REPORT OF THE KING INSTITUTE OF PREVENTIVE MEDICINE, GUINDY

FOR THE PERIOD FROM 1ST APRIL 1952 TO 31ST MARCH 1953

BY

DR. Y. S. NARAYANA RAO, M.B.B.S., D.T.M. (Cal.), D.B. (Lond.)
Director, King Institute, Guindy

AND

REPORT OF THE GOVERNMENT ANALYST, MADRAS

BY

SRI S. NARAYANA AYYAR, M.A., A.I.I.SC., F.F.I.C.
Government Analyst, King Institute, Guindy

PRINTED BY THE SUPERINTENDENT
GOVERNMENT PRESS

REPORT OF THE KING INSTITUTE OF PREVENTIVE MEDICINE, GUINDY, FOR THE PERIOD FROM 1ST APRIL 1952 TO 31ST MARCH

STAFF.

GAZETTED OFFICERS.

Director.

1. Dr. Y. S. Narayana Rao, M.B.B.S., D.T.M. (Cal.), D.B. (Lond.), Director.

2. Dr. M. K. K. Menon, M.B.B.S., Director-in-charge for the period from 12th May to 14th June and 29th September to 8th November 1952 during the leave period of Dr. Y. S. Narayana Rao.

3. Dr. M. Narayana Pai, M.B.B.S., acting Director, from [illegible] to 31st March 1953 during the leave period of Dr. Y. S. Narayana Rao.

Assistant Directors.

4. Dr. M. K. K. Menon, M.B.B.S., Assistant Director, Department of Anti-toxin.

5. Dr. M. Narayana Pai, M.B.B.S., Assistant Director, Biological Control and Drugs (Special), from 8th September 1952 to 22nd March 1953.

6. Dr. K. Dattatreyalu, M.B.B.S., acting Assistant Director, from 23rd March 1953.

7. Dr. C. Venkateswara Rao, M.B.B.S,, L.C., Assistant Director, (Diagnostic).

8. Dr. T. Raghavan, M.B.B.S., Assistant Director, Blood Transfusion, from 1st April to 12th April 1952.

9. Dr. C. Sriramachandra Rao, M.B.B.S., D.P.H., Assistant Director, Blood Transfusion, from 13th April 1952.

10. Dr. N. R. Ratnakannan, M.B.B.S., Assistant Director, Vaccine Lymph Section.

11. Dr. K. Dattatreyalu, M.B.B.S., Assistant Director, Biological Control, from 8th April to 7th September 1952 during the deputation period of Dr. M. Narayana Pai.

12. Dr. K. S. Balasubramaniam, L.M.P., Civil Assistant Surgeon, holding the additional charge of Assistant Director, Vaccine Lymph Section, during the leave period of Dr. N. R. Ratnakannan, from 2nd to 31st March 1953.

13. Dr. Y. S. Narayana Rao, Director, holding the additional charge of the post of Assistant Director (Diagnostic).

14. Dr, N. Sundararajan, M.B.B.S., Assistant Director, Blood Transfusiont, from 13th to 31st March 1953 during the leave of Dr. C. Sriramachandra Rao.

Assistant Surgeons.

15. Dr. C. S. Balasubramaniam, M.B.B.S., Civil Assistant Surgeon, from 1st April to 16th December 1952.

16. Dr. K. Dattatreyalu, M.B.B.S., Civil Assistant Surgeon, from 8th September 1952 to 22nd March 1953.

17. Dr. K. Appu Kurup, L.M.P., L.O., Civil Assistant Surgeon, from 8th September 1952 to 22nd March 1953.

18. Dr. Ambujamma Natarajan, M.B.B.S., Civil Assistant Surgeon, from 1st April to 6th October 1952.

19. Dr. Srimathi Sunithirangan, M.B.B.S., Civil Assistant Surgeon, from 1st April to 16th September 1952.

20. Dr. Srimathi M. Vatsala, M.B.B.S., D.G.O., Civil Assistant Surgeon, from 1st April to 16th September 1952.

21. Dr. K. S. Ramaswamy, M.B.B.S., D.T.M., Civil Assistant Surgeon, from 1st April to 16th September 1952.

22. Dr. D. V. Ramamurthi, M.B.B.S., Civil Assistant Surgeon, from 1st April to 7th May 1952.

23. Dr. G. D. Shenoy, M.B.B.S., D.G.O., Civil Assistant Surgeon.

24. Dr. S. Venkataswamy, L.M.P., Civil Assistant Surgeon.

25. Dr. B. V. Venkatachalapathy Setty, M.B.B.S., Civil Assistant Surgeon.

26. Dr. M. Narayanan, L.M.S., Civil Assistant Surgeon, from 1st April to 16th October 1952.

27. Dr. D. M. Lingayyah, D.M.S., Civil Assistant Surgeon, from 1st to 10th April 1952.

28. Dr. Dinker Babu Rao, M.B.B.S., Civil Assistan Surgeont.

29. Dr. M. R. Natarajan, M.D., Civil Assistant Surgeon. from 1st April to 8th October 1952.

30. Dr. Francis Xavier, M.B.B.S., Civil Assistant Surgeon, from 1st April to 15th September 1952.

31. Dr. P. Ramaswamy, L.M.P., Civil Assistant Surgeon.

32. Dr. T. S. Kasturi, L.M.P., Civil Assistant Surgeon, from 1st April 1952 to 22nd February 1953.

33. Dr. K. S. Balasubramaniam, L.M.P., Civil Assistant Surgeon.

34. Dr. N. Sundararajan, M.B.B.S., Civil Assistant Surgeon.

35. Dr. N. V. Gangadharan, L.M.P., Civil Assistant Surgeon.

36. Dr. V. Krishnamurthi, M.B.B.S., Civil Assistant Surgeon.

37. Dr. S. Gnanadesikhan, M.B.B.S., Civil Assistant Surgeon, from 10th April 1952 to 31st March 1953.

38. Dr. K. Seshiah, L.M.P., Civil Assistant Surgeon, from 7th July 1952 to 31st March 1953.

39. Dr. K. Venugopal, M.B.B.S., Civil Assistant Surgeon.

40. Dr. P. Damodaran, M.B.B.S., Civil Assistant Surgeon, from 8th May to 13th September 1952.

41. Dr. N. Rajasekharan, M.B.B.S., D.G.O., Civil Assistant Surgeon, from 26th August 1952 to 31st March 1953.

42. Dr. T. S. Srinivasa Rao, M.B.B.S., Civil Assistant Surgeon, from 2nd October 1952 to 31st March 1953.

43. Dr. (Kumari) Grace Swamidasan, M.B.B.S., Civil Assistant Surgeon, from 16th December 1952 to 31st March 1953.

Government Analysts Section.

44. Sri S. Narayana Iyer, M.A., A.I.I.SC., F.R.I.C., Government Analyst.

45. Sri Y. G. Doraiswamy, M.SC., Deputy Government Analyst, from 1st April to 1st December 1952.

46. Sri K. R. Srinivasan, M.A., A.R.I.C., Deputy Government Analyst, from 19th December 1952 to 31st March 1953.

47. Sri. K. R. Srinivasan, M.A., A.R.I.C., Senior Assistant to Government Analyst, from 1st April to 18th December 1952.

48. Sri K. Balasubramaniam, B.SC. (Hons.), Senior Assistant to Government Analyst from 19th December 1952 to 31st March 1953.

49. Sri M. Krishnamurthy, M.A., Senior Assistant to Government Analyst (Drugs).

50. Sri K. Narayanaswamy, B.SC. (Hons.), A.R.I.C., Senior Assistant to Government Analyst.

51. Sri P. Nataraja Sarma, M.A., Senior Assistant to Government Analyst.

Water Analysis Section.

52. Sri P. V. Seetharama Iyer, M.A., Chief Water Analyst.

53. Sri N. Swaminathan, B.SC., A.I.I.SC. Assistant Analyst, Water Bacteriology and Chemistry.

54. Sri N. Swaminathan, B.SC., A.I.I.SC., Assistant Analyst, Water Bacteriology and Chemistry, acted as Chief Water Analyst during the leave period from 9th to 31st March 1953.

55. Sri K. R. Ramaswamy, B.SC., Assistant Analyst, Water Bacteriology and Chemistry, from 9th to 31st March 1953.

56. Sri K. G. Veeraraghavan, M.SC., Assistant Analyst, Water Biology.

57. Sri V. R. Srinivasan, M.A., Senior Chemical Assistant.

58. Sri P. Seshagiri Rao, M.SC., D.SC., Biochemist.

59. Kumari R. J. Irani, M.SC., Chemical Assistant, from 1st April to 4th August 1952.

60. Sri P. K. Ramachandran, M.SC., Chemical Assistant, from 14th December 1952 to 31st March 1953.

OFFICE ESTABLISHMENT.

Lay Secretary.

Sri G. T. Harimurthi, M.A., from 11th October 1951 to 6th February 1952.
Sri R. Gopalakrishna Rao, from 7th February to 31st March 1953.

NON-GAZETTED OFFICERS.

Veterinary Assistant Surgeons.

Sri E. R. Nagarajan.
Sri M. S. Jayaraman.

Junior Water Analysts.

Department of Water Analysis .. Sri K. R. Ramaswamy, B.SC.
,, A. S. Hariharan, B.SC.
,, S. Venkataraman, B.SC, (Hons.).
Kumari S. Chellam, B.SC. (Hons.).
Sri D. Seethapathi Rao, B.SC. (Hons.).

Junior Assistants to Government Analyst.	Sri K. Balasubramaniam, B.SC. (Hons.).
	,, N. Srinivasan, M.A.
	,, K. Ramachandran, M.A.
	,, M. V. Narayanan, B.SC. (Hons.).
	,, C. S. Raghunathan, B.SC. (Hons.).
	,, G. Balasubramaniam, B.SC. (Hons.).
	,, S. A. Subramaniam, M.SC.
	,, V. Seshagiri Rao, B.SC. (Hons.).
	,, K. Kuppusamy, M.SC.
	,, M. R. Gopalan, B.SC. (Hons.).
	,, S. Subbaraman, B.SC. (Hons.).
Junior Chemical Assistants ..	Sri S. Srinivasaraghavan, B.SC.
	,, V. V. Krishna Rao, B.SC. (Hons.).
	Kumari H. Packiyam, B.SC. (Hons).
Junior Assistant, Vaccine Lymph Section.	Sri P. Munuswamy Raju.

OFFICE.

NON-GAZETTED OFFICERS.

Manager	Sri S. Gopala Iyer.
Librarian	Sri V. Srinivasa Iyengar, B.A., up to 4th February 1953.
	Srimathi S. Sundaramma, B.SC., from 5th February 1953.
Permanent	Accountant 1, Cashier 1, Upper Division Clerks 3, Lower Division Clerks 17, Typists 5, Stenographers 2, Attenders 2, Telephone Attenders 2 and Peons 9.
Temporary	Upper Division Clerk 1, Lower Division Clerks 3 and Typists 2.

LABORATORY STAFF.

Permanent	Sample Takers 5, Technical Assistants Technicians 16, Laboratory Attendant I Grade, 33, Laboratory Attendants, Grade, 51, Peons 72, Algae Collector and Compounder 1.
Temporary	Technicians 3, Laboratory Attendants Grade, 2, Laboratory Attendants, Grade, 3 and Peons 6.
Miscellaneous staff	Photo Artist 1, Overseer 1, Assistant Overseers 4, Deputy Overseer 1, Electric 1, Mechanic 1 and Refrigerator Mech 1

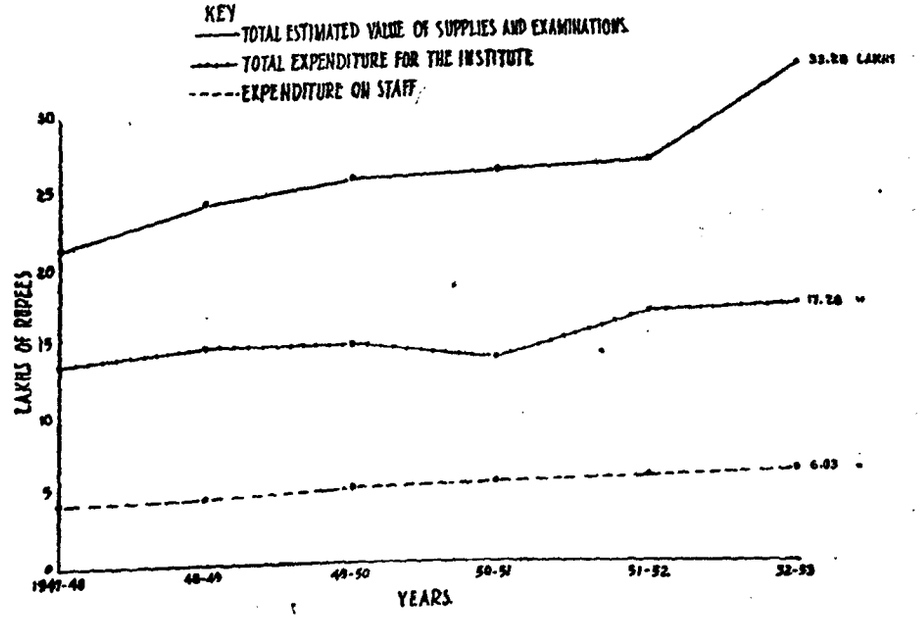
GENERAL REVIEW.

The following graph clearly shows how the work of this Institute is steadily increasing.

It also shows that (1) there has been a steep increase in the net profits amounting to Rs. 5,68,677. This increase is mostly due to a large demand for cholera vaccine during this year; (2) there has also been a slight increase in the total expenditure by about Rs. 75,000. This also is partly due to the increased production of cholera vaccine and also to the regularization and increased emoluments that have been sanctioned to some of the menial staff of this Institute.

CHART 1

THE KING INSTITUTE OF PREVENTIVE MEDICINE, GUINDY.



Finance.—The total expenditure for the year amounted to Rs. 17,28,722 (see Table I) including the amounts borne by other departments on the Institute accounts. The total cash receipts by way of sales proceeds of sera, vaccines, collection of payments for services rendered amounted to Rs. 3,27,675. The difference, i.e., Rs. 14,01,047 represents the net cost of the Institute debitable to State Revenues. It has been pointed out, however, that most of the biological products manufactured in the Institute such as vaccine lymph, bacterial vaccines, sera, sterile solutions, etc., and antitoxins purchased from foreign firms are issued free to Government institutions in the State. Vaccine lymph and prophylactic cholera vaccine are issued free to local bodies. Similarly, services are also rendered free of charge to the Government departments and local bodies. If the above supplies and services rendered by the Institute were to be charged for according to the rates approved by Government, the total anticipated receipts shown in Statement 3 of Table I would amount to Rs. 33,28,691. The difference between the *estimated receipts and the estimated expenditure, i.e., Rs.* 15,99,969 *represents the net profit to Government.*

Staff.—For the last few years there has been a lot of changes in the medical personnel of the staff of this Institute. It is very much regretted (1) that the Institute has become almost a travellor's bungalow for medical officers who just want to be in Madras for some private reasons of their own, thus sacrificing the interest of this Institute; (2) further, medical officers with post-graduate qualifications in Gynæcology and Ophthalmology are being posted to the Institute just as a stop-gap arrangement; (3) there are about six Sub-Assistant Surgeons (L.M.Ps.) at present temporarily posted in this Institute. They have neither the inclination to learn nor are they capable of learning the laboratory techniques as many of them are on the verge of their retirement. It is therefore requested that the above three categories of officers will not be posted to this Institute in future, as unlike other hospitals and dispensaries, medical officers have to put in at least one year's training in the different departments of this Institute in order to be useful and able to do the routine work of this Institute.

Improvements—Buildings.—During the year under report, the following new works have been undertaken:—

(1) *Improvements to the Director's quarters.*—This was partly carried out this year.

(2) Construction of the veranda on the western end of the vaccine section block into a room with two doorways and a window.

(3) Gas and water connexions on three sides of the veranda of the Chief Water Analyst's Laboratory has been completed.

(4) Certain improvements to the Nawab's Garden bungalow were carried out this year.

Most of the items of minor works approved by the Director of Medical Services, Madras, could not be carried out *on account of the late receipt* of Government Order revalidating the sanction of expenditure of Rs. 20,300 originally sanctioned in G.O. No. 68, Health, dated 25th January 1952. G.O. No. 404, Finance, dated 10th March 1953, restricting the above amount to Rs. 10,000 only was received only on 18th March 1953 and it is hoped that the works will be completed within the financial year ending 31st March 1954.

Additional staff.—One post of Typist sanctioned for the department of Water Analysis in connexion with the increased work in G.O. No. 1713, Health, dated 26th May 1952.

Revision of scales of pay.—Scale of pay of Junior Assistants in various departments in King Institute, Guindy, has been revised from Rs. 100—8—140—10—200 to Rs. 120—5—170—7—240 for persons with B.Sc. (Hons.) and higher qualifications—vide G.O. Ms. No. 2876, Health, dated 9th September 1952, and thus a long existing anamoly has been rectified.

Technical Assistant—Government Analyst Section.—Scale of pay revised from Rs. 55—4—95 to Rs. 80—3—110 from 26th May 1952 (date of order)—vide G.O. Ms. No. 1726, Health, dated 26th May 1952.

Calf watchmen and syces.—Scale of pay raised from Rs. 10—½—15 to Rs. 18—½—25 with effect from 1st August 1952—vide G.O. No. 2688, Health, dated 19th August 1952.

Algae Collector.—Scale of pay raised from Rs. 25—2—45 to Rs. 40—3—70 from date of order—vide G.O. No. 2857, Health, dated 8th September 1952.

Government Analyst.—Scale of pay raised from Rs. 500—50/2—750—75/2—900 to Rs. 600—75/2—900 with effect from date of order sanctioned in G.O. No. 3002, Health, dated 22th September 1952.

UpperDivision Clerk, Government Analyst Section.—Special pay of Rs. 5 per mensem sanctioned to the Upper Division Clerk, in the Government Anlayst Section for supervisory work with effect from the date of G.O. No. 3114, Health, dated 4th October 1952.

The following temporary posts have been permanently retained with effect from 1st April 1952.

Department of Water Analysis.

Chief Water Analyst	1	G.O. Ms. No. 2240, Health, dated 11th July 1952.
Assistant Analyst (Water Bacteriology and Chemistry).	1	
Assistant Analyst (Water Biology)	1	
Junior Water Analysts	5	G.O. No. 1578, Health, dated 15th May 1952.
Sample Taker	1	
First grade Laboratory Attendants	2	
Technician	1	
Laboratory Attendant, II Grade	1	
Laboratory Peon	1	

Government Analyst Section.

Junior Assistants to Government Analyst.	1	G.O. No. 1578, Health, dated 15th May 1952.
Laboratory Peons	2	
Carpenter	1	G.O. Ms. No. 1339, Health, dated 24th April 1952.
Assistant Director (Department of Anti-toxin).	1	G.O. Ms. No. 1338, Health, dated 24th April 1952.
Assistant Director (Blood Bank)	1	
Civil Assistant Surgeons (Cholera Vaccine Section).	2	
Civil Assistant Surgeon (Serum Standard Laboratory).	1	
Civil Assistant Surgeon (Department of Anti-toxin).	1	
Medical Bacteriologist (Civil Assistant Surgeon—Department of Biological Control).	1	
Pharmacologist (Department of Biological Control).	1	
Assistant Director [Department of Biological Control and Government Analyst Drugs (Special).]	1	G.O. Ms. No. 1113, Health, dated 1st April 1952.
Biochemist (Serum Concentration Department).	1	
Chemical Assistant, Drugs (Special)	1	
Senior Assistant, Drugs (Special)	1	

Cholera Vaccine Section.

Technical Assistant	1	G.O. No. 1049, Health, dated 28th March 1952.
Technicians	4	
Laboratory Attendants, Grade I	7	
Laboratory Attendants, Grade II	12	
Laboratory Peons	16	

Diagnostic Sera Section.

Laboratory Attendants, Grade I	2	G.O. No. 1049, Health, dated 28th March 1952.
Laboratory Attendants, Grade II	1	
Laboratory Peons	3	

Stores Section.

Peon	1	G.O. No. 1049, Health, dated 28th March 1952.

Library.

Attender	1	G.O. No. 1049, Health, dated 28th March 1952.

Mechanic Section.

Electrician, Grade II	1	G.O. No. 1049, Health, dated 28th March 1952.

Sterile Solution Section.

Technician	1	G.O. No. 1049, Health, dated 28th March 1952.
Laboratory Attendants, Grade I ..	2	

Department of Water Analysis.

Algæ Collector	1	G.O. No. 1049, Health, dated 28th March 1952.

Department of Anti-toxin.

Veterinary Assistant Surgeon	1	G.O. No. 1049, Health, dated 28th March 1952.
Technician	1	
Laboratory Attendant, Grade I ..	1	
Laboratory Attendant, Grade II ..	2	
Laboratory Peons	2	
Deputy Overseer	1	

Serum Standard Laboratory.

Junior Chemical Assistant	1	G.O. No. 1049, Health, dated 28th March 1952.
Technician	1	
Laboratory Attendant, Grade I ..	1	
Laboratory Attendant, Grade II ..	1	
Sweeper	1	

Blood Bank.

Civil Assistant Surgeons	2	G.O. No. 623, Health, dated 27th February 1952.
Technician	1	
Laboratory Attendants, Grade I ..	3	
Laboratory Attendants, Grade II ..	1	
Laboratory Peons	3	

Vaccine Lymph Section.—Two lakhs ten thousand six hundred and twenty-seven ml. of 1 in 10 dilution glycerinated vaccine was issued during the year. The potency of the vaccine lymph at the time of issue from the Institute has continued to be satisfactory. As a matter of fact, since there had been a few reports about the reactions to vaccination having been a little more pronounced than usual, a dilution of 1 in 10 of the lymph instead of 1 in 7, was tried in the experimental range and found to be quite good; and the same dilution of 1 in 10 adopted for general issue. The general case and insertions success rates for the whole State were 96·0 per cent and 87·8 per cent respectively.

Attempts to produce dried vaccine were taken up this year, and the results of preliminary trials were encouraging. Further work and standardization of the process, etc., is being continued.

Diagnostic Department.—There was an increase in the number of specimens examined and reported for microscopical, cultural, serological and agglutination tests as compared with previous years. The demand for various media was heavy but we were able to meet the demands as far as possible with the limited equipment and accommodation.

Prophylactic and Therapeutic Vaccine Section.—10·9 million doses of cholera vaccine were supplied this year as against 5·8 million doses in last year. The incidence of plague was very low this year and consequently only 23,280 c.c. of plague vaccine was issued this year. This section had also manufactured 2·14 lakhs of T.A.B. Vaccine and supplied about 1·86 lakhs doses.

The therapeutic vaccine section had continued to manufacture and supply autogenous vaccines, therapeutic vaccines, various live cultures, the bacterial suspensions to various laboratories.

Sterile Solution Section.—This year the supplies of various sterile solutions have considerably increased. The requirements of the famine and epidemic areas were met to the maximum extent possible. Besides the usual routine solutions manufactured for intravenous use, special solutions also are prepared and supplied on request.

Department of Anti-toxins.—There were 57 horses at the end of the year for the production of Therapeutic Serum for the use of the various medical institutions of the State. The demand for tetanus anti-toxin continued to be high and consequently a large proportion of these horses were assigned for the production of anti-tetanic serum. This department still suffers for want of additional stable accommodation. The entire needs of the State for serum could be satisfied only by still further increasing the total number of horses under serum production. However, it will be seen that the work turned out by this Department has been very considerable as during the year under report a still further increase in anti toxic sera was effected. The total amount of anti-toxic plasma processed this year amounts to 2,731 litres as against 2,084 litres processed last year. The report of the department shows that biological standardizations were conducted on 237 samples of Tetanus anti-toxin and 13 samples of gas ganarene (perfringens) anti-toxin. Experimental work to enhance the antigenic efficiency of Tetanus Toxin manufactured in the laboratory had also continued intensively. A systematic investigation was conducted into the causes of discoloration of the final anti-toxic sera and suitable modification effected in the technique of concentration so that the final products issued resulted in a very clear and practically colourless sera.

Blood-bank Section.—The Blood-bank Section of the King Institute, Guindy, is under the charge of the Assistant Director (Blood Transfusion) assisted by two Civil Assistant Surgeons.

There are 19 blood-banks in the State. Blood Bank equipment for the blood Transfusion Service in the State is being supplied by this section under the Central Supply Scheme.

The Mobile Blood-bank Unit was sent to accept blood donations from the inmates of jails at Vellore, Rajahmundry and Madras Penitentiary.

Training in Blood Transfusion and resuscitation work was given to eleven medical officers.

The Blood-bank took part in two exhibitions conducted in the city and also three in the districts, for popularizing the blood donation.

Plasma and group sera processing is done in the section for supply. Serological investigations were also carried out.

Department of biological control.—This department was started in 1947, to test samples of drugs under the provisions of the Drugs Act, 1940 and rules thereunder. In this department all biological products prepared in the Institute are tested before being issued to the various hospitals, public health bodies, and practitioners. Samples sent by private manufacturing firms both in Madras State as well as other

States in the Indian Union are also tested as far as time and facilities permit. The total number of tests performed in 1952–53 was 7,290 as compared with 6,268 done in 1951–52.

The male frog test for pregnancy has now become a matter of routine: the city hospitals and private practitioners are making use of this test in an increasing measure. The total number of samples of urine tested during the year 1952–53 was 126. The fee for the test is Rs. 5.

The work of the department is increasing steadily and owing to lack of necessary equipment, appliances and accommodation the work has been necessarily restricted.

Department of water analysis.—The purity and hygienic safety of the protected drinking water supplies in the State is maintained by periodical analytical examinations of samples of water and by carrying out the needed improvements or corrective measures by the concerned Health and Sanitary Engineering authorities. At the close of the year under report, there were 172 such supplies under regular examination.

The department also undertook the analysis of samples of water for use in industries and the testing of sewage and trade wastes for the determination of suitable disposal methods. The bacteriological analysis of milk and the testing of disinfectants were also carried out.

In connection with all these activities, a total of 8,928 samples of water, 749 samples of acquatic growths, 18 samples of sewage and trade wastes, 93 samples of bleaching powder, 163 samples of milk and 63 samples of disinfectants were tested during the year under report, representing an over all increase of nearly 1·4 per cent over the figure for the previous year.

Experiments were carried out at the Government Water Purification Research Station, Kilpauk, to determine how far the addition of chlorine to the Red Hills Lake water by means of the Break Point Method and of chloramine prior to slow sand filtration would improve the working of the filters. The results obtained indicate that either method would prevent the production of H_2S in slow sand filters and improve their working period. The Water and Sewage Purification Committee, after reviewing the findings of the experiments, has proposed to try out these methods on a full plant scale on a set of seven sand filters at the Madras Corporation Water Works.

Government in G.O. No. 2635, Health, dated 14th August 1952, have accorded sanction for the carrying out of experiments on a pilot scale on the removal of fluorine from water by the use of alum impregnated paddy husk carbon at Guntakal in collaboration with the authorities of the Southern Railway who have agreed to provide necessary filters, etc., for experiments on the railway well water. The required quantity of the carbon has been manufactured and kept in stock at the Institute. The necessary quantity of alum has also been purchased and stocked. However, no further progress on the scheme could be made during the year since the filters and auxilliary facilities have not yet been provided. The railway authorities have intimated that they are arranging to have the work carried out.

As already stated last year, the present sampling schedule of three examinations per year for protected water-supplies is far too infrequent and needs to be increased. The actual number of times each supply is examined, which is now uniformly three per year, would appear to call for some modification also. The frequency of examination may be related to the nature of the sources from which the water-supply is derived, the purification processes adopted, the quantity of water supplied and the population served. For instance, a supply drawn from a source subject to contamination and employing only chlorination as a public health safety measure, would need a more frequent analytical check on quality than a supply derived from a comparatively less polluted source but subjected to settlement; filtration and chlorination as safety measures.

