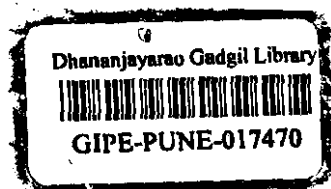


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REPORT
ON THE
INVESTIGATION
OF
INDIGENOUS DRUGS

BY
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GENERAL HOSPITAL, MADRAS,
7th December 1918.

R.C. No. 33.

From

M.R.RY. RAO BAHADUR M. C. KOMAN AVARGAL, L.M. & S.,
HONORARY PHYSICIAN, GENERAL HOSPITAL, AND OFFICER
IN CHARGE OF INVESTIGATION INTO INDIGENOUS DRUGS,
MADRAS.

To

THE HON'BLE THE SURGEON-GENERAL
WITH THE GOVERNMENT OF MADRAS,
MADRAS.

SIR,

I have the honour to submit the report on the investigation into indigenous drugs from 12th July, the date of my assuming charge of the office, to 31st October 1918.

2. *Preliminary work.*—To get an insight into the nature of the work I had to carry out, I considered it necessary that I should acquire a preliminary knowledge of the properties of some of the drugs and their compounds by acquainting myself with what was stated about them in some of the well-known Ayurvedic works and by observing practically their methods of preparation, application and administration. The works of U. C. Dutt, K. L. Dey, *Pharmacographia Indica*, Mohideen Sheriff's works, N. N. Sen's *Ayurveda*; *Susrutha* (English translation), *Charaka* (Malayalam translation) and several Ayurvedic compilations in Malayalam were of much help to me in conducting my investigation. As for the practical portion of my work, I made it a point to visit the local Ayurvedic dispensaries as often as possible and to observe and note what was being done in those institutions. During these visits, I was able to gather information with regard to the methods adopted in the preparation of drugs and their compounds, methods of diagnosing diseases and also the various methods of treatment. The apparatuses which are used in the Ayurvedic pharmacies are all antiquated and require considerable modifications in the light of modern scientific knowledge. Those who practise Ayurveda in the city with a few exceptions were all willing to help me in conducting my investigations. I cannot say the same of the Unani physicians; with the exception of Hakim Shiffai-ul-mulk Zianalabddheen Sahib Bahadur and Hakim Maghddum Asaraff Sahib Bahadur, who were kind enough to give me a few prescriptions, they were either reticent or unwilling to render any help. One of the Unani hakims when asked by the Surgeon-General, if he would divulge the composition and method of preparation of any of his secret remedies, replied that he could not afford to lose his living by such a procedure. No doubt the Surgeon-General admired him for the courage of his conviction, but at the same time was sorry to see even in a venerable hakim an agent to debase the ethics of a noble profession. As my knowledge in the theory and experience in the practice of Ayurveda were not sufficient to enable me to prescribe medicines for diseases, I had to select suitable patients at the General Hospital, to whom to fit the medicines which I was gradually collecting. The selection of cases was a difficult task which any one can easily understand when one had to find diseases to suit medicines. This work of investigation cannot be well conducted in an out-patient dispensary, as it would be difficult to trace the whereabouts of the patients for purposes of correctly noting

results. My thanks are due to the Medical officers of the General Hospital for their kindness in placing under my treatment patients whom I wanted to treat with Ayurvedic or Unani medicines. I have also to thank Vaidya Ratna Pandit D. Gopala Acharlu and Pandit Kannappa Mudaliyar for several free samples of medicines given by them for experimental purposes. I am obliged to the staffs of the local Ayurvedic dispensaries for permitting me to observe the work done in those institutions, although at times my visits must have inconvenienced them to some extent. I have devoted my attention chiefly to studying the therapeutical actions of the drugs and of compound preparations in general use, which I have been able to collect. To make a pharmacological research into these, would require a well-equipped laboratory with a staff of duly-qualified and competent physiologists and chemists who have had a previous training in such work. Even the work of investigation which I am now doing, viz., a study of the therapeutical actions of the drugs of Ayurvedic and Unani systems, will take at least two or three years before it is completed. I therefore request that I may be permitted to submit annual reports on it. The work here has been sufficient to keep me fully engaged and there is still enough of material for further investigation. I have not therefore been able to go on tour hitherto, but as recently the services of a Sub-Assistant Surgeon and a small staff have been sanctioned for me, I intend touring in the districts shortly for collecting materials for investigation.

3. Seven annexures are appended to this report—

- (1) Notes on drugs and compounds which have been investigated.
- (2) Summary of the notes on medicines investigated, found useful and recommended for further trial.
- (3) The composition and the methods of preparations of those mentioned in No. (1).
- (4) The composition and the methods of preparation of the drugs collected but not investigated.
- (5) Statement showing the diseases treated at the General Hospital with Ayurvedic medicines and results.
- (6) Chemical Examiner's report on analysis of drugs.
- (7) Copies of circular letters sent to the District Medical and Sanitary Officers and Civil Surgeons.
- (8) Copies of circular letters sent to the Collectors of districts.

4. In selecting diseases I have generally avoided taking up for Ayurvedic treatment very serious cases, as, as a novice, I did not wish to bring the method of treatment into disrepute.

5. I would suggest that the drugs and compounds whose properties have been already investigated by me and found efficacious may be given a fair trial in the various hospitals in the Presidency and reported upon by the Medical officers in charge.

6. When investigation into a fairly large number of drugs has been completed, I shall submit a statement showing the comparative values of the drugs investigated by me and those already in use.

7. In conclusion, I have to state that I began this work with much diffidence and that the mental strain involved in conducting it was considerable. I have therefore to thank Major-General G. G. Giffard, C.S.I., I.M.S., for his kind advice on many occasions and for encouraging me in every way in the conduct of these investigations.

I have the honour to be,

Sir,

Your most obedient servant,

M. C. KOMAN,
Honorary Physician.

APPENDIX I.

Properties and actions of the drugs and compound preparations administered to patients up to the date of the report.

SINGLE DRUGS.

1. *Mocharas*—*Bombax Malabaricum*—
Natural order—*Malvaceæ*.
Sanskrit—*Salmili*.
Tamil and Malayalam—*Mullilavamaram*.

This is the gum obtained from *Bombax Malabaricum* (vide prescription No. 4).

Therapeutic uses.—This gum is an astringent, demulcent and hæmostatic. This was tried in two cases of chronic dysentery, in hæmoptysis of pulmonary tuberculosis and influenza, hæmatemesis, mæna and menorrhagia and acute dysentery with very beneficial results. The blood disappeared from the vomited and purged matters in two or three doses of 40 grains each, but in acute and chronic dysentery its action was slow and had to be accelerated by the addition of other drugs like *holarrhena anti-dysenterica*, *pomegranate rind*, etc.

Chemical composition.—When macerated in water this gum affords a reddish brown solution which gives a dirty greenish precipitate with ferric salt. The solution contains a little gum precipitated by alcohol. The bulk of the drug remains undissolved (*Pharmacographia Indica*).

2. *Bamboo Manna*—*Bambusa Arundinaceæ*—
Natural order—*Graminæ*.
Sanskrit—*Vanslochana*.
Tamil—*Mungalluppu* (vide prescription No. 3).

The siliceous concretions found in the joints of the female bamboo (*bambusa arundinaceæ*). *Tabasbeer* is its Hindustani name. Small irregularly-shaped fragments of opaque white or bluish opalescent colour. The larger pieces are concave or convex and have evidently derived their form in the joints of the bamboo in which they are found as deposits.

Therapeutic action.—It is said to possess cooling, tonic and aphrodisiac properties and is given for the relief of asthma, cough of consumption and in hectic fever with cough.

It enters into the composition of numerous prescriptions for the affections of the lungs; two of the most common are *Sithopaladi churnam* and *Talisyadi churnam*,

The latter vide prescription No. 3 (b)—has been tried by me in pulmonary tuberculosis, in intestinal tuberculosis with hectic fever, in acute and chronic bronchitis and in bronchitis following influenza. It gave a certain amount of relief in pulmonary tuberculosis and in bronchitis in allaying cough, but the action was very slow. It did not have any effect on the hectic fever of tubercle. A case of bronchitis after influenza was benefited by its use.

3. *Veppalai*—*Holarrhena anti-dysenterica*—
Natural order—*Apocynaceæ*.
Telloherry or Conessi bark. Sanskrit—*Kutaja* (vide prescription No. 7).

The bark of this tree is one of the most important articles in the Hindu *Materia Medica* and is said to possess astringent, digestive and expectorant properties. It is given either alone or in combination with other astringent drugs in cases of acute and chronic dysentery, in piles, in painful dyspepsia and chronic chest affections such as asthma, also in colic and diuresis. The seeds or *veppala-arisi* are considered to be astringent, anthelmintic, carminative and febrifuge. The expressed juice of the bark is considered to be more efficacious in acute cases of dysentery than the bark or the seeds. The bark and seeds are usually combined with other medicines, for example, *Kutaja arishtam*, *Kudaja panitham*, *Dadhumashtaka churnam*. I have found its compound preparations useful in cases of acute and chronic dysentery and chronic diarrhoea.

The action of the seeds when uncombined was found to be very slow. In a case of chronic dysentery of long duration in which amæbæ were found in the stools, a compound preparation of *Kudaja* with *Salmili* brought about a gradual cure.

Chemical composition.—The bark and seeds contain a basic substance named wrightine which has a bitter taste and forms uncrystallisable salts with dilute acids.

4. *Cleome viscosa*—
Natural order—*Capparidæ* (vide prescription No. 9).
Sanskrit—*Adithya Bakhtha*.
Tamil—*Nayi-Velai*.

The seeds of this plant are said to possess anthelmintic and rubefacient properties. *Mohideen Sheriff* recommends the pure dried seeds as substitute for *santonin*. The dose recommended is half to one drachm for adults and half the quantity to children to be given twice a day for two days and followed on the third day by a dose of castor-oil. I tried the drug as per directions given above in an adult and in a child whose motions contained large number of round worm ova, but the result was negative in both the patients.

5. *Aconitum Heterophyllum*—

Natural order—Ranunculaceæ.

Sanskrit—Ativisha

Tamil—Atividyam (vide prescription No. 12).

I found it difficult to get the tuberous roots (adividayam) of this plant in a pure state from the Madras bazaars. The pure roots should break with a short starchy fracture, should taste bitter without producing any acidity and tingling sensation of the tongue. The pure drug was obtained from Malabar and tried in a case of acute dysentery and in a case of chronic enteritis. In both these cases, 30 grains of the drug were rubbed up in two ounces of butter-milk and given twice a day. Eight doses were sufficient to cure the acute case, the diet being arrowroot and milk. It took three weeks for the case of chronic enteritis to get well, the patient being all the time on a diet of well-boiled rice and curd. Mohideen Sheriff recommends its use as an antiperiodic in two drachm doses. The appetite of the patients improved under its use. I consider it a valuable drug in commencing acute dysentery. It enters into several compound preparations for dysentery and diarrhoea with fever.

Chemical composition.—Two uncrystallizable alkaloids are stated to be present in the root one of which is atisine. The other substances present are aconitic acid, tannic acid, cane sugar, fat, starch and vegetable mucilage.

6. *Adhatoda Vasica*—

Natural order—Acanthaceæ.

Sanskrit—Vaaka.

Tamil—Adathoda.

Malayalam—Adalodam (vide prescription No. 10).

This plant is found in most parts of India. The fresh juice or decoction of the leaves or a decoction of the root (vide prescription) is generally administered as an expectorant and antispasmodic in asthma, chronic bronchitis and consumption. The decoction of the roots is generally given combined with other expectorants. This decoction was given in half a dozen cases with varying results. It did good in cases of chronic bronchitis but had not the slightest effect in pulmonary tuberculosis; on the other hand its use for a few days brought on an attack of hæmoptysis in a case of pulmonary tuberculosis. Indian physicians especially on the west coast have high opinions of its efficacy in all pulmonary affections. It is useful in bronchial affections. The leaves are stated to contain an alkaloid known as vasicine in combination with an organic acid to which Dymock gives the name of adathodic acid.

7. *Semecarpus Anacardium*—

Natural order—Anacardiaceæ.

English—Marking nut.

Tamil—Sheran kottai.

Sanskrit—Bhallataka (vide prescription No. 8).

This is a common drug in India. The fruit and the acrid oil which can be obtained from the fruit by expression or with the aid of heat with a certain amount of care are used medicinally. Both when used internally are said to be sedative, antispasmodic, nervine, digestive and alterative. Externally the oil is rubefacient and vesicant. Mohideen Sheriff recommends its use in asthma, in secondary syphilis, dyspepsia, piles, neuralgia, epilepsy, leprosy, psoriasis and other cutaneous affections and nervous debility. He says that marking nut is held in high esteem as a therapeutic agent by the Muhammadan practitioners in India, Persia and Arabia. The Ayurvedic physicians use it as a powerful restorative tonic and recommend its use in chronic stomach complaints and diseases of the rectum. The acrid oil may be given in one to two drachms doses mixed with mucilage and sugar or the nut itself may be given in the form of an electuary made by mixing one part of the nut, six parts of the kernel of cashewnut (*anacardium occidentale*) and one part of clarified honey. Dose 1 to 2½ drachms. Mohideen Sheriff considers marking nut as a specific for acute rheumatism and says it is more sure and speedy in its action than salicylate of soda. I treated a patient admitted into the General Hospital for acute rheumatism affecting the large joints with the electuary of marking nuts. He was discharged cured after having had the treatment for two weeks. In cases of chronic rheumatism in which it was given in the wards, the patients did not derive any benefit. I have seen its efficacy in chronic complaints of the stomach, such as ulcer and chronic gastritis. Kalyana ksharam given in the last-mentioned complaints contains marking nut as its principal ingredient.

8. *Withania Somnifera*—

Natural order—Solanaceæ.

Sanskrit—Aswagandha.

Tamil—Ammukkarān kizhangu (vide prescription No. 1).

The root is said to smell like a horse; hence the name *Aswagandha*.

The specimens I obtained from local bazaars did not possess any such odour.

It is considered a tonic and aphrodisiac by the Indian physicians who use it, in general debility, rheumatism, consumption and loss of appetite. A patient with chronic gastritis and marked loss of appetite and general debility was given a full course of the powdered root alone for a few weeks without any benefit. He was then put on *aswagandha* with *vridhdarak*

(*Argyria speciosa*) which is considered a very good tonic, with the same negative result. A woman with hectic fever of tubercle and marked general weakness was put on the same combination. The result was disappointing. In Indian Materia Medica aswagandha enters into the composition of several medicines used as aphrodisiacs and as remedies for rheumatism.

9. *Ipomea Turpethum*—

(Natural order—Convolvulacæ.)—

Sanskrit—Trivrit.

Tamil—Shivadavir (vide prescription No. 15).

There are two varieties of the root—the black and the white, the black is a powerful irritant and drastic and should be avoided. The white variety used by Indian physicians is a moderate or mild cathartic. I have used it as a mild hydrogogue in the hospital in acute constipation of fevers, chronic constipation, in ascites with cirrhosis of liver, in enlargement of spleen and in all other cases where a purgative was considered necessary. The simple powder in 40 to 60 grains or the compound powder 60 to 90 grains (vide prescription No. 15) may be administered to produce the desired effect. In its action, it is as efficacious if not better than jalap.

Chemical composition.—It contains a resin “turpethine” which is similar in action and properties to jalapin, the resin of jalap. The drug is cheaper than jalap and may be used as an efficient substitute for it.

10. *Eclipta Prostrata*—

Natural order—Compositæ.

Sanskrit—Kesaraja.

Tamil—Karishalanganni.

This weed grows in abundance in Madras in the rainy season and may be found in damp places at other times of the year. There are two varieties of the plant—the yellow flowered and the white flowered—the former variety has thicker leaves and are extensively used in catarrhal jaundice. The fresh leaves are well washed, ground with a few pepper corns and a lump of the size of a lime is administered early in the morning in sour curd or buttermilk. I have found this drug very useful in curing the disease when so administered for five or six days. Occasionally a purgative may be required to aid the action of the drug. In its action, it resembles podophyllin and taraxacum. It may be administered in the form of a succus.

11. *Butea frondosa*—

Natural order—Leguminosæ.

Sanskrit—Palasa.

Tamil—Porasam (vide prescription No. 14).

The seeds have been long known to the Indian physicians to be laxative and anthelmintic in their properties and are given by them in combination with *Hyoscyamus nigra*, *Kamala* and carminatives to expel intestinal worms. In our practice it is given with small doses of *santonin* as a compound powder for the expulsion of round worms. In a case where large numbers of ova of round worms were found in the fæces, compound powder of *Butea frondosa* as per prescription No. 14 was given, but the result was negative. I intend trying hereafter the various reputed anthelmintics used by Indian physicians.

12. *Vanda Roxburghii*—

Natural order—Orchidaceæ.

(Sanskrit)—Rasna.

A compound decoction of this root is being administered in a case of Hemiplegia as the Indian physicians consider it useful in all nervous diseases and rheumatism. It consists of *rasna* (*vanda roxburghii*), *fagonia arabica*, *cedrus deodara*, *acorus calamus* and *zingiber officinalis*, *adhathoda vasica*, *asparagus racemosus*, *boerhavia diffusa*, etc. It has not given appreciable benefit to the patient.

13. *Guggulu*—

Natural order—Bursaracæ.

Botanical name—*Balsamodendron Mukul*.

Sanskrit—Guggulu.

Malayalam—Guggulu.

