186,721	189,210	1,018	167,874	168,892	4,638	805,361	809,999	927	161,072	161,999
Vizagapatam	9,620	133,455	142,985	3,769	[illegible]	[illegible]	4,791	171,987	176,778	2,610	207,122	209,732	363	101,615	101,978	21,053	709,263	730,316	4,211	141,852	146,063
Rajahmundry	10,125	133,182	143,307	11,547	120,894	132,441	25,054	225,536	250,590	21,534	343,986	365,520	17,022	222,879	239,901	85,282	1,046,477	1,131,759	17,056	209,295	226,351
Masulipatam*																					
Guntoor	316	14,733	15,049	520	29,069	29,589	490	28,678	29,168	314	42,099	42,413	270	29,342	29,612	1,910	143,921	145,831	382	28,784	29,166
Nellore	5,138	234,728	239,866	9,972	251,744	261,716	12,498	188,503	201,001	7,811	98,447	106,201	5,757	9,042	14,799	41,209	782,464	823,673	8,242	156,492	164,734
South Arcot	55,144	109	55,253	11,904	108	12,012	29,178	827	30,005	41,977	1,465	43,442	21,229	429	21,658	159,432	2,938	162,370	31,886	588	32,474
Tanjore	13,528	944	14,472	16,981	1,077	17,058	19,338	2,081	21,419	28,107	21,256	49,363	39,837	239	40,076	116,791	25,597	142,388	23,350	5,119	28,477
Madura	438	20	458	199	0	199	435	1	436	873	83	956	172	2	174	2,117	106	2,223	423	21	444
Tinnevelly	120	3	123	175	0	175	532	38	570	1,238	751	1,989	634	1,916	2,550	2,699	2,708	5,407	540	541	1,081
Canara	42,467	6,692	50,159	40,070	7,669	47,739	64,178	4,948	69,126	128,870	6,239	135,109	98,494	16,364	114,858	375,079	41,912	416,991	75,016	8,382	83,398
Malabar	167,256	790,779	958,035	255,274	1,003,868	1,259,142	420,157	1,042,871	463,028	654,146	849,262	1,503,408	643,119	759,366	1,402,485	2,139,952	4,446,146	6,586,098	427,990	889,229	1,317,219
Total	307,582	13,79,822	16,87,404	349,418	16,18,420	19,67,838	577,245	19,42,152	2,519,397	888,002	17,57,431	26,45,433	827,915	13,09,068	21,36,983	29,50,162	80,06,893	109,57,055	590,031	1,601,375	2,191,406

REVENUE BOARD OFFICE,
FORT ST. GEORGE,
9th February, 1857.

(Signed.) G. S. FORBES,
Acting Secretary.

* The quantity only is given, but no value.

† Land frontier is not included in this.

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