An annual apprisal of the significance of the results of bacteriological examination of samples of water collected routinely from the public water supplies is always desirable. The results obtained during the year under report have been tabulated on page 26 together with those for the previous years. In 34·2 per cent of the samples taken from the consumer taps, bacteria of the coliform group were demonstrated. In this respect, the general position as regards the quality of the water supplies continued to remain without significant improvement over the last four years. At the same time, the samples of the treated water taken at the water plants are generally of good quality and the *deterioration occurs during distribution.* On a scientific basis, this has naturally to be attributed to intermediate pollution in service reservoirs and pipe lines or repaired mains which can be located and remedied. However, it would be too naive to assume that this is so in all instances. It is not wholly unlikely that some at least of the instances of gross disparity in quality between the headworks samples and the distribution samples arise from *special* attention paid to treatment and chlorination at the headworks on the day of the sample collector's visit, while the distribution samples reflect the quality of the water which ordinarily passes into the system *without this benefit.*

Researches.—An account of the researches undertaken in this Institute during the year will be found in Part II of this report.

Library.—Rendered very useful service to the members of the staff of the Institute, Research Officers of the I.C.M.R., officers of the B.C.G. Vaccine Laboratory and a few members of the P.H. Medical, Veterinary and P.W. Departments stationed in the City. Occasionally books and journals were also lent to such of those members outside the city as per the discretion of the Director.

During the period under report, 106 and 265 new books and bound volumes of journals were added to the stock of the library bringing the total to about 11,226 volumes.

Exchange.—The number of Institutions sending their journals in exchange for the K.I.P.M. Annual Report is 75.

Accommodation is extremely limited and inadequate for housing the increasing collection of books and periodicals. This has been brought to the notice of the authorities several times. Arrangements should be made at a very early date to revive the original scheme sanctioned in 1939 for the construction of a separate library block. Further housing of almyrahs would be seriously handicapped if this question is not taken up immediately.

Staff meeting.—The weekly meetings of the staff were held regularly.

Educational.—The Certified Laboratory Attendants and Technicians Training courses were continued during the year 1952–53. Fourteen (14) candidates have undergone training in the Certified Laboratory Attendants Course; among them 13 candidates have come out successful. Ten candidates have undergone training in the Certified Laboratory Technicians Training Course and the final examinations were held on 17th September 1953 and 18th September 1953 and the results have not yet been published.

Training.—The following candidates were given training in one or more branches of work of this Institute as indicated :—

1. *Combined course of Clinical Pathology and Bacteriology.*—
   (1) Mrs. Leela Oka, 19, Lawrence Lines, Madras-16 .. Three months.
   (2) Sri C. P. Appa Rao, Analytical Chemist, The Meclec Nutriments and Pharmaceuticals, Ltd., Madras. Three months.
   (3) Sri K. M. Md. Sultan, B.SC. (Fisheries Department), 108, Purasawalkam High Road, Madras. Three months.
2. *Practical training for students of technology, Andhra University, Waltair.*—
   (1) Sri P. Ramachandramurthy .. One month from 7th April to 6th May 1952.
   (2) Sri B. V. Suryanarayanamurthy. One month from 3rd May to 2nd June 1952.

(3) Sri C. V. Mallikarjunamurthy	..	One month from 12th May to 11th June 1952.
(4) N. Sankaramurthi ..	.. ..	One month from 12th May to 11th June 1952.
(5) M. S. Ramalingeswara Sarma	..	Fifteen days from 12th to 26th May 1952.

The following candidates were given laboratory training free of charge :—

(1) Sri G. V. Ganesan, B.SC., Probation, Laboratory Assistant in Class I of Madras Medical Subordinate Services, Branch IV, General for one month from 17th April to 16th May 1952—G O. Ms. No. 1034, Health, dated 28th March 1952.

(2) Two Second-class male attendants—(i) V. Zachariah and (ii) S. Raghavan deputed by the Superintendent, Government Mental Hospital, Madras. For six months from 1st August 1952 to 31st January 1953—Director of Medical Services, Ref. No. 63274-N/52, dated 16th July 1952.

A fellow of the Indian Council of Medical Research Mr. K. C. Abraham, M.A., who has been permitted to do research work at this Institute for two years from July 1951 continued to work during the year under report.

Students of the Bachelor in Pharmacy Course undergoing training in the Madras Medical College were given practical training once in a week (Friday) for three months with effect from November 1952, as desired by the Dean, Madras Medical College.

Class II Health Officers undergoing training in short L.P.H. course in the Madras Medical College were given training in the King Institute for two days at the request of the Dean, Madras Medical College.

List of distinguished visitors.

(1) John Z. Brown, M.D., Dean, University of Utah College of Medicine, Salt Talse City, Utah.

(2) S. Ahmed, Deputy Secretary to the Government of Madras, Department of Health.

(3) A. L. Gonduer, UNESCO, Adviser on Scientific Translation, National Physical Laboratory, New Delhi.

(4) Ernst. I. Tienkel, U.S. Public Health Service.

(5) M. M. Slough, W.H.O., Geneva.

(6) L. C. Yen, National Taiwar University, Medical College, Taipai, FORMOSA.

(7) T. H. Jarany, School of Tropical Medicine, Liverpool.

(8) Harald N. Johnson, M.D., Vinus Research Centre, POONA.

(9) Dr. Col. Maung Gai, Director of Medical Services, Burma Army.

(10) V. Bayi, Vice-Consul of Burma, Madras.

(11) Srimathi Marakatham Chandrasekaran, Deputy Minister of Health Government of India.

(12) Malcolm H. Menill, M.D., Deputy Director, State Institute of Public Health and consultant to T.C.A. California, U.S.A.

(13) Haw-Lukin, W.H.O. Medical Officer, Geneva.

(14) Premsingh, Ralthore, Health Minister, Madhya Bharat.

(15) St. Gargye, Director, Health Services, Madhya Bharat.

(16) C. H nry Kempe, M.D., University of California, Hooper Foundation, Sanfrancisco, California, U.S.A.

(17) Capt. John H. Printer, American Embassy, New Delhi.

(18) John Gordon, Harvard University.

(19) Karl Evang, Oslo, Norway.

(20) Sir Alexander Fleming, London.

PART I—ROUTINE WORK.

VACCINE LYMPH SECTION.

Charge.—Dr. N. R. Ratnakannan.

1. *Manufacture and issue of vaccine lymph.*—Unlike the previous two years 1950–51 and 1951–52 the year under report commenced with a good stock of vaccine as a result of a strenuous production carried out during the year 1951–52. The amount of vaccine held in stock at the commencement was 227,931 ml. of 1 in 7 dilution. During the year 219,838 ml. of 1 : 7 dilution of vaccine was manufactured. The average yield of crude pulp per calf was 29·79 m. There has not been any necessity for a greater production as the supply during the year was also less when compared with the past few years. Two lakhs and ten thousand six hundred and twenty-seven ml. of 1 in 10 dilution vaccine was issued during the year. The closing balance of vaccine at the end of the year was 279,642 ml. of 1 in 7 dilution. Thus in general it may be said the manufacture and issue of vaccine has been within normal limits and the stock position very satisfactory.

The method of purification adopted was by bubbling chloroform vapour through the vaccine, as usual. The purity, toxicity and potency tests were performed on each batch of vaccine before issue and the supplies made only after the batches satisfied the standards prescribed in the Drug Rules in force.

2. *Potency of vaccine lymph.*—During the previous year there had been a few reports about the reactions of vaccination having been a little more pronounced than usual. Hence it was presumed that the potency was too high and so it was decided to issue the vaccine in a dilution of 1 in 10. Accordingly 1 in 10 diluted vaccine was tried out in the test range with the following results :—

Number of batches tested.	Number of cases verified.	Percentage case success.	Percentage insertion success.
265	2,289	98·7	92·3

As the results have been quite good, the supplies to the province was made in a dilution of 1 in 10. The general results obtained by the field health staff with this diluted vaccine is quite good as could be seen from the results submitted below.

3. The analysis of results statements received from the districts, municipalities, Corporation, etc., for the calendar year 1952 :—

(*a*) *Total vaccinations and types* (*Table II*).—According to the result statements received 7,283,743 vaccinations have been performed of which 21·1 per cent were primary, 1·1 per cent secondary and 77·8 per cent re-vaccinations.

(*b*) *Primary vaccinations* (*Tables II and III*).—Results were received for 1,251,323 primary vaccinations and the following are the success rates :—

	Case success rate per cent.		Insertion success rate per cent.	
	1952.	1951.	1952.	1951.
Corporation of Madras	99·7	99·9	94·7	91·0
Municipalities	99·1	98·0	93·2	87·0
Districts	96·0	89·9	87·8	74·2
Average for the State as a whole ..	96·5	91·4	88·8	76·9

(c) *Re-vaccinations* (*Tables II and III*).—Results were received for 3,575,033 re-vaccinations and the success rates were :—

	Case success rate per cent.	
	1952	1951.
Corporation of Madras	6·1	4·8
Municipalities	16·4	13·7
Districts	20·4	12·1
Total ..	18·3	12·3

The success rates in respect of primary and re-vaccinations have shown an appreciable rise as could be seen from the tables presented above. It is felt that this could be attributed mainly to the better cold storage facilities made available for the section by way of equipment which is capable of maintaining low temperatures ranging from—10 degrees Centrigrade to—20 degrees Centrigrade; and probably the change in the seed strains introduced during last year has also been responsible to a certain degree.

4. *Lypmph unaccounted for* (*Tables II and III*).—It is gratifying to note that results were received for 4,451,791 doses out of a total supply of 6,038,210 doses during the year. Only about 26·3 per cent has to be accounted for and it is hoped that a major portion of this figure would have been utilized for vaccinations, the results of which have not yet been submitted to this institution.

5. *Special activities.*—Production of dry vaccine lymph and the use of sheep in the manufacture of vaccine lymph were carried out during the year and the results obtained are described in detail under the head 'Researches'.

Diagnostic Department.

Charge.—Dr. C. Venkateswara Rao, M.B.B.S., L.O.

During the year this department had examined and reported 16,538 specimens received for microscopical, cultural and agglutination tests from the various Government Hospitals, Local Fund and Mission Institutions and Private Practitioners in this State as against 9,655 specimens examined last year. This year the number of specimens is the largest ever examined and reported during the previous years. The number of specimens received from private practitioners also showed a marked increase. There was also an increase in the number of specimens of Blood received for Wassermann and Kahn Tests. A lakh and eight hundred and nine specimens were received this year for those tests as against 98,479 received last year. This department also continued to manufacture and supply the various reagents required for these tests. One hundred and sixty-one specimens were received for histo-pathological examinations, and reported. The amounts of reagents supplied and the analysis of the sources from which the specimens for serological tests were received are shown in Tables IV and IV-A.

As a result of the increased work in the diagnostic department the demand for the media was very heavy and the staff had to work extra hours daily to meet this demand. As the present accommodation and equipment were not sufficient to manufacture the full requirements of media the staff had to work even on holidays to cope up with the increased work. We had proposed for the construction of a service block for this institute with more accommodation and provision for bigger sterilizing equipment, etc., and when that is ready the full requirements of media could be manufactured and supplied. The statement of supplies of media made to other laboratories are shown in Table V (Miscellaneous).

Prophylactic and Therapeutic Vaccine Section.

Charge.—Dr. C. Venkateswara Rao, M.B.B.S., L.O.

There was a severe epidemic of cholera in this State this year and the demand for anti-cholera vaccine was very heavy. 10·9 million doses of anti-cholera vaccine were supplied this year as against 5·8 million doses supplied last year. This section had also manufactured 2·14 lakhs doses of T.A.B. vaccine and supplied 1·86 lakhs doses. Plague vaccine was as usual obtained from Haffkine Institute, Bombay, and distributed to the Public Health Staff of this State. The incidence of plague was low this year and only 23,280 c.c. of plaugue vaccine was issued this year. The Therapeutic Vaccine section had continurd to manufacture and supply the various therapeutic vaccines, bacterial emulsions, live cultures, auto vaccines and specific high titre Sera. Fifty-seven thousand nine hundred and seventeen doses of therapeutic vaccines and 564 doses of auto vaccines were supplied this year. The detailed statement of supplies made are shown in Table V.

Sterile Solution Section.

The section continued to manufacture and supply the various sterile solutions (injectables) to the State Hospitals, Municipal and Local Fund Medical Institutions. This year the supplies have been considerably larger than for any previous year. The requirements of the famine and epidemic areas were met to the maximum extent possible. Nearly three lakhs ampoules of the various sterile solutions were supplied besides 2,795 bottles of special solutions like ringer lactate, molar lactate, glucose saline, etc., The details of the supplies made are shown in Table V (Miscellaneous).

Department of Anti-toxins.

Charge : Dr. M. K. K. Menon.

(a) *Veterinary Section.*

The total number of horses maintained in the Institute for production of therapeutic sera at the beginning of the year was 61. Of these six were dead and eleven were bled out. Thirteen horses were added during the year thus making a total strength of 57 at the end of the year. The majority of these horses were assigned for the production of tetanus anti-toxin as the demand for this serum continued to be high. The number of horses under immunisation and bleeding and the quantity of blood drawn are shown in Tables I and II.

Table I.

Name of toxin.	Number of horses under immunisation and bleeding.	Number under immunisation but not bled.	Total.
Tetanus	44	11	55
Gas gangrene (perfringens) ..	2	Nil.	2

Table II.

Name of anti-toxins.	Quantity of blood drawn in litres.
Tetanus	4,070·5
Perfringens	180·0
Scorpion	33·75
Total ..	4,284·25

(b) *Anaerobic Section.*

Toxic strains of Cl. tetani, Cl. perfringens (welchii), Vibrion septique and Cl. ocdematiens are maintained both in the dry state as well as in the semi solid beef infusion medium. Toxicity and purity tests are done at frequent intervals. For the purpose of making comparative studies cultures of clostridial strains were obtained from laboratories abroad and toxic strains selected from these if found suitable.

Toxins.—The following amounts of toxins were manufactured during the year under review for the immunisation of horses :—

	LITRES.
Tetanus toxin	730
Gas gangrene toxin (perfringens)	110

Biological standardization.

Two hundred and thirty-seven, samples of tetanus anti-toxin and 13 samples of gas gangrene (perfringens) anti-toxin were standardized during the year including samples of serum purchased from outside.

The following samples were received from the undermentioned hospitals for investigation of an clostridial contamination :—

Source.	Samples.	Nature of investigation required,	Result.
1. Superintendent, Government Headquarters Hospital, Chittoor.	Cotton swab from operation theatre, linen, etc.	Evidence of contamination with Cl. tetani.	No Cl. tetani isolated.
2. Superintendent, Kasturba Gandhi Hospital, Madras.	Catgut, cotton wipers gauze, etc.	Evidence of clostridial infection.	No clostridial isolated.
3. District Medical Officer, Kozhikode.	Gauze, cotton, etc.	Evidence of contamination with Cl. tetani.	Cl. tetani not isolated.
4. Assistant Director, Vaccine Lymph Section, King Institute, Guindy.	Sealed glucose medium inoculated with samples of vaccine lymph.	Evidence of clostridial infection,	Cl. welchii isolated.
5. Superintendent, R. M. Hospital, Tanjore.	Gauze, towel cotton, etc.	Evidence of contamination with Cl. tetani.	Cl. tetani not isolated from any of the samples.
6 Superintendent, Headquarters Hospital. Eluru	Cotton gauze, etc. ..	Do.	Do.
7 Superintendent, Government Headquarters Hospital, Guntur.	Silk warm gut, cotton gauze	Do,	Do.

Special activities.

A series of experiments were conducted to determine the levels of tetanus toxin produced by different strains of Cl. tetani in the peptic digest broth prepared in this laboratory and it has been found that the strain hitherto used (Frankfurt A 471) is quite a satisfactory toxin producer. Experiments were also conducted to determine the anti-genic efficiency of our toxin as indicated by the flocculation method. For this purpose concentrated tetanus toxin and anti-toxin were obtained from the State Serum Institute, Copenhagen, which were quickly flocculating and possessed high L f values.

Owing to the difficulty of getting dried scorpion stings from Egypt attempts were made to manufacture scorpion toxin from the local field scorpion Palamneus Swammerdammi. The toxicity of these scorpions appeared to be of very low order and they were not considered fit for horse immunisation.

Production of tetanus toxoid intended for human use was continued. Several batches had to be rejected before a lot could be selected answering to the rigid requirements laid down for this product in the British and American Pharmacopeiae. Certain modifications were introduced in the technique of manufacture of tetanus toxoid intended for human use with a view to enhancing its immunogenic potency. Some of the salient features of this procedure consists in concentrating the toxin by ammonium sulphate precipitation and subsequent dialysis and further processing of the concentrated dialysate.

(c) *Serum Concentration Section.*

During the year under report an increase in the production of Anti-toxic sera was effected. The total amount of anti-toxic plasma processed this year amounts to 2,731 litres as against 2,084 litres processed last year. This comprises the two types of anti-toxic plasma—Antitetanus and anti-perfringens, the tetanus anti-toxin forming the major part. Regarding the perfringens anti-toxin approximately the same level of production was maintained as last year and efforts are being made to assign an increased number of horses for immunisation with this antigen.

During the year some difficulty was experienced with certain batches of anti-toxin in the matter of elimination of discolouration in the final product. A systematic investigation into the causes of this discolouration was made and suitable modification effected in the technique of concentration at certain stages so that the final product resulted in a very clear and practically colourless sera.

Continuation of the experiments for the production of high potency anti-toxic sera by ultra filtration technique is under progress.

The total amount of 2,731 litres of anti-toxic plasma comprising the two types of anti-toxins has been processed in the following quantities under each head :—

Type of anti-toxic plasma.	Volume of plasma processed.
	LITRES.
1 Tetanus	2,681
2 Gas Gangrene (perfringens)	50

(d) *Serum Fllling Section.*

This section is concerned with the ampouling and labelling and issue of the various therapeutic sera and other biological products in accordance with the regulations laid down in the Drug Act.

The statement of therapeutic sera stocked, received, issued, etc., is given in Table VI.

Blood Bank Section.

Staff.—Dr. T. Raghavan, M.B.B.S., Assistant Director (Blood Transfusion), from 1st to 11th April 1952.

Dr. C. S. Ramachandra Rao, M.B.B.S., D.P.H., Assistant Director (Blood Transfusion), from 12th April 1952 to 4th March 1953.

Dr. N. Sundararajan, M.B.B.S., Assistant Director (Blood Transfusion), from 5th to 31st March 1953.

Assisted by.—Dr. S. Venkataswami Naidu.

Dr. N. V. Gangadaran.

There are 19 blood banks all over the State including those in the City State Hospitals. The Nineteenth Blood Bank was at the Government Tuberculosis Sanatorium, Tambaram, this year.

The mobile blood bank was sent to accept blood donations from the inmates of Jails at Vellore, Rajahmundry and Madras Penitentiary.

The Blood Bank took part in the various exhibitions conducted in the City and also in the districts for popularizing blood donations. Blood was taken at the exhibition stalls from voluntary donors to convince the visitors the simplicity and harmlessness of blood donation. Blood pressure of the visitors was taken at the Exhibition Blood Bank Stall and was immediately informed to them. The blood grouping results were also intimated to the donors.

Training in Blood Transfusion and resuscitation work was given to eleven medical officers.

Blood Bank equipments for the Blood Transfusion service to the medical institutions in the State are being supplied under the Central Supply Scheme of the King Institute, Guindy.

The work done by the Blood Bank Section during 1st April 1952 to 31st March 1953 is given below :—

	Litres.
I. Blood—	
(1) Number of blood bottles received	2,503
(2) Amount of blood used for processing	779·8
II. Plasma—	
(1) Balance of Plasma from previous year	28
(2) Amount of plasma processed	318
(3) Amount of plasma issued	286·5
(4) Dry serum issued	173
III. High titre—blood grouping sera—	
A	3,734 c.c.
B	3,751 c.c.
O	3,264 c.c.
IV. Donors received by the bank—	
Voluntary blood donors paid	373
Voluntary blood donors unpaid	25
V. Exhibition—	
Number of exhibition and propaganda work taken outside station.	2
Number of exhibition taken part in the City	3
VI. Jails visited for blood collection—	
(1) Central Jail, Vellore.	
(2) Central Jail, Rajahmundry.	
(3) Penitentiary, Madras.	

Department of Biological Control.

Charge.—Dr. K. Dattatreyalu, M.B.B.S., from 1st April to 7th September 1952 and from 21st to 31st March 1953. Dr. M. Narayana Pai, M.B.B.S., from 8th September 1952 to 20th March 1953.

Pharmacologist.—Dr. K. Venugopal, M.B.B.S., from 1st April to 5th December 1952. Dr. K. Dattatreyalu, M.B.B.S., from 6th December 1952 to 20th March 1953.

Bacteriologist.—Dr. S. Gnanadesikan, M.B.B.S., throughout the year.

Chemical Assistant.—Miss R. J. Irani, from 1st April 1952 to 4th August 1952 and Sri P. K. Ramachandran, from 13th December 1952 to 31st March 1953.

Total number of tests performed during the year 1952–53 is 7,290 as compared with 6,268 tests done during the year 1951–52. The work of the department has been steadily increasing as shown below :—

	Number of tests done.
1948–49	437
1949–50	1,562
1950–51	5,348
1951–52	6,268
1952–53	7,290

Sterility test.—The total number of specimens received and examined for sterility tests during the year was 2,319 as compared with 2,187 in the year 1951–52. Out of 2,319 specimens tested for sterility, 60 were found to be contaminated and hence reported not sterile. This consisted of 32 biological products manufactured in the King Institute, 26 specimens received from City and moffusil hospitals, one from the Madras University Laboratory, and one from a private firm.

Pyrogen test.—We received during the year 466 specimens as against 413 specimens during the year 1951–52. Out of these, 17 specimens were pyrogenic. This consisted of 12 'experimental' biological products manufactured in King Institute, Guindy, 2 specimens from City and moffusil hospitals, one from a moffusil private hospital and two from private firms.

Chemical analysis.—One hundred and forty-five specimens were examined under this heading as against 261 specimens in 1951–52. Out of these specimens 13 were not of standard quality. This consisted of six from City and moffusil hospitals, one from the Inspector of Manufacturing Concerns in Drugs, 5 from the Director of Medical Services and one from the Director of Public Health.

Toxicity test.—Two thousand six hundred and twenty-seven specimens were examined under this head during the year under report as against 2,137 specimens in 1951–52. On testing these specimens on experimental animals, only one sample of plasma from the Institute was found to be toxic. It can be seen from the figures that there is an appreciable increase in work year by year. The number of specimens received under this head from the time of inception of this department in September 1947 are—

1948–49	Nil.
1949–50	85
1950–51	1,086
1951–52	2,137
1952–53	2,627

Antitoxin potency test.—Thirty-one specimens were tested in this series.

Biological assay of digitalis.—Fourteen tests were done in this series. Out of these, 3 samples were found to be *not satisfactory*.

Pituitary assay.—One specimen of pituitary extract was received from a moffusil hospital and was tested for its potency and found to be satisfactory.

Penicillin assay.—Seven penicillin assays were done.

Potency test of anti-typhoid vaccine.—One sample of anti-typhoid vaccine was received from a public health laboratory outside the State for testing and found to be satisfactory.

Penicillin and other anti-biotic sensitivity tests.—Four spicimens were received and tested under this series.

Miscellaneous tests.—Tests on opacity, identity and serological tests with high titre sera were done on 1,415 specimens of prophylactic vaccines.

Vaccine lymph.—One hundred and six tests of bacterial content, colony count and safety tests were done on specimens of vaccine lymph.

Catgut absorbability on animals.—Seventeen specimens of catgut sutures received from private firms and from a moffusil hospital were tested for absorbability. Out of these, 4 specimens from a private firm and one from a moffusil hospital were found to be not absorbed. Hence reported accordingly.

Mice virulence tests on vibrio cholera strains.—Seven tests were done under this series.

Mouse protection tests of cholera vaccine.—Four tests were done under this head.

Male frog test for pregnancy.—One hundred and twenty-six specimens of urine received from the Women and Children Hospital, Egmore, Kasturba Gandhi Hospital for Women and Children, Triplicane, Raja Sir Ramaswami Mudaliar Lying-in Hospital, Royapuram, Willingdon Nursing Home and private medical practitioners were examined. Out of these 31 were positive.

Research.—Please refer under ' Research '.

Financial.—A sum of Rs. 1,353 was realized as fees for examination of specimens from private firms and individuals for the year 1952–53 as against Rs. 1,580 for 1951–52.

It will be seen that the value of the tests performed in the year 1951–52 and 1952–53, if charged at the usual rates fixed by the Government under the Drugs Act, will amount to Rs. 1,96,335 and Rs. 2,29,919 respectively. A detailed statement of the work done by this department is furnished in Table IX. Despite lack of suitable equipment to conduct many special tests and want of accommodation, the work of the department has been increasing as compared with previous years.

Drugs Act.—Twenty-four tests were done on eleven specimens received from the Provincial Drug Controller for examination under the Drugs Act. Out of these, one was found not to conform to the standards. It has been noticed that the provisions and rules relating to labels and wrappers have not been scrupulously observed. In many cases, the batch number, the date of manufacture and the date of expiry have not been mentioned on the label. In some cases, the volume of the contents did not correspond to the volume printed on the label. Irregularities have been brought to the notice of the various manufacturing concerns and it is hoped that, in future, the rules regarding labels and wrappers will be properly observed.

Researches.—Research work is being conducted on the following subjects :—

(1) The value of the frog as an experimental animal in the Bio-assay of digitalis and allied compounds.

(2) The comparative value of the intra-dermal and sub-cutaneous methods of prophylactic inoculation of anti-typhoid vaccine.

(3) Experimental work to evolve as in vitro technique for determining the absorbability of surgical catguts.

(4) The anti-bacterial action of the betal leaf against the organisms of coli, typhoid, and dysentery group.

(5) The value of the male frog test in the early diagnosis of pregnancy.

A few of interesting cases are given below :—

(1) Some samples of liver extract of different batch numbers manufactured by an Indian firm outside this State were sent by a District Medical Officer complaining that they produced toxic reactions on injection to patients (like collapse and death a few minutes after injection. On testing these samples on laboratory animals, some produced local necroses and abscess and some produced death. Hence the samples were reported to be unsuitable for parenteral use.

(2) A private hospital from the moffusil sent a sample of sodium citrate 3·8 per cent saying that it produced severe reaction in patients receiving blood transfusions and they wanted to find out the cause. On examination, it was found to be sterile but when injected intravenously into the rabbits it produced fever. On chemical analysis, it confirmed to the strength claimed on the label. The spicimen was declared unsuitable for perenteral use.

(3) We received a sample of surgical catgut manufactured by a foreign firm from a District Medical Officer stating " Patients in whom this variety of gut was used have shown sepsis and the gut is found unabsorbed even after ten days". We examined and found it to be sterile but on implanting into the thigh muscle of a rabbit the suture was found to be not absorbed even after two weeks.

(4) A sample of glucose solution 25 per cent manufactured by a local firm was sent by the head of a City Hospital with a complaint that it produced severe rigors when injected intravenously into patients. On testing, it was found to be sterile, but was found to be pyrogenic. Hence the sample was declared unsuitable for parenteral use.

(5) A sample of calcium gluconate-*cum*-iodine prepared by a muffassal firm was sent to this department for analysis by the Inspector of Manufacturing Concerns in Drugs. On analysis, the calcium gluconate content exceeded the B.P. limits and no free iodine was present as claimed on the label.

(6) A sample of urea stibamine manufactured by an Indian firm outside the State was sent to us by the head of a City Hospital stating that it gave severe reactions in patients. We examined and found it to conform to Indian Pharmacopoeial list as for identity, safety and freedom from abnormal toxicity.

(7) A sample of penicillin G manufactured by a foreign firm was sent to us by a local firm for potency. It was assayed biologically and was found to be 50·0 per cent potent as compared with the working standard in this laboratory.

(8) A specimen of Tr. Digitalis manufactured by a private firm from outside the State was sent to this department by the Superintendent, King George Hospital, Visakhapatnam, for analysis with a statement that it was not active therapeutically, on analysis by the frog method, it was found to be 34·6 per cent of the 1948 B.P. Standard.