Guggulu or Indian bdellium is obtained by making incisions in the tree through which the gum resin exudes. It is used by Indian physicians in rheumatism, nervous diseases urinary affections and skin diseases. For these purposes it is given in several compound preparations, such as *yogorajaguggulu*, *adithyapaka guggulu*, *kaisara guggulu*, *sadhangha guggulu*, *kanchanar guggulu*. I have been administering *yogoraja guggulu* with *rasnadhiquath* in a case of hemiplegia without any apparent benefit.

14. *Oxalis corniculata*—

Natural order—Geraniaceæ.

Sanskrit—*Amlanonika*.

Tamil—*Puliyarai*.

The juice of the leaves of this plant is considered refrigerant, appetising and stomachic. In slight forms of chronic dysentery, the leaves boiled in butter milk and given twice or thrice

a day prove very useful. Chakradatta gives this in the form of a ghrta (means ghee preparation) and recommends its use in dysentery, piles and prolapse of the rectum. The herb can be obtained in abundance at a very cheap rate at all the markets in Madras.

15. *Silajit*. (vide prescription No. 5). The literal meaning of this word is stone and lac. There are two common varieties which can be obtained from the bazaar, gomuthra silajit and Karpooa silajit. Gomuthra silajit has a strong smell of stale cow's urine. It is dark, sticky and unctuous. Karpooa silajit is found in white plates like marble but is less hard. Silajit is a bituminous exudation from rocks and mountains in the hottest part of the year. On igniting it, it leaves a large quantity of ash consisting of lime, magnesia, silica and oxides of iron. It is said that there are four varieties of silajit. (Vide Kaviraj N. N. Sen's book.) The four varieties get their hue from the presence of gold, silver, copper or iron in their composition. Gold silajit is said to be red, the silver variety white, the copper variety of bluish green colour and iron silajit blackish. The only two varieties shown me in the Venkataramana dispensary, Mylapore, were the black and the white. The black variety is the one which is mostly used and is known as gomuthra silajit. An extract is made from the crude substance by making an emulsion of it with hot water and repeatedly exposing the emulsion to the sun. A cream floats on the surface and it is removed and collected. The process is continued as long as any cream rises. The extract of silajit thus collected is sundried and then purified by being soaked in a decoction of certain plants. It is said to be a powerful tonic, useful in urinary diseases, diabetes, gravel and consumption.

The dose is 6 to 12 grains.

I have used this medicine with Abhrak Basmam (vide prescription No. 35) in two cases of diabetes and the action was beneficial. In one case the sugar disappeared completely after three weeks' use although at the commencement of the treatment there were 22 grains to an ounce. In the other case which is still under treatment, the quantity of sugar is reduced from 86 grains to 8 grains per ounce; the accompanying symptoms such as excessive flow of urine, thirst, neuritis of legs, etc., have also subsided to a very considerable extent. Both the patients were on milk and bread diet. Probably the diet has a great deal to account for the reduction of the quantity of sugar. A few years ago I saw a case of chronic cystitis deriving much benefit from the use of silajit which was administered by an Unani Physician.

16. *Sida Cordifolia*—

Natural order—Malvaceae.

Sanskrit—Bala.

Tamil—Mayirmanikam.

Malayalam—Kurundhoti.

V. C. Dutt says that the Sanskrit writers describe four varieties of Bala and the roots of all these species are regarded as cooling, tonic, and useful in diseases of nervous system. The Indian physicians of the west coast use the bark of *Sida cordifolia* in diseases of the nervous system such as paralysis, sciatica, facial palsy, hemiplegia, vertigo, etc. It is used alone or in combination with other medicines as in mashabalathi kashayam, ksheerabala or bala thaila. Bala thaila is an oil prepared by making a decoction of the bark of *Sida cordifolia* to which sesamum oil and milk are added in certain definite proportions and boiled. This process is repeated several times by adding fresh milk and a paste of the bark of the root; this is done 14 to 101 times or more. An ounce of 101 times boiled thaila is sold on the west coast at Rs. 8. I have used this specific oil in several cases of facial paralysis, sciatica, both internally and externally and found it to be very efficacious in curing those diseases when they are due to inflammation of the nerves. I have received a supply of this oil from Malabar and intend giving a good trial in suitable cases in the hospital.

17. *Phyllanthus emblica*—

Natural order—Euphorbiaceae.

Synonym—Emblie myrabolans.

Sanskrit—Amlaka.

Tamil and Malayalam—Nellikayi.

This is a drug which is held in high esteem equally by both the Unani and Ayurvedic physicians. The fruits are said to possess cooling, refrigerant, diuretic and laxative properties and are considered to be purifiers of the humours of the body. The dried fruits are said to be astringent and useful in hæmorrhages. Unani physicians give a confection made of this fruit—vide prescription No. 41, for anorexia, biliousness, and palpitation of the heart. Hakim Shifa-ul-mulk Zianulabdeen Sahib Bahadur speaks very highly of its property which he thinks depends upon the organic acids present in the fruit. In insanity and other affections of the brain, the dried fruits are boiled over night in water which is allowed to cool and a continuous stream of this water is poured on the head for 15 or 20 minutes to allay the brain irritation.

These myrabolans enter into many compound preparations of Ayurveda. Triphala (3 fruits) which consists of equal parts of powdered emblic myrabolans, chebulic myrabolans and beleric myrabolans is administered as a laxative and corrector of humours, in headaches, biliousness, dyspepsia and constipation, piles, enlarged liver and ascites. Nellikaya leghyam,

confection of Nellikaya (vide prescription No. 41) has been found to be useful in chronic dyspepsia and also as an appetiser. Dymock says that all the three myrabolans contain a large quantity of gallic and tannic acids, emblic myrabolans contain also 10 per cent of glucose.

Chebulic myrabolans are known as abhaya in Sanskrit, kadukhai in Tamil and Malayalam. Beleric Myrabolans are known as vibhitaki in Sanskrit and thandrakai in Tamil and Malayalam.

The Unani practitioners have slightly modified the prescription for Triphala (vide prescription No. 28) and given it the name Ithriphal.

The latter was given in doses of 3 drachms at bed time in a case of chronic constipation and found to give considerable relief.

COMPOUND PREPARATIONS.

I. Karpooradhi Churnam (vide prescription No. 13). This prescription has been used in cases of bronchial catarrh and bronchitis and found to help free expectoration in those diseases. It is prescribed in the Madras Ayurvedic dispensaries in catarrhal bronchitis, laryngitis, nasal catarrh.

II. Talisyadhi and sithopaladhi churnams—vide prescription No. 8 (a) and (b) and vide notes on Bamboo manna marked No. 2.

III. Worm powder—vide prescription No. 14 and vide notes on *Butea frondosa* marked No. 11.

IV. Trivrit churnam—vide prescription No. 15, and vide notes on *Ipomea turpethum* marked No. 9.

V. Anandha and swatchanda Bhairavi pills—vide prescriptions Nos. 16 and 20.

These pills were used in malarial fever with enlarged spleen and liver along with Panchathiktha decoction or Panchathiktha panakam and with Leghu Sudarsana Churnam or Brihat Sudarsana Churnam. In three cases of malarial fever where diagnosis was confirmed under microscope by the presence of malarial parasites in the blood, the patient was free from fever from 4 to 7 days after the administration of the drug. In one case where the disease was of a malignant type with crescents in the blood, the fever returned in a mild form, after a few days of apyrexia. The treatment is being continued.

VI. Dadhumaastaka churnam—vide prescription No. 18.

This compound was tried in a few cases of acute and chronic dysentery in doses of 30 to 60 grains and found to be very useful.

VII. Leghu Sudarsana Churnam—vide prescription No. 19.

Brihat Sudarsana Churnam—vide prescription No. 23.

Panchathikthaka Panakam—vide prescription No. 26.

and decoction—vide prescription No. 17.

All these have more or less the same properties and are being given in the Ayurvedic dispensaries in Madras in malarial fevers, in malarial enlargement of spleen and liver, in fevers of influenza and bronchitis and other fevers of unknown origin. I have tried these preparations in the hospital in these diseases but they have not proved as efficacious as I expected them to be. They are certainly of use in those diseases, when along with them preparations of mercury, sulphur and Aconite like one of the following pills Anandhabhairavi (prescription No. 16) Swatchandhabhairavi or Kasturibhairavi are administered.

The principal ingredients of these compound powders are Chinthai Kodi (*Tinospora cordifolia*) Katurhini (*Picrorrhiza kurroa*), Parpatakam (*Oldenlandia herbacea*), Korai-kalangu (*Cyperus rotundus*), Neem (*Azadirachta indica*), Chireta (*Opheliae chiratta*) which are reputed to possess antipyretic and antiperiodic properties in Hindu Materia Medica. Usually some carminatives and laxatives are added as correctives.

VIII. Kutajapanithum—vide prescription No. 21 and notes on Veppalaarisi marked III—was found to be useful in cases of acute and chronic bowel complaints with diarrhoea or dysentery. Its action is similar to that of Dhadumastaka churnam (prescription No. 18).

IX. Bhaskara Lavanam—vide prescription No. 24. It was tried in two cases of chronic gastritis. In one case there was a certain amount of relief to the stomach, but in the other case no relief was obtained.

X. Leghu Sanka Dravkam—vide prescription No. 25. This preparation which smells strongly of nitrous fumes appears to be a compound of the mineral acids. I have given it a fair trial in cases of cirrhosis of the liver with ascites—This compound distillate was recommended to me for the relief of all liver complaints by some of the Ayurvedic physicians in the town. In one of my cases, which is under treatment from 14th August 1918, it is doing some good, as the patient had to be tapped only once five weeks ago, and very little fluid has accumulated since then. This patient also gets a mild hydrogogue cathartic of *Ipomea Turpethum*. In another case of cirrhosis of the liver with ascites which has been of more than five years standing, this medicine did not do the slightest benefit and the fluid had to be removed by repeated tappings.

XI. Zoofa—vide prescription No. 27.

This unani preparation has proved very efficacious in relieving the cough of bronchitis especially that of post influenzal bronchitis.

XII. Ithraphal—vide prescription No. 28. This is a unani preparation and it is a mild laxative. It was tried in a few cases of chronic constipation and found to give relief. Three drachms of the confection is an ordinary adult dose to be given at bed time.

XIII. Jawarish-a-Kamoon—vide prescription No. 30.

This was given to a case of chronic gastritis (dyspepsia). It did not give any relief.

XIV. Loha Bhasma or Iron Bhasma was obtained from Zandu Pharmacy, Bombay. It was tried in a case of anaemia with general debility. The strength and the blood of the patient improved under its use and it had no constipating effect.

XV. Siddha Bhasmam—vide prescription No. 32—Pandit Kanniyappa Mudaliyar extols its use as a specific for consumption. I tried it in a case of pulmonary tuberculosis in the second stage and in another case where the disease was fairly advanced. The first case put on weight and strength while taking it and is doing well at the time of the report. In the second case there was no appreciable effect, for in addition to the advanced pulmonary tuberculosis, the patient also had a complication of tuberculosis of the intestines.

XVI. Purnachandrodhayam and specific oil for Syphilis—vide prescription Nos. 33 and 34. Both these medicines were administered as instructed by the physician who gave them. The oil is what is known as Sarva Megha Sanjeevi Oil which is considered to be a specific in syphilis. After a preliminary use of the oil, Purnachandrodhayam, which is considered as the King of Specifics in all stages of Syphilis was administered for 40 days. The case selected was a typical one of secondary syphilis. There were several patches of ulcers on the body with dry crusts on some of them. Most of these healed under treatment but as two of them remained persistently unhealed and as the patient appeared to be discontented, an intravenous injection of ampalsves 0.9 gram was given. The remaining ulcers healed within four days. There is no doubt that Purnachandrodhayam on account of the mercury, arsenic and gold it contains has some effect on syphilis but the action is very slow and does not compare favourably with that of Salvarsan or of mercury administered in accordance with B.P.

XVII. Specific for Diabetes Mellitus—vide prescription No. 35.

Reference has already been made to this in the notes, on Silajit No. 15. Talc Basmam (Abhrak) is very much extolled as a remedy in Diabetes Mellitus. It will be given a further trial in that disease.

XVIII. Vathagni Kumarsa—prescription No. 6.

I tried this preparation for several weeks in a case of hectic fever of tuberculosis but the patient was not in any way benefited.

XIX. Iron Kalpam—vide prescription No. 36.

This is an organic compound of iron. It was tried in anaemia and dyspepsia with anorexia and was found very beneficial in improving the blood, strengthening the patient and also in creating an appetite. This preparation was supplied by Vaidya Rathna Pandit Kannappa Mudaliyar.

XX. Narayana Thailam.

The chief ingredients are:

- Sathavari. (Asparagus racemosa).
- Aswagandha (Withania somnifera).
- Vilvamula (Root of Aegle marmelos).
- Patala (Sterospermum suaveolens).
- Gokshuram (Tribulus terrestris).
- Syonika (Colasynthas indica).
- Agnimantha (Premna spindsa).

It is recommended for local massage in hemiplegia, lumbago, headache and paraplegia. This was tried externally in lumbago and was found to give relief.

XXI. Agnithundi Pill—

Prepared in accordance with Saranghadhara. Its chief ingredients are sulphide of mercury thrikatu (ginger, long pepper and pepper), chithraka (Plumbago zeylanica), the two Ksharas (Carbonate of Potassium and Sodium), Nux vomicae, Aconite, etc. It is recommended as useful in dyspepsia, indigestion, colic and as a tonic in all conditions of debility. It was given to dyspeptic patients who were very weak. The improvement was very gradual.

XXII. Specific powder from a hakim in George town, for tubercle, asthma and diabetes. As the hakim refused to give the composition or the mode of its preparation, I had to get it analysed—vide-Chemical Examiner's report. I did not find it doing any appreciable good hitherto in tubercle. In one case it reduced the temperature for three days but the fever rose up again and further administration did not do any good. In a case of pulmonary tuberculosis with hectic fever, the patient did not show any sign of improvement, though the medicine was administered in accordance with the hakim's instructions. In a third case of pulmonary and intestinal tuberculosis, the patient derived no benefit but succumbed to the disease.

XXIII. Dec' Glycyrrhiza Co.—vide prescription No. 11 and No. 23, page 12, summary of notes on drugs.

Just as in the British Pharmacopoeia, all parts of vegetables, viz., roots, flowers, leaves, fruits, extracts (as catechu and opium), bark, wood and gum are used in Hindu medicine. Charaka divides the medicines into three classes according to the action they are supposed to have on the different organs of the system or particular symptoms of the disease. For example, Jeevanya—medicines which prolong life, Deepaniya which increase the appetite and increase digestive power, Jwarahara-Febrifuge.

The different forms in which medicines are administered are—

- (1) Churna or powders.
- (2) Swarasa or expressed juice.
- (3) Quaths or decoctions.
- (4) Phanta or hot infusions.
- (5) Sithakashaya or cold infusions.
- (6) Panya or weak decoctions.
- (7) Mantha, emulsion of medicine in water.
- (8) Kshcerapaka or decoction in milk.
- (9) Avaleha or extract.
- (10) Vati or pills.
- (11) Modaka or boluses prepared by the addition of syrup.
- (12) Khandapaka or confections.
- (13) Phudapaka or roasting.
- (14) Sandhanavarga or products of acetous fermentation.
- (15) Dravaka or distilled mineral acids (e.g., Swalpadravaka and Saukadravaka).
- (16) Asava and Arishta or medicated spirituous liquors.

These last are prepared with the aid of honey and treacle from various medicinal substances. If the raw drugs are only steeped in water for fermentation, the product is Asava. If, however, they are steeped in decoction of particular substances, the product is arishta.

- (17) Medicated oils and ghrita.

The medicated oils are prepared by concentrating the decoction of vegetable drugs in oil, and ghritas are prepared by using clarified butter or ghee instead of oil. Ghritas are chiefly used internally and oils externally. Medicated oils and ghritas must be prepared according to the method known as ghrithapaka or thailapaka :

Different modes of applying medicines—

- (a) Vasthi karma or injections into the rectum.
- (b) Pbalavarthi or suppositories.
- (c) Naasya or application of medicated substances to the nose.
- (d) Kavala or Gargles.
- (e) Sirovasthi or applications to the head.
- (f) Netra karma or application to the eyes.
- (g) Plasters or pralepa.
- (h) Poultices or Pradeha.
- (i) Svedhana or application of heat to the skin for inducing perspiration.
- (j) Dhumapana or inhalations.
- (k) Dupana or fumigations.
- (l) Ksharakarama or caustic applications.

In inorganic materia medica, the following mineral substances are mentioned :—

Sulphur, mercury, arsenic, white arsenic, orpiment, realgar, iron, sulphate of iron, iron pyrites, gold, silver, copper, sulphate of copper, tin, zinc, lead, galena, brass, mica, talc, alum, borax, lime, several salts of sodium; principally the five salts of sodium known as Panchalavanam, carbonate of sodium, and potassium, nitrate of potash, diamond, pearl, coral, silajit and red ochre. There are several compounds of these minerals mentioned but the purification of the minerals and the modes of preparation of their compounds are very tedious processes. The appliances for purifying and preparing these compounds are crude remnants of remote conception which might have been excellent when they were first put forth by the inventors in those remote times. Refer to pages 19 to 41 Vol. II N. N. Sen's Ayurvedic Medicines, also to pages 24 and 25 of N. C. Dutt's Materia Medica. They require considerable modifications and improvements in accordance with modern science. Several of these compounds such as Makaradhvajam, Vasantha Kusumakaram, Mrigangharasa, Poornachandrodayam, Raja Mrigangharasa, Pancharutha Parpati, Mruthathapaua Rasa and several other similar compounds which are considered excellent medicines by Hindu physicians require much time labour, skill, patience and money in their preparation in accordance with Hindu Pharmacy, if they are to serve the purposes for which they are intended.

APPENDIX II.

Summary of the notes on the medicines investigated, found useful, and recommended for further trial.

Names of the drugs.	Botanical names.	Prescription number.	Notes on drugs number.	Where obtainable.	Diseases used in.	Number of cases.		Result.	Remarks.
						Hospital.	Private.		
1. Mocharas	Stombox Malbaricus (gum of).	..	1	Bazaar medicine.	1. Chronic dysentery 2. Hæmoptysis 3. Hæmetemisis 4. Malaria 5. Menorrhagia 6. Acute dysentery 7. Chronic diarrhoea	2 2 1 1 1 1 2	.. 1 1 .. 1 ..	Cured Do. Do. Do. Do. Cured Action very slow ..	(a) In combination with other medicines. The drug has to be combined with mooharas and similar drugs to act beneficially in diarrhoea and dysentery (acute and chronic).
2. Vappalai ariahi and pattai.	Holarrhena anti-dysenterica, seeds, bark.	..	8	Bazaar medicine, also fresh plant.	Acute and chronic dysentery ..	..	..	Cured	This drug enters into several compound preparations for acute and chronic diarrhoea and dysentery. Used in the form of decoction.
3. Athividyam	Aconitum heterophyllum.	..	5	Bazaar medicine.	Acute and chronic dysentery ..	..	..	Cured	This drug enters into several compound preparations for acute and chronic diarrhoea and dysentery. Used in the form of decoction.
4. Adathoda	Justicia adathoda ..	..	6	Do.	Acute and chronic bronchitis ..	6	..	Did good in combination with other expectorants.	Used in the form of decoction.
5. Trivrit	Ipsomea turpethum ..	..	9	Do.	In acute and chronic constipation, ascites with cirrhosis of liver and constipation of fevers.	In several cases	..	Found useful ..	It is a good hydrogogue cathartic and can be substituted for Jalap but the compound powder (see infra) is preferable to the simple powder of the root.
6. Kariabalanguni ..	Eclipta prostrata ..	..	10	Fresh plant ..	In ocatral jaundice	In several private cases.	2	Gave very satisfactory results.	.....
7. Paliyarai	Oxalis corniculata ..	..	14	Do.	In chronic enteritis .. ..	..	2	Cured	Given boiled in buttermilk.
8. Bala	Sida Cordifolia ..	..	16	Fresh root ..	Sciatica Facial palsy .. ..	..	2 2	Do. Do.	Used in the form of Bala Thaila or Keheerabala.
9. Talisyadhi Churnam..	.....	3 (b)	2	Zandu Pharmacy, Bombay (easily made locally)	Pulmonary tuberculosis Bronchitis and Hætic fever of Tuberculosis.	3 1	..	Relieved Do. No relief	Was useful in relieving cough. The chief ingredients are Bamboo Manna and Pinus Webbiana.
10. Trivrit Churnam ..	.....	15	9	Do.	Same as No. 5 supra	Several cases	..	Very satisfactory ..	This compound preparation gave more satisfactory results than the simple drug.
11. Dadamasthaka Churnam.	.....	18	6	Do.	Acute dysentery Chronic dysentery	1 1	..	Cured Do.	This preparation contains drugs marked 1, 2, 8 supra and other astringent drugs.
12. Leghu Sudarsana Churnam.	.....	19	7	Do.	Malaria and enlarged spleen Enlarged spleen and liver	4 1	..	Four relieved and one case discharged otherwise.	When given in combination with iron or Anandha-Bhiravi.
13. Brihat Sudarsana Churnam.	.....	23	7	Do.	Influenza (Broncho-pneumonia). Malaria Bronchitis after influenza Anæmia Enlarged spleen and liver Malaria with ascites and Cirrhosis of liver.	2 3 1 1 1 1	..	All the cases were benefited.	Combined with Anandha Bhiravi.

Summary of the notes on the medicines investigated, found useful, and recommended for further trial--cont.

Names of the drugs.	Botanical names.	Prescription number.	Notes on drugs number.	Where obtainable.	Diseases used in.	Number of cases.		Result.	Remarks.
						Hospital.	Private.		
14. Kutaja Arishtam and 15. Kutaja Panitham 21	8 V. 8	Venkatramana dispensary, Mylapore.	Chronic dysentery Chronic malaria and enlarged spleen (diarrhoea). Acute dysentery Chronic gastritis (diarrhoea) .. Influenza (malaria)	1 1 2 1 1	} Very beneficial results.	See notes on 1 and 2 (supra).
16. Loha Basmam .. 17. Ananda Bhiravi 16	14 7	Zandu Pharmacy. Do.	Chronic gastritis with anaemia.. Enlarged spleen Ascites and enlarged spleen .. Malaria Post influenza bronchitis .. Cirrhosis of liver and ascites ..	1 1 1 5 2 4		
18. Lohu Sanka Dravakam.	25	10	Venkatramana dispensary, Mylapore.	Ascites Cirrhosis of liver and ascites ..	1 4	} Ascites subsided in one case and two were discharged otherwise.	} One case remaining under treatment is improving.
19. Specific for Diabetes Mellitus.	34	17	Devi Siddha Vaidyasala, Esplanade, Madras.	Diabetes mellitus	3	..		
20. Iron Kalpam	36	19	Do.	Chronic gastritis Anaemia	1 1	} Did much good } Do.	} The process of preparing this compound is tedious.
21. Siddha Basmam	12	15	Do.	Pulmonary tuberculosis	2	..		
22. Zoofa	27	11	Made locally ..	Influenza Influenza (broncho-pneumonia) .. Influenza (bronchitis) Bronchitis	1 2 1 1	} One case of broncho pneumonia died and the others derived benefit.	}
23. Decoction Glycyrrhizae co.	11	12	Bazaar medicine (easily made locally).	Several cases of acute and chronic bronchitis which were admitted as such or which occurred as complications of other diseases in the hospital.		
24. Confection Semicarpus Anacardium.	8	7	Must be locally made.	Acute rheumatism Chronic rheumatism	1 1	} Cured } Not benefited	} Further trial is necessary.
25. Panchathikthaka Decoction.	17	7	Bazaar medicine (made locally).	In cases of malaria		
26. Ithraphal	28	17	Bazaar medicine (locally made).	Chronic constipation	1	} Cured	}

APPENDIX III

List of drugs and compound preparations collected in Madras and investigated up to date of report.

Names of drugs.	Botanical names.	Quantity.
1. <i>Ashwagandha</i> — Dose.—Twenty grains of the powder in milk or sugar thrice a day. Ther. uses.—In general and nervous debility, in consumption, in rheumatism, in hectic fever.	Amukkarankilangu (Tamil). <i>Withania Somnifera</i>	
2. <i>Guggulu</i> — Gum resin from Balsam odendron Mukul, U. C. Dutt, page 132. Preparations.—Yoga raja Guggulu, Kanchnar Guggulu, etc. Ther. uses.—For rheumatic and nervous complaints, scrofula, chronic ulcers, etc.		
3. <i>Bamboo Manna</i> — Two compound powders are prepared from this—	<i>Vansalochana</i> (Sanskrit) ..	
(a) <i>Sithopaladi Churnam</i> —		
(1) Bamboo Manna	<i>Bambusa Arundinacæ</i> ..	8 parts.
(2) Long pepper	<i>Piper longum</i>	8 "
(3) Cardamom	<i>Elettaria cardamum</i> ..	2 "
(4) Cinnamon	Bark of <i>cinamomum zeylanicum</i> .	1 part.
(5) Sugar .. .. .	.....	16 parts.
Dose.—One dram thrice a day		
Ther. uses.—In consumption with dry hacking cough, hæmoptysis.		
(b) <i>Thalisyadi Churnam</i> —		
(1) Bamboo Manna .. .. .	.....	8 parts.
(2) Long pepper .. .. .	.....	6 "
(3) Talispathri (<i>Pinus Webbiana</i>) ..	.....	4 "
(4) Dry ginger	<i>Zingiber officinalis</i>	2 "
(5) Pepper	<i>Piper Nigrum</i>	1 part.
(6) Cardamom .. .. .	.....	$\frac{1}{2}$ "
(7) Cinnamon .. .. .	.....	$\frac{1}{4}$ "
(8) Sugar .. .. .	.....	42 parts
Dose.—40 to 60 grains		
Ther. uses.—In consumption with abundant expectoration.		
4. <i>Mocharas</i> — Dose.—20 to 40 grains Ther. uses.—in powder for acute dysentery, chronic dysentery and diarrhoea, hæmoptysis, hæmetemesis, also a local hæmostatic.	<i>Salmili</i> (Sanskrit) Gum of <i>Bombax Malabaricum</i> .	
5. <i>Silajit</i> — Dose.—6 to 12 grains twice or thrice a day. Ther. uses.—In diabetes mellitus, in anæmia and palpitation, in cystitis, in albuminuria. This is a costly medicine and has to be obtained from Kashmere and North India. According to U. C. Dutt, silajit consists of lime, magnesia, silica and iron (Proto and Peroxide).		
6. <i>Vathagni Kumaran</i> — Rub together 8 parts of purified mercury and purified sulphur until the whole is converted into black sulphide of mercury. Then rub in juice of betel wine for two or three days for a few hours a day. Then rub in juice of pomegranate flower, then add two parts by weight of thalakam (orpiment). Heat in a Valukayanthram in sand bath gradually for three days. What sublimes at the upper part of the vessel as a solid mass is Vathagni Kumaran.		

List of drugs and compound preparations collected in Madras and investigated up to date of report—cont.

Names of drugs.	Botanical names.	Quantity.															
<p>Dose.—$\frac{1}{2}$ to 1 grain twice or thrice a day after meals.</p> <p>Ther. uses.—In intermittent fever, enlarged spleen, kala-azar, in hectic fever of consumption.</p>																	
<p>7. <i>Holarrenha Anti-dysenterica</i>—(Country ipecao). Veppalai.</p> <p>The seeds (veppalarishi) powdered and rubbed is given in 30 to 60 gr. doses in chronic dysentery, acute dysentery, chronic diarrhoea. The bark is given in a variety of ways for the same complaints. The expressed juice of the bark is given with honey.</p>																	
<p>8. <i>Sherankottai, marking nut</i>—</p> <p>Preparations—Acrid oil and electuary.</p> <p><i>Electuary</i>—</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Marking nut</td> <td style="width: 30%; text-align: center;">....</td> <td style="width: 20%; text-align: right;">1 part.</td> </tr> <tr> <td>Cashew nut kernel</td> <td style="text-align: center;">Anacardium, Occidentale..</td> <td style="text-align: right;">6 parts.</td> </tr> <tr> <td>Clarified honey</td> <td style="text-align: center;">....</td> <td style="text-align: right;">1 part.</td> </tr> </table> <p>• Rub marking nut well in a stone mortar, and add gradually the cashew nut powder and honey.</p> <p>Dose —Oil $1\frac{1}{2}$ dram to $2\frac{1}{2}$ dram. Electuary— Do. Three or four doses daily.</p> <p>Ther. uses.—In acute rheumatism; not half so useful in chronic and muscular rheumatism.</p>			Marking nut	1 part.	Cashew nut kernel	Anacardium, Occidentale..	6 parts.	Clarified honey	1 part.						
Marking nut	1 part.															
Cashew nut kernel	Anacardium, Occidentale..	6 parts.															
Clarified honey	1 part.															
<p>9. <i>Nayivela Verai</i>— Aditya Baktha (Sanskrit).</p> <p>The seeds of <i>Cleome Viscosa</i>. Doses.—30 to 60 grains for adults, twice a day for two days followed on the third day by castor oil. Ther. uses.—Anthelmintic, substitute for santonin.</p>																	
<p>10. <i>Adhathoda</i>— Justicia Adathoda, Vasaka. (Sanskrit.)</p> <p>Preparation.—decoction. Take of Adathoda root in cut pieces one part, water 16 parts, boil down to one-fourth quantity. Strain—dose—1 ounce thrice a day either alone or combined with other expectorants. Ther. uses.—In acute and chronic bronchitis, asthma.</p>																	
<p>11. The following may be given alone or combined with the above (No. 10). <i>Dec' Glycyrrhiza Co.</i>—</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(a) Cubebs</td> <td style="width: 30%;">(a) Cubeba Officinale.</td> <td></td> </tr> <tr> <td>(b) Liquorice</td> <td>(b) Glycyrrhizae Glabra.</td> <td></td> </tr> <tr> <td>(c) Long pepper</td> <td>(c) Chavica Roxburghi.</td> <td></td> </tr> <tr> <td>(d) Chitharathai</td> <td>(d) Alpina chinensis.</td> <td></td> </tr> <tr> <td>(e) Kadukkai</td> <td>(e) Myrabolans Chebulio.</td> <td></td> </tr> </table> <p>Take equal parts by weight and powder. One part by weight of powder and 15 oz. water to be boiled and reduced to 4 oz. or it may be converted into electuary with honey. Doses —Compound decoction 1 oz. three or four times a day. Ther. uses.—In acute and chronic bronchitis.</p>			(a) Cubebs	(a) Cubeba Officinale.		(b) Liquorice	(b) Glycyrrhizae Glabra.		(c) Long pepper	(c) Chavica Roxburghi.		(d) Chitharathai	(d) Alpina chinensis.		(e) Kadukkai	(e) Myrabolans Chebulio.	
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(e) Kadukkai	(e) Myrabolans Chebulio.																
<p>12. <i>Athavidayam</i>— Aconitum Heterophyllum.</p> <p>Ther. uses.—In chronic bowel complaints as chronic diarrhoea, chronic dysentery, and acute dysentery. Doses.—30 grains rubbed up in buttermilk or the decoction of pomegranate flower and leaves twice or thrice a day. Generally administered with the juice of the bark of holarrenha anti-dysenterica.</p>																	

List of drugs and compound preparations collected in Madras and investigated up to date of report—cont.

Names of drugs.	Botanical names.	Quantity.
13. Harpuradi Churnam—		
Camphora	Cinnamomum Camphora, (Paaha carpooram) Tamil.	½ tola.
Cinnamon	Cinnamomum Zeylanicum.	} 1½ tolas each.
Cubebs	Cubeba officinale.	
Nutmeg	Myristica fragrans.	
Mace (japathri)	Myristica Officinalis ..	
Cloves	Eugenia Caryophyllata ..	
Nagakesari	Cherunagpoo (Mesua Ferrea).	3 tolas.
Pepper	Piper nigrum	4½ tolas.
Long pepper	Chavica roxburghi	5 "
Dry ginger	Zingiber officinales	7½ "
Powder after sundrying and add double the quantity of sugar.		
Doses.—40 to 60 grains.		
Ther. uses.—Bronchial and laryngeal catarrh—also in indigestion.		
14. Worm powder—		
For round and thread worms—		
Purasem verai	Seeds of butea frondosa ..	} 2 palams each.
Veppalarisi	Holarrhena anti-dysenterica seeds.	
Vayu vilangam	Embelia ribes	
Cloves	Eugenia caryophyllatus ..	
Cardamoms	Elettaria cardomomum ..	
Large long pepper	Piper longum	
Cinnamon	Cinnamomum zeylanicum.	
Chinnamon leaves	Cinnamomum leaves of ..	
Ginger	Zingiber officinale	
Pepper	Piper nigrum	
Borax	} 2 tolas each.
Bamboo Manna .. .. .	.....
Long pepper	Chavica Roxburghi	
Chitramulam	Root of Plumbago zeylani- cum.	
Korakilangu	Tubers of cyperus rotundus.	
Vailayal uppu	Black salt (vit salt)	
Induppu	Rook salt	
Aranakun	Piper aurantiacum	
Kadukkayi	Chebulic myrabolans	
Thanrikayi	Beleric myrabolans	
Nellikayi	Emblie myrabolans	
Powder fine		
Doses.—16 to 20 grains twice or thrice a day for three days followed by castor oil.		
Ther. uses.—Anthelmintic powder ..		
15. Trivrit Churnam—		
Trivrit or Sivadaver	Ipomoea Turpethum	42 palams.
Chebulic myrobalans	} 1 palam each.
Belleric myrobalans .. .. .	.....
Emblie myrobalans .. .. .	.....
Vayuvilangam	Embelia ribes	
Rose buds (dry) .. .. .	.....
Cardomoms .. .. .	.....
Cinnamon .. .. .	.....
Cinnamon leaves .. .. .	.....
Korakilangu	Tubers of Cyperus Rotun- dus.	
Dry ginger .. .. .	.....
Pepper .. .. .	.....
Long pepper .. .. .	.....
Senna leaves .. .. .	.....
Katurohni	Picrorrhiza kurroa	
Doses—40 grains to 1½ drams with sugar in the morning.		
Ther. action.—Purgative.		

List of drugs and compound preparations collected in Madras and investigated up to date of report—cont.