(9) A moffusil hospital sent a sample of extractum pituitary liquidum manufactured by a company from outside the State (manufactured in August 1951). The hospital wished to know whether it could be used even after the expiry date, i.e., 1st January 1953, with the original potency. We assayed it by the biological method on laboratory animals and found it to be potent and gave the opinion that the batch may be used for a further period of 6 months after the expiry date.

(10) The Director of Medical Services sent twelve samples of cotton to find out the suitability for purchase. On testing them, we found seven of them suitable and five unsuitable.

Department of Water Analysis and Algae Control.

Charge.—Sri P. V. Seetharama Iyer, M.A., Chief Water Analyst.

General.—The department continued to maintain a check over the hygienic quality of the water supplied by the municipal, the panchayat, the railway and other protected drinking water supplies in the State. Besides this, scientific advice, supervision and field analytical help were rendered to the Public Health and the Sanitary Engineering departments in matters relating to the control of organic growths in water sources, water purification processes, disposal of sewage and trade wastes and investigations on new water-supply and sewage disposal schemes. The analyses of chemicals, filter sand and other materials generally used in water treatment were also carried out. Bacteriological examinations of samples of milk, aerated waters and foods were undertaken by this department, as part of its routine work, as in previous years. A large number of samples of water were also tested for their suitability for use in various industrial processes.

A sum of Rs. 6,534-12-3 was received during the year under report towards fee for the analysis of water and other samples submitted for analysis by private individuals. The fee realized under the same head last year was Rs. 5,070.

The analytical work relating to the examination of samples of water from municipal, panchayat board, jail and other protected water supplies in the State as well as the testing of chemicals used in water purification at these water works is a free service rendered by the Government to these bodies, in the interest of public welfare and the safety of the health of the people. For the same reason, the water supplies at many important railway stations are also examined free of charge, three times a year. Proposals have however been made recommending the levy of fees for the collection and examination of samples of drinking water from these railway stations but no decision has yet been arrived at on this matter by the Government.

Field investigations on water purification and algal control problems were undertaken by the scientific staff of the department during the year under report, as and when necessary. A short account of some of the more important of these investigations is given later in this report.

At the request of the Deputy Director (Chemicals) of the Indian Standards Institution, the Chief Water Analyst was nominated as one of the members of the Coal Tar Disinfectants Sub-Committee (DC 2 : 7). The Deputy Director of Inspection (Ministry of Works, Housing and Supply), Government of India, requested assistance in the matter of testing of disinfectants in connexion with the registration of firms as manufacturers of disinfectant fluids in the list of approved contractors of the Directorate-General of Supplies and Disposals. It was stated in reply that the Institute would be glad to undertake this work and the fee for the tests was fixed at Rs. 45 per sample.

Statistical data.—There were 168 protected water-supplies listed for periodical examination at the beginning of the year under report. These comprise the supplies to 60 municipalities, 17 panchayat boards, 24 jails and certified schools, 54 railway stations and 13 institutions like universities, hospitals, project camps, etc.

The examination of the water-supply to Kaggalu Camp Jail was discontinued during the year. The new protected water-supply to Salem Municipality derived from the Stanley Reservoir, Mettur, as well as the supply to Tirumalai drawn from the Papavinasam source and the supply to Tirupati derived from a new well were included for periodical analytical examination at the Institute. The water supplies to the Stanley Hospital, Madras, and the Government Headquarters Hospital, Coimbatore, were also added in the list for routine examination during the year under report.

The total number of samples of water analysed during the year was 8,928, as compared with 8,903 during the previous years and 8,306 in 1950 to 1951. Out of this, 4,883 samples were tested in connexion with the examination of the quality of the protected water supplies in the State. Two hundred and thirteen were tested in connexion with investigation on new urban and rural water-supply schemes and 499 were from Government and private sources.

Seven hundred and forty-nine samples of water and biological growths were examined in the Water Biology Laboratory in connexion with routine biological assay of water samples and algal control operations.

Two thousand six hundred and ninety-three samples of water were analysed for their bacteriological, chemical and physical features in connexion with the experiments on water purification carried out at the Government Research Station, Kilpauk. In addition, 6 samples of alum and 8 samples of bleaching powder were also tested.

There was a small reduction in the number of samples of water received for test regarding their suitability for use in industrial processes. Sixty-one samples were received in this connexion, during the year under report while the number

in the previous year was 89. Water samples were analysed to test their suitability for (1) boilers, (2) manufacturing ice, (3) laundering, (4) fruit canning, (5) bleaching and dyeing of textiles and (6) processing of photographic and cine films, etc.

The number of samples of sewage and trade wastes tested during the year under report was 18.

Ninety-three samples of bleaching powder in use at different water works in the State were tested for their available chlorine content. Thirty-seven of these (nearly 40 per cent) were found to contain less than 1 per cent of chlorine and were totally unfit for use. Only 14 of the 93 samples (15 per cent) showed an available chlorine content ranging from 15 to 25 per cent, which may be considered as not unsatisfactory for use in water sterilization. This shows vividly the serious handicap water works authorities have to suffer when attempting to chlorinate their supplies with a continually deteriorating germicidal agent. The need to replace all existing chlorinating equipment using bleaching powder with apparatus using liquid chlorine cannot be too strongly emphasized. Until this is done, this vital procedure in water purification is bound to be erratic in its results.

The periodical collection and bacteriological examination of samples of reconstituted milk at various stages of production from the Government Milk Factory, Teynampet, was continued. A total of 163 samples of milk and 6 samples of milk powder were tested in this connexion. Bacteriological examination of the vessels used in the factory was also made and 48 samples of rinse water were tested for this purpose.

The number of tests carried out on disinfectants during the year under report was 63, while the number was 39 during the previous year. In addition, 8 samples of formaldehyde solutions and 11 samples of soap were tested for their bactericidal potency.

As in previous years, the department continued to manufacture and supply pancreatic extract for use in the preparation of culture media. The quantity manufactured during the year was 337·08 litres. Standardized reagents, microscopical stains, etc., amounting to over 55 litres were also prepared and supplied for use in other departments of this Institute.

Section of water bacteriology and chemistry—(*a*) *Bacteriological.*—Six thousand and twenty-three samples of water, milk, aerated waters, food products, etc., were tested bacteriologically during the year under report; out of this, 1,121 samples of water were derived from the research experiments carried out at the Kilpauk Research Station.

As already stated in the report for the previous year, in the routine analysis of samples of water taken from supplies whose bacteriological status is well known through repeated analyses over long periods, the samples are tested to ascertain the least volume showing the presence of bacteria belonging to the coliform group. This test together with the results of chemical analysis and the details of the local sanitary survey, affords information to the Analyst regarding the hygienic quality of the water, the potential danger of undesirable contamination, and the efficacy of the purification methods adopted in rendering the water safe for drinking purposes.

In the case of samples of water tested in connexion with special investigations, or from sources under investigation for new water-supply schemes, a more elaborate procedure of bateriological assay is adopted involving the identification of the types of coliform organisms present and classifying them as coli, type I considered to be excretal in origin, intermediates and aerogenes-cloaceae organisms on the basis of their biochemical reaction and ability to grow in McConkey's broth at 44°C. and in citrate broth at 37°C.

Besides this confirmatory test, such samples are also analysed for the determination of the number of bacterial colonies per c.c. growing on nutrient

agar in 48 hours at 37°C and for the presence of vibrios in 100 c.c. volumes. These subsidiary tests are valuable in assessing the nature and extent of contamination the source is subject to and the degree of improvement effected by the purification methods adopted, and in the case of investigation on new supplies, the nature of the treatment that would be required to render the water potable.

It has been stated in the report for the previous year, that, in the case of many public water supplies in the State, a noticeable deterioration occurs in the bacteriological quality of the water during its transit through the distribution pipes. While this is an unsatisfactory feature, the potential health hazard it may imply would depend on the nature of the contaminant in the pipe line or which gains access to it. Therefore, as far as possible, conformatory tests are carried out to determine the type of coliform organisms present in all instances of such pipe line deterioration also.

(*b*) *Chemical.*—The total number of samples of water analysed chemically during the year under report was 2,775, while 2,666 samples were tested for their physical characteristics like turbidity, colour and smell. The corresponding figures for the previous year were 2,580 and 2,523. The small increase during the year under report was chiefly due to a larger number of samples analysed in connexion with the research work at the Kilpauk Station. Details regarding the number of samples of bleaching powder, lime, alum, sand etc., tested and other analytical work carried out at the chemical laboratory are given in Table VII, Part II.

The Soap method for the determination of hardness in water has been replaced in this laboratory by the "Versenate method", in view of its greater accuracy, and freedom from any personal error. The Versenate method consists in titrating a known volume of sample, buffered to a pH of 10·0, against a standard solution of Di-sodium of Ethylene di-amine-tetra-acetate (Versenate) with Eriochrome Black-T as the internal indicator. The colour change from red to blue is sharp and definite. This method is also useful in the direct determination of calcium present in water samples.

A sample of water was received for analysis, as it was noticed, that when added to milk and boiled, it caused curdling of the milk. This sample was found on test to have a high hardness and a high content of magnesium chloride (110·0 parts per 100,000). Experiments conducted in the laboratory with the addition of small amounts of magnesium salt to milk, confirmed the finding that curdling was caused by the presence of magnesium compounds.

Section of water biology.—Samples of water collected on a routine basis from the protected water-supplies in the State and also samples sent by Government and private agencies were examined microscopically to determine the nature and intensity of biological growths present in them. In all cases where the growth were noticed to be excessive, or the analytical results indicated possibilities of further development to undesirable levels, measures for the control of such offending growths were recommended based on laboratory trials with different types of algicides.

The total number of samples examined microscopically during the year under report was 516, of which 43 samples were taken from the Red Hills Lake, Madras, in connexion with the algicidal treatment to the Lake water.

Seventeen water-supplies in the State have adopted systematic algal control measures with success. As far as circumstances would permit, algal control treatments were carried out under the supervision of the analytical staff deputed specially for the purpose. Special samples from the water-supplies which show evidences of algal infestation were also examined from time to time in order to keep a close watch on the behaviour of the biological growths under different seasonal conditions.

Some interesting observations appear worth recording.

A fairly large number of colonies of the Rotifer *Conochilus* were collected from a pond in the Madras Race Club. These belong to the order *Melicertida* and have not been commonly met with in other bodies of water in the Southern districts.

Samples of water from a well (No. 3) in Bungarpet Railway Station showed the presence of many cells of the algal organisms *Carteria* and the Zooplankton, *Anthophysa*. The latter belongs to the order *Monadida* in the Class *Zoomastigophora*. It is a flagellated form with a long stout, much branched stalk. The bodies are arranged in rosette-like structures at the end of the stalks. Each zooid was pyriform in shape and possessed two flagella of unequal length.

An organism, Synura by name, which appears to occur in abundance in temperate waters, often causing considerable nuisance in water supplies and rarely encountered in the water samples examined at these laboratories was noticed for the first time in a sample drawn from Coonoor. This sample was taken from Longwood, Shola, Coonoor and showed the presence of a few *Synura* colonies in an actively living condition.

The occurrence of *Ceratium sp.*, a Dinoflagellate in the Lake water at Yercaud, the presence of the Diatom *Melosira* with autospores in the Tiger Hill reservoir water at Ootacamund and the isolation the algae *Nautococcus* in a well water from Salem are also of special interest from the point of view of aquatic ecology.

Municipal and panchayat board water-supplies.—Sixty municipalities and 17 panchayats possess piped water-supplies at present. These provide a total supply of about 33·64 million gallons per day and serve the requirements of a total estimated population of 5·71 millions in these towns.

The general quality of the raw untreated waters remained more or less unchanged as compared with the previous year. One hundred and eleven of 164 (or 68·4 per cent) of the samples of raw water taken from ground water sources were of fair to good bacteriological purity and showed the presence of coliform organisms in volumes ranging from 10·0 c.c. and upwards only. The corresponding percentage in the previous year was 72·0 per cent. The small decrease in the percentage during the year under report was due to the slight fall in quality noticed in samples taken from Chingleput, Gudiyattam, Tirupati and Tiruvallur.

In the case of samples of water collected from surface sources, evidence of heavy bacterial and organic pollution were frequently met with. Sixty-one out of 108 (56·5 per cent) of the samples showed the presence of coliform organisms in 1·0 c.c. volumes or less. The corresponding figure for the previous year was 62·6 per cent.

Alum coagulation, settlement and filtration through rapid gravity mechanical sand filters followed by chlorination is adopted as 7 Waterworks (Bodinayakanur, Fort Cochin, Erode, Rajahmundry, Salem, Mettupalayam and Mettur Dam). The coagulant used in all cases is alum. At Mettur Dam, however, Ferric chloride was used for a short period for want of alum. It was found that ferric chloride exerted a strongly corrosive action on valves and other structures and its use was discontinued, as alum was again obtained. The supply to Fort Cochin was far from adequate and the flow of water in the pipes was scanty.

Rapid sand filters of the pressure type are in use at Chidambaram, Palakol, Masulipatnam and Pudukkottai. Purification by filtration through slow sand filters followed by chlorination is adopted at Eluru, Kakinada, Kurnool, Madras, Adoni, Salem, Periyakulam and Ramachandrapuram. One new rapid sand gravity filter has been added to the plant at Rajahmundry while the filter plants at Kurnool and Kakinada have each been enlarged with the addition of two and three slow sand filter beds respectively during the year under report.

Kurnool, which has been selected as the temporary capital of the Andhra State, has a good protected water-supply. The supply derived from the Kurnool-Cuddapah Canal is stored in two earthen tanks. The water from the tanks is filtered through slow sand filters and chlorinated before it is supplied to the municipality. The purified water has been generally of satisfactory quality. The average daily supply is about 5 lakhs of gallons.

All but 12 water-supplies in the State are chlorinated. Twenty-one use automatic apparatus with liquid chlorine while the rest treat the water with bleaching powder solution. It has to be stated that the automatic Chloronome at Erode, Mettupalayam and Salem were not functioning satisfactorily. The need for chlorinating the water-supply to Ootacamund Municipality has been pointed out in previous reports. But no tangible action appears to have been taken in this connection.

The standard of bacterial quality adopted for a chlorinated water-supply is the absence of coliform organisms in 60 c.cs. of the sample tested. Judged by this standard, out of 228 samples of chlorinated water collected at the various head-works during the year under report, 73·7 per cent were of satisfactory quality. The corresponding percentage was 86 during the previous year.

Seven hundred and sixty-eight samples of water were collected from the service taps in the municipalities and panchayat boards as compared with 729 in the previous year and tested for their hygienic quality. The following statement shows the number of samples which were found to be of unsatisfactory bacterial purity in each group of supply divided according to the type or treatment adopted.

(1) *Municipal water-supplies.*

Type of supply.	Number of supplies.	Number of samples tested.	Number of samples unsatisfactory.	Per cent unsatisfactory.			
				1952–53.	1951–52.	1950–51.	1949–50.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Untreated	11	98	49	50	31·8	35·9	47·3
Chlorinated only ..	33	348	127	36·5	37·1	32·1	37·9
Filtered and chlorinated.	16	187	51	27·3	29·1	32·1	13·7
Total ..	60	633	227	35·8	34·0	23·8	32·8

(2) *Panchayat board water-supplies.*

Untreated	1	9	4	44·4	0	47·6	50·0
Chlorinated only ..	14	114	39	34·2	33·0	44·6	32·2
Filtered and chlorinated.	2	12	3	25·0	0	9·0	39·0
Total ..	17	135	46	34·0	27·0	41·9	34·4

It will be seen from the table that the quality of the municipal water supplies remains on the whole more or less unchanged over the last four years though there would appear to be a rather marked fall in the quality of the untreated supplies. It is also seen that there has been a slight deterioration in the quality of the water-supply to the panchayat boards. The filtered and chlorinated supplies to Mettur Dam and Ramachandrapuram gave somewhat fluctuating results during the year.

The quality of the drinking water supplied from the protected supplies in the State requires to be improved considerably. This need would be apparent when it is realized that a third of all the *purified* samples drawn from consumers' taps is not of approved quality as judged by tests for bacteriological purity and hygienic safety. It would require a comprehensive and thorough investigation by a special analytical unit to ascertain the causes leading to he deterioration in quality during distribution, so that these may be corrected and the full benefits of the purification achieved at the headworks may be derived by the consuming public. This was one of the purposes with which the Water and Sewage Purification Committee proposed the constitution of a Mobile Analytical Inspectorate. This proposal has not met with Government approval. It would be desirable to reconsider the position.

Jails, certified schools, etc.—The periodical examination of the water supplied at 24 jails, Certified Schools, Vigilance Homes and other Institutions of correction was also carried out during the year. Many of these institutions use bleaching powder as the sterilizing agent for purifying their drinking water-supply. The powder used was often times of poor quality and therefore, the treatment was not quite satisfactory.

The supply to Bellary Central Jail, derived from the municipal mains, was irregular and somewhat inadequate also. The water supplies to the jails on the West Coast and at Cuddalore and Tanjore are treated with lime in order to correct the corrosive nature of the raw waster with successful results.

Other institutions.—A total of 15 Government Institutions, Universities, Hydro-electric and Irrigation Project Camps and Hospitals are grouped together under this category. The King Institute water-supply is also regularly tested regarding its quality.

The scarcity of water for laboratory and other requirements, which was felt at the King Institute over the last few years, was relieved during the year under report when the new infiltration gallery put up at Ikkaduthangal near the present well was brought into commission. A similar gallery in the same area has been laid for supplying water to the Raj Bhavan Estate, Guindy.

The water-supplies to the Stanley Hospital, Madras and the Government Headquarters Hospital, Coimbatore were added in the list during this year. The Annamalai University, whose water-supply has been consistently of unsatisfactory quality, has got ready a plan for putting new sedimentation basins and filters for improving their water-supply. The Glenmorgan and Singara camp water-supplies, which have been the subject of repeated adverse comments in previous years, still remain in an unsatisfactory state.

Railway station water-supplies.—The examination of the drinking water-supply at 54 Railway stations on the Southern and the Eastern Railways was continued during the year. Ten of these draw their supply from the neighbouring municipality.

Owing to acute scarcity of water from the usual source of supply at Narasaraopet, water from an old abandoned infiltration gallery trench belonging to the municipality was drawn for use. This water showed a high fluorine content (3·0 to 3·8 ppm). The use of the water from the Meter Gauge well at Guntakal and from the old quarry well at Ongole was discontinued during the report year. The water-supply to Adoni Railway Station, drawn from a well, was noticed to be subject to pollution, especially after rains. The well is not protected with a parapet wall. At Calicut Railway Station, the supply of drinking water is very insufficient as it is stored only in small cisterns. On the platform, taps however supply water with caution boards marked "not for drinking purposes." The undesirability of having a dual supply on station platforms has already been pointed out. The results of analysis of samples from the drinking water-supply at Nidamangalam showed that unchlorinated water sometimes gains access to the supply pipes during pumping hours, as the elevated reservoir where chlorination is carried out, has a common inlet and outlet pipe. It appears that measures would soon be taken to correct this defect. The results obtained with the use of a proprietary product "Chloroston" for water sterilisation at the stations on the Eastern Railway continued to be often unsatisfactory.

Water and Sewage Purification Committee.—The Water and Sewage Purification Committee met twice during the period under report on 4th August 1952 and 27th January 1953.

At the meeting held on 4th August 1952, the Committee discussed the question of the levy of fees for the analysis of samples of water carried out at the King Institute, in connection with the investigation and execution of new Urban and Rural Water-Supply schemes, undertaken on behalf of local bodies by the Sanitary Engineer. The Committee was of the opinion that a lump sum provision may be made towards the expenditure in connection with field investigations and analytical examinations carried out by the King Institute in the estimates made by the Sanitary Engineer in regard to each such scheme. The Director, King Institute could send a bill for the expenditure incurred and this may be met by book adjustment between him and the Sanitary Engineer.

The question of the periodical examination of samples of drinking water from 30 additional important railway stations at the King Institute and the levy of fees for the collection and the examination of samples of drinking water from railway stations was considered at the meeting held on 27th January 1953. The addition of these thirty stations was suggested by the Committee in its Resolution No. 7 dated 18th August 1948 in the interest of Public Health. The General Manager, Southern Railway had given a list of stations from which samples of drinking water were tested in 1951–52 at the Railway laboratories. This list, however contains only four of the thirty stations, which were considered specially important by the Committee as centres of heavy traffic, both of pilgrims and others. Further discussion was postponed pending a consideration of the matter with special reference to the Public Health Act. Government have passed an order recording the correspondence on this subject. No specific orders have yet been passed separately sanctioning the inclusion of the additional railway water-supplies for periodical examination as well as on the question of the levy of fees.

The Committee also discussed in detail a suggestion made by the Health Officer of the Corporation of Madras regarding the application of copper sulphate, chlorine and ammonia to the Red Hills Lake water as a measure for improving the working of the Kilpauk slow sand filters. The Committee was of the opinion that the admixture of waters from the wells along the conduits with the Red Hills Lake water is liable to aggravate the problems relating to the working of the Kilpauk slow sand filters. The suggestion made by the Health Officer for the application of copper sulphate chlorine and ammonia to the lake water at different points may result in the deposition of dead organic matter on the filter beds and increase the difficulties of filtration. So, the Committee considered that periodical copper sulphating of the Red Hills Lake may be continued for controlling the algal growths in the water. This would facilitate settlement of the dead and decayed vegetation in the lake itself and reduce the burden on the sand filters.

Besides the algicidal treatment to Red Hills Lake, it was considered essential to adopt further measures for improving the working of the slow sand filters. The Committee resolved that the method of treatment most suited to deal with the lake water should be decided upon by conducting a large-scale experiment on one row of seven of the Kilpauk filters, adopting Break Point chlorination, chloramination and cupri-chloramine as a treatment procedure, either simultaneously or in succession. By this means, a suitable method of treatment could be rapidly evolved. At the same time, any one of the proposed treatment methods would yield a water of better quality than that yielded by the filters in their present state.

In this connection, an extensive survey of the quality of water yielded by the 20 wells from which water was being pumped and mixed with the Red Hills Lake water in the conduit was carried out at the request of the Sanitary Engineer. Eight of these wells yielded a water containing mineral matter in solution in excess of the normal acceptable limits for a good potable water. Six of these also had a high chloride content. Six wells yielded water containing excessive amounts of

iron in solution (above 0·5 p.p.m.) while the rest showed the presence of iron in concentrations varying from nil to 0·5 p.p.m. Phosphates and nitrites, which constitute food material for algal growths, were also present in these waters.

Experimental filter station, Kilpauk.—The two main lines of research work which were in progress at this station during the previous year were continued during the year under report. These researches related to (1) Chlorination of the Red Hills Lake water adopting the Break Point method prior to sand filtration, and (2) Chloramination of the Red Hills Lake water prior to sand filtration. These experiments are being carried out with a view to study the improvement that may be obtained in the working of a sand filter by the special treatment applied to the raw water.

Under ordinary conditions, the sand filters produce large amounts of sulphuretted hydrogen and the filtered water is foul smelling during certain seasons of the year. Moreover, the heavy load of suspended organic matter in the lake water and the local growths that occur on the surface of the filters cause rapid clogging. The filtered water is often devoid of dissolved oxygen. So, anaerobic conditions exist in the filters and also in the pipe lines.

The production or H_2S in slow sand filters has been ascertained to be due to the activity under anaerobic conditions of micro-organisms (Sporo-vibrio desulphuricans and other allied types) which occur in the lake water and which infest the slow sand filters and the pipe lines. Also, the loss of dissolved oxygen during slow sand filtration was considered to be due to the metabolic activity of bacterial organisms. Hence, it follows that if measures are taken to destory the causative organisms in the water and in the filter bed, the production of H_2S and the depletion of dissolved oxygen could be avoided. Chlorine was selected as the bactericidal agent of choice for this purpose.

Two methods of chlorination were experimented with (1) The Break Point Method and (2) The method of Chloramination.

Experiments on the Break Point Method of chlorination were started in May 1950 and have since been continued without a break. The results obtained have been presented in detail, in the reports of the Water and Sewage Purification Committee for the years 1950, 1951 and 1952, and have also been given briefly in the report of the King Institute for the years 1950–51 and 1951–52. The results obtained during the year under report confirmed the earlier findings. It would thus seem fairly well established that this method of pre-treatment would help in (1) increasing the filtered water output by the sand filters, (2) yielding a water which would be satisfactory from the bacteriological point of view, (3) eliminating the production of H_2S in the sand filters and (4) reducing the organic matter content of the water to a greater extent than ordinary sand filtration.

Chloramination of Red Hills lake water prior to sand filtration.—Compared to the method of Break Point chlorination, chloramination, where both ammonical nitrogen and chlorine are added to the water, appeared to offer greater advantages. By this method, it seemed possible to maintain a high chlorine residual in the treated water in the open filters, since chloramine is not so rapidly dissipated by sunlight as free chlorine.

The experiment was started in November 1951. Ammonia in the form of ammonium sulphate solution was first added to the water and later chlorine. The dosage used was 0·5 part per million of ammonical notrogen and 1·5 parts per million of chlorine.

The analytical data and filtration statistics collected in the course of the experiment indicated that the application of chloramine to the raw water increased the output from the sand filter. It yielded twice the quantity of filtered water per unit area of filter surface cleaned as compared with a control filter fed with untreated water. In this respect, both Break Point chlorination and chloramination appeared to yield similar results.

The chloraminated sand filter consistently yielded a filtrate containing 0·2 to 0·5 part per million of residual chlorine. The filtered water did not contain coliform organisms in 60 c.c. volumes in almost all the samples tested. It was thus found that as regards bacterial purity, both Break Point chlorination and chloramination would prove equally efficacious in producing a satisfactory filtered water from the sand filters.

While the control sand filter produced marked amounts of sulphuretted hydrogen within a short time after the commencement of each run, especially in the period May to October (0·5 to 2·5) parts per million, the chloraminated filter did not produce H_2S in the course of these experiments.

The dissolved oxygen content of the Red Hills Lake water was least (average of 2·5 parts per million) in the period October to December. In the other months, it was 4·6 parts per million. The dissolved oxygen content of the filtrates from the Break Point chlorinated and the chloraminated filters showed certain remarkable features different from the hitherto recorded. Previously a marked loss of dissolved oxygen was noticed when the treated water was passed through the filters. But during the period September 1952 to March 1953, both filters yielded a filtrate which contained somewhat larger amounts of dissolved oxygen than the raw water. The filtrate from the control sand filter however continued to show the usual total loss of dissolved oxygen during the same period. Subsequently, however, the loss of dissolved oxygen in the filters receiving treated water again manifested itself. The reason for the temporary increase in oxygen content on passage through the sand filters is not apparent.

The results obtained on treatment of the Red Hills Lake water with Break Point Method of chlorination and with chloramine suggest that chloramination may prove almost as effective as Break Point chlorination in improving the efficiency of the slow sand filters with special reference to (1) Filter output, (2) Removal of suspended impurities (3) destruction of bacterial organisms and (4) prevention of the production of H_2S.

The experiments are being continued.

The analytical and other experimental work relating to the research studies at the Experimental station was carried out by Sri K. G. Veeraraghavan, M.SC., Assistant Analyst (Water Biology) and Sri A. S. Hariharan, Junior Water Analyst, during the year under report.

Field investigations.—As in previous years, the staff of the Water Analysis Department was deputed to carry out field investigations on problems relating to water-supplies, sewage and trade waste treatment and disposal, etc., whenever the results of the laboratory examinations required it, or when such assistance was requested by the Sanitary Engineering and the Public Health authorities.

A brief account of some of the interesting investigations made during the year is given below, which would also indicate the variety of the problems investigated :—

(1) *Coimbatore water-supply—(Sri P. V. Seetharama Iyer, M.A., and Sri A. S. Hariharan, B.Sc.).*—An investigation into the nature of the changes in the chemical and biological characteristics occurring in the Siruvani Lake water during its flow through the tunnel and the river course in the valley from the tunnel exit to the settling tanks was carried out in the last week of April 1952. This investigation was undertaken in connection with the proposal to divert the lake water from the tunnel exit through a pipe flume down to the settling basins.