Names of drugs.	Botanical names.	Quantity.
16. Ananda Bhairavi pills—		
Borax pure		} 2 palams each.
Purified lingam or (sulphide of mercury).		
Long pepper		
Aconitum ferox.. .. .		
Pepper powder		
Powder these and grind in lime juice and make into pills of 1½ grains each.		
Dose—One pill twice a day.		
Ther. uses—In fever due to indigestion, bronchial catarrh, bronchitis, in malarial fever.		
17. Panchathikthaka powder and decoction—		
Shindal kodi	Tinospora cordifolia ..	
Parpataka	Oldenlandia herbacea ..	
Chiratta.. .. .	Ophelia chiratta	
Cherutaku	Siphonanthus Indica ..	
Korakilangu	Tubers of cyperus rotundus.	
Dry ginger	Zingiber officinale	
Take all the above in equal parts and powder.		
One drachm of the powder in decoction twice a day. Rub the above pill in the decoction.		
18. Dadimastaka churnam—		
Pomegranate fruit rind	Punica granatum (rind of the fruit of).	
Mocharas	Bombax Malabarioum (gum of).	
Veppalarisi	Holarrhena anti-dysenterica	
Poppy heads	Papaver somniferum (capsules of).	
Poppy seeds	Papaver somniferum (seeds of).	
Mangottai paruppu	Mangofera Indica (kernel of nut).	
Vattaithiruppu (pathasa).	Stephania Hernandifolia.	
Athividayam	Aconitum heterophyllum ..	
Equal parts in powder, sieved through cloth.		
Adult dose—30 to 60 grains.		
Children—10 to 15 grains.		
Ther. uses—In acute and chronic dysentery.		
19. Leghu Sudarsana churnam—		
Sindalkodi	Tinospora cordifolium ..	} Equal parts by weight.
Kattuthippali veru	Root of chavica roxburghi.	
Thippali	Chavica roxburghi	
Katurhini	Picrorrhiza kurroa	
Kadukkai	Chebulic myrobolans	
Dry ginger	Zingiber officinale	
Cloves	Eugenia caryophyllata ..	
Bark of margosa	Melia Azadirachtæ	
White sandalwood .. .. .	.....
Add half the total quantity by weight of chiratta.		
Dose—5 to 20 grains.		
Ther. uses—Malarial fevers and fever of unknown origin.		
20. Swatchanda Bhairavi pills—		
Pure mercury .. .. .	.....	} 1 tola.
Pure sulphur .. .. .	.....
Pure aconitum ferox .. .. .	.....
Nutmeg .. .. .	.....
Pepper, long .. .. .	.....
Rub them, make into pills of 1½ grains each. This pill is given with Sudarsana churnam in malarial fevers.		
Dose—One pill twice or thrice a day.		

List of drugs and compound preparations collected in Madras and investigated up to date of report—*cont.*

Names of drugs.	Botanical names.	Quantity.
21. Kudajapanitham—		
Veppalampattai	Bark of <i>Holarrhena anti-dysenterica</i> .	100 palams.
Swarnamakahika	Ponnimalai or iron pyrites.	1 palam.
Thrikadugu (ginger, pepper and long pepper).	....	1 palam each.
Lodhra or Pachothipattai	<i>Symplocos Racemosa</i> .	} 1 palam each.
Mocharas	<i>Bombax Malabaricum</i> (gum of).	
Kurrunthoti or Chittamutti	<i>Sida cardifolia</i> .	
Rind of pomegranate fruit	<i>Punica granatum</i> .	
Pulp of Bael fruit	<i>Ægle marmelos</i> .	
Mastaka or Korailangu	<i>Cyperus rotundus</i> .	
Manjiata	<i>Rubia cordifolia</i> .	
Katagathikai or Dhathaki	Wood <i>fordia floribunda</i> .	
Veppalampattai	Bark of <i>Holarrhena anti-dysenterica</i> .	10 palams.
Jaggery .. .. .	....	30 "
Ghee .. .. .	....	20 "

100 palams of veppalampattai are to be boiled in 16 measures of water and reduced to 2 measures. Strain, add to the filtrate jaggery and filter again and make into the consistency of treacle. Take out, add rest well powdered and add ghee at the end, while hot, and stir it well.

Dose— $1\frac{1}{2}$ to 2 drachms.

Ther. uses—In acute and chronic dysentery and piles.

22. Yogaraja guggulu—

Chief ingredients are—

Plumbago root.

Long pepper root.

Seeds of *Nigella sativa*.

Cummin seeds.

Guggulu.

Cardamoms.

Rock salt.

Pinus webbiana, etc.

Used in syphilis, leprosy, rheumatism, chronic nervous diseases.

23. Brihat Sudarsana Churnam—

Sandalwood	<i>Pterocarpus santalinus</i> (<i>Santalum album</i>).	} $\frac{1}{2}$ palam each.
Turmeric	<i>Curcuma longa</i> .	
Devadaru powder	<i>Cedrus deodora</i> .	
Vasambu	<i>Acorus calamus</i> .	
Korailangu	<i>Cyperus rotundus</i> , tubers of.	
Kadukkaitolu	<i>Chebulic myrabolans</i> .	
Cherukanjuri	Kodithwa (<i>Tragia-cannabina</i>).	
Karkatashringi	<i>Rhus succedanea</i> .	
Dry ginger	<i>Zingiber officinale</i> .	
Kandankattari	<i>Solanum xanthocarpus</i> .	
Parpatakam	<i>Oldenlandia herbacea</i> .	
Nim bark	<i>Azadirachta Indica</i> .	
Kattutippali veru	Root of <i>Chavica roxburghi</i> .	
Vetti veru	<i>Andropogon muricatus</i> .	
Baskaramulam	<i>Calatropis gigantea</i> .	
Thippali	<i>Chavica roxburghi</i> .	
Booram kilangu	Shati (Sanskrit) <i>Kachura Kilangu</i> (Mal.) <i>Curcuma zedoaria</i> .	
Perukurumba veru	<i>Sansevieria zeylanica</i> .	
Veppalarisi	Seeds of <i>Holarrhena anti-dysenterica</i> .	
Sadavari	Tannirmuttankilangu (Tam.) <i>Hemidesmus Indicus</i> .	

List of drugs and compound preparations collected in Madras and investigated up to date of report—cont.

Names of drugs.	Botanical names.	Quantity.	
23. Brihat Sudarsana Churnam—cont.			
Raktachandanam	Pterocarpus santalinus.	} ½ palam each.	
Pathimukam .. .. .	.....	
Vilamicham	Andropogon Muricatus (variety).		
Cinnamon bark	Cinnamomum zeylanicum.		
Orilla	Prischnivarni, uraria lagopoides.		
Omum	Ptycotis ajowan.		
Athividayam	Aconitum heterophyllum.		
Bael root	Ægle marmelos, root of.		
Pepper	Piper nigrum.		
Gooseberry without seeds	Emblie myrabolans.		
Shintalkodi	Tinospora cordifolia.		
Katurohini	Picrorhiza kurroa.		
Plumbago root	Plumbago zeylanicum.		
Paipadal	Triehosanthus dioica.		
Moovila	Triparni, Naregamia alata.		
Chiratta	Ophelia chiratta		6 palams.
Powder and sieve through cloth.			
Dose—Adults—40 to 60 grains.			
Ther. uses—In all malarial and chronic fevers, anaemia, enlarged spleen.			
24. Bhaskara laovanam—			
Long pepper	Pippali—piper longum or Chavica roxburghi.	} 2 palams each.	
Kattuthippali veru or Kandamthippilli ..	Root of Chavica roxburghi.		
Coriander	Coriander sativa.		
Black cummin seeds	Karinchiragum, Nigella sativa.		
Induppu	Rock salt.		
Valayaluppu	Villavana.		
Cinnamon leaves	Leaves of Cinnamomum zeylanicum.		
Thalispatri	Pinus webbiana.		
Cherunagappu	Mesua ferrea (Nagakesari) (Sans).		
Soovrchaluppu (black salt)		5 palams.
Pepper	Piper nigrum.	} 1 palam each.	
Omum	Ptychotis ajowan.		
Dry ginger	Zingiber officinale.	} 6½ palams each.	
Cinnamon	Cinnamomum zeylanicum ..		
Cardamum seeds	Elettaria cardomomum ..	} 8 palams.	
Kalluppu	Rock salt (one variety) ..		
Pomegranate fruit rind	Rind of the fruit of Punica-granatum.	4 "	
Pulivanchi	Amblavedasa (Sans.) Rumax vesicarius.	1 palam.	
Powder, sieve through cloth			
Dose—30 grains to 1½ drachms, twice a day before food.			
Ther. uses—In indigestion, chronic and painful dyspepsia, dilatation of the stomach, and chronic gastritis.			
25. Laghu Sanka dravaka—			
Country nitre	8 palams.	
Alum	4 "	
Amm. chloride	} 2 palams each.	
Pure borax .. .. .	.....	
Pot. carbonas	Yava-Kasharam		
Valayaluppu	Vit salt		
Gandhaka vadiuppu	Nitre (variety)	} 1 palam each.	
Poonier or sodi. carbonas .. .. .	.....	
Pure ferrus sulphate .. .. .	.....	
Pure copper sulphate .. .. .	.....	
Suvarchala uppu	Black salt	
Powder and distil.			

List of drugs and compound preparations collected in Madras and investigated up to date of report—*cont.*

Names of drugs.	Botanical names.	Quantity.
Dose—5 to 10 drops twice a day.		
Ther. uses—In enlarged liver and spleen, indigestion and colic, in cirrhosis of the liver, ascites. If there is fever, administer in water and give fever mixture or powder.		
26. <i>Panchathikthaka panakam</i> —		
Chiratta	<i>Ophelia chiratta.</i>	
Katurohini	<i>Picrorrhiza kurroa.</i>	
Parpatakam	<i>Oldenlandia herbacea.</i>	
Korakilangu	Tubers of <i>Cyperus rotundus.</i>	
Seendalkodi	<i>Tinospora cordifolia.</i>	.....
Take equal parts of each of the above by weight—Boil in 16 parts of water and reduce to 4 parts (one-fourth of the whole), add sugar equal to the weight of the powders and convert into syrup.		
Dose—Half an ounce B.D.S. or T.D.S., given in conjunction with Swachuntha Bhairavi, Anatha Bhairavi or Jwaramurari pills.		
Ther. uses—Malarial fever with enlarged spleen.		
27. <i>Zoopha</i> —		
(1) Zoopha	Husk of the seeds of <i>Hyssopus officinalis.</i>	} 1 palam each.
(2) Ajmuth	<i>Oarum roxburghi</i>	
(3) Sombu	<i>Pimpinella anisum.</i>	} 3 varahanida.
(4) Liquorice	<i>Glycyrrhiza glabra.</i>	
(5) Thuthi verai	<i>Abutilon Indicum</i>	Do.
(6) Bedana	<i>Pyrus cydonia</i>	Do.
(7) Badam pisni (gum)	<i>Amygdala</i>	Do.
(8) Misiki	Seeds of <i>Hibiscus abelmoschus.</i>	½ palam.
(9) Saphisthan	<i>Cordia myxa.</i>	30 fruits.
(10) Alubukara	<i>Prunus bukhariensis</i>	Do.
(11) Raisins	<i>Vitis vinifera</i>	1 palam.
(12) Dried figs	<i>Ficus</i>	10 fruits.
Bruise 2, 3 and 4 and boil all the ingredients with two measures of water down to ½ measure—strain through cloth and take the filtrate, add about ½ viss sugar and make into syrup.		
Dose—one tola T.D.S.		
Ther. uses—for all lung complaints except consumption.		
28. <i>Ithraphal</i> —		
Kabul kadukkayi thol	<i>Chebulic myrabolans</i>	} 1 palam each.
Surat nellikayi	Emblie do.	
Manjakatukkathol	<i>Chebulic do.</i> (variety).	
Pinchikatukka	Do.—unripe and small.	
Powder, grease it with almond oil, add honey and turn into confection.		
Dose—one tola at bed time, 2 hours after meals.		
Ther. uses—In rheumatism, constipation, heaviness of head, nasal catarrh, cold in the eye, sciatica.		
29. <i>Nellikayi leghayam</i> —(<i>Phyllanthus emblica</i>).		
Follow step in 12 (appendix 4) first part of the directions; add 3 times the quantity of sugar—turn into confection.		
Dose—one dr. to two drs.		
Ther. uses—For anorexia, biliousness, palpitation, etc.		
The property of nellikayi which is very largely used by the Unani doctor is said to depend upon the organic acids present in it.		

List of drugs and compound preparations collected in Madras and investigated up to date of report—cont.

Names of drugs.	Botanical names.	Quantity.
30. Javarish-as-kammoon—(composition)—		
(1) Kammoona karmani	Nigella sativa	15 tolas.
(2) White pepper	} Piper nigrum	3½ tolas each.
(3) Black pepper		
(4) Cinnamon bark	Cinnamomum zeylanicum ..	1½ tolas.
(5) Dry sathab leaves	Leaves of Ruta Augustifolia.	4½ "
(6) Ginger morabba	Ginger conserve	12 "
(7) Myrabolans conserve .. .. .	.....	18 "
(8) Confection of roses .. .. .	.....	80 "
(9) Sugar .. .. .	.....	30 "
Turn into confection		
Doses—1½ tolas T.D.S.		
Ther. uses. In diarrhoea, indigestion, dyspepsia, sour belching, removes foul-breath and watering from the mouth.		
31. Oxalis corniculata—vide No. 14, Appendix I.		
32. Siddha basmam—		
Pravala basmam	Coral basmam	3 Rs. weight.
Thangha basmam	Gold basmam	½ Rs. "
Muthu basmam	Pearl basmam	1 Re. "
Karocoba basmam	Amber basmam	2 Rs. "
Pooneru churnam	Sodium oxide	1 gundamani.
Thambra basmam	Copper basmam	1 rice weight.
Rub the above in aloe juice; then heat in a crucible made of hare's bone (hare's bone ground in lime water and made into crucible) in ten cow dung cakes fire. Grind the basmam and put in a bottle.		
Dose—1 grain.		
Uses—In consumption (pulmonary tubercle).		
Diet—Good nourishing food.		
33. Purna chanthrodhayam—		
Lingam (purified) .. .. .	.....	4 Rs. weight.
Sulphur do. .. .. .	.....	16 Rs. "
Orpiment do. .. .. .	.....	1 Re. "
Gold leaf do. .. .. .	.....	Do.
Rub mercury and gold, add sulphur and rub and then add orpiment and grind in aloe juice one day, next day in human milk and on the third day in the juice of shoe flower (<i>Hebiscus rosa sinensis</i>) with pooneru one rice weight. Make puttam in paddy husk for one day.		
Dose—2 grains twice a day in honey.		
No special diet.		
Uses—In cases of syphilis and venereal diseases. This should be preceded by the specific oil given below for three days with marupathiyam.		
34. Specific oil for syphilis, venereal diseases and skin diseases—		
Notohi (Neergundhi)	Vitex negundo	} 20 palams each.
Bark of poovaras	Bark of <i>Thespesia populnea</i> .	
Chengam verpattai .. .. .	.....	..
Pungam verupattai	Pongamia glabra .. .. .	..
Ponan kanni	Alternanthera Sessilis .. .. .	..
Kalyanan muruku leaves (juice of) ..	Erythrina Indica	10 palams.
Karasarankanni leaves (juice of) ..	Eclipta prostrata	"
Nuna leaves (juice of)	Morinda citrifolia	10 palams..
Chittamutty	Sida cordifolia	½ palam.
Sivanar vembu	Indigofera Aspalatheides ..	½ "
Karim jeerekun	Nigella sativa	½ "
Omum	Ptychotis ajowan	½ "

List of drugs and compound preparations collected in Madras and investigated up to date of report—*cont.*

Names of drugs.	Botanical names.	Quantity.
Chithorathay	Alpina chinensis	1 palam.
Paranghy Chakkay	Smilax chinensis	5 palams.
Kadukkai	The three myrabolans	1 palam.
Thanikayee		"
Nellikayee		"
Dry ginger	Zingiber officinale	"
Pepper	Piper Nigra.	"
Dry gooseberry	Phyllanthus Emblica	"
Oubebs	Cubeba officinale	"
White sandalwood powder	Santalum alba	"
Nannari or Sarsaparilla	Hemidesmus Indicus	"
Sombu	Pimpinella anisum	"
Jeeragham	Cumina cyminum	"
Coriander seeds	Coriandrum sativum	"
Sindal kodi or gulancha	Tinospora cordifolia	"
Purified croton seeds well ground	Croton tiglium	1 palams.
Garlic	Allium sativum	7 "

Boil in pure castor-oil (12 visses) until all water is evaporated.

Doses.—One to two teaspoons for three or five days with two days marupathyam (special diet).

Diet.—Avoid gingelly oil and mustard, substitute ghee and cuminseeds. Burnt tamarind and lime juice may be used.

35. *Specific for Diabetes mellitus*—

Iron Silajit basmam .. .. .	.....	1 palam.
Talo basmam .. .. .	.....	1 "
Avaram pattai	Bark of Cassia auriculata	5 palams each.
Padri Ver pattai	Bignonia suaveolens	
Kadalazhangam pattai	Lodoicea seychellarum	
Sindal kodi	Tinospora cordifolia	
Poppy capsules	Capsules of Papaver somniferum.	5 palams.
Seruu kattu kodi	Cocculus villosus	
Pinchi kadukayee	Small chebulic myrabolans.	1 palam.
Nutmeg	Myristica fragrans	
Dates	Phoenix dactylifera	"
Kurasani omum	Hyoscyamus nigrum	"
Nagakottai churnam	Eugenia jambolans	5 palams.

Powder the vegetable drugs, add Silajit and Talo basmams. Make a decoction with a second set of the same vegetable drugs, grind the first for fifteen days in the decoction. Make pills of six grains each; one B.D.S. in water or Nagakottai decoction (decoction of the dried nut of Eugenia jambolans).

36. *Kalpam* (Iron specific)—

(1) Iron powder .. .. .	.....	5 palams.
(2) Pepper .. .. .	.....	5 "
(3) Garlic .. .. .	.....	5 "
(4) Limes .. .. .	.....	50 "

Powder the first three and grind in lime juice (juice of 10 limes). Put in pudam of 20 cow-dung cakes. Split each of the remaining 40 limes into fours. Fill each with the article after pudam. Put in a pot and pour the juice of eclipta prostrata to the level of the article, cover, and close rims with wax. Bury under ground in wet soil for four months.

List of drugs and compound preparations collected in Madras and investigated up to date of report—cont.

Names of drugs.	Botanical names.	Quantity.
Repeat and instead of putting inside split limes, paste the pudamed article over cleaned dry ginger which has been perforated freely with needles. Bury under ground as before. Mix both at the end of four months and grind.		
Dose. —2 to 5 grains.		
Uses.—In Anaemia, Jaundice and Dyspepsia.		
37. <i>Ipoemica Turpethum</i> —vide No. 9—Appendix I.		
38. <i>Eclipta Prostrata</i> —vide No. 10—Appendix I.		
39. <i>Butea Frondosa</i> —vide No. 11—Appendix I.		
40. <i>Vanda Roeburghi</i> —vide No. 12—Appendix I.		
41. <i>Sida Cordifolia</i> —vide No. 16—Appendix I.		
42. <i>Phyllanthus Emblica</i> —vide No. 17—Appendix I.		
43. <i>Agnithundi pills</i> —vide No. XXI—Appendix I.		
44. <i>Specific powder for Tubercle, etc.</i> —vide No. XXII—Appendix I.		
45. <i>Loha Bhasmam</i> —vide No. XIV—Appendix I.		
46. <i>Narayana Thailam</i> —vide No. XX—Appendix I.		
47. <i>Talisryadhi and sithopaladhi churnams</i> —vide 3 (a) and (b) supra.		

APPENDIX IV.

List of drugs and compound preparations collected in Madras up to the date of report and to be investigated hereafter.

Names of drugs.	Botanical names.	Quantity.
<p>1. <i>Gudumal</i>— One tola of the whole plant is to be boiled in 4 oz. of water and reduced to 1 oz. Dose.—One ounce thrice a day. Ther. use.—In Diabetes mellitus. Pandit Gopalachari Garu says that this plant is obtainable from the Himalayas and Gwalior and is much used in the north of India for diabetes.</p>	Hydrocotyle Asiatica.	
<p>2. <i>Vellarai</i>— Prepare decoction as No. 1 Dose—One ounce thrice a day. Ther. use.—In syphilis, leprosy, mental weakness, and insanity.</p>		
<p>3. <i>Laksha</i> (Lac).— Dose.—5 to 10 grains thrice a day. Ther. use.—Stops bleeding in hæmoptysis, piles and menorrhagia.</p>		
<p>4. <i>Bonduc seeds or Kachakayi</i>— Preparation.—Equal parts of Bonduc seeds and piper <i>Nigrum</i> well powdered.</p>	Seeds of <i>Cæsalpinia Bonducella</i> ; <i>Kuberakshi</i> (Sanskrit).	
<p>Dose. 15 to 30 grains thrice daily. Ther. use.—In intermittent fevers.</p>		
<p>5. <i>Tivrit legyam</i>— Confection of <i>Ipomœa Turpethum</i>. Sivadaver—2½ vissees—cut into small pieces and bruise—boil in 24½ measures of water down to ½ of the quantity—strain, add sugar-candy to the filtrate. The weight of the sugar-candy must be three times the weight of the powder given below :— Cardamoms. Cinnamon leaves, and Cinnamon bark Sivadaver</p>		1 palam each 1 viss.
<p>Powder well and strain through muslin or fine cloth. After the sugar candy has melted in the filtered decoction and the latter has the consistency of treacle, add the powder and turn into confection.</p>		
<p>Dose.—Two drachms in the morning. Ther. use.—Purgative.</p>		
<p>6. <i>Vivambara Rosa</i>.— All the ingredients same as <i>Anandha Bairavi</i>—sulphur to be added. Given with <i>Panchathikthaka</i> decoction in ordinary fever, catarrh and indigestion.</p>		
<p>7. <i>Kasturi Bhairavi</i>.— Purified lingam. Purified scamite ferox. Purified borax. Nutmeg. Pepper. Tippali. Musk.</p>		
<p>Take equal parts of each by weight, grind in water and make into pills of one grain each.</p>		
<p>Ther. use.—In all phlegm fevers, acute bronchitis, pneumonia.</p>		
<p>Dose.—One pill thrice a day, rubbed in the decoction of <i>Chiltharathai</i> (<i>Alpina chinensis</i>).</p>		

List of drugs and compound preparations collected in Madras up to the date of report and to be investigated hereafter—cont.

Names of drugs.	Botanical names.	Quantity.
9. Kapa Kethu sati.—		
Sanka basmam	Conch basmam.	} Equal parts by weight.
Long pepper	Chavica Roxburghi.	
Borax, desiccated .. .. .	.....
Aconitum ferox purified .. .. .	.....
Grind in decoction of <i>Curcuma zedoaria</i> , <i>Kachora kilangu</i> and turn into pill mass. Divide into $\frac{1}{4}$ -grain pills. Dose. One pill of $\frac{1}{4}$ grain to be given in decoction of <i>chitharathai</i> thrice a day. Ther. use—Bronchitis, catarrh and especially in bronchitis of children.		
9. Chithra kathi pills or powder.—		
Composition—		
1. Chithramulam	Root of <i>Plumbago-seylanica</i> .	
2. Thipelli ver	Root of <i>Chavica Roxburghi</i> .	
3. Sarjikaksharam	Orude Sod. Carbonate or Barilla.	
<i>Panchalavanam or five salts—</i>		
4. Common salt .. .. .	.....
5. Induppu (<i>Saindhva lavanam</i>) .. .. .	.....
6. Vilayaluppu (vit salt) .. .. .	.....
7. Karpuppu (<i>kaoha lavanam</i>) .. .. .	.....
8. Suverchalappu (black salt) .. .. .	.....
9. Dry ginger	<i>Zingiber officinale</i> .	
10. Long pepper	<i>Chavica Roxburghi</i> .	
11. Black pepper	<i>Piper Nigrum</i> .	
12. Assafœtida .. .. .	.....
13. Omum	<i>Ptychotis Ajowan</i> .	
14. Chaviyam (<i>chavica</i>) (<i>Kattu Mulaku-</i> <i>ver</i>).	<i>Piper ohaba</i> .	
Take each of the above in equal parts— powder fine. Use as powder—or grind with lime-juice and turn into pills of 5 grains each. Doses.—15 grains of the powder or three pills T.D.S. Ther. uses.—In chronic and muscular rheumatism and in all painful affections of the joints and bones.		
10. For Catarrhal Jaundice—		
Leaves of castor oil plant	<i>Ricinis communis</i> .	Equal parts.
Leaves of Keelarnelli	<i>Phyllanthus Niruri</i> .	
Grind together and rub into a bolus of the size of a small lime. Administer three mornings in milk and on the fourth morning give a purga- tive like <i>Trivrit Churnam</i> .		
11. Mundi.—		
Leaves of the plant should be dried in the shade. Dose. 20 grains, twice a day. Ther. uses. Nervine tonic, anti—syphilitic, and in chronic skin diseases.		
12. Noushdhara—		
Rose flower	Flowers of <i>Rosa Damascena</i> .	1 $\frac{1}{2}$ varahanida.
Koraki langu	Tubers of <i>Cyperus Rotundus</i> .	1 $\frac{1}{2}$ "
Mastaki	Resin and Galls of <i>Pistacea</i> <i>Terebinthinae</i> .	1 $\frac{1}{2}$ "
Nilakatambu	<i>Ipomea Hederaceae</i>	1 $\frac{1}{2}$ "
Cloves	<i>Eugenia Carophylli</i>	1 $\frac{1}{2}$ "
Jada Manji	<i>Nardostachy Jata-mansi</i>	1 $\frac{1}{2}$ "
Cardamom seeds	<i>Elettaria Cardomomum</i>	1 "
Talispathri	<i>Pinus Webiana</i>	1 $\frac{1}{2}$ "
Cinnamon leaves	<i>Cinnamomum zeylanicum</i>	1 $\frac{1}{2}$ "
Kichili kilangu	<i>Curcuma zedoaria</i>	1 $\frac{1}{2}$ "
Cinnamon bark .. .. .	.....	1 $\frac{1}{2}$ "
Large cinnamon bark .. .. .	.....	1 $\frac{1}{2}$ "

List of drugs and compound preparations collected in Madras up to the date of report and to be investigated hereafter—*cont.*

Names of drugs.	Botanical names.	Quantity.
Nutmeg	Myristica fragrans ..	1 varahanida.
Mace	Do. officinalis ..	1 "
Agar	Aquilaria Agallocha ..	1 "
Saffron	Sassaferas Indica ..	1 "
Surat gooseberries	Phyllanthus Emblica or Emblic myroblaana.	3 1/2 palams
Honey .. .. .	.....	10 "
Sugarcandy (China) .. .. .	.....	10 "

Soak Surat. Nellikkayi (gooseberries) in water for 12 hours, strain and throw away the water. Add fresh water and boil for a couple of hours. They become soft. Make into a paste by grinding. Powder the other ingredients except saffron and mustaki. Make treacle of honey and sugarcandy. Add the first paste and after 10 minutes add the powder to the latter. After boiling for 20 to 30 minutes, add mustaki and saffron. Turn the whole into confection.

Dose.—Infants $\frac{1}{4}$ tamarind seed weight; adults 1 tola.

Ther.—use. In diarrhoea, dyspepsia, indigestion, in intestinal colic, also in palpitation of the heart.

13. *Unani Cholera pills.*—

(1) Calotropis gigantea flower (white variety) .. .. .	.....	2 tolas.
(2) White pepper .. .. .	.....	2 "
(3) Common salt .. .. .	.....	1 tola.
(4) Lime-juice .. .. .	.....	3 tolas.

Powder the first three ingredients, mix with lime juice and convert into two-grain pills.

Dose.—One to two pills with equal parts of rose-water and omum-water every two or three hours.

In young children half the dose; don't give more than four doses.

14. *Cough powder.*—

(1) Black pepper	Piper Nigrum	1 tola.
(2) Ajowan	Ptychotis Ajowan	1 "
(3) Thippali	Chavica Roxburghi	1 "
(4) Rock salt	Rock salt	1 "
(5) Namakai siah, or black salt or (karupuppu, Tamil)	Do. (variety)	1 "
(6) Borax	Borax	40 "
(7) Adathoda leaves	Leaves of Justicia Adathoda.	40 tolas.

Put all the abovementioned ingredients in a small pot, close the mouth carefully and put the pot in the burning fire for some time so that the ingredients in it may be completely burnt. Use the burnt powder, 2 to 6 grains mixed with honey.

Uses.—In catarrh and bronchitis.

15. *Pills for Dysentery.*—

(1) Gall nuts	Beleric myrobalans	1 tola.
(2) Chotimayi	Tamarix Articulata	1 "
(3) Opium	Opium	1 "
(4) Acaciæ gum .. .. .	.....	1 "

Dissolve opium in a little water. Powder the rest of the ingredients and mix with the solution and make into pills of three grains each.

Dose.—One or two pills three or four times a day.

List of drugs and compound preparations collected in Madras up to the date of report and to be investigated hereafter—cont.

Names of drugs.	Botanical names.	Quantity.
16. Tankana Pills.—		
(1) Borax, purified	Borax	} ½ tola each.
(2) Nitre	Pot Nitrate	
(3) Assafostida	Assafostida	
(4) Kantham	Magnetic oxide of iron	
(5) Purified iron pyrites	Swarna Makshika	
(6) Opium	Opium	
(7) Garlic	Allium sativa	
(8) Kernel of Boduc seeds	Kernel of Bonducella Semina.	
Powder, grind in ginger juice and turn into 2 or 2½ grains pills. Given in painful dyspepsia; laxative of Triphala should be given.		
17. Krimiharavati or Anthelmintic Pills.—		
Mercury .. .. .	.....	1 tola.
Sulphur .. .. .	.....	1 "
Kuras-ani-omum	Hyoscyamus Nigrum	3 tolas
Vayuvelangam	Embelia Kibes	4 "
Butea frondosa .. .. .	.....	6 "
Musthi (seeds of Nuxvomica) .. .. .	.....	6 "
Grind in water and turn into two-grain pills.		
Dose.—One pill four times a day for children and two or three pills four times a day for adults; next day castor-oil.		
Ther. uses.—Anthelmintic for all intestinal worms.		
18. Swasakudaram.—		
Composition—		
Pure mercury	}	One of each.
Pure sulphur		
Pure aconitum ferox		
Borax		
Orpiment		
Pepper .. .. .	.....	8 parts.
Dose—1½ to 2 grains.		
Ther. use.—Asthma, bronchitis.		
19. Mruthouthapanarasa.—		
Composition—		
Gold .. .. .	.....	1 part.
Silver .. .. .	.....	1 "
Rasaindhuram .. .. .	.....	1 "
Copper bhasmam .. .. .	.....	1 "
Mica .. .. .	.....	2 parts.
Panchalavanam .. .. .	.....	1 part each.
Garalam	Cobra poison	3 tolas.
Aconite .. .. .	.....	2 "
Reduce to powder, macerate the powder in the expressed juices of the following:—		
(1) Moringa	Moringa Pterygosperma .. .. .	.. .. .
(2) Datura fastuosa.		
(3) Justicia Adathoda.		
(4) Apamarga	Achyranthæ aspera .. .. .	.. .. .
(5) Crocodile bile.		
(6) Peacock bile.		
(7) Wild boar bile.		
Dose.—½ to 1 mustard weight.		
Ther. uses.—Apoplexy, convulsive fits.		
20. Rasothamathi powder.—		
(1) Mercury.	}	Equal parts.
(2) Sulphur.		
(3) Manosila		
(4) Cumin seeds.		
(5) Karungeeragam		
(6) Manjal (Haridra)		
(7) Maramanjai		
(8) Pepper		
(9) Sindhuram		
	Realgar	
	Nigella sativa	
	Curcuma Longa	
	Coscinum Fenestratum	
	Piper Nigrum	
	Red oxide of lead (Minium).]	

List of drugs and compound preparations collected in Madras up to the date of report and to be investigated hereafter—cont.

Names of drugs.	Botanical names.	Quantity.
Grind Nos. 1, 2, 3 and 9. Powder the rest separately—mix and grind altogether.		
Ther. use.—For external application for ringworm—mixed with coconut-oil or lime-juice.		
21. <i>Rohithaka Arishtam</i> —		
Andersonia Rohithaka (Shemmaram; Tam.).		
Composition:—		
Bark of Rohitha.		
To be put into 24 measures of water and boiled down to 6 measures—strain add jaggery 5 visses.		
(1) Dhataki	Woodfordia Floribunda	} 4 palams each.
(2) Long pepper	Chavica Roxburghi	
(3) Kandan Tippali	do. root of .. .	
(4) Cheviam	Piper chaba .. .	
(5) Ohithramulam	Plumbago zeylanicum	
(6) Ginger	Zingiber officinale ..	
(7) Cardamoms	Elettaria cardamomum	
(8) Cinnamon	Cinnamomum zeylanicum.	
(9) Do. bark	do. bark of	
(10) Triphala	The three myrabolans.	
Powder these and mix them with the syrup already made and keep sealed for one month air-tight.		
Ther. uses.—In enlargement of the liver and spleen.		
Dose.—Quarter to one ounce.		
22. <i>Lohasava</i> .—		
Take fine iron powder, purify by soaking in lime juice and then burn the whole.		
Thrikadugu	The three acids.	} 8 palams each.
Thripala	The three myrabolans.	
Omum	Ptychotis Ajowan.	
Vayuvilangam	Embelia Ribes.	
Koraikilangu	Tubers of Cyperus Rotundus.	
Chithramulam	Plumbago zeylanicum.	
To be well powdered. Put in 25½ measures of water with jaggery 5 visses and honey 3 visses; mix and keep sealed for one month.		
Ther. uses.—For all anæmias.		
Dose.—Two drachms to one ounce.		
23. <i>Balasanjeevi pills</i> —		
Poornachandrodayam .. .. .	.....	1 Re. weight.
Kunkumappoo	Sassafras Indica	1 dr.
Gorojanam	Fel Bovinum (dessicate)	1½ drs.
Musk	Moschus Moschiferus	15 grs.
Camphor	Pachakarpuram (unbaked)	1½ drs.
Koshtam	Aplotaxis auriculata	} 1 palam each.
Akrakaram (pellitory root)	Anacyclus Pyrethrum	
Dry ginger	Zingiber officinale	
Pepper	Piper Nigrum .. .	
Long pepper	Chavica Roxburghi	
Kadukkai	Chebulic myrabolans	
Thanikkai	Beleric. do.	
Nellikai	Emblic do.	
Chithirathai	Plumbago zeylanicum	
Cheviyam	Piper chaba	
Cherutheku	Cleorodendron serratum	
Katurohini	Picrorrhiza Kurroa	
Powder vegetable drugs and grind first 5 and mix with the powder—grind in—Adathodai (a) Adhathodi vasica juice first day; grind in <i>Vishnukranthi</i> (b) <i>Evolvulus alsinoides</i> juice on the second day; third day in Utharani (c).		

List of drugs and compound preparations collected in Madras up to the date of report and to be investigated hereafter—cont.