Samples of water were collected from nine sampling points along the stretch of the stream under study and tested in the field to determine their temparature, turbidity, PHt dissolved oxygen content, free carbondioxide content, organic matter content, Bio-chemicæ Oxygen Demand and bacteriological quality. A fuller analysis was made at the Guindy laboratories.

The data gathered from this extensive survey showed that there is no materials alteration in the chemical quality of the water during its flow down the valley. The presence of many falls and cascades effects an increase in the dissolved oxygen content of the water (from 76 per cent to 94 per cent saturation) and raised the pH value from the initial acidic range (6·4 to 6·6) to the alkaline range (7·4). A slight increase in turbidity was also noticed at the lower sampling point near the offtake of the settling basins, due to suspended inorganic debris.

The algal flora of the lake water comprised mainly Dinabryon, Dictyosphærium and Desmids. The water of the Pattiar river, a feeder stream of the lake, showed predominantly Diatom plankton, with numerous *Peridiniums*. After the tunnel exit, however, there was a considerable decrease in the plankton organisms. The occurrence of amœboid organisms (Testata) in the lower reaches points to organic pollution.

A continuous fall in bacterial quality was noticed from the tunnel exit to the settling tanks. B. Coli I, indicative of undesirable bacterial pollution was isolated at all the lower sampling stations.

The investigation was carried ou during a dry period and so, the influence of other waters joining the stream under study could not be observed. It was however considered that the proposal to divert the water through pipes from the tunnel exit to the settling basins would prevent the bacterial contamination of the water and prove beneficial, especially since chlorniation is the only hygienic safeguard adopted for the protected water-supply to Coimbatore Municipality.

2. *Guntur Water-supply Scheme (Sri K. G. Veeraraghavan, M.Sc.)*—An nvestigation was carried out in December 1952, on the newly constructed raw water storage tank, Guntur water-supply scheme, for the purpose of ascertaining measures that would be required to control the growth of plankton algæ and aquatic weeds.

The tank covers an area of approximately 80 acres. The bunds are 52 feet high and 30 feet wide berm runs at the foot on the inner face of the bunds. There was a small amount of water in the tank at the time of the visit. Numerous plants belonging to *Cryptocoryne*, grew near the southern margin, while at other portions *Potomogeton, Cyperus*, and grasses occurred in dense masses. The surface of the berm was covered with grass and many shrubs, mainly *Euphorbia* sp.

Samples of soil were collected from different regions, in the tank bed and analysed for their organic matter, nitrate and phosphate contents. The measures suggested for controlling algal and other growths in the tank, when filled up with canal water, included removal of all existing emergent vegetation, avoidance of muddy and silt laden canal water for filling the tank, manual removal of aquatic vegetation and systematic application of algicides at appropriate seasons.

3. *Algal flora of temple tanks (Sri K. G. Veeraraghavan, M.Sc.).*—In connexion with the study of the algal flora of temple tanks and measures required to eradicate the nuisance caused by these growths a survey of the algal flora of two tanks inside the Tiruvannamalai temple was carried out in September 1952.

These two tanks, the Sivaganga tank and the Brahma Theertham are situated close to each other. Yet, they differed remarkably in their plankton flora.

The water in the Sivaganga tank, emitted a foul smell of hydrogen sulphide and contained excessive amounts of organic matter (2·03 parts per 100,000) and ammoniacal nitrogen (1·0 part per 100,000). It supported a plankton rich in *Micractenium, Eudorina, Euglena, Trachelomonas* and *Microcystis*. The Brahma Theertham on the other hand had a relatively low organic matter (0·12 part per 100,000) and ammoniacal nitrogen content (0·01 part per 100,000). The plankton comprised almost exclusively of small animalculæ, especially Ostracoda and algal types were practically absent.

The occurrence of numerous *Eudorina* and *Micractenium* together with the blue green alga *Mycrocystis* in a temple tank is an interesting observation. A large number of such waters, previously studied, showed a plankton growth comprising

almost totally of blue green algae (*Microcystis, Anaebaena, Oscillatoria*) and *Euglenoid* forms.

The Sivaganga tank water was treated with copper sulphate (1·5 ppm.) and chlorine (2·0 ppm.). The treatment was effective in decreasing the algal intensity and in eliminating the odour nuisance.

Disposal of distillery wastes (Sri P. V. Seetharama Iyer, M.A. and Sri N. Swaminathan).—In connexion with the problem of the disposal of the waste waters from the Vizagapatam Sugar and Refinery, Limited, Anakapalle, an investigation on the nature of the waste and the treatment required for its satisfactory disposal was made in December 1952.

Sugar is manufactured in this factory from sugarcane juice and alcohol from molasses. The distillery waste (about 15–18 thousand gallons a day) consisted mainly of the spent wash. Formerly this was discharged into a nearby stream (The Sarada River) and as there was very little flow in the stream, complaints were received by the Local Health Authorities of foul smell from the water. At the time of visit, the waste was led into a few soak pits dug on the river bank.

The fresh distillery waste was brownish black in colour with an aromatic smell. Its total solids content was 8,630·0 parts per 100,000 of which only 160·0 parts were suspended solids, the rest remaining in solution. The soluble material comprised 2,095 parts per 100,000 of organic matter (Tidy's 4-hour oxygen consumed test). The pH of the waste was low (4·2) and it had a five-day biochemical oxygen demand of 5,500·0 parts per 100,000.

Treatment by anærobic digestion followed by filtration through trickling fitters before disposal into the river course or utilization of the waste as cattle feed after concentration were both found to be unsuited to the prevailing conditions at the factory.

Numerous tests were carried out to determine the improvement in the quality of the waste by treatment with alum, ferric chloride, calcium chloride, decolorising charcoal and lime. All but lime treatment yielded unsatisfactory results. Treatment with lime in two or three stages, with intervening periods of settlement was found to reduce the total solids and the oxidizable organic matter content by 35 to 72 per cent respectively. The treated waste was clear cherry red in colour. This treatment rendered the water suitable for disposal into the soak pits without causing offensive odours or serious pollution of the stream water. The lime treated waste should have a pH value well above 8·0 in order to prevent rapid putrefaction on standing in the soak pits. The treated waste would also prove suitable for land irrigation, while the sludge from the settling tanks, may be used as fertiliser for crops.

Details regarding the method of treatment and disposal using certain existing facilities in the factory were furnished to the management.

Pithapuram water-supply investigation (Sri S. Venkataraman, M.A.).—In connexion with an investigation for a new protected water-supply for the Pithapuram Panchayat, a field study was made of the quality of the water yielded by existing bore wells in the locality in April 1952. Samples from these bores collected and sent for analysis at the Institute were found to be generally discoloured and to contain iron.

Samples from five bore-wells were collected during the visit and tested on the spot to determine their content of iron, manganese, free Co 2, alkalinity and pH. The sources were subjected to continuous and vigorous pumping before the samples were taken to ensure the collection of a truly representative sample from each bore-well.

All the wells yielded water which was clear and colourless with a fairly high alkalinity and a pH ranging from 7·2 to 7·4. Iron and nanganese were absent in four of the sources, while the fifth showed the presence of only a trace of iron. On

the basis of their general chemical characteristics and proximity to the town, three of the sources tested were considered to be suitable for use for the supply of drinking water to the panchayat. The absence of iron shown by spot tests on representative samples drawn from the bore-wells, while samples sent to the institute for analysis from the same sources previously were found to contain iron, demonstrates clearly the importance of taking adequate precautions in the collection and transport of water samples for analysis. At the time of the visit, it was noticed that thick cowdung water was poured into the pumps for priming purposes and the samples collected soon after the commencement of pumping were highly discoloured and showed the presence of iron. It appeared very likely that the presence of iron noticed in the samples previously submitted for test was due to this factor.

PART II—RESEARCHES.

I. Vaccine Lymph Section—Dried Vaccine Lymph.

(Dr. Y. S. Narayana Rao, Dr. N. R. Ratnakannan and Dr. K. S. Balasubramaniam.)

Potent dried smallpox vaccine is the ideal one for use in the programme of vaccination especially in a country like ours. But the preparation of the dried vaccine presents a lot of difficulties and hence probably the product has not yet been manufactured for general use by any of the Vaccine Institutions in India. Some of the main difficulties encountered are (1) the question of purity of the vaccine before drying, (2) reduction in the virus content of the vaccine during the process of drying and (3) keeping quality of dried vaccine under adverse conditions.

The preparation of dried vaccine lymph on an experimental scale using the centrifugal freeze drying equipment (Edward's model) has been attempted during the year and the results obtained have been quite good. The method of production adopted is described in brief below.

The crude vaccinial pulp was homogenised in the usual way, excepting for the fact that instead of the usual diluent of 50 per cent glycerine water, lactose salt solution, a special diluent, advocated by Hornibrook and Gebhard (Public Health Reports, Volume, 66, No. 2 pp. 38–43) was used. The strength of the ground vaccine in this solution is 1 in 4 as against the usual strength of 1 in 5 in the case of glycerinated lymph.

This solution was found to be very useful in the preservation of the virus during the process of drying. The ground-up material was treated with chloroform vapour and the purity tests were put up. The vaccine was stored at 4°C until the purity tests were passed (about 48–72 hours). After the tests have been satisfactory, the vaccine was taken up for drying.

The vaccine was distributed into 0·25, 0·5 and 1 c.c. ampoules and the drying carried out for about 9 hours for each lot and the ampoules were sealed in vacuum. Purity tests were done on representative samples of the dried vaccine ampoules. Tests for potency on the calves were also done with the dried vaccine. After these purity, safety and potency tests, the dried vaccine was exposed to room temperature for about one week and primary vaccinations were done, using the dried vaccine. Results are given below :—

Results of tests done on the dried vaccine lymph.—The reconstitution of the dried vaccine was done with 50 per cent glycerine water to make up the original volume. No difficulty was experienced in reconstitution and the vaccine goes into a suspension very easily.

Purity tests.—Total count—60 colonies per c.c.
Pathogenic organisms—Absent.

Safety tests.—Guinea pig injected intraperitoneally with 3 c.c. of the reconstituted vaccine was well and alive after seven days.

Potency on calves.—Continuous vesiculation along the line of scarification in a dilution up to 1 ; 100 and almost continuous in 1 : 500.

Results of primary vaccination conducted.

Details of vaccine.	Number vaccinated.	Number verified.	Number successful.	Percentage case success.	Number of insertions verified.	Number of insertions successful.	Percentage insertion success.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dried vaccine ..	21	21	20	95·2	42	33	78·6

Of course the results of the primary vaccination are not as good as could be desired but, the method of production has to be improved further and the work will be continued during the next official year.

As regards the difficulties enumerated already, we would like to comment as follows :—

(1) *The purity of the vaccine before drying.*—Chloroform vapour treatment appears to be fairly satisfactory method but this does lower down the potency of the vaccine though not to any great extent. Since there is a further reduction of potency during the process of drying it is preferable to employ methods other than chloroforming. With this in view external application of a mixture of penicillin 100 units per c.c. and 1 mg. of streptomycine per c.c. in 50 per cent glycerine over the vaccinated area twice a day during the five days before harvesting the crude pulp was tried. The purity tests of the vaccine so treated appear to be satisfactory. No definite opinion could be given at this stage whether this method holds out any advantages over the chloroforming technique.

External application of Roccal—Alkyl dimethyl benzyl ammonium chloride—as advocated by Ducor D. H. (Public Health Report, Volume 62 pp. 565–581) was also tried but the results have not been good.

(2) The reduction in the virus content of the vaccine during the process of drying—

That there is a certain amount of reduction of virus content is generally accepted and it may even be said that there is a loss of more than 50 per cent of the total virus content in some cases. But this is not a serious draw back, provided it is ensured that there is an appreciable viable virus content in the dried sample which can withstand adverse conditions of storage. This can be easily achieved provided a proper medium is used for the vaccine and by using a little more concentrated vaccine. The special lactose salt solution employed and a concentration of 1 in 4 vaccine seems to be satisfactory.

It is the usual practice of this Institute to supply vaccine lymph to the field in a dilution of 1 in 7 and hence the cost of production is bound to be appreciably higher in the case of the dried vaccine if a 1 in 4 dilution has to be employed. But considering the fact that the dry vaccine will be of immense benefit in places far off from the supply centre, the cost involved can be said to be well compensated for.

(3) *The keeping quality of the dried vaccine.*—This depends to a large extent on the technique of drying and the final moisture content of the dried sample. Work on this has not yet been completed and it is proposed to continue this work during the next year.

II. Use of sheep as vaccinifers in the production of vaccine lymph.

The work started already in 1950–51 was continued this year. The usual seed calf lymph was passed through sheep and the material collected was used as the seed for the production of the sheep vaccine. Three batches of vaccine were prepared and the average yield of crude pulp per sheep was 28·1 gms. Purification of the vaccine was done by the chloroform vapour treatment and by Phenol.

·4 per cent as described by Doughlas Mclean [Lancet (1949), Volume II, pp. 476–77). The results of the purity tests are given below:—

	Total count.	Pathogens.
Batch I—		
A. Phenol treated	8,300	Streptococci hæmolyticus present.
B. Chloroformed	10,700	Absent.
Batch II—		
A.	4,000	Absent.
B.	40,000	Ps. Pyocyaneous present.
Batch III—		
A.	3,500	Cl. welchi present.
B.	Not done.	Not done.

As could be seen from the results Cl. welchi was isolated from one of the batches and hence it was considered unsafe to use any of the batches prepared for the field trial. It may not be out of place to mention in this connexion that never has there been any contamination of the calf lymph with the clostrideal group of organisms in this laboratory. So further trials at manufacture of sheep vaccine were given up. During the trials conducted, the following disadvantages in the use of sheep as vaccinifers were observed :—

(1) It is found difficult with sheep to maintain the standard of cleanliness obtainable with the calf due to the hairy coat of the sheep.

(2) There is a rather rapid growth of hair within 120 hours and hence a lot of hair gets mixed up with the pulp and thus there is a greater source of contamination of the vaccine.

(3) The presence of hair in the crude pulp collected hinders very much a proper homogenisation and sometimes the grinding machine gets stuck up in the process of grinding.

Considering all these difficulties, it is felt that the use of sheep as vaccinifers in preference to calves, especially where the latter are easily available, is not desirable.

The value of the male frog test for pregnancy.

[M. Narayana Pai, M.B. & B.S. and K. Dattatreyulu, M.B. & B.S.
(Department of Biological Control].

The present investigation was undertaken to determine the reliability of the male Frog test. It was found difficult to obtain suitable female virgin rabbits, at certain times and a number of requests for the Friedman tests had either to be postponed or abandoned. It was therefore, decided in such cases, to perform the male Frog test and confirm it later if possible by Friedman's test or clinical observation of the patient. The investigation covered a period from 6th July 1950 to 31st March 1953.

Technique.

Male frogs weighing between 20 gms. and 50 gms. were employed. Each frog was carefully checked for its male characteristics, viz., swollen, heavily pigmented thumb and the presence of air sacs near the angles of the jaw, which are inflated during croaking.

The early morning specimen of urine was used for the test. Catheter specimens were not insisted on. Before injecting the frog, a sample of its urine was drawn from the Cloaca by means of a pippette with a curved tip and examined for the presence of spermatozoa. In no case were any spermatozoa present. In six cases the frog died within a few minutes after the injection due to the presence of some toxic factor, not necessarily bacterial. (In such cases, the test was reported as inconclusive.) The amount of urine injected was between 5 and 10 c.c. depending upon the size of the frog and the injection was made into the dorsal lymph sac, half the quantity of urine being injected on each side.

Three samples of urine were withdrawn by the pippette 1½, hours, 2½ hours and 4 hours after injection and examined, on a slide, with a cover slip under a microscope. If the first and second samples were positive, the third (4 hours) specimen was not drawn. If no spermatozoa were found in all the specimens (up to the 4th-hour specimen), the test was reported as negative.

Urine from known cases of pregnancy were used as positive controls and urine from male patients, male and female children and known non-pregnant females as negative controls.

In 21 cases where both tests (Friedman's test and Frog test) were done, the results were identical, except in one case in which the rabbit died during the course of the Friedman test. The Friedman tests were done in the Diagnostic section of the King Institute.

The earliest stage of pregnancy in which a positive result was obtained was one week from the last "missed period" (three cases)

The spermatozoa were easily identified by an oval head and a long tail. They showed great activity in the fresh specimen, lashing their tails and in some cases a "bending and unbending" movement. In about 15 minutes, however, activity ceased up to 15 or more spermatozoa could be seen in each field under high power (1/7).

Species of frog used.—Four different species were used. Rana Tigrina, Rana Hyxadactyla and two other species not identified. The total number of frogs used was 617 and the number of specimens of urine 236.

In the small series of 236 tests of the present report there have been no false positives and only two cases gave a false negative result, viz., one case of threatend abortion and one case of vasicular mole, giving an accuracy of about 99 per cent. The positive control and negative controls gave 100 per cent accuracy. It will be noticed that in no case was there a difference between the Frog test and the Friedman test.

Follow-up of cases.—Unfortunately all cases could not be followed up, as many of them were out-patient cases and did not turn up again. Twenty-seven cases which gave a positive Frog test were followed up and were found to be pregnant. Twenty-seven cases which gave a negative test were followed up and found to be non-pregnant. It is, however, reported that in none of the cases which gave a negative Frog test and which underwent laparotomy was there any evidence of pregnancy. This gives an accuracy of 100·0 per cent.

It is regretted that in many cases, the various medical officers did not follow up the cases for two or three months after the test was performed and reported. In an investigation like the present one, the co-operation of the Clinician is essential if the value of a laboratory test is to be assessed. However, from the information available the test gives an accuracy of about 99·0 per cent which should be considered as very highly satisfactory.

The above results indicate that the male Frog test is a reliable test for the diagnosis of pregnancy. Its advantages are (1) simplicity : no elaborate instruments or operative procedure necessary as in Friedman's test; (2) Rapidity : a report can be given within 4 hours whereas in Friedman's test 48 to 72 hours are necessary (3) Economy : suitable frogs are easily available at Rs. 2 per dozen. Three frogs are sufficient for each specimen of urine and these frogs can be used again after a period of rest of about ten days. The frogs are also easy to maintain.

Summary.

(1) The male Frog test was performed on 236 specimens of urine.

(2) No false positives were obtained. Only two false negative results were obtained. The test gives an accuracy of 99·0 per cent.

(3) The test is simple, rapid, and economical. It can be performed in a small laboratory and no elaborate apparatus or instruments are necessary :—

Filtrable Viruses Enquiry under the Director, King Institute, Guindy, financed by the Indian Council of Medical Research.

(By Dr. Y. S. Narayana Rao, Dr. G. N. V. Krishnan and Sri K. N. Gopalan).

A. Vaccinia and Variola.

Two strains of vaccinia virus maintained on the chorio-allantoic membrane of the developing chick have passed from the 102nd to 122nd and 202nd to 225th passages, respectively. A new strain was isolated by adapting Paris dry lymph to passage in the egg and this strain has been maintained up to the 17th passage for use in the cross immunity experiments on monkeys.

Two strains of variola have passed from the 24th to 43rd and 46th to 63rd passagees in the egg. A new strain of variola was isolated during the year from a case of hæmorrhagic smallpox admitted in the Infectious Diseases Hospital, Madras. This is in the 18th egg passage.

Lesions from two buffaloes sent by the Investigation Officer, Ranipet Laboratory, were ground in tyrode solution and inoculated into eggs. A strain of virus was isolated which is in the 9th egg passage. Passage of the strain by vaccination on monkeys gave vesiculation similar to that of vaccinia.

Comparison of the protective value of different types of vaccine lymph and variola virus against smallpox :—

Thirteen monkeys were vaccinated with seed vaccine lymph, 15 monkeys with dry lymph and 11 with membrane lymph for testing the protection afforded by them against smallpox. The persistence of immunity in these monkeys, is to be assessed by challenging, at the end of the year.

B. Lymphogranuloma venereum.

With the co-operation of the Venereal department of the Government General Hospital and Stanley Hospital, Madras, Frei's (human pus) antigen was prepared from 5 fresh cases and about 350 doses distributed. Apart from meeting the demands of private practitioners and hospitals of this stage, the antigen has been sent to Armed Forces Medical College, Poona, and the School of Tropical Medicine, Calcutta.

Filariasis enquiry under the Director, King Institute, Guindy, financed by the Indian Council of Medical Research.

(By Dr. Y. S. Narayana Rao and Dr. G. N. V. Krishnan.)

A. Lizard Filariasis.

During the period April 1952 to March 1953, 1,453 lizards were examined and 258 were found to be infected with *Conispiculum guindiensis*. As was observed last year, the infection rate in Calotes is getting progressively reduced.

Table showing *Conispiculum* infection rates in *Calotes*.

Year	Number of Calotes examined.	Number infected.	Percentage infected.
1947	653	252	38·6
1948	2,811	961	34·2
1949	2,315	677	29·2
1950	(Not examined.)		
1951	802	189	23·6
1952	1,509	310	20·5

A fair quantity of the antigen was prepared from the male and female worms collected from the lizards. In addition to the use for skin test in a non-endemic area, the antigen was supplied for early diagnosis of filariasis to the Government General Hospital, Madras.

Rearing of Lizards in captivity.

Calotes were observed not to feed by themselves in captivity and die in a few days in the laboratory. By forced feeding with insects it was previously found that the Calotes could be kept alive for about three weeks. With a view to keep them alive for longer periods to enable us to do transmission experiments and conduct other laboratory studies, feeding them with milk with a pipette was tried. Calotes take 2 to 3 c.cs. of milk easily. They were fed with milk once a day. So far, calotes fed on milk survived in the laboratory up to a maximum of 73 days.

Effect of injecting Microfilaria into Normal Lizards.

Six lizards kept in the laboratory for 2 to 3 weeks and showing no microfilaria on two examinations were given ½ to 1 c.c. of citrated blood from infected lizards showing microfilaria. These injections were given intraperitoneally. The tail blood was examined daily for the presence of microfilaria. Four of them died before microfilaria appeared in the tail blood. In the other two, microfilaria appeared in the tail blood on the 10th day and disappeared on the 11th and 12th days, respectively. They were killed to see if they harboured any adult worms. There were none.

Action of drugs on Lizard Filariasis.

(1) *Stibinol.*—Four infected lizards were given half a c.c. of *Stibinol* intramuscularly. A second injection was given on the 4th day. Three of them died on the following day and the fourth died on the next day. The drug had no effect either on the adult worm or on microfilaria during this period.

(2) *Sodium fluoride.*—It was observed by Dr. R. Subramaniam, Physician, Government General Hospital, Madras, that intramuscular injections of 1 per cent aqueous sodium fluoride not only eliminated micro-filaria in blood, but also produced a reduction in the swelling of limbs in human filariasis. One infected *Calotes* was given 1 c.c. of 1 per cent aqueous solution of sodium fluoride and two infected Calotes of ½ c.c. each intramuscularly. The *Calotes* which received 1 c.c. of sodium fluoride died the same day; the other two were given two more doses of ½ c.c. each of sodium fluoride at intervals of 3 to 5 days. Sodium fluoride produced no effect on *C. guindiensis* infection in Calotes up to 19 days (the period of survival of the lizards).

(3) *Sulfarsenol.*—Three infected Calotes were given 5 mgs., and two 10 mgs. each, one 20 mgs., and one 50 mgs. of *Sulfarsenol* intramuscularly. Calotes which received 20 and 50 mgs. died on the 2nd day. The other five were given 18 mgs. of Sulfarsenol on the 4th day. The Calotes continued to show microfilaria till they died between 6 and 36 days.

The effect of the following substances on microfilaria in vitro was tested:—

(1) Penicillin, (2) Streptomycin, (3) Sodium Fluoride, (4) Urea Stibamine, (5) Stibinol, (6) Stibatin, (7) Sulfarsenol, (8) N.A.B., (9) Genetian Violet and (10) ethylene Blue. M

Penicillin, Streptomycin and N.A.B. have no effect on microfilaria. The concentration in which the other substances were tested and the time in which the activity of the microfilaria was completely stopped are given in the table.

TABLE.

Substance. (1)	Concentration. (2)	Duration of activity of microfilaria. (3)	
	PER CENT.	HOURS.	MINUTES.
Control	..	73	40
1. Sodium fluoride	0·5	3	27
2. Stibinol	0·5	28	2
3. Stibatin	5·0	3	45
4. Urea Stibamine	0·5	46	46
Do.	0·67	21	55
5. Sulfarsenol	0·05	47	13
Do.	0·06	21	10
6. Genetian violet	1·2	..	20
7. Methylene blue	0·5	..	13

B. Human Filariasis.

Value of a skin test using an antigen prepared with C. guindiensis in the early diagnosis of filariasis.

Previous work in endemic areas in and around Saidapet revealed that a number of symptomless microfilaria-negative subjects gave a positive reaction with this antigen. It is not possible to say if these reactors are really infected subjects in the latent stage of infection. So, in order to ascertain the specificity of the antigen (or rather to ascertain if the antigen gave any non-specific reactions) the tests were carried out *at Coonoor, a place where filariasis is not endemic.* The test was done on 112 subjects showing no clinical manifestations of filariasis, 2 persons giving the history of lymphangitis and one showing swelling of one leg. Night blood was examined in only 36 of them. None of them showed microfilaria in blood. Motions of 24 were examined. Hookworm ova was present in one and round-worm ova in six of them. Three of the symptomless group and one showing the swelling of a leg gave positive skin reactions. The latter reactor was from Kayamkulam in Travancore. She showed a swelling of her right leg of one month's duration. Her night blood was free from microfilaria and her motions free from parasites. She is clearly a case of clinical filariasis. The former 3 gave no history of lymphangitis or any other clinical manifestations of filariasis. All these three have come to Coonoor from Kangayam, a village near Tirupur. Their motions revealed a heavy infection with round worms. Their night blood was free from microfilaria. The positive reactions in these are not likely to be due to cross re-action due to round-worm infection as three others infected with round-worms did not give a positive reaction with this antigen.

Out of 112 symptomless subjects tested at Coonoor, with the filarial antigen, only three or 2·7 per cent gave a positive reaction. All these three positive reactors and 16 of the non-reactors were from Kangayam. The other 93 who are local subjects did not show any reaction to this antigen.

THE EDIBLE BRACKISH WATER BIVALVES OF SOUTH INDIA AND THEIR BEARING ON HUMAN DISEASES—AN ENQUIRY UNDER THE DIRECTOR, KING INSTITUTE, GUINDY.

(By K. C. Abraham, M.A., Fellow of the Indian Council of Medical Research.)

Since clams (mostly *Meretrix casta*) form the most important edible bivalves in South India, the clam meat and the brackish water in which they live in the Adyar estuary at Madras, have been analysed. The methods used were those

recommended by the American Public Health Association (Jour. A.P.H. Assoc. 1947). The normal bacterial flora of the clam was found to be non-pathogenic forms such as *Pseudomonas sp. Proteus, Bacillus subtilis* and inagglutinable vibrios.

Several attempts were made without success with various media using different pH and incubation temperature, to obtain in pure culture, the spirochaetes (*Cristispira balbianii* Gross) found in the crystalline style of *M. casta.*

The study was then concentrated on the viability of cholera vibrio in the clam. Clams collected from Adyar were fed on freshly isolated strains (Inaba) of vibrio and maintained in brackish water in the laboratory. Wilson and Riley's medium and peptone water with subsequent plating on Aronson's medium were tried in the isolation of vibrio. Several improvements were effected in course of time such as the addition of 0·31 per cent boric acid to inhibit the growth of *Pseudomonas* in the water, inoculation of vibrio suspensions into the foot of the clam instead of feeding, till finally an apparatus was devised for continuous circulation of water for keeping the clams for longer periods in the laboratory. With the aid of this apparatus vibrios have been recovered from the *clam meat up to a period of three days* and from the water for a little longer period. The addition of peptone up to 2 per cent to the water and provision of better aeration had no effect on the period for which vibrios could be isolated after inoculation. There was no evidence of multiplication of the vibrios in this clam unlike what Toyama observed in a marine mollusc at 15° to 25°C (Chinese Med. Jour., Vol. 70, p. 587, 1952), but on the contrary the number of colonies fell steadily from the first day after inoculation.