Names of drugs	Botanical names.	Quantity.	
<p><i>Achrynathes aspera</i> juice—fourth day in human milk, fifth day in ginger juice, sixth day in Thulasi (<i>d</i>) <i>Ocimum sanctum</i> juice, and then turn into one and half grains pills. Dose.—One to three pills for children under three—</p>			
<p>24. <i>Gorojan pills.</i>—</p>			
Pravala Bhasmam .. .. .	.....	1 Re. weight.
Hart's horn Bhasmam .. .. .	.....	1 Re. "
Turtle shell Bhasmam .. .. .	.....	2 Rs. "
Kunkumappoo	<i>Sassafras Indica</i>	1 Re. "	
Kasturi	<i>Moschus moschiferus</i>	1/2 varahanidal.	
Dry ginger	<i>Zingiber officinale</i>	2 "	
Triphal each	The three myrabolans	2 "	
Trikatugu each	The three acrids	2 "	
Cloves	<i>Eugenia caryophyllata</i>	2 "	
Cardomum	<i>Elettaria cardomomum</i>	2 "	
Koshtam	<i>Aplotaxis auriculata</i>	2 "	
Akrakaram	<i>Anacyolus Pyrethrum</i>	2 "	
Talispathri	<i>Pinus Webbiana</i>	2 "	
Omum	<i>Ptychotis ajowan</i>	2 "	
<p>Grind in juice of leaf of betel—chavica first day, 2nd day in Thulasi, <i>Ocimum sanctum</i> juice, 3rd day in <i>Carpoo-avallee</i> juice, <i>Anisochilus Carnosus</i>.</p>			
<p>25. <i>Parangyathi churnam</i>—</p>			
(1) Madhusuhi	<i>Smilax Chinensis</i> .	} 1 palam each.	
(2) Indian sarasparilla	<i>Hemidesmus Indicus</i> .		
(3) Aswaganthi	<i>Withania somnifera</i> .		
(4) Jeerakam	Cummin seeds.		
(5) Vidari	<i>Convolvulus-paniculata</i> .		
(6) Sugarcandy .. .. .	.....	
<p>Powder the vegetable drugs and mix with sugarcandy. Dose.—Thirty to sixty grains. Ther. uses.—Constitutional syphilis.</p>			
<p>26. <i>Sucethana lepam</i>—</p>			
Devatharam	<i>Cedrus deodara</i>	}	
Ginger .. .. .	.....	
Amom. Chloride .. .. .	.....	
<p>All in equal parts to be mixed with cow's urine or limejuice or brandy. Ther. uses.—To be externally applied in inflammations.</p>			
<p>27. <i>Punarnavathi churnam</i>—</p>			
White punarnava root	<i>Boerhaavia Diffusa</i> .	}	
Thevatharam	<i>Cedrus Deodara</i> .		
Chinthalkodi	<i>Tinospora cordifolia</i> .		
Sirubothi	<i>Cissampelos Pereira</i> .		
Ginger	<i>Zingiberis officinales</i> .		
Ananeringal	<i>Gokshuram—Tribulus Terrestis</i> .		
Turmeric	<i>Curcuma longa</i> .		
Maramanjai	<i>Coscinium Fenestrata</i> .		
Chiretta	<i>Ophelia Chiratta</i> .		
Ramamallika	<i>Jasminum (small variety)</i> .		
Athivasa	<i>Aconitum Heterophyllum</i> .		
<p>Equal parts in powder. Dose.—Ten grains three times a day. Ther. uses.—In fever with dropsy.</p>			
<p>28. <i>Bathing oil for the head in Glandular Swellings of the neck</i>—</p>			
Karunuchi	<i>Vitex nigundo</i>
<p>Four palams of the above in one measure of water to be pounded and pressed out three times.</p>			

List of drugs and compound preparations collected in Madras up to the date of report and to be investigated hereafter—*cont.*

Names of drugs.	Botanical names.	Quantity.
To this water, add the following medicines for kalkam:—		
Vasambu	<i>Acorus calamus.</i>	} 1½ Kanchu each.
Myrobolans without kernal	Lac sticks	
Kolarakku	<i>Pterocarpus santalinus.</i>	
Sandalwood	<i>Picrorrhiza kurroa.</i>	
Kadugurohini		
The Kalkam medicines are to be ground well and with one nazhi (quarter measure) of coconut oil must be added to the above decoction and then boiled; on the day it is to be strained, the milky juice of two copras or dried coconuts is to be added. Boil again until the whole is of arakkupakam.		
Apply this over the head.		
A lady for a month's use may require three nazhis.		
Ther. uses.—For glandular swellings of the neck.		
29. <i>Gochurathi churnam</i> —		
Gokshuram	<i>Tribulus terrestris</i>	9 tolas.
Enbebs	<i>Cubeba officinale</i>	3 "
Nagakesari	<i>Mesua ferrea</i>	3 "
Ravel ehinni	<i>Rhei radix</i>	3 "
Surakaram	Pot nitrate	3 "
Powder and mix		
Dose.—Ten to 20 grains for all urinary diseases.		
30. <i>Kushtadi churnam</i> —		
Cherubodhi	<i>Stephania hernandifolia.</i>	} All in equal parts.
Malkangni	<i>Celastrus paniculata.</i>	
Lodhuka chekkai or pattai	<i>Symplocos racemosa</i>	
Maramanjai	<i>Coccoloba fenestratum.</i>	
Koshtum	<i>Aplotaxis auriculata.</i>	
Uses.—For tooth-ache, and gingivitis, add tharikadugu or alum to suit the case.		
31. <i>Agni muka churnam</i> —		
Assafoetida		1 tola.
Vasambu	<i>Acorus calamus</i>	4 tolas.
Tippali	<i>Chavica roxburghi</i>	6 "
Ginger	<i>Zingiber officinale</i>	8 "
Omum	<i>Ptychotis ajowan</i>	10 "
Chebulic myrobolans		12 "
Chithramulam	<i>Plumbago root</i>	14 "
Koshtum	<i>Aplotaxis auriculata</i>	16 "
Powder and mix.		
Ther. uses.—For indigestion, dyspepsia.		
Dose.—10 to 16 grains.		
32. <i>Abhaya modakam</i> —		
Kadukkai	<i>Chebulic myrobolans.</i>	} All in equal parts. One part of each.
Pepper	<i>Piper nigrum.</i>	
Ginger	<i>Zingiber officinale.</i>	
Vayuvilangam	<i>Embelia ribes.</i>	
Nellikai	<i>Emblie myrobolans</i>	
Tippali	<i>Chavica roxburghi.</i>	
Modi	Do. root of.	
Lavangapathiri	Cinnamon leaves.	
Koraikilangu	Tubers of <i>cyperus rotundus.</i>	
Croton seeds, purified	Seeds of <i>croton tiglium</i> .. .. .		2 parts.
Trivarth	<i>Ipomoea turpethum</i>	8 "
Sugar		6 "
Mix.		

List of drugs and compound preparations collected in Madras up to the date of report and to be investigated hereafter—cont.

Names of drugs.	Botanical names.	Quantity.
<p>Ther. uses.—Purgative to adults; not meant for children. Dose.—6 to 8 grains.</p>		
32. Purification of croton seeds—		
<p>First boil well in buffalo's dung; after drying remove the central sprout and then boil in milk.</p>		
33. Itchabhathi—		
Mercury, purified .. .. .	.....	½ tola.
Sulphur .. .. .	.....	1 "
Pepper .. .. .	.....	1½ tolas.
Borax .. .. .	.....	2 "
Ginger .. .. .	.....	2½ "
Kadukkai .. .. .	.....	3 "
Purified croton seeds .. .. .	.....	3½ "
<p>Rub together mercury and sulphur first and then the rest with the mass. Turn into pills of green dhal size. Dose.—One to four pills. Ther. uses.—Purgative.</p>		
34. Vathagajangusam (from Vydia chintamani)—		
Mercury .. .. .	.....	6 tolas.
Sulphur .. .. .	.....	8 "
Nux vomica	Strychnos nucis vomicee ..	8 "
Thri kadugu	The three acrids (each) ..	1 tola.
Thriphala	The three myrabolans (each)	1 "
<p>Grind in decoction of rasna and turn into pills of two grains each. Ther. uses.—In rheumatic pains and nervous disorders.</p>		
35. Karpura rasa—		
Pure hingulam (sulphide of mercury) ..		
Opium		
Koraikilangu	Tubers of cyperus rotundus.	} All in equal parts.
Veppalarisi	Seeds of Holarrhena anti-dysenterica.	
	Myristica fragrans.	
Nutmeg		
Camphor		
<p>Purify hingulam by rubbing in lime juice, then dry, rub the whole in omum water and then turn into two grains pills. Ther. uses.—Diarrhoea, indigestion.</p>		
36. Thrinethrarasam—		
Purified aconite	Aconitum ferox.	} In equal parts
Kadugurohini	Picrorrhiza kurros.	
Pepper	Piper nigrum.	
Rub in Karsananganni juice	Eclipta prostrata.	
<p>Make into two grains pills. Ther. use.—In fevers. Purify aconite by boiling in cow dung.. The following are some of the Arishtas and Asavas used in Ayurvedic dispensaries :—</p>		
(1) Ealarishta	for nervous disorders.	
(2) Rohitarishta	for enlarged spleen.	
(3) Draksharishta	as a tonic in general debility.	
(4) Chandanasava	for gonorrhoea, gleet, etc.	
(5) Kanakasava (Dbatura)	for bronchitis and asthma,	
(6) Asokarishta (saraca Indica)	for menstrual disorders.	
(7) Arjunarishta	for heart diseases.	
(8) Lohasavam	as a general tonic.	
(9) Kudajarishta	for diarrhoea, dysentery, etc.	

Dhataki flowers (flowers of *woodfordia floribunda*) are to be added to the prepared liquids in making most of the *Arishtas* and *Asavas* for causing alcoholic fermentation, before the pots in which the materials are placed, are sealed and put away.

Arishtas are prepared by the materials being immersed in decoctions and *Asavas* only in water.

The following legyams are also used in Ayurvedic dispensaries.

- | | | | | |
|------------------|----|----|----|--|
| (1) Vilvadhī | .. | .. | .. | for dyspepsia. |
| (2) Kushmandam | .. | .. | .. | for debility. |
| (3) Chyavanprash | .. | .. | .. | for consumption, asthma.
and general debility.* |

APPENDIX V.

Statement showing the names of diseases treated with results at the Government General Hospital, Madras, from 12th July to 31st October 1918 by Ayurvedic and Unani medicines.

Number.	Names of diseases.	Total.	Results.				
		Number of admissions.	Cured.	Relieved.	Discharged otherwise.	Died.	Remaining.
		no.	no.	no.	no.	no.	no.
1	acute Rheumatism	1	1	..	..	..	..
2	Chronic do.	1	..	..	1	..	..
3	Acute dysentery	4	3	..	..	..	1
4	Chronic do.	2	1	..	1	..	..
5	Anæmia	1	..	..	..	..	1
6	Ascaris Lumbricoides	2	..	..	2	..	..
7	Asthma with acute bronchitis	1	..	1	..	..	..
8	Asthma and bronchopneumonia of influenza	1	..	..	..	1	..
9	Asthma bronchial	1	..	1	..	..	..
10	Bronchial catarrh	1	1	..	..	..	..
11	Bronchitis post-Influenzal	2	2	..	..	..	..
12	Acute bronchitis	1	1	..	..	..	..
13	Chronic bronchitis	3	1	2	..	..	..
14	Chronic gastritis	3	1	1	..	..	1
15	Chronic diarrhoea	1	..	1	..	..	..
16	Chronic constipation	1	1	..	..	..	..
17	Constipation	1	1	..	..	..	..
18	Diabetes mellitus	2	1	1	..	..	..
19	Cirrhosis of liver with ascites	4	..	1	2	..	1
20	Hemiplegia	1	..	..	..	..	1
21	Influenza	3	2	1	..	..	..
22	Malaria	4	1	3	..	..	1
23	Malaria with asthma	1	..	..	..	..	1
24	Malaria with enlarged spleen	4	..	1	2	..	..
25	Malaria with enlarged liver and spleen	1	..	1	..	..	..
26	Pulmonary tuberculosis	5	..	4	..	1	..
27	Secondary syphilis	1	..	1	..	..	..
	Total	53	17	18	9	3	7

APPENDIX VI.

Substances analysed by the Chemical Examiner, Madras.

1. A sample of Poornachandrothayam which is supposed to contain gold was obtained from Venkataramana Dispensary, Mylapore. Some of the Indian physicians doubt whether gold which is not volatile could be present in the compound. Chemical Examiner's report showed that the sample contained gold.

2. Specific Powder—vide Notes No. 22. This was found to consist mostly of ferric oxide, traces of gold, lime sulphates.

3. Poonier Chunnam—vide prescription No. 32 contained lime, sodium oxide, potassium oxide, alumina, carbonic acid and chlorine.

4. Coral Basmam—vide prescription No. 32 contained calcium carbonate and sulphide.

5. Tale Basmam—vide prescription No. 35 contained alumina, magnesia and silica.

6. Iron Kalpam—vide prescription No. 36 contained ferric oxide and some vegetable powder.

7. Vasantha Kusumakaram contained mercury, gold, iron, lime, silica, alumina and traces of tin.

8. Karooba and pearl Basmam contained mostly resinous product resembling benzoin and traces of lime were also present in the ash.

APPENDIX VII.

Letter—from M.B. Ry. Rao Sahib M. C. Koman Avargal, L.M. & S., Honorary Physician, Government General Hospital, and Officer in charge of investigation into Ayurvedic and Unani Medicines, Madras.

To the District Medical and Sanitary Officer
Civil Surgeon.

Dated— 1918.

I have the honour to request favour of information on the following points in connexion with my investigation into Ayurvedic and Unani drugs:—

(1) The names and residence of well-known Ayurvedic and Unani physicians in your district or division.

(2) How many of them can be got at easily and how many are likely to help me.

(3) Whether you can kindly arrange with some of them if not with all, to meet me at some place selected by you.

(4) Whether they have any special methods of treatment for the following diseases and whether you have come across cases in which they were found useful:—

Cerebral apoplexy, cholera, plague, hemiplegia, paraplegia, locomotor ataxia, progressive muscular atrophy, pseudohypertrophic paralysis, spastic paraplegia, neuralgias especially sciatica, syphilis, leprosy, tubercular diseases, diabetes (mellitus and insipidus), asthma, chronic bronchitis, hydrophobia, mania, septicæmia, dysentery, chronic enteritis, pneumonia, different forms of Bright's disease, cirrhosis of liver with ascites, kala-azar, malaria and its complications, acute rheumatism, diseases of the heart, lymphangitis and filarial diseases, all other important diseases for which specifics are available.

(5) Kindly let me have your own experience of the use of any drugs in these systems if you have experimented with or used them.

I further request you will kindly obtain, if possible, information regarding the chief drugs and specifics used by the Ayurvedic and Unani physicians, under the following headings:—

(1) Names of single drugs when used alone.

(2) The composition of their compound preparations.

(3) The method of preparation.

(4) The mode of administration.

(5) Therapeutic uses.

(6) Dosage.

(7) The nature of diet in each case.

(8) Any other remarks with regard to 'physiological action, poisonous doses, sources, character, etc.

I have to arrange the programme of my visits into districts on hearing from you.

APPENDIX VIII.

Letter—from M.B. By. Rao Sahib M. C. KOMAN Avargal, L.M. & S., Honorary Physician, General Hospital and Officer in charge of investigation into Unani and Ayurvedic Medicines, Madras.

To—the Collector of

I have the honour to request you will kindly ask the Divisional Officers and Tahsildars under you to send me a list of the names of Ayurvedic and Unani physicians of your district, who, they think, will be able and willing to help me in my investigation. It would facilitate my work if these physicians could be kindly induced to meet me at the district or taluk headquarters. On hearing from the officers mentioned above, I shall furnish you with a programme of my tour.

APPENDIX A.

NOTE SUBMITTED BY MR. ANANTHASUBRAMANIAM.

1. *Cost of production of power alcohol.*—We must first decide what we mean by the expression 'power alcohol'. The Government of India, in their resolution of 1927 defined industrial alcohol as spirit of the strength of 55° O.P. and above. The Joint Power Alcohol Committee set up by the Governments of the United Provinces and Bihar defined power alcohol as dehydrated ethyl alcohol of at least 99.4 per cent by volume.

In Mandya we have installed a dehydrating column and have just been able to produce dehydrated ethyl alcohol of 99.4 per cent strength. It is proposed to utilize this alcohol for purposes of an admixture with petrol to be sold as motor fuel.

As regards cost of manufacture of power alcohol we have, in our letter of August 1937, mentioned the cost of production. "We have no information on the cost of production of absolute alcohol, but the manufacturers of the plant claim that absolute alcohol can be produced at a cost of 5½ annas per gallon after paying for molasses at the rate of Rs. 7 per ton and assuming that the distillery is worked as an adjunct to an existing sugar factory. In this connexion, it may be stated that the entire question of the production of power alcohol from molasses has recently been investigated by a joint Committee appointed by the Governments of the United Provinces and Bihar. It is understood that according to this Committee, the cost of production of power alcohol will be in the neighbourhood of 6 to 7 annas per gallon." As stated, we have as yet no definite data regarding cost of manufacture of absolute alcohol. It should be possible for the Mysore Sugar Company, to arrive at some definite figures on this point, in a couple of months' time.

The main point with reference to cost of manufacture is the cost at which molasses can be obtained for the purpose of being converted into absolute alcohol. In Mandya, we have a surplus of molasses. We reckon the value of molasses at Rs. 7 per ton, which represents its equivalent fuel value, if molasses, instead of being used for manufacture of absolute alcohol, is burnt under the boilers. Based on this calculation, the estimated cost of production for spirit of 96 per cent strength has been in the neighbourhood of 5½ annas per gallon. We reckon that it would cost an anna more for dehydration purpose so that the cost of manufacture of absolute alcohol would be between 6 and 7 annas per gallon.

2. *Trials made at Mandya with power alcohol as fuel.*—As already stated above, we have just begun to produce absolute alcohol and we have not yet started experiments with the use of this alcohol. We have, in Mandya, gained some experience with the use of power alcohol of 96 per cent strength, both by itself and also as an admixture with petrol. On our locomotives and tractors, which have been specially designed to run on power alcohol, we have experienced no trouble and they have given entire satisfaction. On the motor lorries also, which have high compression engines, viz., Fords and Internationals which have high altitude pistons, we have had very satisfactory results with the use of power alcohol. In regard to experiments conducted on pleasure cars, from experience we have found that the engines of these cars require certain adjustments in order to make them adaptable for running on alcohol of 96 per cent strength.

The main conclusion we have arrived at is that 96 per cent alcohol does not form a stable mixture with petrol in all proportions. Experience has shown that an admixture of alcohol of less than 60 per cent with petrol does not make the mixture a stable one. It is understood that in Brazil mixture of alcohol with petrol is stable in all proportions.

3. *How much excess of molasses over local requirements would be available for sale from the Mandya factory.*—The factory at Mandya would normally produce about 10,000 tons of molasses per annum, if the present rate of output of sugar is maintained. We have built up a demand for the consumption of products obtained out of about 3¼,000 tons of molasses and with a view to utilize the excess quantity that is now available, it is proposed, with the co-operation of Government, to produce absolute alcohol, which under legislative enactment will have to be compulsorily mixed with petrol and sold as motor fuel. The normal sale of petrol in the Mysore State is 2,700,000 gallons per annum, and on the basis of an admixture of 15 per cent alcohol, we expect an out-take of 350,000 gallons of absolute alcohol which would account for another 5,000 tons of molasses; i.e., about 2,000–1,000 tons available for a year or two; practically no surplus later. Capacity 1,500 gallons for 24 hours expect to work 320 days.

APPENDIX B.

POSSIBILITIES OF RAW MATERIALS FOR PRODUCTION OF POWER ALCOHOL.

For power alcohol to be a success, the cost of the alcohol to the consumer should be the same as that of petrol. It may be necessary therefore in attempting to promote this basic industry to find ways and means of obtaining the above condition (1) by procuring suitable cheap raw materials, (2) by cutting down the cost of production, (3) by removing partly or wholly the tax that is now levied on alcohol intended for burning purposes, (4) by Government's subsidy. In the present note the possibilities of available cheap raw materials for power alcohol production are considered. The question of reduction of duty or of Government subsidy may have to be considered from the results of this enquiry.

1. *Molasses*.—Owing to the conditions prevalent in India, the current price of molasses is very low and is practically nil near the sugar factories. The Indian Molasses Company, Calcutta, paid 1 anna 5 pies per maund (82.7 lb.) of molasses during 1936–37 season and even when freight is paid for transport, owing to the concessions offered by the railway companies, the increase in the cost is not very considerable. But it should be remembered that the price of this material may go up in course of time. According to the rough estimates available, only 13,000 tons of molasses are produced in this Presidency and of these nearly 5,000 tons seem to be used for the production of alcoholic beverages. The remaining quantity can give us only 500,000 gallons of alcohol, whereas much more (total about 22½ lakhs gallons) will be needed, if uniform distribution of power alcohol should be available throughout the whole Presidency. The quantity of molasses can be expected to increase in the near future to some extent due to the increased production of sugar in this Presidency and to a further extent due to the introduction of prohibition. But still there is a large need for the development of our resources for power alcohol and I have taken up for consideration only those raw materials which can be employed directly as substitutes for molasses without any elaborate preliminary treatment and I have attempted to work out the probable contribution of the cost of the raw material towards the price of the final product, power alcohol.

2. *Jaggery*.—The price of this material fluctuates enormously depending upon the season and the current price of sugar. At times it is very cheap and distilleries buy large quantities and stock the material. It may be mentioned that the inferior quality of jaggery, which is soft and which is not much in demand, does not make any difference in alcohol production. We can safely fix the available price for jaggery at 8 annas per maund of 25 lb. or Rs. 1-10-6 per maund of 82.7 lb. Taking the average of 4.15 gallons of absolute alcohol per maund (82.7 lb.), the cost of the raw material per gallon of alcohol is Re. 0-6-4.

3. *Cane tops*.—It has been estimated by W. L. Owen (I.S.J. 1936, page 431) that about 20–25 per cent of the cane is removed as cane tops unfit for crushing. Only a small fraction of this is employed as seed and the rest is at present being wasted and can very well be used for the production of alcohol. One ton of these tops is estimated by him to produce seven gallons of alcohol. It is not used by the sugar factory because of the high content of glucose in the juice; but this is not a disadvantage in the manufacture of alcohol. The material should be very cheap and the cost of it can be put more or less on the same level as that of molasses. It has of course to be crushed to obtain the juice but a considerable amount of bagasse will be obtained which as fuel can pay the cost of crushing.

4. *Sugarcane*.—This offers a very good raw material for distilleries situated in sugarcane growing tracts. It can be crushed and the juice can be employed directly for fermentation. Taking the average economic price of cane per ton as Rs. 6, since one ton of cane (15 per cent total sugars) can yield fifteen gallons of alcohol, the cost of this raw material per gallon of alcohol will be about 6 annas. There are some advantages in the use of this. Even canes that are not quite ripe may be employed because the difference is only due to the presence of glucose in the place of sucrose. Further as has been suggested by W. L. Owen, canes considered to be of inferior quality for sugar manufacture but yielding very high tonnage (such as 36x of Louisiana which yields 52 tons per acre) could be obtained very cheap for this purpose without any disadvantage to the process of distillation. Here again the cost of crushing will be met by the fuel value of bagasse.

5. *Palmyra palm and coconut palm juice*.—This should be a very good source for the production of alcohol if used directly. The palmyra juice contains as much fermentable sugar as the sugarcane juice. The present price of the juice or of the palmyra jaggery cannot be taken as an index of the correct economic value of the material, since in most districts it still finds use as a beverage after fermentation. It is difficult to be accurate in stating the exact price at which it is available in districts where prohibition has been introduced or will be available all over the Presidency in course of time. It could, however, be surmised on a rough estimate that this raw material will cost almost the same as the cane juice.

6. *Sweet potatoes*.—In several parts of this Presidency, sweet potatoes are grown in large quantities. Recent analysis made in the Andhra University laboratories shows that it contains about 20–22 per cent of fermentable carbohydrates (4 per cent sugars and the rest starch) and it can yield about 27 gallons of power alcohol per ton. The cost of this raw material which is now mainly produced for edible purposes, is about 13 annas gallon of alcohol. It is quite possible that when large quantities are grown for the production of alcohol this cost may come down to two-thirds or even to half. In that case, the cost of raw material per gallon of alcohol will be about 8½ annas or 6½ annas. It should be noted, however, that there is need for preliminary saccharification of the starch.

7. *Mohua flowers*.—This material is very cheap at the site of production. For distilleries located at a distance, the freight becomes the chief item. Further it seems to be much in demand for the production of beverages, owing to the fine flavour it imparts to the alcohol.

Since there has been some delay in my obtaining information regarding the current price of the flowers I have to postpone the final estimate of the cost of the materials necessary for producing on gallon of power alcohol.

Obviously there is the possibility of one or more of the above raw materials in every part of the Presidency offering adequate scope for the production of power alcohol. Excepting molasses the present cost of the raw materials is rather high and hence there will be need for the reduction of

the excise duty on power alcohol. Owing to the fact that alcohol is of vital importance to the development of several industries, its production should be encouraged as is done in several of the forward countries in the world by offering special facilities such as reduction or complete removal of duty, cheap freight and cheap denaturants.

APPENDIX C.

NOTE ON THE DIFFERENT METHODS OF MANUFACTURE OF POWER ALCOHOL.

Before 1923, alcohol of 95-96 per cent strength only was available for use as a source of power. Merck were, of course, preparing small quantities of 99.6 per cent to 100 per cent alcohol by distilling rectified spirits over quicklime and later over metallic sodium, but the product thus obtained was too costly to be used for power purposes.

In 1923, the Distilleries des Deux-Sevres et Melle worked out a commercial process for the manufacture of absolute alcohol of 99.8 per cent to 100 per cent strength by using benzene for the azeotropic separation of water. This process was soon followed by others, e.g., Drawinol process, Haig process, gypsum process, the Bauxite process, etc. These methods have been rapidly improved during the last ten years, so much so that absolute alcohol which used to cost about Rs. 10 per gallon some 15 years ago, can now be marketed in India at 6 to 8 annas per gallon exclusive of duty.

The processes at present in use for the manufacture of power alcohol, could be grouped under two heads—viz., (a) azeotropic methods, and (b) salt dehydration methods. In the azeotropic methods a liquid entraining agent is used, which forms an azeotropic mixture of alcohol, water and the entraining agent which possesses a lower boiling point than the individual constituents present or combinations of them two by two. Hence during distillation the azeotropic mixture passes over first, carrying with it all the water. The entraining agents, whose use has been developed on a commercial scale are benzene in the Melle process and trichlorethylene in the Drawinol process.

In the salt dehydration method, 93-95 per cent alcohol is vapourized and passed through a column containing the dehydrating agent, which can either be a liquid, e.g., alkali acetates dissolved in absolute alcohol as in the Haig process or a solid, e.g., gypsum as in the process patented by the I. G. Farben Industrie or quicklime as in the older Merck process.

The patentees for the major processes are—

- (1) Melle process—Societe Anonyme Les Usines de Melle, France.
- (2) Drawinol process—Reich—Monopolver—Waltung of Germany acting through Messrs. E. Merck, Dramstadt.
- (3) Haig process—Haig—Verein Holzverkohlungs—Industries, Frankfurt (Main), Germany.
- (4) Gypsum process I. G. Farben Industries Aktiengesellschaft acting through Bamag-Meguini Aktiengesellschaft, Berlin NW 87, Germany.

The above patentees do not undertake the supply of the necessary plants for their methods, but have entrusted it to their agent-licensees.

The following gives the present annual production of absolute alcohol by the two groups of methods:—

World Production of Absolute Alcohol (1937).

(1 Hectoliter = 22 gallons.)

I. Azeotropic methods—		HECTOLITERS.
(a) Melle system	.. .. .	5,250,000
(b) Drawinol system	.. .. .	3,000,000
	Total	8,250,000
II. Salt-dehydration and other processes—		
(a) Haig system (alkali acetates)	.. .. .	3,975,000
(b) I. G. F. system (gypsum)	.. .. .	265,000
(c) Merck pressure system (lime)	.. .. .	120,000
	Total	4,360,000

Melle process.—The Melle process was originally designed in 1923 for the preparation of absolute alcohol from 95 per cent rectified spirits (First Technique), but the process has since been modified (Fourth Technique) so as to avoid the intermediary preparation of 95 per cent alcohol and to prepare absolute alcohol straightaway from the mash in one continuous series of operations.

The advantage of this modification is that it effects a saving of 50 to 60 Kg. of steam per hectoliter (22 gallons) of alcohol produced. This is an important saving especially in South India where the cost of coal or even wood is high.

Existing distilleries producing rectified spirits can also fit up the additional parts required for absolute alcohol production by the Melle process in such a way that they can produce either rectified spirits or absolute alcohol at will.

The Melle process possesses the largest number of installations and the longest turnover of absolute alcohol in the world and the Fourth Technique offers, no doubt, the cheapest method of manufacture of power alcohol. The Mandya Sugar Factory have adopted the Melle's plant in their distillery which is producing both rectified spirits (95 per cent) and absolute alcohol (Melle, First Technique).

A possible disadvantage of the Melle process is the use of benzene as the entraining agent, which is not produced in large quantities at present in India. But the loss of entraining liquid is claimed to be 0.04 to 0.05 per cent only of the alcohol produced in which case it is possible to obtain the small supplies needed for renewal, within the country itself. The difficulty will, however, cease, when the by-product recovery ovens are adopted to a greater extent by the coking plants in Bihar and Bengal.

Considering all factors, the Melle process is to be recommended for adoption. Where the distillery is concerned only with the manufacture of absolute alcohol, Melle's Fourth Technique may be adopted. The smallest convenient unit at present marketed is about 30-40 hl. per day, but the Melle office states that if the power alcohol is to be used round about the locality where it is manufactured, a plant of even lesser capacity, e.g., 20 hl. per day, would prove an economic unit and could work on the principles of the Fourth Technique.

The Drawinol process works on the same principles as the Melle process but uses trichlorethylene as the entraining agent. It is claimed that the dehydration efficiency (the proportion of water present in the ternary mixture) and the decantation efficiency (the volume of the aqueous layer) of trichlorethylene are superior to those of benzene and hence the operations are quicker and more efficiently carried out. Disadvantages of the method are the entraining liquid and the necessity for a complete separation of the trichlorethylene, since it has a density of 1.47 and even very small proportions left unseparated will affect the specific gravity of alcohol appreciably. The method is largely adopted by the German Government which has a monopoly of the production of power alcohol in the country. Under Indian conditions it offers no attractions superior to those of the Melle process.

Among the salt dehydration methods, the Haig process is one that commands the largest production. In this respect it is next only to the Melle process. It possesses the advantage that the materials used, viz., alkali acetates are cheap and could be obtained within India itself, and moreover the loss of the dehydrating agent is very small. The equipment and operations are simpler than in the Melle's process. The main disadvantage is that superheated steam at the rate of 65 Kg. of steam at 360° C are necessary for dehydrating the alkali acetates. Considering the high cost of steam in the Madras Presidency it is doubtful whether the method will work out cheaper than the Melle process.

On the other hand, the gypsum process offers peculiar advantages especially in areas, e.g., Trichinopoly and Erode, where cheap supplies of gypsum are available. The technical side of the process has been considerably improved in recent years. The dehydrating equipment consists of a revolving drum containing powdered anhydrous gypsum. The gypsum is converted into a hemi-hydrate which is dehydrated by indirect heating with liquids of suitable boiling point. The whole plant is simple and could be fitted on even to small distilleries preparing rectified spirits. The process seems to be peculiarly suited to deal with the molasses of small sugar factories with a crushing capacity of 100-200 tons of cane per day.

In conclusion, it may be stated that the conditions in the Madras Presidency favour the adoption of the Melle process, for large distilleries with a daily production capacity of 1,000 gallons and above and the gypsum process for small distilleries, especially, near localities where gypsum deposits occur.

APPENDIX D.

ESTIMATED COST OF PRODUCTION OF ABSOLUTE ALCOHOL.

A. Basis of calculation—

- 1 The distillery will treat 7,000 tons of molasses per annum.
- 2 Cost of molasses—Rs. 7 per ton.
- 3 Cost of coal—Rs. 17 per ton.
- 4 Cost of sulphuric acid—Rs. 2-8-0 per gallon.
- 5 Cost of ammonium sulphate—Rs. 121 per ton.
- 6 Total capital involved, including working capital—Rs. 4,00,000.
- 7 Royalty (reckoned on a plant having slightly more than a 50 per cent capacity margin)—£500 = Rs. 10,666-10-8.
- 8 Yield—One ton molasses yields 60 gallons absolute alcohol.
- 9 Depreciation—6½ per cent on plant. 6½ per cent on buildings.
- 10 Interest—6 per cent on total capital involved.
- 11 Number of working days—300 per annum.

	RS.
B. The total annual production—7,000 × 60 gallons = 420,000 gallons.	
C. Cost of installation delivered and erected and put into operation including building, molasses and alcohol, storage	3,25,000
D. Cost of production, Fourth Technique Melle—	
T	
1 Molasses 7,000 × Rs. 7	49,000
2 Coal (35 lb. steam per gallon of alcohol or 5 lb. of coal per gallon of alcohol). Therefore 420,000 gallons × 5 lb. say 940 tons	15,980
3 Sulphuric acid—About 7 grammes per gallon of wash (wash at 6 per cent). Say about 6,375 gallons at Rs. 2-8-0	15,940
4 Ammonium sulphate 7½ tons at Rs. 121	910
5 Government licence fee	100
6 Depreciation—	
Plant Rs. 2,25,000 at 6½ per cent	
Buildings Rs. 1,00,000 at 6½ per cent	20,310
7 Interest (six per cent on Rs. 4,00,000)	24,000
8 Labour including supervision, clerical and engineering staff	25,000
9 Light, power, laboratory material, greases and oils for pumps, cleaning materials	1,200
10 Upkeep and maintenance, including repairs	1,200
11 Dehydration carrier liquid	600
12 Insurance—Fire, workmen's compensation, riot and civil commotion	3,130
13 Storage, transfer and issue spirit wastages at 1½ per cent, say, 6,300 gallons at six annas per gallon	2,360
	1,59,730

Say approximately Re. 0-6-1-02 per gallon.

NOTE.—6. Depreciation has been calculated at 6½ per cent as allowed for income-tax purposes, but most business concerns would depreciate plant of this kind at ten per cent and steel framed corrugated sheet buildings at five per cent per annum.

No allowance has been made above for possible charges incurred in disposing of spent wash.

APPENDIX E.

(40 hl.—150 days).

ESTIMATE FOR A POWER ALCOHOL DISTILLERY OF 40 HECTOLITRES DAILY CAPACITY WORKING FOR 150 DAYS AND ATTACHED TO A SUGAR FACTORY.