THE KING INSTITUTE, GUINDY, MADRAS,
22nd October 1953.

Y. S. NARAYANA RAO,
Director.

TABLE I.

Statement No. 1—*Expenditure Actuals*, 1952–53.

		Rs.	A.	P.
(*a*) Expenditure Actuals—				
1	Pay of officers	1,50,251	3	0
2	Pay of establishments	1,95,839	1	0
3	Dearness allowance	1,21,842	7	0
4	Pay of menials	6,060	1	0
5	Travelling and other compensatory allowances	84,459	8	0
6	Telephone charges	2,244	5	0
7	Books and periodicals	5,503	3	11
8	Service postage and telegrams	43,049	2	6
9	Cleaning charges and office expenses	4,799	9	9
10	Rates and taxes	10,502	6	0
11	Purchase of serum	3,60,112	15	0
12	Instruments and chemicals	3,00,015	7	5
13	Purchase and feeding of calves and other animals	1,00,322	12	5
14	Motor car maintenance charges	8,392	6	0
15	Electric current charges	21,312	1	9
16	Customs duty	91,657	3	0
17	Other contingencies	79,602	5	8
18	Dearness allowance to menials	9,967	2	0
	Total ..	15,95,933	4	5
(*b*) Administration of Drugs Act, 1940—				
1	Pay of officers	20,183	9	0
2	Pay of establishments	3,563	12	0
3	Travelling allowance and other compensatory allowances	4,248	1	0
4	Dearness allowance	4,906	14	0
5	Apparatus and office furniture	18,776	11	5
	Total ..	51,678	15	5
(*c*) Accounts borne on other budget on Institute account—				
	Proportionate cost of management and supervision by the Director of Medical Services and his staff.	3,030	0	0
	Cost of audit on construction and repair of buildings and electrical installations.	402	0	0
	Maintenance charges of buildings and electrical installations.	40,241	0	0
	Depreciation and interest charged on—			
	(*a*) Buildings	29,199	0	0
	(*b*) Electric current and machinery	4,397	0	0
	Cost of stationery, clothing and printing	3,224	0	0
	Superannuation allowance and pension	617	0	0
	Total ..	81,110	0	0
	Grand total ..	17,28,722	3	10
	Deduct—Net receipts (actuals) ..	3,27,674	13	0
	Net cost to State funds ..	14,01,047	6	10

Statement No. 2—*Actual Receipts.*

1	Sale-proceeds of sera and vaccine	1,70,552	0	0
2	Recoveries of overpayments—Bacteriological laboratories.	1,214	0	0
3	Collection of payments for services rendered	63,763	0	0
4	Miscellaneous	13,481	0	0
5	Contribution from local bodies for analysis of food samples	79,524	0	0
	Total ..	3,28,534	0	0
6	*Deduct*—Refunds—Bacteriological laboratories ..	859	3	0
	Net actual receipts ..	3,27,674	13	0

TABLE I—*cont.*

Statement No. 3—Estimated cost of supplies and services made.

		Rs.	A.	P.
1	Bacteriological and chemical examinations	5,64,838	8	10
2	Bacteriological vaccine supplies	10,04,431	4	10
3	Value of cultures and antigens, etc.	1,64,495	10	8
4	Vaccine lymph	3,77,388	2	0
5	Sera	7,61,980	10	0
6	Value of examinations done under the Drugs Act	2,29,919	0	0
	Total ..	31,03,053	4	4

Government Analyst Section.

Food—

1	Contribution from local bodies working the Madras Prevention of Adulteration Act.	1,38,308	0	0
2	Value for analysis done for Government institutions ..	73,590	0	0
3	Fees received from unofficial sources for analysis of food samples.	1,520	0	0

Drugs—

4	Value for drug samples analysed for hospital samples and under the Madras Drugs Rules.	11,640	0	0
5	Fees received from unofficial sources for analysis of drug samples.	580	0	0
	Total ..	2,25,638	0	0
	Grand total, value of Receipts ..	33,28,691	4	4
	Deduct—Expenditure ..	17,28,722	3	10
	Net value of Profits ..	15,99,969	0	6

TABLE II.

Type of vaccinations (1st January to 31st December 1952).

Serial number and type.	Total number of cases verified.	Total number of cases not verified.	Total.	Percentage of each type to the total cases done.
1 Primary	1,251,323	282,441	1,533,764	21·7
2 Secondary	86,075	..	86,075	1·1
3 Re-vaccinations	3,575,033	2,088,871	5,663,904	77·8

	Cases.	Percentage of each type to the total quantity issued.
1 Total quantity of vaccine lymph issued at four insertions per dose.	6,038,210	..
2 Total quantity of vaccine lymph used for vaccinating cases in 1, 2 and 3 calculated at four insertions per case ..	4,451,791	73·7
3 Total vaccine lymph unaccounted for	1,586,419	26·3

TABLE III.

Primary, secondary and re-vaccination results for 1952.

(The districts are in order of case success rate in primary vaccinations.)

Serial number and district.	Primary vaccinations. Case success. Total cases.	Primary vaccinations. Case success. Percentage of case success.	Primary vaccinations. Insertion success. Total number of insertions verified.	Primary vaccinations. Insertion success. Percentage of insertion success.	Re-vaccinations. Total cases.	Re-vaccinations. Percentage of case success.	Total number not verified.	Total vaccination.	Percentage of lymph unaccounted for.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1 South Kanara.	46,264	99·4	183,852	95·5	94,735	28·4	56,828	197,827	0·5
2 The Nilgiris.	7,190	99·1	28,500	98·1	18,448	20·1	7,790	33,428	0·3
3 Chittoor ..	39,978	98·3	159,002	98·7	91,945	28·5	63,280	195,203	9·0
4 Madurai ..	50,800	98·2	201,655	91·5	210,181	23·3	197,012	457,993	21·2
5 Chingleput ..	31,228	97·9	117,191	98·7	78,473	14·5	63,983	173,684	11·6
6 Malabar ..	86,533	97·8	316,174	95·8	223,699	20·9	137,344	447,576	23·1
7 Ramanathapuram.	14,930	97·4	59,601	91·3	29,579	21·3	37,005	81,514	62·5
8 Bellary ..	35,560	97·2	140,814	90·3	72,224	15·0	62,453	170,237	17·1
9 South Arcot.	68,431	97·2	248,312	77·7	189,945	21·7	204,341	457,717	5·2
10 Tirunelveli ..	47,354	97·2	186,864	88·9	94,075	22·1	99,631	241,060	11·2
11 North Arcot.	56,670	96·9	222,551	92·5	102,632	20·8	99,739	259,041	18·3
12 Salem ..	72,013	96·6	280,286	88·9	138,336	12·9	124,548	334,897	11·9
13 Tanjore ..	67,183	96·5	253,897	91·7	161,128	21·7	144,584	372,895	12·5
14 Guntur ..	15,767	96·2	60,141	87·0	50,084	16·9	36,654	102,505	65·1
15 Tiruchirappalli.	54,518	96·2	217,217	84·6	98,658	18·6	116,449	269,625	15·2
16 Anantapur ..	34,151	96·1	136,710	89·3	88,946	15·6	55,529	178,626	13·7
17 Coimbatore ..	50,031	96·1	190,205	91·8	132,833	19·6	151,381	334,245	12·4
18 West Godavari.	27,023	95·9	105,508	87·9	71,260	22·1	55,550	153,833	30·4
19 East Godavari.	42,319	95·5	162,616	84·5	125,908	29·2	83,923	252,150	24·4
20 Krishna ..	34,665	94·0	133,427	86·0	82,524	15·4	66,961	184,150	16·5
21 Nellore ..	33,207	93·5	132,558	81·6	90,871	20·5	59,564	183,642	65·5
22 Kurnool ..	24,317	92·7	96,231	76·9	71,564	9·9	49,466	145,347	36·6
23 Cuddapah ..	18,349	89·9	73,088	76·9	68,352	6·7	42,725	129,426	41·3
24 Visakhapatnam.	95,757	89·8	374,952	75 2	381,756	22·0	271,665	749,178	26·8
District total ..	1,049,238	96·0	3,579,967	87·8	2,768,156	20·4	2,288,405	6,105,799	24·6
25 Municipalities.	142,071	99·1	561,143	93·2	606,133	16·4	107,602	855,806	24·1
26 Madras Corporation.	59,038	99·7	225,090	94·7	198,044	6·1	54,588	311,670	8·0
27 Other bodies.	976	98·7	2,594	78·9	2,700	41·6	6,792	10,468	95·4
Grand total ..	1,251,323	96·5	4,864,139	88·8	3,575,033	18·3	2,457,387	7,283,743	26·3

TABLE IV.

PART I.—*Statement showing the pathological specimens examined in the Laboratories of the State-public local fund, aided hospitals and dispensaries in the Madras State during the year from 1st April 1952 to 31st March 1953.*

Name of institution and section .. Clinical Section, K.I.P.M., Guindy.

Serial number.	Part.	Description.	Number examined.	Number positive.	Details regarding positive.	
(1)	(2)	(3)	(4)	(5)	(6)	
		Microscopical and bacteriological tests.				
1	A	Blood films	67	3	Malaria	1
					Micro filaria ..	2
					Relapsing fever ..	..
					Spirochaetes ..	..
					Leishmania Donavani	..
					Other organisms ..	..
2	..	Blood—red cells, white cells—differential counts ..	240	..	R.B.C.	11
3	..	Blood for total count ..	31	..	W.B.C.	20

TABLE IV—*cont.*

PART I.—*Statement showing the pathological specimens examined in the laboratories of the State-public local fund, aided hospitals and dispensaries in the Madras State during the year from 1st April 1952 to 31st March 1953*—cont.

Serial number.	Part.	Description.	Number examined.	Number positive.	Details regarding positive.	
(1)	(2)	(3)	(4)	(5)	(6)	
		Microscopical and bacteriological tests—cont.				
4	..	Blood for Hæmoglobin ..	10	..		
5	..	Blood for grouping	2,489	..	Group A	640
					Do. B	655
					Do. O	850
					Do A & B	344
5-A	..	R.H. tests	58	37	Negative	21
					Positive	37
6	..	Blood for agglutination tests.	4,438	2,057	Enteric group—	
					Sal. typhi ..	972
					Sal. paratyphi A.	26
					Do. B.	18
					Do. C.	13
					More than one organism ..	1,020
					Dysentery group—	
					Sh. shiga	..
					Sh. flexner ..	..
					Weilfelix reaction—	
					O × 2	..
					O × 19	..
					O × K	3
					More than one organism ..	5
		Cold agglutination	36	3	Malta fever—	
					Br. abortus	
					Br. melitensis	
					Negative	33
7	..	Blood for Aldehyde test ..	35	11	Positive	3
	..	Blood for Antimony test ..	27	12	....	
8	..	Blood for culture	1,130	405	....	
					Sal. typhi ..	60
					Sal. paratyphi A.	8
					Do. B.	323
					Do. C.	7
					Other organisms ..	7
		Part A, total ..	8,561	2,528		
9	B	Cerebro spinal fluid for cell count	30	..	M. tuberculosis	
					N. meningitidis ..	2
		Cerebro spinal fluid for other examinations	132	17	D. pneumonia ..	6
					H. influenza ..	4
					Others	5
		Cerebro spinal fluid for cultural examinations ..	131	16	M. tuberculosis	
					N. meningitidis ..	1
					D. pneumonia ..	6
					H. influenza ..	4
					Others	5
		Part B, total ..	293	33		
10	C	Urine for—				
		Qualitative tests	13	..	B. Coli	106
		Quantitative	..	..	Enteric	9
		Microscopical examination.	24	..	Others	38
		Cultural examination ..	463	153		
		Part C, total ..	500	153		

TABLE IV—*cont.*

PART I.—*Statement showing the pathological specimens examined in the Laboratories of the State-public local fund, aided hospitals and dispensaries in the Madras State during the year from 1st April 1952 to 31st March 1953*—cont.

Serial number.	Part.	Description.	Number examined.	Number positive.	Details regarding positive.	
(1)	(2)	(3)	(4)	(5)	(6)	
		Microscopical and bacteriological tests—cont.				
11	D	Motion for microscopical examinations	43	9	E. Hystolitica (vegetative and cystic)	2
					Ova	2
					Cellular exudate ..	1
					Others	4
		Motion for cultural examinations.	4,238	2,202	V. Cholera	2,006
					Dysentery group ..	..
					Enteric group ..	6
					Others	10
		Part D, total ..	4,281	2,031		
12	E	Pathological fluids for microscopical examinations.	1,374	104	M. tuberculosis ..	82
					N. leprae	1
					N. gonorrhoea ..	1
					T. pallidum ..	..
					P. pestis	1
					C. diphtheria ..	5
					Other organisms ..	15
		Pathological fluids for cultural examinations.	1,441	198	M. tuberculosis ..	9
					C. diphtheria ..	2
					Other organisms ..	187
		Part E, total ..	2,815	302		
13	F	Test on animals with specimens or pathological fluids.	88	2	M. tuberculosis	
					C. diphtheria	
					Others	
					Freidman's test ..	2
		Part F, total ..	88	2		
		Part I, grand total ..	16,538	5,049		

PART III.—*Statement showing the number of serological tests done from 1st April 1952 to 31st March 1953.*

Serial number.	Name of the tests.	Number examined.	Number positive.
1	Number of bloods for Kahn test	63,015	14,408
2	Number of bloods for Wassermann test	35,632	17,192
3	Number of cerebro-spinal fluids for Wassermann test.	1,351	521
4	Number of cerebro-spinal fluids for Lange's tests ..	798	143
5	Kahn verification and Paul Bunnel test	13	..
	Total number of serological tests ..	100,809	32,264
	Total number of bloods received lysed and broken.	2,054	
	Total number of bloods found lysed and broken (while testing).	1,440	

TABLE IV-A.

Serology Section, King Institute, Guindy.

Serial number and name of institution.	Blood for Kahn test.			Blood for Wassermann test.			Cerebro-spinal fluid for Lang's test.			Cerebro-spinal fluid for Wassermann test.		
	Number examined.	Negative.	Positive.	Number examined.	Negative.	Positive.	Number examined.	Negative.	Positive.	Number examined.	Negative.	Positive.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(11)	(12)	(13)	(8)	(9)	(10)
1 General Hospital, Madras (Venereal Department, Out-patient).	16,154	10,572	5,942	15,830	8,110	7,720	203	179	24	248	153	95
2 Stanley Hospital, Madras ..	4,995	3,264	1,731	4,731	2,259	2,028	43	30	13	153	91	62
3 Blood Bank (General Hospital, Stanley Hospital and King Institute, Guindy.	8,198	7,088	1,110	7,866	5,376	2,490	..	..	..	..	..	..
4 Women and Children Hospital, Madras.	7,590	6,977	613	542	116	426	..	..	..	1	1	..
5 Kasturba Gandhi Hospital, Madras.	1,578	1,218	360	327	37	290	..	..	..	3	3	..
6 Ophthalmic Hospital, Madras.	3,067	2,673	494	466	83	383	..	..	..	..	..	..
7 Indian Medicine Hospital, Madras.	612	529	83	60	9	57	..	..	..	..	..	..
8 Mental Hospital, Madras ..	1,126	946	180	166	42	124	133	97	36	151	83	63
9 Government Royapettia Hospital, Madras.	39	31	8	18	8	10	2	2	..	5	5	..
10 Other hospitals in Madras City.	3,760	3,202	558	1,194	599	596	302	255	47	531	322	209
11 Mufassal hospitals (town) ..	13,365	10,246	3,119	3,238	700	2,538	64	50	14	149	99	50
12 Local fund and rural dispensaries.	502	455	47	72	34	38	5	5	..	7	6	1
13 Primary public health centres.	722	664	58	14	4	10	..	..	..	1	1	..
14 Private practitioners	947	842	105	1,546	1,063	483	46	37	9	102	61	41
Grand total ..	63,015	48,607	14,408	35,632	18,440	17,192	798	655	143	1,351	830	521

Serial number and name of institution.	Kahn vertification test.	Kahn negative and Wassermann positive.	Kahn positive and Wassermann negative.	Paul Bunnel test.
(1)	(14)	(16)	(17)	(15)
1 General Hospital, Madras (Venereal Department, Out-patient).	..	2,557	386	..
2 Stanley Hospital, Madras ..	..	493	91	..
3 Blood Bank (General Hospital, Stanley Hospital and King Institute, Guindy.	..	1,590	126	..
4 Women and Children Hospital, Madras.	..	9	88	..
5 Kasturba Gandhi Hospital, Madras.	..	6	28	..
6 Ophthalmic Hospital, Madras.	..	5	58	..
7 Indian Medicine Hospital, Madras.	..	1	6	2
8 Mental Hospital, Madras ..	1	2	24	..
9 Government Royapettia Hospital, Madras.	..	34	222	..
10 Other hospitals in Madras City.	..	2	3	..
11 Mufassal hospitals (town) ..	..	..	..	..
12 Local fund and rural dispensaries.	..	52	8	1
13 Primary public health centres.	..	4,767	1,080	3
14 Private practitioners	1	1	..	..
Grand total ..	2	4,767	1,080	3

TABLE V-A.

Statement showing supplies of prophylactic vaccines, cholera, T.A.B. and plague for the period from 1st April 1952 to 31st March 1953.

Serial number and name of vaccine.	Opening balance in c.c.	Receipt from mufassals in c.c.	Manufacture in c.c.	Issues in c.c.	Closing balance in c.c.
(1)	(2)	(3)	(4)	(5)	(6)
1 Cholera	1,789,842	113,600	9,302,075	10,937,525	767,992
2 T.A.B.	5,340	2,415	214,009	186,498	35,266
3. Plague	33,980	Nil.	* 20,000	23,280	30,700

* Received from the Haffkine's Institute, Bombay.

TABLE V-B.

Statement showing supplies of stock vaccines (polyvalent), etc., and autogenous vaccines for the period commencing from 1st April 1952 to 31st March 1953.

Serial number and name of organism.	Stock vaccine doses.	Autogenous doses.
Pyogenic group of genito-urinary origin.		
1 Gonococcus	9,383	..
2 Gonococcus + Staphylococcus (compound Gonoccocus vaccine) ..	973	..
3 B. coli	616	12
4 B. coli + Streptococcus (puerperal)	234	..
5 Streptococcus (puerperal)	684	..
6 B. coli + Enterococcus	..	12
7 Streptococcus + Staphylococcus + B. Diphtheroid	..	6
8 B. coli + Staphylococcus + Diphtheroid	..	6
9 B. Phycyaneus + Staphylococcus	..	6
Pyogenic group of miscellaneous origin.		
10 Staphylococcus vaccine	6,036	90
11 Streptococcus + Staphylococcus	7,120	..
12 Streptococcus (pyogenic)	996	..
13 Streptococcus (pyoveharal)	668	..
14 Streptococcus (filarial)	14,603	..
15 B. acne	168	..
16 B. acne + Staphylococcus	30	12
17 Staphylococcus + B. Diphtheroid	..	24
18 Streptococcus + N. catarrhalis	..	18
Respiratory group.		
19 Streptococcus + N. catarrhalis + Pneumococcus (compound catarrhal vaccine).	1,903	42
20 Streptococcus + N. catarrhalis + Pneumococcus	78	6
21 B. Pertussis + Streptococcus + Pneumococcus + N. catarrhalis + H. influenza (whooping cough curative vaccine).	3,405	..
22 B. pertussis (whooping cough prophylactic vaccine)	1,251	..
23 Streptococcus	..	18
24 Streptococcus + N. catarrhalis	..	24
25 Streptococcus + Pneumococcus	..	84
26 Streptococcus + H. influenza + B. Diphtheroid + Streptococcus ..	..	6
27 Streptococcus + B. Diphtheroid + Pneumococcus	..	6
28 Streptococcus + Pneumococcus + N. catarrhalis + Staphylococcus	..	24
29 Streptococcus + Pneumococcus + Staphylococcus	..	18
30 Streptococcus + Pneumococcus + N. catarrhalis + B. friedlander ..	..	18

TABLE V-B—*cont.*

Statement showing supplies of stock vaccines (polyvalent), etc., and autogenous vaccines for the period commencing from 1st April 1952 to 31st March 1953 —cont.

Serial number and name of organism.	Stock vaccine doses.	Autogenous doses.
Respiratory group—*cont.*		
31 Streptococcus + Pneumococcus + B. friedlander		6
32 Streptococcus + N. catarrhalis + H. influenza		6
33 Streptococcus + B. friedlander		6
34 Streptococcus + N. catarrhalis + Staphylococcus		12
35 Pneumococcus + N. catarrhalis		24
36 Pneumococcus + B. friedlander		6
37 Staphylococcus + B. diphtheroid		12
Intestinal group.		
38 Salm Typhi + Salm paratyphi A & B (T.A.B. vaccine dilution 1 in 4 for protein shock treatment).	5,115	
39 Salm typhi + Salm paratyphi A & B (T.A.B. curative vaccine)	4,552	
40 Salm typhi (Typhoid curative) vaccine	102	
41 Enterococcus		6
42 Enterococcus + B. coli		6
Total doses	57,917	564
Miscellaneous.		
43 Old tuberculin (human) for V.P. tests	3,522 doses.	
44 Old tuberculin (human) for Mantoux tests	1,800 „	
45 Live cultures of all organisms	331 tubes.	
46 Bacterial suspensions	30,660 c.c.	
47 High titre sera	634 „	
48 Reports on Kala Azar	Nil.	
49 Reports on specimens received for auto-vaccine	18	
50 Kahn antigen	3,886 c.c.	
51 Bullock heart extract for Wassermann test	130 „	
52 1 per cent cholesterol solution for Wassermann test	Nil.	
53 Anti-sheep amboceptor	2 c.c.	
54 Dysentery bacteriophage	1,203 × 3 c.c.	
55 Distilled water (unsterilized)	Nil.	
56 Distilled water (*sterilized*)	4 tubes.	
57 Wassermann capsules 5 c.c.	134,184	
58 Various media	59 sets and 553 bottles of 1 oz. each and 151,605 tubes and 38,416 c.c.	
59 Various sterile materials for obtaining cultures	247 sets and 3,081 tubes.	
60 Peptone water	462 tubes.	
Sterile solutions.		
1 25 per cent glucose 20 c.c.	173,853 ampoules.	
2 Do. 10 c.c.	34,281 do.	
3 5 per cent calcium gluconate 5 c.c.	19,757 do.	
4 10 per cent calcium chloride 10 c.c.	2,971 do.	
5 Distilled water 20 c.c.	33,423 do.	
6 Distilled water 10 c.c.	25,161 do.	
7 Normal saline 10 c.c.		
8 Special solutions like ringer lactate, etc.	2,795 bottles.	
9 Miscellaneous solution in ampoules	3,003 ampoules.	

TABLE VI.

Statement of therapeutic sera 1952–53.

Serial number and name of sera.	Stock on 1st April 1952.	Receipts from 1st April 1952 to 31st March 1953.	Issued from 1st April 1952 to 31st March 1953.	Balance on 31st March 1953.
(1)	(2)	(3)	(4)	(5)
1 Anti-anthrax, 10 c.c.	32	12	32	12
2 Anti-gas gangrene, 4,000 units	Nil.	1,372	1,338	34
Do. 10,000 units	4,159	7,000	4,537	6,622
3 Anti-scorpion, 1 c.c.	3,251	3,412	4,372	2,291
4 Anti-streptococcus, 5 c.c.	159		159	Nil.
5 Anti-venene, 10 c.c.	171	1,199	1,290	80
6 Diphtheria-anti-toxin, 10,000 units	2,633	22,049	13,689	10,993
7 Diphtheria prophylactic T.A.F., 1 c.c.	166	812	243	735
8 Do. T.A.F., 10 c.c.	74	4	52	26
9 Do. A.P.T., 0·5 c.c.	114	450	72	492
10 Do. A.P.T., 5 c.c.	135	Nil.	52	83
11	22	9,333	5,164	4,191
12 Haemostatic, 2 c.c.	Nil.	2,500	2,500	Nil.
13 Coagulen ciba, 5 c.c.	82,171	285,906	266,058	102,019
14 Tetanus-anti-toxin, 1,500/1950 I.U.	Nil.	955	955	Nil.
15 Do. 20,000/1950 I.U.	6,002	33,734	26,670	13,066
16 Do. 25,000/1950 I.U.	46	..	9	37
17 Tetanus toxoid, 1 c.c.	33	..	2	31
18 Do. 5 c.c.				
	99,168	368,738	327,194	140,712

TABLE VI-A.

Statement showing King Institute products bulbed during 1952–53, *i.e., from 1st April* 1952 *to* 31*st March* 1953.

Serial number and name of sera.	Number of ampoules bulbed.
1 Tetanus antitoxin, 1,500/1950 I.U. (prophylactic)	70,324
2 Do. 10 doses vials (prophylactic)	1,022
3 Do. 25,000/1950 I.U. (curative)	5,112
4 Anti gas-gangrene, 4,000 units	1,403

TABLE VII.

Department of Water Analysis.

PART I.

WATER SAMPLES.

Serial number and description.	Number examined.
(*a*) *Domestic purposes.*	
1 Bacteriological examination of water samples from protected water-supplies.	2,027
2 Chemical examination of water samples from protected water-supplies	1,428
3 Samples for bacteriological examination from investigation sources	51
4 Do. chemical examination from rural water-supply and other investigation sources.	124
5 Do. bacteriological examination from private bodies and Government and other institutions.	262
6 Do. chemical examination from private bodies and Government and other institutions.	235
7 Water samples for fluoride estimation	38
8 Do. vibrio tests	2,340
9 Do. physical tests like turbidity, odour and colour	1,808
10 Field investigation by the staff of the Water Analysis section	20
11 Analysis of water samples treated with ferric chloride from milk	4

TABLE VII—*cont.*

Department of Water Analysis—cont.

PART I—*cont.*

WATER SAMPLES—*cont.*

Serial number and description.	Number examined.
(*b*) *Government Experimental Filter Station, Kilpauk, Madras.*	
1 Water samples for bacteriological analysis	1,121
2 Do. chemical analysis	858
3 Do. physical tests (colour smell and turbidity)	858
4 Do. the estimation of dissolved oxygen, H_2S and CO_2	816
5 Tests for the determination of dose of chlorine for break points chlorination and chloramination.	22
6 Determination of residual chlorine	614
7 Samples of filter sand for test	8
8 Do. alum for test	6
9 Do. bleaching powder for test	8
10 Do. biological growths for microscopic examination	45
(*c*) *Non-domestic purposes.*	
1 Water samples for use in boilers	23
2 Do. suitability for ice manufacturing and cold storage	4
3 Do. gardening, and bathing	18
4 Do. cleaning milk can and bottles	1
5 Do. laundry purposes	4
6 Do. building construction	1
7 Do. bleaching textiles, etc.	1
8 Do. fruit canny purpose	2
9 Do. laboratory use	4
10 Do. photographic work	2
11 Do. manufacture of distilled water	1
12 Water sample to find out whether it is the causative feature to produce drowziness.	2
13 Do. to cause beri beri	1
14 Do. to cause vomitting	1
15 Do. the well has been added with poison.	1
16 Do. it is responsible for cinoling of milk on boiling.	1
17 Do. it has got any bad effects on syrup manufacture.	1
18 Water samples for fluoride estimation in connexton with fluorisis cases.	1
19 Water samples received in connection with some criminal cases	17
20 Leakage water from Mettur dam	7
(*d*) *Water Biology.*	
1 Microscopic examination of samples of water	516
2 Do. organic growths in filter sand, pipe lines, settlement basins, etc.	233
3 Tests for the determination of algecides	88
4 Do. residual copper sulphate, chlorine, etc.	56
5 Estimation of dissolved gases in samples of water	149
6 Field test for estimating pH of water samples	32
7 Do. colour and transparency of water samples	125
8 Do. organic matter in water samples	164
9 Samples of aquatic vegetation for identification	14
10 Do. ooze from tanks	4

TABLE VII—*cont.*

PART II.