Number of working days	150 (5 months).
Daily production	900 gallons.
Annual production	135,000 gallons.
Molasses required	2,250 tons.
Method of manufacture	Melle's fourth Technique.
RS.	
Capital required—	
Plant	1,20,000
Royalty and erection charges	10,000
Buildings and stagings	50,000
	1,80,000
	Total charges.
	RS.
	Charge per gallon (135,000 gallons).
	RS. A. P.
I. Depreciation—	
On plant plus erection charges at 10 per cent on Rs. 130,000 for twelve months	13,000
On buildings and royalty at 5 per cent on Rs. 60,000 for twelve months	3,000
	16,000
II. Steam—	
45 lb. per gallon of alcohol 1 lb. of wood gives 2½ lb. steam. Total wood required 1,080 tons, price at Rs. 10 per ton	10,900
III. Labour and staff	5,120
IV. Chemicals	1,400
V. Molasses—2,250 tons at Rs. 7 per ton	15,750
VI. Overhead expenses (insurance fire, upkeep, etc.)	3,000
VII. Interest .. .. .	..
	0 1 11
	0 1 3½
	0 0 8
	0 0 2
	0 1 11
	0 0 4½
	0 1 3
	0 7 7
Total expenses ..	

APPENDIX F.

POWER ALCOHOL REQUIREMENTS OF DIFFERENT AREAS.

Districts.	Estimated petrol consumption in gallons.	Total petrol consumption for the area.	Estimated consumption of absolute alcohol at 15 per cent blend (gallons).	Molasses required (in tons).	Names of factories in area.	Productive capacity of molasses in tons per annum.	Present production of molasses in tons per annum.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I {	Visagapatam .. 620,112	1,344,748	201,712	3,362	The Deccan Sugar and Abkar Company, Limited, Sarnalkot. Sri Ramakrishna Sugar Mills, Kirlampudi. Sri Rama Sugar Mills, Limited, Bobbili. Ettikopaka Co-operative Industrial and Credit Society, Limited, Narasapatam road. Visagapatam Sugars and Refineries, Limited, Thummapala.	..	3,836
East Godavari .. 344,292							
West Godavari .. 380,344							
II {	K stna .. 531,696	1,553,664	233,050	3,884	The Vuyyuru Co-operative Industrial and Credit Society, Limited, Vuyyuru.	2,400	1,164
Guntur .. 704,388							
Nellore .. 317,580							
III {	Cuddapah .. 267,024	1,086,538	155,481	2,501	The India Sugars and Refineries, Limited, Hospet.	2,100	1,762
Anantapur .. 249,000							
Bellary .. 281,144							
IV {	Kurnool .. 259,370	4,894,992	734,249	12,237	The Madras Sugars Limited, Mailpatti.	..	30
Chittoor .. 332,460							
Chingleput .. 342,552							
North Arcot .. 600,600							
V {	Madras City .. 3,619,380	1,757,544	263,632	4,394	The East India Distilleries and Sugar Factory, Nellikuppam. The Southern India Sugar Company, Limited, Karur.	..	6,858
South Arcot .. 410,244							
Tanjore .. 581,016							
VI {	Trichinopoly .. 766,284	2,557,668	383,650	6,394
Salem .. 767,880							
Coimbatore .. 1,393,284							
VII {	Nilgiris .. 396,604	2,486,436	372,965	6,216	AL. VR. ST. Sugar Mills and Distillery, Tachanallur. Lakshmi Sugar Mills, Alwartunagari.	..	416
Madura .. 1,057,944							
Ramnad .. 797,724							
VIII {	Tinnevely .. 630,768	1,591,512	238,727	3,979
Malabar .. 1,090,272							
South Kanara .. 501,240							
Total	17,223,102	2,563,466	43,057	12		

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REPORT OF THE COMMITTEE ON THE GOVERNMENT INDIAN MEDICAL SCHOOL.

We, the Members of the Committee appointed by His Excellency the Governor of Madras under G.O. Ms. No. 1988, dated the 13th May 1940 "to report on the lines on which the curriculum of studies and methods of teaching and examination followed in the Indian Medical School should be improved or altered," have the honour to submit the following report.

2. The terms of reference are as follows:—

- (i) To examine and suggest ways and means of improving or altering
 - (a) curriculum of studies,
 - (b) method of teaching,
 - (c) method of examination; and

(ii) to consider the question whether the number of beds provided in the hospital attached to the School for clinical instruction is adequate and if not, what the bed strength of the hospital should be.

3. The Committee met for the first time at Fort St. George on the 3rd July 1940 and resolved to request Dr. G. Srinivasamurthi, Principal of the Government Indian Medical School, to prepare and send a note on the points of reference for the use of the Members; and the Secretary to get copies of the curricula of studies and syllabuses followed in similar institutions in other Provinces.

4. After the receipt of the Principal's note, the Committee went round the School and Hospital on 18th September 1940. They met on the 19th, 20th and 23rd September at the Madras University Buildings and had preliminary discussion on the various points with the Principal. The Committee met again from 21st to 29th October 1940 except on the 26th and 27th. Further meetings of the Committee were held on the 6th, 7th and 8th January 1941 for discussion of the draft report and such alterations as were considered necessary or desirable, having been made, the report was signed on the 10th January 1941.

5. The Committee decided that there was no necessity to examine any outside bodies or individuals connected with Indian Medicine, as the present enquiry was concerned only with a particular institution, namely, the Indian Medical School.

Origin, object and working of the school.

6. It is desirable to give a brief description of the School and its working before we proceed further. Towards the end of 1921 the Government of Madras appointed a Committee under the Chairmanship of Mr. (now Sir) Mahomed Usman to report "on the question of the recognition and encouragement of the Indigenous Systems of Medicine in vogue in this Presidency." After a thorough and exhaustive investigation of various questions, they recommended to the Government the recognition of the Indian Systems of Medicine and the establishment of suitable centres of Medical Education by them. In their view "Every scheme of study of Indian Medicine, whether Ayurveda, Siddha or Unani should make adequate provision not only for efficient training in subjects appropriate to itself but also for the teaching of the essentials of whatever is valuable in Western Medicine." Accepting the recommendation of the Committee, the Government established the Indian Medical School in 1925 to give such instruction to its students as would enable them to become practitioner of Indian Systems of Medicine with a good working knowledge of the Western System.

7. In addition to the L.I.M. (Licentiate in Indian Medicine) Course which extends over a period of five years, provision is also made for imparting post-graduate instruction in Indian Medicine and Western Medicine to fully qualified practitioners of Western Medicine and Indian Medicine respectively. These are known as A.I.M. (Associate in Indian Medicine) and A.L.I.M. (Associate Licentiate in Indian Medicine) Courses, extending over a period of two years each. There is also provision for passed L.I.Ms. of the School to specialize in branches of Indian Medicine in which they have not specialized in their L.I.M. Course and also for obtaining a higher qualification (H.P.I.M.) in their own branch and there is also a Compounders' Course.

8. The L.I.M. Class is divided into four sections:—

- (i) Ayurveda—Telugu Section,
- (ii) Ayurveda—Tamil Section,
- (iii) Siddha Section, and
- (iv) Unani Section.

The following table shows the strength of the students for 1940-41 in each of the sections of the five years:—

Section.	First year.	Second year.	Third year.	Fourth year.	Fifth year.
Ayurveda—Telugu	58	65	29	21	14
Ayurveda—Tamil	24	36	20	19	6
Siddha	17	23	12	12	11
Unani	3	8	6	4	2

The present curriculum of studies.

9. The following is the present curriculum of studies for all sections:—

(The names of the subjects are given in English so as to be applicable to all sections, viz., Ayurveda, Siddha and Unani, but instruction in the various subjects is based upon the Ayurveda, Siddha and Unani writings, respectively, the subjects included in Western Medicine being taught in accordance with English books on the subject.)

First year.

1	General Science	Complete Course.
2	Materia Medica and Pharmacy—General	Do.
3	Do. Special	Do.
4	Fundamental Principles of Indian Medicine	First Course.
5	Anatomy and dissections	Do.
6	Physiology	Do.
7	General Literature (Sanskrit, Tamil or Arabic studies)	Do.

Board Examinations in subjects 1 to 3.

Second year.

1	Anatomy	Second Course.
2	Physiology	Do.
3	Fundamental Principles of Indian Medicine	Do.
4	General Literature (Sanskrit, Tamil or Arabic studies)	Do.

Board Examinations in subjects 1 to 3.

Third year.

1	Pathology and Diagnosis	Complete Course.
2	Hygiene and Public Health	Do.
3	General Literature (Sanskrit, Tamil or Arabic studies)	Third Course.
4	Medicine (including Mental Diseases, etc.)	First Course.
5	Surgery (including Diseases of Eye, Ear, Nose and Throat, etc.)	Do.
6	Obstetrics, Gynaecology and Pediatrics	Do.

Board Examinations in subjects 1 to 3.

Clinical practice—

In-patient department—Medical	3 months.
Out-patient department—Medical	2 do.
Do. Surgical	2 do.
In-patient department—Surgical	2 do.

Fourth year.

1 } Subjects Nos. 4 to 6 of Third year (continued)	Second Course.	
2 }		
3 }		
4	Medical Jurisprudence and Toxicology	Complete Course.

Board Examinations in subjects 1 to 4.

Clinical practice—

In-patient department—Medical	3 months.
Do. Surgical	2 do.
Do. Obstetrical	2 do.
Out-patient department—Surgical and Ear, Nose and Throat sections (one month each)	2 do.

Fifth year.

Apprentice Physician's course—

Medical practice at out-patient, in-patient and Pharmacy departments	6 months.
Surgical practice (including Obstetrical practice at the out-patient and in-patient departments)	3 do.

Only those who have satisfactorily undergone the apprentice physician's course will be eligible for the grant of the Diploma of Licentiate in Indian Medicine.

General proposals.

10. Keeping in view the purpose for which the School was started, we have examined in detail the curriculum of studies, methods of teaching and examination followed in the School.

11. Since the curriculum of studies is based on the general educational qualification of the students admitted into the School, the Committee discussed at length, as a preliminary to the detailed discussion of the curriculum of studies, what the minimum general educational qualification of students admitted into the School should be. Dr. G. Srinivasamurthi, Principal of the School, strongly pleaded before us for the raising of the general educational qualification of the students from the S.S.L.C. to the Intermediate standard and consequently for converting the School into a College. But since we think that this question of raising the School into a College does not come within the terms of reference, we do not propose to go into it. It has been the practice to admit into the

School students who have not completed the S.S.L.C. course, with the result that such students find it difficult to follow the subjects of Western Medicine which are taught in English. Therefore we suggest that the completed S.S.L.C. should be the minimum general educational qualification for students hereafter.

12. The authoritative texts in Ayurveda, Siddha and Unani Systems are in Sanskrit, Tamil and Urdu respectively and practitioners of these systems if they want to be competent and efficient, should have a good knowledge in their respective languages. The majority of students at present admitted into the Ayurveda Section is ignorant of the Sanskrit language. We feel convinced that unless these practitioners of the Indian Systems of Medicine know their respective languages thoroughly well, they cannot be efficient in their profession.

13. The views of the Principal and a lecturer from each of the four sections were taken on this question. The Principal thought that it would be ideal to insist on a knowledge of Sanskrit before a student was admitted to the Ayurveda Section but that the number of students in the Ayurveda-Telugu Section would fall considerably during the first few years, as very few Andhra students had a knowledge of Sanskrit at present. Lecturers of the Ayurveda-Telugu Section and the Ayurveda-Tamil Section admitted that a knowledge of Sanskrit was quite essential. The Lecturer of the Siddha Section was of the opinion that a knowledge of advanced Tamil was quite essential for a Siddha student for the proper appreciation of the original texts. The Lecturer in Unani said that all the text-books in Unani System were very well translated into Urdu from Arabic and that there was no necessity to teach the students the Arabic language as a language and suggested that advanced Urdu might be taught in place of Arabic. After careful consideration of the opinions of the Principal and the Lecturers, we have come to the conclusion that admission to the school should be made on the basis of an examination in Sanskrit for Ayurveda students, in Tamil for Siddha students and in Urdu for Unani students. It may be that, by the insistence of this knowledge from the students, the strength of the Andhra students studying Ayurveda might fall in the first few years after the introduction of this rule but we are certain that in course of time the Andhra students will adjust themselves to the change and seek admission in as large a number as at present.

Proposed Curriculum of Studies—L.I.M. (Licentiate in Indian Medicine) Course.

14. As regards the curriculum of studies for L.I.M. Course we make the following proposals:—
- (i) *General Science.*—The present standard of teaching in Physics, Inorganic Chemistry and Botany is quite sufficient. In addition there should be an elementary course in Organic Chemistry.
 - (ii) *Materia Medica and Pharmacy.*—The subject of Materia Medica is taught at present according to both systems, Indian as well as Western. Since the object of the Indian Medical School is to train students mainly in the Indian Systems of Medicine, it is unnecessary to expect them to learn Western Materia Medica *in extenso*. Hereafter Indian Materia Medica should be taught thoroughly in the school, along with a few selected special drugs from the British Pharmacopoeia which would be very useful. The syllabus in Indian Pharmacopoeia should be the same as at present.
 - (iii) *Fundamental principles of Indian Medicine.*—We do not propose any change in the curriculum.
 - (iv) *Anatomy and dissections.*—We consider that an intensive study of the subject of Anatomy is unnecessary as too much time will be consumed in studies which have no clinical bearing. Dissections should be taught with a greater number of dissected models such as are kept now in the two Medical Colleges in Madras.
 - (v) *Physiology.*—The general outlines of Physiology should be taught as at present.
 - (vi) *General literature (Sanskrit, Tamil or Arabic studies).*—At present students of the Ayurveda Sections are taught *Mana Meyodayam*. The subject is a very difficult one which cannot be easily grasped by students of the standard studying in the Indian Medical School. Therefore we recommend that it may be deleted from the present curriculum of studies, and a simple treatise on *Jyotisha* may be substituted. Students of the Unani Section are being taught the Arabic language. Since all the original books in Arabic on the subject of Unani are found translated into the Urdu language, we think that hereafter advanced Urdu may be taught to the students of the Unani Section instead of Arabic. We strongly recommend that Sanskrit should be taught to the Ayurveda students, Tamil to Siddha students and Urdu to Unani students by persons well qualified to do so.
 - (vii) *Pathology and diagnosis.*—Both systems of Pathology—Indian and Allopathic—should be taught. As regards the Western System of Pathology, only elementary principles need be taught. Diagnosis of diseases should always be according to the Indian Systems of Medicine.
 - (viii) *Hygiene and public health.*—No change is required. What is being taught now is quite sufficient.
 - (ix) *Medicine including mental diseases, etc.*—We are of opinion that there should be an intensive study of Indian Medicine by the students of the Indian Medical School, as they are expected to practise mainly Indian Medicine. However, some lectures on Comparative Medicine should also be delivered.

HOSPITAL AND BEDS.

27. We are of opinion that patients in the out-patient—Medical section—should be treated according to Ayurveda or Siddha or Unani Systems and patients in out-patient—Surgical section—according to Western System, using Indian Medicines wherever possible.

In-patient department.

The present sanctioned strength of beds in the hospital attached to the Indian Medical School is as follows:—

Ward.		Beds.
Male.		
Ayurveda (Telugu)	10	10
Panchakarma (including Indian Surgical non-operative and Tuberculosis sections)	10	10
Siddha	10	10
Unani	10	10
Surgical (including Eye, Ear, Nose and Throat sections)	15	15
		55
Female.		
Ayurveda	5	5
Siddha	5	5
Unani	5	5
Labour (including Surgical, Eye, Ear, Nose and Throat)	10	10
		25

The present number of 80 beds in the Hospital is quite inadequate and in our opinion it should be trebled, but owing to present financial conditions we recommend that it should be raised at least to 165 beds immediately as detailed below:—

Sections.	Number of beds.
Ayurveda	50
Siddha	30
Unani	20
Surgical (General)	20
Do. (Septic)	10
Obstetrics	20
Eye, Ear, Nose and Throat	12 (including 4 beds for women).
Tuberculosis	3
	165

The present accommodation in the Hospital is quite inadequate even for the present number of beds. Accommodation has to be provided for the additional beds recommended above. Within the school compound there is a large vacant site wherein buildings might be put up.

MAHOMED USMAN, *Chairman.*

M. R. GURUSWAMI,

* K. BALASUBRAHMANYA AYYAR,

S. K. PILLAI,

M. A. NAIR.

Members.

MADRAS,
10th January 1941.

* With a note.

NOTE OF SRI K. BALASUBRAHMANYA AYYAR, DATED 10TH JANUARY 1941.

All are agreed that a good knowledge of Sanskrit is essential for a student of Ayurveda to grasp thoroughly the subjects taught in the Ayurveda Section. Hence, the Committee have recommended in the report that an examination in Sanskrit should be held as a preliminary test for admission of students to that section. But the report has not indicated what standard should be adopted for the examination. From my experience of the working of Ayurvedic Colleges, I feel that unless a student possesses a knowledge of Sanskrit approximating to the standard required for the Government entrance examination, Sahitya, he will not be in a position to follow intelligently the text-books that are taught in the Ayurveda section. Though it may be that by the adoption of this standard, the strength of the Ayurveda section may fall in the beginning, I am sure in the course of a few years, the number will increase. But, even at the risk of a reduction in the number of students in the beginning, I think it is necessary that the examination should come up to this standard, since on the efficiency of the students that will finally pass out of the institution, the usefulness of the School and of the indigenous system of medicine will largely depend. The general literature course for the first three years of the L.I.M. will enable the students to further improve their knowledge of the Sanskrit language especially of Sanskrit Grammar (Siddhanta Koumudi). Therefore my suggestion is that the Principal should, at least after a few years, adopt for the admission examination in the School the same standard, which is required for the Government Entrance Sahitya Examination.