MISCELLANEOUS SAMPLES.

Serial number and description. (1)	Number examined. (2)
1 Bleaching powder for detaining available chlorine content	93
2 Alum samples	2
3 PH adjustments	2
4 Earth for analysis	4
5 Sand for analysis	2
6 Preparation of special media for Vaccine Lymph section	3
7 Testing purity of sulphuric acid	1
8 Determination of pH of tuberculin solution	1
9 Analysis of pancreative extract (digestion value of trypsim and total solid)	11
10 Estimation of fluorine in bone meal	1
11 Determination of fecl ³dose	1
12 Salt samples	3
13 Methavol for presence of accetive	4
14 Gas analysis	1
15 Soda ash and stone lime	4
16 Analysis of liver extract	13
17 Estimation of D.D.T. in tank water	7
18 Analysis of dichronate	1
19 Milk samples for bacteriological examination	163
20 Milk powder Do.	6
21 Soda water Do.	5
22 Bacteriological examination of utensils used in milk factory	48
23 Bactericidal tests on sample of formaldelyde solution	8
24 Do. samples of soap	1
25 Sewage and industrial waters	1
26 Tests to determine tridial walker co-efficient of disinfectants	1

PART III.

SOLUTIONS SUPPLIED.

Serial number and description.	Quantity supplied in c.c.
1 Normal sodium hydroxide	3,100
2 N/10 hydrochloric acid	420
3 0·01 per cent phenol red solution	180
4 0·4 per cent phenol red solution	120
5 Benedict solution (qualitative)	1,745
6 N/10 silver nitrate solution	200
7 Hiss's Stains Nos. 1 and 2	620
8 Buffer salt solution pH 9·2	2,000
9 Fagalla stains	50
10 Lead acetite solution	50
11 R.B.C. Diluting fluid	250
12 Pancreative extract	337,080
13 Wet stains supplied	33,780

CONTENTS

		PAGE
I.	Staff	57
II.	Introduction	58
III.	Finance	59
IV.	Working of the Madras Prevention of Adulteration Act	60
V.	Notes on adulteration in—	
	Milk	69
	Butter and ghee	70
	Oils	71
	Coffee	71
	Tea	71
	Other samples	71
VI.	Fines	72
VII.	Work for other Government departments—	
	(1) Government hospitals	76
	(2) Civil Supplies department	76
	(3) Government Milk Factory	76
	(4) Rationing department	77
	(5) Jails	77
	(6) Industries and Commerce	77
	(7) Magistrates and Police	77
	(8) Other Madras Government departments	77
	(9) Government of India departments—	
	(a) Railways	77
	(b) Regional Food Commissioner, etc.	77
	(c) Deputy Superintendent of Police, Special Police Establishment, Ambala.	77
VIII.	Food samples from unofficial sources	78
IX.	High Court judgments	81
X.	Analysis of drugs—	
	Under the Drugs Act and Madras Drug Rules, 1945	94
	From Government hospitals and institutions	102
	From private sources	116
XI.	Miscellaneous	117
	APPENDIX A.—Statement showing the detailed particulars about the samples sent by the local bodies (Excluding Madras City), the number of samples under each category and the number adulterated grouped under the various districts.	124
	APPENDIX B.—Statement showing the number of convictions, fines in analysis and non-analysis cases, maximum, minimum and average fines in each local body.	136

REPORT OF THE GOVERNMENT ANALYST, MADRAS, FOR THE YEAR 1ST APRIL 1952 TO 31ST MARCH 1953

I. STAFF.

Government Analyst	Sri S. Narayana Ayyar, M.A., A.I.I.SC., F.R.I.C.	
Deputy Government Analyst	Sri Y. G. Doraiswami, M.SC., A.R.I.C.; from 1st April to 1st December 1952.	
	,, K. R. Srinivasan, M.A., F.R.I.C.; from 19th December 1952 to 31st March 1953.	
Senior Assistants to Government Analyst.	Sri K. R. Srinivasan, M.A., F.R.I.C.	
	,, K. Narayanaswami, M.A., A.R.I.C.	
	,, M. Krishnamurthi, M.SC.	
	,, P. S. Nataraja Sarma, M.A.	
	,, K. Balasubramaniam, B.SC. (Hons.), from 19th December 1952.	
Junior Assistants to Government Analyst.	Sri K. Balasubramanian, B.SC. (Hons.), from 1st March to 19th December 1952.	
	,, K. Ramachandran, M.A.	
	,, N. Srinivasan, M.A.	
	,, M. V. Narayanan, B.SC. (Hons.).	
	,, C. S. Raghunathan, B.SC. (Hons.).	
	,, G. Balasubramanian, B.SC. (Hons.).	
	,, S. A. Subramanian, M.SC.	
	,, K. Kuppuswami, M.SC.	
	,, V. Seshagiri Rao, B.SC. (Hons.).	
	,, M. R. Gopalan, B.SC. (Hons.).	
	,, S. Subbaraman, B.SC. (Hons.).	
	,, V. Ramachandran, M.A., acted in leave vacancies.	

The Laboratory staff included one Technical Assistant, Three First Grade Attendants, one II Grade Attendant and seven peons. The Office staff consisted of one Upper Division Clerk, one Steno-Typist, Three Typists and two lower division clerks.

Sri Y. G. Doraiswami, Deputy Government Analyst was on leave on average pay out of India from 1st December 1952. Sri K. R. Srinivasan, M.A., F.R.I.C., Senior Assistant to the Government Analyst officiated as Deputy Government Analyst from 19th December 1952 and Sri K. Balasubramaniam (Junior Assistant to the Government Analyst) was promoted as Senior Assistant in the resulting vacancy.

TABLE VIII.

Protected water-supplies examined at the King Institute, Guindy, with details regarding source, method of filtration, chlorination, etc.

Protected water-supplies.	Total number of		Source.					
	Places.	Sources.	Impounded reservoir.	River or stream.	Tank.	Well.	Infiltration gallery or well.	
							Bed of river.	Bank of river.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Municipalities	60	85	11	14	7	14	25	14
Panchayat boards ..	17	24	Nil.	10	3	6	3	2
Jails, Borstal and Certified schools and Vigilance Homes.	24	31	2	1	1	14	10	3
Railway stations ..	54	62	1	..	Nil.	51	5	2
Swimming pools ..	1	1	..	..	..	1	..	..
Other institutions ..	17	25	6	9	..	6	3	1
Total ..	173	228	20	37	11	92	46	22

	Filtration.					Chlorination.			
	Slow-sand filter.	Mechanical filter.		Infiltration gallery or well.	Not filtered.	Automatic liquid chlorine.	Bleaching powder.		Unchlorinated.
		Pressure.	Gravity.				Mechanical.	Hand controlled.	
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Municipalities ..	7	5	6	39	28	24	1	39	21
Panchayat boards ..	1	Nil.	1	5	17	2	1	20	1
Jails, Borstal and Certified schools and Vigilance Homes.	2	1	Nil.	13	15	7	Nil.	21	3
Railway stations ..	Nil.	1	4	7	50	17	26	17	2
Swimming pools ..	..	1	..	..	..	1	..	..	..
Other institutions ..	3	3	4	4	11	7	3	7	8
Total	13	11	15	68	121	58	31	104	35

TABLE IX.

Department of Biological Control, King Institute, Guindy, Madras-15.

Tabular statement of tests conducted during the year 1952–53.

Serial number and nature of the test.	Tests done for various departments of Institute.	Tests done for Government hospitals.	Tests done for private firms.	Tests done for Government institutions.	Tests done for Inspectorate of Manufacturing Concerns in Drugs.	Director of Medical Services, Madras.	Tests done for States other than Madras.	Total tests in the year 1952–53.	Number of specimens found unsuitable in 1952–53.	Value of tests if charged at scheduled rate in 1952–53.	Total number of tests in 1951–52.	Value if charged at the scheduled rate in 1951–52.	Amount realised.	
													1951–52.	1952–53.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
										Rs.		Rs.	Rs.	Rs.
1 Pyrogen tests	432	23	5	..	6	..	..	466	17	23,300	413	20,650	..	..
2 Sterility tests	2,218	68	22	2	7	..	..	2,319	60	27,828	2,187	26,244	..	..
3 Toxicity tests	2,615	5	3	..	3	..	2	2,627	1	1,31,350	2,187	1,06,850	..	..
4 Chemical assays	119	9	1	..	4	..	..	135	13	4,350	261	7,830	..	..
5 Bio-assays—														
(a) Tincture digitalis, digitalis leaves and powder digitalis	..	7	7	..	..	..	..	14	8	335	40	960	..	..
(b) Pituary	..	1	..	..	..	..	..	1	..	50	..	..	..	..
6 Anti-toxin potency tests and bio-assays.	23	..	6	..	..	..	..	31	..	2,825	43	3,225	..	..
7 Penicillin assays	..	..	3	4	..	..	..	7	..	175	10	250	..	..
8 Penicillin sensitivity tests	..	..	..	..	4	..	..	4	..	100	3	75	..	..
9 Prophylactic vaccines test of opacity, identity and serological with H.I.S. ..	1,415	..	..	..	..	..	..	1,415	..	35,375	976	24,400	..	..
10 Vaccine lymph, bacterial content, colony count and safety tests	106	..	..	..	..	..	..	106	..	2,650	78	1,950	..	..
11 Mice virulence tests on vibrio cholera strains	7	..	..	..	..	..	..	7	..	350	6	300	..	..
12 Male frog tests	..	102	24	..	7	..	..	126	..	630	39	195	..	..
13 *Absorbability tests* (Catgut)	..	..	17	..	3	..	..	17	..	850	65	3,250	..	..
14 Anti-typhoid vaccine examination of vaccine employing animal test ..	..	..	..	..	4	..	8	12	1	600	..	..	..	..
15 Miscellaneous—														
(i) Mouse protection test	4	..	..	..	..	..	..	4	1	200	10	150	..	..
(ii) Miscellaneous in 1951–52	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	6,939	215	88	6	24	..	8	7,290	94	2,29,919	6,268	1,96,335	1,580	1,353

The following Junior Assistants were on earned leave for the periods shown against them :—

Sri N. Srinivasan for 61 days from 21st April to 20th June 1952.

Sri G. Balasubramaniam, for 32 days from 16th August to 16th September 1952.

Sri M. R. Gopalan for 14 days from 4th to 17th September 1952.

Sri M. V. Narayanan, for 4 days from 13th to 16th October 1952 and for 27 days from 17 November to 13th December 1952.

Sri V. Seshagiri Rao for 76 days from 18th January to 12th April 1952 and 27 days from 19th January to 14th February 1953.

II. INTRODUCTION.

The statutory work of analysing food samples under the Madras Prevention of Adulteration Act from 238 local bodies in the Madras State and drug samples received under the Madras Drugs Rules, 1945, was done in the Government Analyst's Laboratory. Being the only Government Food and Drug Laboratory for the whole State, it is called upon to analyse samples from various Government departments with a view to check up the purity and quality of foods and drugs. Government hospitals and Jails send diet articles and drugs to see whether contractors supply unadulterated and wholesome products. The Government Milk Factory and Rationing Department under the Department of Civil Supplies utilized the services of this laboratory. Food samples suspected to be damaged were also sent by some Departments of the Government of India ; such as the Southern Railway and the Regional Food Commissioner. Consequent on the enforcement of Prohibition, there is a very brisk trade in tinctures.

Work in the analysis of drugs is also on the increase. Many tinctures manufactured in the neighbouring States of Travancore-Cochin, Mysore and Hyderabad and sold in the State have been found to consist of alcohol of the specified strength and an artificial colouring matter but without the extractives. These are actually consumed not for medicinal use but by the liquor addicts. Instances of infringing Trade Marks and substituting spurious drugs have also been brought to the notice of the Police who send the samples to this laboratory to test the drugs. Owing to inadequate accommodation and staff it has not been possible to undertake analysis of foods and drugs on an adequate scale. Adulteration of foods and drugs continues unabated. If any appreciable improvement is to be effected, a very co siderable increase in the number of samples followed by deterrent punishment of offenders is absolutely necessary. It is gratifying to note that the Central Prevention of Food Adulteration Bill which has been approved by the Select Committee in Parliament and is in the final stages of enactment provides adequate punishment. If Government launch upon a bold scheme of laboratory expansion, the extra cost may, to a very considerable extent, be expected to be recouped in the form of fines and the consumer would get some protection from the fradulent practices of the unscrupulous merchants.

Other special features of the year were—

(i) the increase of the contribution from Rs. 5 to Rs. 7-8-0 payable by the Local Bodies to Government as analytical charges per sample from 1st April 1952—G.O. No. 1266, Health, dated 10th April 1952.

(ii) Government authorized the Government Analyst (Drugs) to issue certificates for drugs falling under Schedule C-1 to the Madras Drugs Rules ; those under Schedule C, which require biological assay are being analysed as usual by the Government Analyst (Drugs Special).

(iii) New Rules.—Government have in G.O. No. 3822, Health, dated 3rd December 1952 issued new rules permitting the sale of coffee-chicory mixtures and prohibiting the use of misleading expressions such as "FRENCH COFFEE" on the label. They have also prohibited the use of synthetic sweeteners other than Saccharin in manufacturing food except in food manufactured for the exclusive use of persons suffering from disease.

The Director of Medical Services, Madras, accepted the suggestion of the Government Analyst that the free fatty acid for edible oils supplied to Government hospitals should not exceed 3·0 per cent expressed as Olei· acid. This was given effect to for the contract year 1953–54 onwards (vide D.M.S. Circular P. No. 132-A2/52, dated 13th November 1952).

The number of samples analysed under the various categories during the year under report is given below :—

TABLE I.

Number and categories of samples analysed from different sources in the Government Analyst Laboratory.

Source.	1952–53. Number of samples.	1952–53. Number adulterated or unsatisfactory.	1951–52. Number of samples.	1951–52. Number adulterated or unsatisfactory.
(1)	(2)	(3)	(4)	(5)
Food samples under the Madras Prevention of Adulteration Act.	18,252	8,199	18,512	8,734
Food samples from Government Hospitals ..	6,187	1,092	5,286	943
Food samples from other Government Departments.	925	141	1,161	124
Food samples from unofficial sources ..	60	20	100	13
Total (Foods) ..	25,424	9,442	25,059	9,814
Drugs analysed under the Madras Drugs Rules.	92	46	67	20
Drugs analysed from Government Hospitals and other Government Institutions.	275	180	161	70
Drugs from unofficial sources	17	7	25	5
Total (Drugs) ..	384	233	253	95

III. FINANCE.

The total estimated income is Rs. 2,25,638 and the estimated expenditure is Rs. 1,42,881 showing a profit of Rs. 82,757. The increase in income is mainly due to the raising of the rate of fees charged for samples taken under the Madras Prevention of Adulteration Act from Rs. 5 to Rs 7–8–0 from 1st April 1952 The working of the Act has also resulted in a profit of Rs. 86,148 being Government's share of the fines realized for offences under the Act, credited to the Judicial Budget.

TABLE II.

Financial statement of the Government Analyst Department for the year 1952–53.

ESTIMATED RECEIPTS.

		Rs.
	Food.	
1	Contribution to Government from local bodies working the Madras Prevention of Adulteration Act at Rs. 7–8–0 per sample	1,38,308
2	Value for analysis done for Government Institutions ..	73,590
3	Fees received from unofficial sources for analysis of food samples	1,520
	Drugs.	
4	Value for drug samples analysed for Hospital and samples under the Madras Drugs Rules	11,640
5	Fees received from unofficial sources for analysis of drug samples	580
	Total, Receipts ..	2,25,638

TABLE II—*cont.*

Financial statement of the Government Analyst Department for the year 1952–53—cont.

ESTIMATED EXPENDITURE.

	Rs.
1 Salaries and allowances of the staff of the Government Analyst	76,063
2 Superannuation allowance and pension on above ..	617
3 Proportionate cost of certain common staff of the King Institute	1,440
4 Proportionate cost of management and supervision by the Director of Medical Services and the Director, King Institute	303
5 Stores, instruments and chemicals, including gas and water charges	30,001
6 Customs duty	9,165
7 Contingencies	15,409
8 Electric current	2,131
9 Cost of stationery, clothing and printing	322
10 Proportionate charges on cost of audit maintenance, interest and depreciation on buildings, electric, installation and other plants	7,430
Total, Expenditure ..	1,42,881
Share of the fines accruing to Government on account of the working of the Madras Prevention of Adulteration Act (10 per cent of total fines plus half the excess fines over the contribution by the local body to Government towards fee for analysis)	86,148

IV. WORKING OF THE MADRAS PREVENTION OF ADULTERATION ACT.

During the year under report the Madras Prevention of Adulteration Act was in force in 239 local bodies including the Madras Corporation which has its own food analysis laboratory in the City. The remaining 238 local bodies sent their usual quota of samples. A few sent extra samples as shown in Table IV. The number of extra samples for the year was 629 as against 795 for the previous year.

The total number of samples analysed in this laboratory under the Act was 18,252 of which 8,189 (44·9 per cent) was adulterated. Including 4,827 samples analysed in the Madras Corporation laboratory, the total number analysed under the Act in the Madras State was 23,079. Charts I and II illustrate the figures for the last 22 years in respect of total number of food samples and the percentage of adulterated samples.

Table III gives the number of samples sent by the Municipalities and Panchayat Boards. Table IV giver the extra samples sent by the various local bodies.

Tables V, VI and VII give the nature of samples taken under the Act for the whole Madras State, the nature of samples in the Corporation Food Analysis Laboratory and in the Government Analyst's Laboratory respectively. The figures for the previous year have been included for comparison.

Appendix "A" at the end of this report gives detailed particulars about the nples sent by the local bodies (excluding Madras city), the number of samples der each category, and the number adulterated, grouped under the various stricts.

A few photographs illustrating the various tests conducted in the Government nalyst's Laboratory are given at the end of the report.

TABLE III.

Number of samples analysed and found adulterated in the Madras State.

—	1952–53. Number of samples taken.	1952–53. Number adulterated.	1952–53. Per centage adulterated.	1951–52. Number of samples taken.	1951–52. Number adulterated.	1951–52. Per centage adulterated.
Municipalities.						
28 Class A	6,944	3,212	45·9	7,162	3,574	49·9
24 Class B	2,316	1,086	46·3	2,337	1,121	48·0
46 Class C	2,540	1,161	45·7	2,472	1,164	47·1
Panchayat Boards.						
139 Panchayats	6,400	2,730	42·7	6,541	2,875	44·0
Total for 238 local bodies, analysed in Government Analyst's Laboratory	18,252	8,189	44·9	18,512	8,734	47·2
Corporation.						
Madras City	4,827	2,647	54·8	4,931	2,572	52·2
Total for 239 local bodies in the State ..	23,079	10,836	46·9	23,443	11,306	48·2

TABLE IV.

Statement showing the number of extra samples sent by local bodies during the year 1952–53.

Name of municipality.	Number of extra samples.	Name of municipality.	Number of extra samples.
MUNICIPALITIES.			
A Class.		*B Class*—cont.	
1 Madurai	8	22 Kurnool	2
2 Coimbatore	7	23 Ongole	1
3 Kakinada	1	24 Tiruppur	13
4 Guntur	3	25 Udamalpet	1
5 Salem	91	26 Villupuram	2
6 Ootacamund	8	Total ..	23
7 Rajahmundry	8		
8 Mangalore	12	*C Class.*	
9 Tirunelveli	32	27 Rajapalayam	9
10 Bellary	4	28 Srivilliputtur	5
11 Kancheepuram	48	29 Bapatla	11
12 Cuddalore	1	30 Dharapuram	3
13 Kumbakonam	24	31 Gobichettipalayam	1
14 Nagapattinam	9	32 Guntakkal	9
15 Palghat	1	33 Kodaikanal	15
16 Tuticorin	66	34 Melapalayam	1
17 Pollachi	7	35 Rasipuram	1
Total ..	330	36 Srirangam	2
		37 Trivellore	26
B Class.		38 Udipi	1
18 Adoni	1	Total ..	84
19 Amalapuram	1		
20 Cannanore	1	Grand total ..	437
21 Karaikudi	1		

TABLE IV—*cont.*

Statement showing the number of extra samples sent by local bodies during the year 1952–53—cont.

Name.	Number of extra samples.
PANCHAYATS.	
Anantapur district—	
39 Dharmavaram	5
40 Kadiri	5
41 Gooty	2
42 Penukonda	2
North Arcot district—	
43 Arcot	2
44 Arkonam	4
South Arcot district—	
45 Nellikuppam	1
46 Panruti	3
47 Vriddhachalam	12
Bellary district—	
48 Harpanahalli	4
49 Rayadrug	2
50 Yemmiganur	2
Coimbatore district—	
51 Avanashi	11
52 Kurichi	6
Chittoor district—	
53 Kuppam	4
54 Madanapalle	4
55 Do. Sanatorium	2
56 Palmaner	1
57 Punganur	1
58 Vayalpad	2
Cuddapah district—	
59 Pulivendla	4
60 Rayachoti	2
Chingleput district—	
61 Alandoor	1
62 Madurantakam	2
East Godavari district—	
63 Samalkot	5
64 Ramachandrapuram	1
West Godavari district—	
65 Kovvur	2
66 Narsapur	9
67 Tadepalligudem	1
68 Tanuku	1
Krishna district—	
69 Nuzvid	3
Kurnool district—	
70 Giddalur	1
71 Markapur	1
Madurai district—	
72 Ayakudi	2
73 Idappadi	2
74 Melur	1
75 Nilakkottai	2
76 Sholavandan	1
77 Cumbum	2
Nellore district—	
78 Kavali	4
79 Nayudupet	2
Nilgiri district—	
80 Kotagiri	1
Ramanathapuram district—	
81 Kilakarai	1
82 Pallathur	4
83 Paramakudi	1
84 Tirupattur	7
Salem district—	
85 Shevaroys	1
Tanjore district—	
86 Papanasam	6
87 Tiruturaipundi	5
88 Tiruvaiyaru	1
89 Tiruvadamarudur	1
Tiruchirappalli district—	
90 Kulittalai	2
91 Manapparai	1
92 Musiri	1
Tirunelveli district—	
93 Ambasamudram	2
94 Courtallam	13
95 Kadayanallur	1
96 Kallidaikurichi	12
97 Tiruchendur	2
98 Viravanallur	3
Visakhapatnam district—	
99 Narsapatam	2
Srikakulam district—	
100 Parvathipur	1
Grand Total	**629**

TABLE V.

Number of samples taken in 239 local bodies (including Madras City) working the Act in the State.

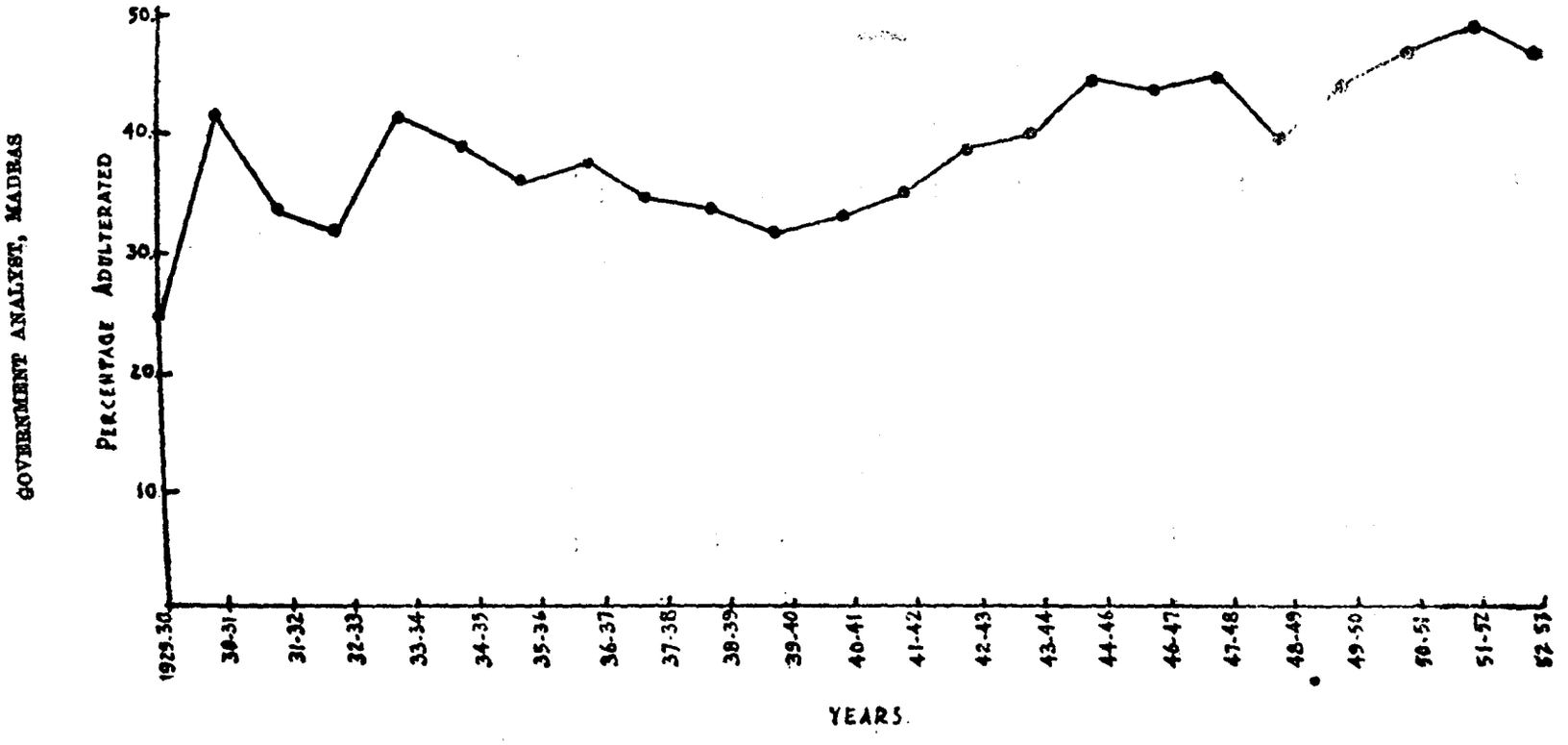
Nature of sample.	1952–53. Total.	1952–53. Number adulterated.	1952–53. Percentage adulterated.	1951–52. Total.	1951–52. Number adulterated.	1951–52. Percentage adulterated.
Milk	14,206	8,395	59·1	14,177	9,083	64·1
Ghee	1,816	707	38·4	1,879	610	32·5
Butter	960	421	46·8	871	377	43·3
Gingelly oil	1,883	196	10·4	1,835	173	9·4
Coconut oil	1,038	29	27·9	1,368	78	5·7
Groundnut oil	355	36	10·1	409	27	6·6
Kusuma oil	9	4	44·4	16	4	25·0
Coffee powder	1,258	490	38·9	1,230	355	28·9
Sweets	149	103	69·1	101	70	69·3
Turmeric	186	31	16·7	201	39	19·4
Tea	351	43	12·3	557	170	30·5
Honey	97	29	29·9	82	11	13·4
Dhalls and flours	647	275	42·5	557	258	46·3
Hydrogenated vegetable oils.	61	17	27·9	30	16	53·3
iscellaneous	123	58	47·1	130	35	26·9
Total	23,079	10,834	46·9	23,443	11,306	48·2

TABLE VI.

Nature of samples taken in Madras City alone in the calendar year 1952.

Nature of samples.	Number of samples taken.	Number adulterated.	Percentage adulterated.
Milk	2,810	2,036	72·5
Butter	470	184	39·1
Ghee	683	214	31·3
Gingelly oil	362	70	19·3
Groundnut oil	36	1	2·8
Coconut oil	156	10	6·4
Coffee powder	169	94	55·6
Tea	35	..	..
Ghee substitutes	30	5	16·7
Other articles	76	33	43·4
Total	4,827	2,647	54·8

CHART II



REPORT OF THE

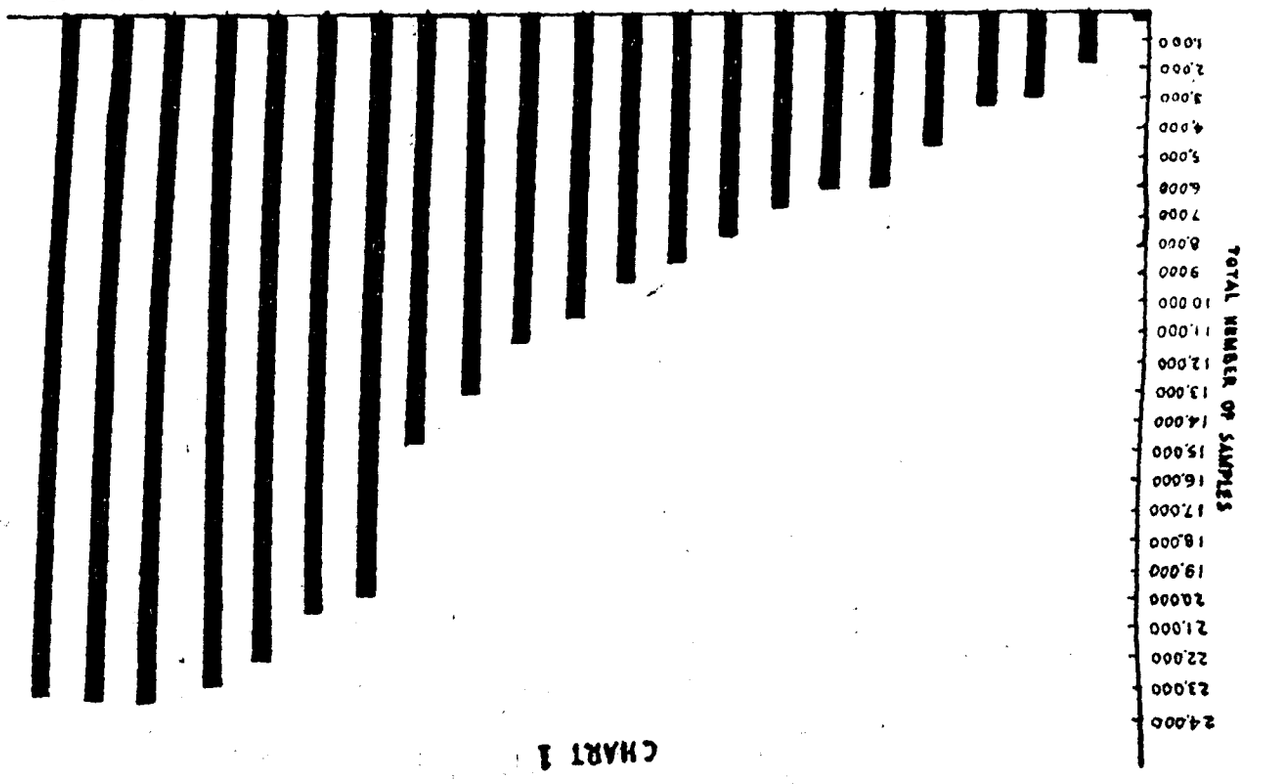


TABLE VII.

Nature of samples taken in 238 local bodies working the Act in the Madras State during the year 1952–53 and analysed in the Government Analyst's laboratory.

Nature of samples.	1952–53.			1951–52.		
	Total number of samples taken.	Number adulterated.	Percentage adulterated.	Total number of samples taken.	Number adulterated.	Percentage adulterated.
Milk	11,396	6,359	55·8	11,340	6,926	61·1
Ghee	1,133	493	43·7	1,161	438	37·7
Butter	430	237	55·1	404	235	58·2
Gingelly oil	1,521	126	8·3	1,515	134	8·8
Coconut oil	882	19	2·2	1,134	55	4·9
Groundnut oil	319	35	10·9	352	24	6·8
Kusumba oil	9	4	44·4	16	4	25·0
Coffee Powder	1,089	396	35·4	1,054	337	31·9
Sweets made in ghee ..	149	103	69·1	101	70	69·3
Turmeric	186	31	16·7	201	39	19·4
Tea	316	43	13·6	524	165	31·5
Honey	97	29	29·9	82	11	13·4
Dhalls and flours ..	647	275	42·5	557	258	46·3
Hydrogenated vegetable oils.	31	12	38·7	17	11	64·7
Miscellaneous	47	25	53·2	54	27	50·0
Total ..	18,252	8,187	44·9	18,512	8,734	47·2

The number of samples analysed in the Government Analyst's Laboratory during the year was practically the same as that of the previous year. The extent of adulteration continues to be high, though there is a slight decrease from 48·2 per cent to 44·9 per cent.

Table VII shows that the percentage of adulterated milk samples has fallen to 55·8 per cent for the year from 61·1 per cent for the previous year though in regard to ghee the percentage of adulterated samples has increased to 43·7 per cent from 37·7 per cent. It will be noted that adulteration continues at a high level. The dishonest merchant feels that the economic fraud practised by him is rarely detected and if detected he can afford to pay off the nominal fine imposed by the Magistrate. Since the separation of the Judiciary from the Executive a tendency to impose very low fines is definitely noticeable though a few Magistrates remarked as indicated below about the seriousness of food adulteration offences and the inadequacy of the fines prescribed in the Statute.

Remarks of the Sub-Magistrate, Mannargudi convicting the Co-operative Milk Supply Society.

C.C. No. 385 *of* 1952.—I, therefore hold accused 1 (Society) represented by the Secretary and accused 2 the vendor who actually sold the milk guilty of the offences charged and convict them and acquit accused 3 (Secretary in his personal capacity) instead of setting an example to other individual dealers by selling genuine milk, the Society itself has taken to such malpractice and it has to be deterrently dealt with. I accordingly sentence accused 1 to pay a fine of Rs. 100 in default to suffer simple imprisonment for one month and accused 2 to a fine of Rs. 10 in default to simple imprisonment for one week.

The Sub-Magistrate, Udamalpet, in a case (C.C. No. 623 of 1953) where the vendor sold tea adulterated with 60·0 per cent foreign leaf said :—

He cannot pay a heavy fine. It is unfortunate there is no provision to directly imprison these people. There is no point in sentencing the accused to pay a heavy fine which he cannot obviously pay. A fine of Rs. 15 was imposed.

Remarks of Sub-Collector, Madanapalle, in his Annual Report on the working of the Madanapalle Tuberculosis Sanatorium Local Authority for the year 1952 observes as follows regarding food adulteration :—

The percentage of adulteration varied from 6 per cent to 91 per cent (coffee powder) and fines varying from Rs. 5 to Rs. 30 were levied in Court. It is to be noted the fine of Rs. 5 does not even pay for the food analysis charge which is Rs. 7–8–0 apart from collection and sending expenses.

Remarks of the Sub-Magistrate, Kasaragod, in sentencing the officials of a Co-operative Milk Supply Society (C.C. No. 349 of 1952) milk adulterated with 24·0 per cent added water :—

It is common knowledge that the tendency to adulterate articles of food and particularly milk offered for sale is daily on the increase. Only to ensure the supply of better quality milk the people of Kasaragod have sponsored the society. When the persons responsible for its proper working should indulge in acts calculated to negative the very purpose for which the society is constituted and when those in management practically concede that they are always selling milk adulterated with 24·0 per cent water I must hold that this pernicious offence against themselves and the Society is not the solitary case of an unwary lapse on the part of particular individual but a deliberate and calculated crime committed daily by all concerned deserving to be discountenanced very seriously. I therefore award the maximum punishment to the accused and sentence them each to pay a fine of Rs. 100 and in default to undergo simple imprisonment for one month.

The necessity for awarding deterrent sentence has been stressed by a Bombay Presidency Magistrate. The following extracts have been taken from "Indian Pharmacist" for January 1953 :—

Pokardas Tejumal Kataria was sentenced to one year's rigorous imprisonment by the Chief Presidency Magistrate, Bombay on 15th January 1953 for manufacturing spurious drugs and using false trade and proprietary marks of another company. The Magistrate observed : Only a man of debased mentality and cruel at heart at least and who had no consideration for the life of others would put into the market spurious drugs for the consumption of unwary sick persons. Court should give such punishment to manufacturers of spurious drugs which would act as a deterrent to other dis-honest persons.

But one can justifiably hope that the consumer's interests would be protected if the Central Prevention of Food Adulteration Bill which has been approved by the Select Committee is passed into law because it provides deterrent sentences for food adulteration offences. It would also remove the various defects of the existing Madras Prevention of Adulteration Act.

The figures in Appendix "A" at the end of this report show that the commonly adulterated articles are milk, ghee, butter. Milk adulteration is rampant throughout the Madras State and very early steps have to be taken to stop this evil. More than 70·0 per cent of the milk samples were adulterated in the districts of Coimbatore, East Godavari, West Godavari, Guntur and Nellore. Taking the individual municipalities, the heavy adulteration in the following towns is worthy of note :—

Name.	Total number of milk samples.	Number adulterated.
Coimbatore	142	133
Srirangam	27	21
Kakinada	160	130
Rajahmundry	152	139
Guntur	135	103
Vijayavada	250	168
Masulipatnam	89	68
Nellore	87	52
Anakapalle	53	47

Adulteration of the food articles mentioned below was particularly heavy in the districts indicated :—

Butter.—Districts of Madurai, Tanjore, Tirunelveli, North Arcot, South Arcot, Bellary, Guntur, East Godavari, West Godavari and Visakhapatnam.

Ghee.—Districts of Tanjore, Tiruchirappalli, Tirunelveli, Chingleput, Anantapur and Bellary.

Gingelly oil.—Chingleput district.

Coffee.—Districts of Coimbatore, Tiruchirappalli, Ramanathapuram, Tirunelveli and Chittoor.

Tea.—Coimbatore district.

Dhalls and flours.—Districts of Anantapur, Bellary, Visakhapatnam, Kurnool, Malabar, Nilgiris and Salem.

A considerable quantity of kesari dhall and flour is imported into the Madras and Travancore-Cochin States from Bombay and Madhya Pradesh and these first gain access to the border districts. It would be desirable if a ban is placed by the States concerned on the production and export of kesari dhall which is notoriously unwholesome and deleterious to health.

The adulteration in tea has decreased to 13·6 per cent from 31·5 per cent for last year. On the other hand a slight increase in adulteration is noticed in the case of coffee. There has also been a number of instances in which the labelling did not conform to the rules, the merchant invariably attempting to mislead the purchaser into thinking that the packet contains pure coffee although in another corner of the label, the percentage of coffee and chicory are printed away from the view of the prospective customer.

Some local bodies have suggested the following difficulties ;—

(*a*) Vendors selling milk at night and evading sampling.

(*b*) Difficulty in getting correct addresses of villagers.

(*c*) The use of the same building as shop and residence.

(*d*) Absence of co-operation from the panchayat board authorities.

(*e*) Difficulty in seizing unwholesome products such as kesari dhall in transit to neighbouring States.

The percentages of adulterated samples in the various districts of the Madras State and the Madras City are given in Table VIII along with their rank in adulteration for the previous year.

TABLE VIII.

Districts arranged according to the increased order of adulterated samples.

Name of district.	Rank for the year under report (1952–53).	Percentage of adulteration.	Rank for the previous year (1951–52).	Percentage of adulteration.
Madurai ..	1	29·7	2	34·4
Ramanathapuram.	2	33·0	3	35·5
Cuddapah ..	3	36·7	1	31·3
South Arcot ..	4	38·5	5	39·3
North Arcot ..	5	40·7	7	44·2
South Kanara ..	6	41·8	21	55·3
Guntur	7	43·8	6	43·4
Tiruchirappalli ..	8	44·4	9	45·6
Malabar	9	44·9	12	46·3
Visakhapatnam.	10	45·9	16	51·4
Tirunelveli ..	11	46·1	15	50·3
Tanjore	12	46·1	8	44·9
Chingleput ..	13	46·4	17	51·8
Chittoor	14	46·7	10	46·0
Nilgiris	15	46·8	13	49·3
Nellore	16	47·7	11	46·2
Kurnool	17	48·4	4	37·6
Salem	18	50·0	23	57·1
Krishna	19	50·5	19	53·4
West Godavari ..	20	53·1	22	56·0
Bellary	21	53·4	14	50·1
Anantapur ..	22	54·6	20	53·5
Madras City ..	23	54·8	18	52·2
East Godavari ..	24	55·2	24	59·0
Coimbatore ..	25	58·7	25	63·0

Madras City which had the 18th rank last year has the 23rd during the year showing a deterioration. Kurnool which had the fourth rank last year gets only the 17th rank during the year. Bellary which had the 14th rank has deteriorated further and gets only the 21st rank.

A few districts which have shown appreciable improvement are South Kanara, Visakhapatnam and Salem.

It should be mentioned that the ranking is affected by the number of milk samples taken by the Local Body. Since milk is very largely adulterated, the percentage of adulterated samples would mount up if sampling was largely confined to milk. Even so it is noticed that adulteration has been markedly heavy in the districts of Coimbatore, East Godavary, Bellary, Anantapur and Salem for many years.

V. NOTES ON ADULTERATION.

Adulteration continues to be high in milk, though some improvement is noticeable when compared to the previous year. Out of 11,369 milk samples analysed during the year 6,359 (55·8 per cent) were adulterated as against a total of 11,340 and 6,926 (61·1 per cent) adulterated samples for the year 1951–52. The extent of adulteration ranged from 5 per cent to 92 per cent. Sampling milk is a very easy process and the sampling officials without taking much trouble find it convenient to take a comparatively large number of milk samples from hawkers and other vendors, whose definite address cannot be traced. Ultimately summons cannot be served on them and the prosecutions have to be withdrawn. It is very essential that co-operative societies and resident vendors should be systematically and repeatedly sampled before samples are taken from itinerant vendors.

The average figures for genuine and adulterated milk for the year under report are given below, they are found to be practically similar to those recorded for the previous year given in brackets.

		Fat. PER CENT.	Solids-not-fat. PER CENT.
Cow's milk	Genuine	4·7 (4·4)	9·3 (9·1)
	Adulterated	3·8 (3·1)	6·4 (5·4)
Buffalo milk	Genuine	6·7 (6·2)	9·6 (9·7)
	Adulterated	4·8 (4·6)	7·0 (6·7)
Goat milk	Genuine	5·1	9·5
	Adulterated	3·6	6·3
Mixed milk	Genuine	5·9 (5·7)	9·5 (9·3)
	Adulterated	4·4 (4·2)	6·7 (6·8)

Standards of 3 per cent and 9 per cent for fat and solids-not-fat have been fixed for Goat's milk under the Madras Prevention of Adulteration Act and the average obtained for the sample is higher than the presumptive standards.

Butter and ghee.—The year under report shows that adulteration in ghee is on the increase and that in butter also continues to be high. Of the 430 samples of butter analysed 237 (55·1 per cent) were adulterated, the corresponding figures for the previous years being 404 and 235 (58·2 per cent). Of the 237 adulterated samples 68 contained more moisture than the permitted limit of 20·0 per cent. Seventy-two were adulterated with foreign fat and 97 were

adulteratad with excess water and foreign fat. The adulteration was particularly high in the following *local bodies* :—

Butter.

Name of town.	Total samples.	Number adulterated.
Vellore	7	4
Cuddalore	14	11
Adoni	9	6
Kakinada	3	3
Mandapeta	8	5
Nidadavole	8	7
Tanuku	4	3
Chirala	43	29
Nidubrolu	5	4
Madurai	10	9
Tanjore	26	23
Kumbakonam	4	3
Sirkali	5	5

Ghee.

Name of town.	Total samples.	Number adulterated.
Anantapur	16	11
Tadpatri	10	8
Arni	18	13
Arkonam	4	4
Tindivanam	7	6
Yemmiganur	29	22
Bellary	19	13
Hospet	9	6
Alandur	4	3
Madurantakam	4	4
Mettupalayam	3	3
Samalkot	5	4
Bapatla	29	17
Kasaragod	7	7
Kurnool	16	10
Dindigul	5	4
Tanjore	16	13
Kumbakonam	5	4
Mayuram	10	8
Karur	3	3
Tiruchirappalli	21	14
Kulitalai	6	5
Tuticorin	4	4
Palayamkottai	5	4

Taking the districts as a whole into consideration, the adulteration was particularly high in the following *districts* :—

Butter.

Name of district.	Total samples.	Number adulterated.
South Arcot	30	22
Guntur	99	59
Tanjore	43	38
Tirunelveli	10	6
Visakhapatnam	18	9
East Godavari	15	10
West Godavari	17	14
Madurai	12	9

Ghee.

Anantapur	72	37
Bellary	79	51
Chingleput	35	21
Madurai	35	12
Tanjore	46	28
Tiruchirappalli	63	40
Tirunelveli	39	21

The percentage of adulteration ranged from 10·0 per cent to 100·0 per cent. All the ghee samples sent by Arkonam (4), Madurantakam (4), Kasaragod (7), Tuticorin (4) were adulterated; 11 out of 16 from Anantapur, 13 out of 18 from Arni, 22 out of 29 from Yemmiganur, 10 out of 16 from Kurnool, 13 out of 16 from Tanjore and 14 out of 21 from Tiruchirappalli were adulterated.

The average Reichert Wollny value for genuine butter and ghee and adulterated butter and ghee are given below, the figures within the brackets showing the figures for the previous year.

		Reichert value.	Moisture per cent.
Butter	Genuine	27·5 (27·4)	18·0 (17·4)
	Adulterated ..	21·2 (20·8)	24·3 (23 9)
Ghee	Genuine	28·8 (27·8)	
	Adulterated ..	11·3 (12·1)	

Oils.—Adulteration has been on the decrease, thanks to the high price of groundnut oil which has been a cheap adulterant all these years. One hundred and thirty-one (8 9 per cent) out of 1,610 samples have been found to be adulterated. The percentage of adulteration is the highest in Chingleput district. Out of 94 samples taken 26 are adulterated.

Only two coconut oil samples were adulterated with mineral oil. Seventy-two out of 969 coconut oils were adulterated with groundnut oil.

Tea.—There has been a distinct improvement so far as adulteration in tea is concerned. Out of 316 tea samples, 43 (13·6 per cent) were adulterated as against a total of 524 samples and 165 (31·5 per cent) for the previous year.

Coffee.—Of 1,089 samples 311 (28·4 per cent) were reported as adulterated and 136 as contravening the labelling regulations. During the previous year the total number was 1,054 and the number adulterated 337.

Of the five samples sold as chicory, four consisted of powder prepared from roasted wild date seeds.

One noteworthy feature during the year is the use of wild date as the adulterant throughout the Madras State. This is a very cheap substitute sold occasionally as "Indian Chicory". Owing to the restricted quota, it is not

possible to concentrate, on sampling coffee alone and hence the use of this adulterant is becoming more and more frequent. P obably a ban on the sale of Coffee-Chicory mixtures would be the best method of stopping the use of such spurious products.

Another very common practice for the manufacturers is to put up misleading labels on coffee-chicory mixtures. The percentages of coffee and chicory are printed in very small letters on some part of the label away from public view but the product is described as "Coffee" in the centre of the label to mislead the public into thinking that the product is genuine Coffee. The local bodies have been advised in such cases to prosecute the merchan s straightaway for incorrect labelling, even without sending the sample for analysis.

VI. FINES.

App ndix "B" (at the end of this report) gives the number of convictions, fines in analysis cases and non-analysis cases maximum, minimum and average fines in each local body. The number of pending cases which is rather large in a few places has also been indicated.

The average fine for the year is only Rs. 40 as compared with Rs. 36 for the previous year and Rs. 43 for the year 1950–51. In the City of Madras the average fine has fallen to Rs. 31 from Rs. 34 for the year 1951.

The average fines during the year have markedly decreased in the following municipalities when compared to those for the previous year.

	Average fine in 1952–53. Rs.	Average fine in 1951–52. Rs.
Municipalities.		
Kakinada	44	55
Ootacamund	29	78
Nellore	28	39
Elluru	25	39
Pollachi	29	91
Adoni	18	38
Pudukottai	37	57
Villupuram	27	48
Peddapuram	37	64
Mettupalayam	37	70
Tirupati	32	51

The following panchayats also record a fall in the average fine during the year :—

Panchayats.	1952–53. Rs.	1951–52. Rs.
Kadiri	16	48
Satyamangalam	25	45
Pithapuram	20	64
Markapur	34	66
Tiruvadamarudur	58	91

However the average fine shows an improvement in the case of the following local bodies :—

	1952–53. Rs.	1951–52. Rs.
Municipalities.		
Coonoor	51	30
Nagapattinam	83	62
Tenali	63	47
Bodinayakanur	62	46
Salur	57	32
Panchayats.		
Penukonda	47	26
Uravakonda	38	13
Arkonam	85	40
Alandoor	60	30
Palmaner	48	21
Jammalamadugu	56	25
Samalkot	48	26
Kasaragod	40	22

The following 59 local bodies have not been able to recoup the contribution paid to Government as fees for analysis as against only 23 for previous year :—

	Contribution to Government. Rs.	Fine collected. Rs.
Municipalities.		
Guntur	2,183	1,522
Palayamcottai	720	530
Virudhunagar	720	356
Vilupuram	735	565
Proddatur	540	365
Srivilliputtur	578	400
Ambur	360	100
Bheemunipatnam	369	322
Chittoor	360	40
Dharapuram	383	245
Gudiyattam	360	160
Tiruppattur (North Arcot)	360	130
Walajapet	360	105
Arni	360	190
Gudur	360	310
Palacole	360	105
Panchayats.		
Kadiri (Anantapur district) ..	398	240
South Arcot district—		
Bhuvanagiri	360	286
Nellikuppam	368	242
Tirukoilur	360	237
Bellary district—		
Harpanahalli	390	240
Rayadrug	375	300

Panchayats—cont.

	Contribution to Government.	Fine collected.
	Rs.	Rs.
Coimbatore district—		
Bhavani	360	315
Chingleput district—		
Alandur	368	358
Madu antakam	375	305
Tiruvattiyur	360	175
Poonamalle	360	Nil.
Sriperumbudur	60	50
Chittoor district—		
Madanapalle	390	263
Punganur	368	305
Tiruttani	360	175
Vayalpad	375	235
Cuddapah district—		
Badvel	360	205
Jammalamadugu	360	280
Pulivendla	390	250
East Godavari district—		
Polavaram	360	255
Guntur district—		
Repallee	360	350
Sattenapalli	360	140
Krishna district—		
Avanigadda	233	75
Madurai district—		
Ayakudi	375	125
Batlagundu	360	220
Chinnamanur	360	50
Neelakottai	375	180
Sholavandan	368	305
Tirumangalam	360	240
Nellore district—		
Kovvur	360	75
Ramanathapuram district—		
Mudukulathur	143	130
Kilakarai	368	80
Kandanur	360	15
Pallattur	390	233
Sattur	360	340
Tirupattur	413	265
Salem district—		
Idappadi	375	265
Tiruchengode	360	335
Tanjore district—		
Papanasam	405	270
Pattukkottai	360	295
Tiruchirappalli district—		
Manapparai	360	300
Tirunelveli district—		
Ettayapuram	360	90
Koilpatti	360	152
Srivaikuntam	360	220

However, some local bodies who have efficiently worked the Act have recovered many times their contribution. In the following local bodies the fines imposed are more than five times the contribution :—

Municipalities.

	Contribution.	Fines.
	Rs.	Rs.
Rajahmundry	1,680	10,166
Tanjore	1,620	8,330

Panchayat Boards.

Arkonam	390	2,715
Dharmapuri	360	2,008

Although the contribution per sample payable to Government by the Local Body has been raised from Rs. 5 to Rs. 7-8-0 from 1st April 1952 it does not account for the marked fall in fines. Whereas during the previous year a dozen municipalities and 3 panchayat boards realized a fine equivalent to over six times their contribution, during the year under report only four local bodies mentioned above have realized five times their contribution.

The highest fine imposed during the year was—

Rs. 300 in Coimbatore.

Rs. 350 in Nagapattinam.

Rs. 215 in Mayuram.

Rs. 200 in Coonoor, Tenali, Mannargudi, Bapatla, Alandur, Nuzvid and Kotagiri.

Rs. 100 and above but less than Rs. 200 were imposed in 74 local bodies during the year as against 89 local bodies in the previous year.

Ninety-four local bodies, as against 99 for the previous year, have instituted proceedings under Part III of the Rules for Exposure of Food to Dust and flies, Substantial fines have been collected by the following local bodies :—

Fines in non-Analysis cases.

	Rs.		Rs.
Tanjore	270	Madurantakam	333
Nagapattinam	193	Naidupet	200
Karur	244	Bobbili	180
Satyamangalam	195		

The above fines include fines realized in cases for preventing the Sanitary Inspector from taking samples (sections 14, 3), etc.

It is very necessary that the Health authorities should make more effective use of the rules and see that better sanitation is enforced in food exposed for sale to the public in shops and open stalls.

VII. WORK FOR OTHER GOVERNMENT DEPARTMENTS.

Various Government Departments of the Madras State as well as some of the Departments of the Government of India have sent samples for analysis. The total number of samples thus received is 7,112 which shows an increase over

the previous year (6,452) and the number reported as adulterated or unsatisfactory was 1,233. The various sources are given in Table XI below and in fuller detail in Table XII.

TABLE XI.

	Number of samples received in 1952-53. Total.	Number adulterated or unsatisfactory.	1951-52 Total.
Government Hospitals	6,187	1,092	5,286
Civil Supplies	408	24	544
Government Milk Factory ..	183	5	188
Rationing Department	11	2	46
Jails	119	7	99
Industries and Commerce	7	..	5
Magistrates and Police	17	6	98
Other Government Departments ..	100	51	98
Government of India Departments—			
(*a*) Railways	9	2	38
(*b*) Regional Food Commissioner.	41	34	48
(*c*) Deputy Superintendent of Police, Special Police Establishment, Ambala. ..	30	10	..
	7,112	1,233	6,452

Table XII gives the number and nature of samples received from the Government Departments.

TABLE XII.

Number and nature of samples received from various Government departments during the year 1952–53.

	Number of samples.	Number adulterated or unsatisfactory.
(1) *Government hospitals.*		
Bread	1,444	354
Milk	1,084	133
Butter	517	151
Ghee	670	166
Gingelly oil	870	137
Coconut oil	234	1
Dhall	576	81
Coffee powder	289	21
Curry powder	13	5
Iddlies	28	3
Rice	64	3
Brown sugar and jaggery	210	2
Biscuits	114	19
Tamarind	22	..
Arrowroot flour ..	12	6
Barley and Sago ..	14	5
Lemonade	6	2
Pepper	2	1
White sugar	1	..
Curd	1	..
Chillies	4	..
Washing soda	9	..
Cheekoy powder ..	1	..
Chlorinated lime ..	1	1
Distilled water ..	1	..
Total ..	6,187	1,091

	Total samples received.	Number adulterated or unsatisfactory.
(2) *Civil Supplies department.*		
Wheat	289	15
Milo	62	5
Rice	33	1
Bran	2	..
Maida flour	3	..
Pyrethrum	3	..
Paddy	1	1
Jowar	12	2
Atta	1	..
Carbondisulphide ..	1	..
Semolina	1	..
Total ..	408	24
(3) *Government Milk Factory.*		
Reconstituted milk ..	160	..
Skimmed milk powder.	9	1
Vanaspathi	10	..
Margarine	2	2
Special Milk	1	1
Milk with water miscible Vitamin A ..	1	1
Total ..	183	5

TABLE XII—*cont.*

Number and nature of samples received from various Government departments during the year 1952–53—cont.

	Total samples received.	Number adulterated or unsatisfactory.
(4) *Rationing department.*		
Flours	3	1
Iddli	3	1
Dough	2	..
Pongal	1	..
Appa	1	..
Puttu	1	..
Total ..	11	2
(5) *Jails.*		
Ghee	35	4
Milk	27	..
Gingelly oil	42	1
Dhall	9	2
Wheat	1	..
Bread	2	..
Tamarind	3	..
Total ..	119	7
(6) *Industries and Commerce Department.*		
Hydrogenated vegetable oil products of the following brands:—		
Asoka	2	..
Lion	2	..
Dalda	2	..
Swastik	1	..
Total ..	7	..

	Number of samples.	Number adulterated.
(7) *Magistrates and Police (Referee samples).*		
Milk	4	1
Ghee	5	1
Maida	1	..
Gingelly oil	2	1
Coffee	3	1
Butter	1	1
Groundnut oil ..	1	..
Total ..	17	6
(8) *Other Madras Government departments.*		
Milk powder	23	23
Tin food peas	1	..
Milk	3	2
Jaggery	2	..
Sugar	2	1
Wheat bran	9	2
Fish	3	..
Groundnut oil ..	2	2
Seeds	1	..
Carrot	1	..
Flours	6	..
Chicory	6	4
Rice	1	1
Coffee	1	..
Bark	1	..
Peas	1	..
Tapioca starch ..	4	..
Atta	2	2
Ice fruit	1	..
Children food	1	1
Egg powder	1	1
Betel nuts	1	..
Biscuits	1	1
Sago	1	..
Dhall	2	2
Teas	1	..
Tippi mavu	6	1
Wheat flour	4	4
Milo	1	1
Ghee	5	1
Honey	1	..
Stumps	1	..
Vargu	2	..
Hydrochloric Acid B P.	1	1
Benzoine	1	1
Total ..	100	51
(9) *Government of India departments.*		
(*a*) Railways—		
Chocolate	1	1
Coconut oil	2	..
Kardi oil	1	1
Rice	4	..
Coffee	1	..
Total ..	9	2
(*b*) Regional Food Commissioner, Central Storage Department—		
Wheat	16	9
Reconditioned wheat.	8	8
Rice	6	6
Milo	4	4
Reconditioned Milo ..	3	3
Glucose barley sugar.	1	1
Chaff and trash ..	2	2
Grains	1	1
Total ..	41	34
(*c*) Deputy Superintendent of Police, Special Police Establishment, Ambala—		
Wheat atta	26	10
Wheat flour	3	..
Wheat suji	1	..
Total ..	30	10

VIII. FOOD SAMPLES FROM UNOFFICIAL SOURCES.

Food samples from unofficial sources are given in the following Table XIII.

TABLE XIII.

Statement showing the samples received from unofficial sources during the year 1952-53.

	Number of samples.	Number adulterated or unsatisfactory.
Milk powder	6	3
Ghee	12	2
Gingelly oil	3	..
Groundnut oil	7	4
Butter	4	1
Malt Extract	1	..
Tapioca starch	3	..
Ragi	1	1
Wheat	1	..
Refined medicinal castor oil	1	..
Distilled water	2	..
Refined edible oils	1	..
Oil	1	1
Honey	1	..
Kardi oil	1	1
Vanaspathi	1	..
Dried Yeast	1	1
Curry powder	1	1
Diabetic biscuits	1	1
Bees wax	1	..
Peas	1	1
Dhall	1	..
Arrowroot flour	1	..
Wheat flour	..	..
Oil seeds	1	1
Molasses	1	..
Leaf	1	1
Glucose "D" Powder	1	..
Copper sulphate	1	..
Groundnut ash	1	..
Total ..	60	20

GOVERNMENT HOSPITALS.

During the year under report a total of 6,187 samples were received as against 5,286 in the previous year showing an increase of 901 samples.

Bread.—Out of the 1,444 samples received, 305 samples had excess acidity, 37 had been insufficiently baked and 12 samples were reported as unsatisfactory for other reasons.

Milk.—Out of the 1,084 samples, 133 samples were reported as adulterated, 144 for being adulterated with water, 11 for deficiency in fat and 8 samples for extraneous water and deficiency in fat. The percentage of adulterated samples was 12·3 per cent as against 17·2 per cent for last year.

Butter.—Out of the 517 samples, 151 samples (29·2 per cent) were reported as adulterated as against a total of 591 and 211 (35·0 per cent) adulterated for the previous year. Ninety-six samples contained excess water above the permissible limit of 20 per cent, 50 contained foreign fat and 5 samples were adulterated with both foreign fat and excess water.

Ghee.—Out of the 670 samples received, 166 samples were reported as adulterated as against a total of 495 and 112 adulterated samples for the previous year. One hundred and thirty-two were adulterated with foreign fat and 34 samples had a free fatty acid content in excess of the maximum permitted limit of 2·5 per cent expressed as oleic acid.

Gingelly oil.—Out of 870 samples received, 137 were reported as unsatisfactory, the corresponding figures for the previous year being 669 and 59 respectively. Fifty-nine samples were adulterated with groundnut oil, 67 had high acidity and 9 samples were unsatisfactory for other reasons. One sample contained 100 per cent foreign oil and one other sample consisted of safflower oil only.

Coconut oil.—Out of the 234 samples received, only one sample was reported as adulterated with 15 per cent groundnut oil.

Dhall.—Out of the 576 samples received, 81 were reported as not satisfactory, 60 for having been coloured with artificial dye, 2 for being adulterated with bengal-gram dhall, 2 for having been adulterated with lak dhall; the remaining 17 samples for being mouldy and also being infected with insects, etc.

Coffee.—Out of the 289 samples received, 21 were reported as adulterated, the common adulterants being chicory, roasted wild date seed, and some unidentified seeds.

Curry powder.—Out of the 13 samples of curry powder 4 contained no mustard at all. Two contained 1·5 per cent and 1·6 per cent of sand.

Rice.—Of the 64 samples received, three were reported as unsatisfactory, two for being mouldy and one for being infested with weevils.

Brown sugar.—One sample of jaggery was found to contain 1·8 per cent of acid insoluble ash as against the permitted limit of 0·6 per cent.

Biscuits.—Out of the 114 samples received 19 were reported as unsatisfactory, 18 for having high acidity and one for having a bitter taste.

Arrowroot flour.—Out of 12 samples of arrowroot flour 5 consisted of tapioca flour.

Barley and sago.—Out of 14 samples of barley and sago samples received, 1 sample of barley was found to contain 3·9 per cent of earthy matter and four samples of sago were found to consist entirely of tapioca flour whereas genuine sago should be derived from the sago palm Matroxilon Sago.

Lemonade.—Two out of six samples received from the Government General Hospital, Madras, contained saccharin.

Pepper.—Out of the two samples of pepper, one sample (from Government Tuberculosis Sanatorium, Bellary) contained 25 per cent foreign seed resembling pepper.

Ragi flour.—A ragi flour contained 1·9 per cent sand and was reported unsatisfactory.

Civil Supplies Department.—Samples of funigated foodgrains, such as wheat, milo, rice, etc., were received from the Civil Supplies Department. Some of them were tested for residual hydrocyanic acid before they were released for human consumption. A few samples were analysed for their moisture content.

Government Milk Factory.—The Government Analyst Laboratory continued to assist the Government Milk Factory in many ways. Vanaspati (partly hydrogenated vegetable oil) continued to be used as the fat in reconstituting milk from skim milk powder. One hundred and sixty samples of reconstituted milk were tested to see whether the percentage of fat and solids—not faty correspond to those of genuine milk. During the year a total of 432 lb. of Vanaspati with carotene dissolved in it was supplied to the factory. Nine samples of spray-dried skimmed milk powder were tested on behalf of the Factory to see whether they were fit for use in

the preparation of reconstituted milk. Eight samples were found to be satisfactory and one was certified as unfit for use since it contained 7·1 per cent of moisture and 5·7 per cent water insoluble matter as against the permitted limits of 5 per cent and 1·5 per cent respectively. The representative of Hindusthan Vanaspati Manufacturing Company recommended the use of margarine for use in reconstituting milk but since two samples contained 10·8 per cent and 13·5 per cent of water and the fat derived from it had a melting point of 39·5° C, it was recommended that margarine should not be used in the place of Vanaspati.

Rationing Department.—Since rationing was discontinued during the year, the number of samples received was only 11 as against a total of 46 in the previous year. One sample of flour consisted of self-rising flour and was certified as unsatisfactory. Three samples of iddly were received to see whether rice had been used in the preparation. The use of rice in iddly had been prohibited under the rationing regulations. One sample contained rice.

Jails.—One hundred and nineteen samples were received from Jails during the year of which 7 were reported as unsatisfactory. The corresponding figures for the previous year were 99 and 23 respectively. Three samples of ghee were adulterated with foreign fat while one contained excessive acidity. A sample of gingelly oil was reported as unfit for human consumption as it had excessive acidity. Two samples of dhall were coloured with an artificial dye and certified as unfit for use.

Industries and Commerce.—Seven samples of different brands of hydrogenated vegetable oil products received from the Director of Industries and Commerce were found to conform to the specifications prescribed by the Government of India under the Vegetable Oil Products Control Order.

7. *Magistrates and Police.*—A total of 17 samples was received from the Magistrates. Fourteen are referee samples, and 3 were sent at the instance of the Police for investigation.

Other Government departments—Wheat bran.—Of the 3 tender samples for King Institute, 2 were satisfactory, but 1 contained about 10 per cent paddy husk and was certified as unsatisfactory.

Dried cod fish.—A sample of cod fish reported to have been supplied by the Medical Store Department, Calcutta, received from the Director of Fisheries, Madras, was positive to Eber's test and thus showed signs of incipient decomposition. It was recommended that the stock should be used up quickly.

A sample of "Ice Fruit" from Municipal Health Officer, Madurai, contained 0·01 per cent saccharin and a coloring matter.

A sample of "Egg Powder" from the President, Adambakkam Panchayat Board, Madras, 16 had developed excessive acidity and left an insoluble residue of 62·0 per cent on reconstitution with cold water. Consequently it was certified as unfit for human consumption.

A sample of groundnut oil received from the Municipal Health Officer, Kancheepuram, reported to have produced vomiting and diarrhoea was found to be adulterated with oil derived from the seeds identified as *Croton Sparsiflorus Morons* by the Government Systematic Botanist, Coimbatore. The oil extracted from the seeds had the following physical constants:—

Percentage of fat in the seed	20·2
Refractive index at 40·C	70·9
Iodine value	162·0

Tapioca Powder.—Two samples of crude tapioca Powder were received from the District Health Officer, Salem and District Health Officer, Coimbatore, alleged to produce gastric irritation. The one from Coimbatore contained about 28 per cent woody fibre and 62 parts per million of hydrocyanic acid. The sample from Salem contained 13·5 per cent crude fibre.

Government of India departments—(a) Railways.—A sample of chocolate contained 40·0 per cent of fat with a free fatty acid content of 11·3 per cent and was certified as unfit for human consumption. A sample of coffee seeds received from the Chief Commercial Manager, Southern Railways, suspected to be contaminated by acetic acid was free from it. A sample of Kardi oil was certified as containing 5·0 per cent arachis oil.

(b) *Food department, Government of India.*—A total of 41 samples of foodgrains, etc., has been received from the Regional Food Commissioner, Central Storage Depot, Avadi, Waltair, etc., of which 34 have been reported as unfit for human consumption as they were found to be moudly with musty smell and were also partly destroyed by insects.

(c) *Deputy Superintendent of Police, Special Police Establishment, Ambala.*—Out of 30 samples of wheat atta received 10 were reported unsatisfactory, as they did not satisfy the specifications prescribed for the genuine wheat atta.

Samples from Unofficial Sources.

A total number of 60 samples was received from unofficial sources.

Ragi from Tea Estates, India Limited, Coimbatore.—The sample contained over 50 per cent discoloured grains having a somewhat bitter taste, but no deleterious substance was present. The probable explanation is that bitterness is associated with immature ragi seeds.

Skimmed milk powder.—Two samples taken from damaged imported stock received from Messrs. Wilson & Co., consisted of hard lumps leaving 31·0 per cent insoluble residue on reconstitution with water. Consequently the samples were declared as unfit for human consumption.

A sample of *Dried vat bottom yeast* from Messrs. Jeypore Sugar Company Limited contained 20 parts per million of arsenic and was reported as unfit for human consumption and cattle feed.

A sample of *Diabetic Biscuits* received from Health Products, Vepery, Madras, contained 51·1 per cent carbohydrates.

Ground nut.—A sample of partly carbonised groundnut was received from an Insurance Company to find out whether it was derived from unshelled whole groundnuts or from kernels or from groundnut shells only. The substance was completely ashed and the phosphorous content of the ash showed that the sample had been derived practically completely from groundnut shell with about 7·0 per cent groundnut kernel.

IX. HIGH COURT JUDGMENTS.

The following are some of the important High Court Judgments in food adulteration cases.

Criminal Appeal No. 55/1952—*Validity of Kesari dhall—Rule* 28-*E.*—A District Magistrate in Visakhapatnam acquitted an accused on appeal holding that Rule 28-E prohibiting the sale or possession for the purpose of sale of Kesari dhall (100·0 per cent) is ultra vires. On a further appeal, the High Court reversed the decision and convicted the accused. The following is an extract from the High Court Judgment:

"The accused who was found in possession of 28 kunchams of kesari dhall was prosecuted under rule 28-E framed under section 20 (2) (*f*) of the Madras Prevention of Adulteration Act III of 1918, on the ground that he intended to keep kesari dhall for human consumption in his shop, the possession of which is prohibited. The Government published in the *Fort St. George Gazette* in G.O. No. 3082, P.H,, dated 1st September 1950, Rule 28-E in Part VI of the

rules prohibiting the possession of kesari dhall by anybody for the purpose of sale under any description. Possibly this arose from some cases of ill-health which were detected on account of consumption of kesari dhall. The learned Sub-Magistrate who tried this case in the first instance found the accused guilty and fined Rs. 100. The learned Subdivisional Magistrate on appeal came to the conclusion that a natural product like kesari dhall could not be adulterated and that the Government Order prohibiting the sale of kesari dhall was ultra vires the powers of the Government under section 20 (2) (*f*) of the Madras Prevention of Adulteration Act. Hence this State Appeal.

I am unable to deduce any support for this conclusion from the reasoning of the learned Subdivisional Magistrate that a natural product could not be adulterated. It can be adulterated as for instance by means of colouring. Besides what was prohibited was the very possession of the dhall itself, because the kesari dhall used for human consumption was found to be deleterious to human health.

Therefore the acquittal by the learned Subdivisional Magistrate is set aside and the conviction by the learned Sub-Magistrate is restored. Taking into consideration the extenuating features the accused is fined Rs. 50 or in default to undergo 15 days' rigorous imprisonment."

Criminal Appeal No. 52/1952—*Certificate of the Government Analyst should be accepted.*—When a milk was certified adulterated by the Freezing Point test, accused quoted some Patna High Court Judgment, where no Freezing Point test at all was done, and the learned Town SubMagistrate, Coimbatore, accepting the defence contention acquitted the accused. On appeal, the Madras High Court reversed the lower Court's decision and convicted the accused holding that the certificate of the Analyst should have been accepted under section 16 (2) of the Act.

The following is an extract from the High Court Judgment :—

"The lower court was certainly wrong in holding that the Analyst's certificate was not conclusive when the accused had not asked for the personal appearance of the Analyst and for an opportunity to cross-examine him and so should have accepted the report of the Analyst and found that the offence had been made out—Section 16 (2) of the Madras Prevention of Adulteration Act. Then if really the Magistrate had felt a genuine doubt about the Analyst's certificate, he should have summoned the Analyst and cleared his own doubts and rendered justice. In fact, there seems to have been no ground whatsoever in this case for summoning the Analyst on behalf of the Court when the accused himself has not asked for it. Therefore, the order of the lower court based solely upon the fact that the Analyst's certificate is not conclusive has got to be set aside."

Criminal Appeal No. 95/1952.—When a Sanitary Inspector did not permit the vendor to affix the vendor's own seal on the sample, the Magistrate acquitted the accused. The High Court reversed the decision and convicted the accused holding that the rules do not require the seal of the accused to be affixed on the sample bottle. The following is an extract from the High Court Judgment :—

"Section 15 of the Madras Prevention of Adulteration Act lays down the procedure when an article is purchased for analysis. It states that when the local executive officer or any other person purchases a sample of food with the intention of submitting it to be analysed by the Public Analyst, he shall notify to the person from whom he has purchased the article his intention to have it analysed and shall divide it into three parts to be then and there separated and each part to be marked and sealed or fastened up in such manner as its nature permits and shall deliver one of the said parts to the seller and retain another of the parts for production in case proceedings are taken and submit the third part, if he deems it right to have the article analysed, to the Public Analyst. In this instance all these have been done. The Magistrate threw out the case

on the sole ground that the seal which has got to be affixed should be the seal of the accused or of the person selling the article and for which I find absolutely no warrant whatsoever. Therefore, the acquittal based upon this solely untenable ground is set aside and in the circumstances of the case, a fine of Rs. 25 is imposed. In default of payment of fine the accused will suffer imprisonment for one week."

Criminal Appeal No. 698/1951.—When a sample of Bengalgram flour was purchased from a merchant's shop at Mangalore, the Sub Magistrate acquitted the owner of the shop on the ground that the flour was actually sold by the Clerk who also gave receipt for the amount. The High Court convicted the shop-owner. Sampling Inspectors will note that reference is made to a number of previous High Court rulings on the question of "sale" when an article is purchased by a Sampling Inspector. The following is an extract from the High Court Judgment :

"This is an appeal preferred by the State against the order of acquittal by the Stationary Sub-Magistrate, Mangalore, in C.C. Nos. 14 and 19 of 1951.

The short facts are.—On information received the Sanitary Inspector Sri Sanjeevi Rao went to the shop of Janab Dada Haji Ebrahim Halari on 28th September 1950 at about 10-45 a.m. The Sanitary Inspector demanded and purchased one pavu of Bengalgram dhal and ten palams of flour at two annas each from out of the stock which was kept for sale in the godown situated at door No. 113 of the 20th ward of Mangalore Municipality. This purchase is spoken to not only by this Sanjeevi Rao examined as P.W. 1 but also by two receipts taken from this merchant marked as Exhibits P-1 and P-2 and which have been signed "per pro Dada Haji Ibrahim Halari" by a clerk of that firm. The purchases were bottled and then they have been submitted to the Analyst. On examination it has been found that they contained artificial water soluble yellow colouring matter derived from coaltar. Therefore this merchant has been put up for an offence under section 5 (1) (*a*) and (*b*) of the Madras Act III of 1918 read with Rules 29 and 28-D framed under clause (*f*) of sub-section (2) of section 20 of the aforesaid Act and G.O. No. 680, P.H., dated 24th February 1950 as amended in G.O. No. 1613, P.H., dated 5th May 1950.

On coming to court this Haji Ibrahim Hilari who was represented by a special vakalat contended that he was not guilty of the offence with which he was charged and stated nothing more than that and his learned advocate proceeded to argue on the information available without further explanation or adduction of evidence on the part of the accused.

The learned Magistrate who tried this case came to the conclusion that the accused should be acquitted on two grounds, viz., that Exhibits. P-1 and P-2 have not been properly proved and secondly that the sale in this case was not a voluntary transaction. The State has thereupon instructed the learned Public Prosecutor to file this appeal.

In my opinion both the grounds put forward by the learned Magistrate are totally devoid of any substance. First of all, Exhibits. P-1 and P-2 have been taken from the accused in the presence of the Sanitary Inspector P.W. 1. They have been signed then and there for the accused by one of his clerks. The learned Magistrate seems to have a singular idea of the provisions of the Indian Evidence Act in that he thinks that a document cannot be proved by a person who was present when the statement therein was made and reduced to writing. So the first point taken by the learned Magistrate, beyond exhibiting his own ignorance of the rule of hearsay evidence merits no attention at our hands and it has got to be rejected.

Turning to the second point the learned advocate on behalf of the accused before me relies upon the decision of Horwill J. In re *Bellemkonda Kanakayya*(1). In that case what happened was that A was the owner of a shop where he kept and offered ghee for sale. B was working in that shop and his duty was to sell the ghee to customers. The Sanitary Inspector entered the shop, exercised his powers under section 14 and demanded a sample from B who was then selling articles in

his master's absence. The sample was found to be adulterated ghee and both the accused were prosecuted. The learned Judge remarked as follows :—

The charge against the petitioner was of offering ghee for sale. But it was argued that he would be guilty of selling the ghee. A sale is a voluntary transaction even when it is preceded by an agreement to sell. When a person exhibits articles in his shop he is making a general offer to sell them, and any person who comes into the shop and offers the price accepts his offer; but the intending purchaser cannot use physical force or threats to compel the owner to part with the goods. If he does, the transaction is not a sale. If the Sanitary Inspector had not exercised his powers under section 14 but had merely tendered the money and the petitioner had voluntarily handed over the goods, then there would have been a sale and the fact that it was subsequently found that the goods were required not for consumption but for analysis, would make no difference to the nature of the transaction that had been entered into. In this case, the petitioner should presumably not have parted with the goods voluntarily when he knew that they would be used for the purpose of bringing a case against him and his master. The petitioner was not therefore guilty of selling ghee. Lakshmanao Rao, J. in a similar case held that the parting with a commodity when it is demanded by the Sanitary Inspector in the exercise of his powers under section 14 of the Act did not amount to a sale. (I) A.I.R. 1942, Mad. 609.

The facts of this case are however different and fall within the later decision in *Public Prosecutor* v. *Ramachandrayya* (1948 M.W.N. Crl. 32). In that case what happened was that the Sanitary Inspector got a quantity of milk not obviously for his consumption or drinking more milk but for only the purpose of having that milk tested for finding out whether it had been adulterated. This transaction was described as not being a sale by the learned advocate who appeared for the accused in that case. Govinda Menon, J. who went into the matter at great length held, following a previous judgment of this court by Kuppuswami Ayyar J. in *Public Prosecutor* v. *Narayanan Sing* (1944 M.W.N. 131 (cr) that the transaction was a sale. The learned Judge remarked :—

In Public Prosecutor v. *Narayana Sing* (1944 M.W.N. 131 Cr.) Kuppuswami Iyer J. has held that when a Sanitary Inspector purchased milk from the accused, tested it and found it was adulterated, the transaction amounted to a purchase and therefore the accused was guilty under rule 29 (*b*) of the rules and section 5 (1) (*b*) read with rule 27 of the Madras Prevention of Adulteration Act. Moreover, in this case Exhibits P-2 the receipt contains an admission by the second accused that he was selling buffalo milk to the Maruthi Vilas Coffee Hotel and the transaction by which P.W. 1 got the sample is also admitted to be a sale. Apart from the admission contained in Exhibits P-2 when Mr. Venkatasubbiah exchanged money consideration for the milk, he was acting as a purchaser and the society, a separate legal entity was performing a contract of sale in delivering milk. Therefore, it may even be unnecessary to decide whether the transaction with P.W. 1 was sale at all., even though I am convinced that it is also a sale."

In this case I have already pointed out how the Sanitary Inspector went and demanded a small quantity of Bengalgram dhal and flour kept for sale in the godown and how he was sold a pavu for two annas and how this is acknowledged in the receipts Exhibits P-1 and P-2 which have been properly proved. Therefore, the facts of this case fall directly under the decision in *Public Prosector* v .*Ramachandrayya* (1948 M.W.N. Cr. 32) cited above and the second ground on which the Magistrate acquitted this accused cannot be supported and has got to be rejected as wholly untenable.

In the result, the acquittal is set aside and the accused is convicted under section 5 (1) (*a*) (*b*) of the Madras Act III of 1918 read with rules 29 and 28-D framed under clause (2) of section 20 (*f*) and G O. No. 680, P.H., dated 24th February 1950, as amended in G.O. No. 1613, P.H., dated 5th May 1950.

The sentence to be awarded remains to be considered and having regard to the time which has elapsed, I think a moderate fine meet the ends of justice; The accused is fined a sum of Rs. 50."

Criminal Appeal No. 53 *of* 1952.—Acquittal of an accused in the lower court who failed to produce a proper warranty set aside by the High Court. The following is an extract from the High Court Judgment :—

The accused is a wholesale dealer for vending tins of tea purchased by him from Britania Tea Company. On complaints that this tea was adulterated the Sanitary Inspector of Cannanore Municipality raided his shop and took samples and when sent to the Analyst it was found that instead of being a beverage which cheers but does not inebriate it was found to contain 60 per cent of foreign adultertant husk. Therefore, the accused was prosecuted and his plea in the Lower Court was that he had no responsibility for this adulteration and that he sold only what he purchased in sealed tins from the Britania Company. The learned Stationary Sub-Magistrate, Cannanore, accepted this contention and acquitted this accused.

In appeal it is pointed out by the learned Public Prosecutor that the Lower Court ought to have found that the warranty provided by section 6 of the Madras Prevention of Adulteration Act could not be invoked unless the proviso to section 6 be held applicable to the facts of this case. It is common ground that this proviso was not invoked in the manner set out in the Act. The learned Advocate for the respondent accused also does not dispute this position because there is a ruling of Horwill J. in *Public Prosecutor, Madras* v. *Pulliah Chetti* (1946 I. M.L.J. 461) in point.

The acquittal of the Lower Court is set aside and the accused is convicted as charged."

Criminal Revision Case No. 373/1952—*Fine enhanced in High Court.*—A merchant at Kuppam prevented the Sanitary Inspector from seizing a large stock of flour suspected to be Lak Dhall flour. While imposing a small fine of Rs. 5 for the charge of preventing the Inspector, the Magistrate remarked that there are similar merchants in the place who were not being prosecuted. The High Court considered the Magistrate's reasoning as faulty. The following is an extract from the High Court Judgment :—

"This is a Criminal Revision Case which has been filed by the Public Prosecutor for enhancement of sentences awarded in C.C. No. 1989/52 of the file of the Sub-Magistrate, Palmaner. The facts are: P.W. 1 the Health Inspector since May 1951 and known to the accused as Health Inspector went to the shop of the accused father and son dealing in food stuffs on 14th September 1951 at about 3 p.m. The Health Inspector was accompanied by his peon K. Munuswamy for the purpose of taking samples of flour which they were selling as Muthur flour otherwise known as Mattar flour as an article of food for human consumption. The peon was wearing his badge. Police Constable Subramanyam and Panchayat Board member Ratnachari were also there. The Health Inspector, because he suspected that the article contained lak dhall, wanted to take a sample. The flour was kept in accused's shop, along with other articles for sale. The Health Inspector purchased a sample of flour from the accused for two annas and got a receipt Exhibit P (*a*). He then made the sample flour purchased into three parts and as required by rules gave one portion to the accused and wanted to seize the entire stock on suspicion in the discharge of his duties as Health Inspector. The accused prevented the Health Inspector from seizing the balance of the stuff and stated that without Collector's orders they would not deliver the flour to him. To this effect they also gave a letter Exhibit P-2. The Health Inspector came away empty handed without seizing the stock and made a report to his superior authorities. The accused have been prosecuted under section 186, I.P.C.

In the lower Court the prosecution having adduced the necessary evidence and the accused admitting the offence they were found guilty as charged and each of the accused was fined Rs. 5.

There can be no doubt that the fine of Rs. 5 is ridiculous because the offence was a grave one of merchants refusing to give the stock to a public servant when that stock was suspected to be adulterated stuff and which vending and purchase were injurious to the health of the community. The reason put forward by the Magistrate for awarding this small fine is that that there are similar merchants in

the place who were not being prosecuted under the Madras Prevention of Adulteration Act III.

Therefore the fine of Rs. 5 is enhanced to Rs. 25 on each of the accused, namely Rs. 50 in all or in default simple imprisonment for one month.

The following is another instance where the fine has been enhanced by the High Court for a similar offence of sale of lak dhall. (*Extract from Criminal Revision Case No.* 374/1952.) :—

"The accused who was proved to have vended adulterated flour which was found to contain 50 per cent of Lak Dhall was fined Re. 1 by the learned Magistrate on the ground that there are other merchants committing the same offence who were not being prosecuted. The reasoning given is ridiculous and the fine imposed is totally inadequate. The fine is enhanced to Rs. 25 or in default to simple imprisonment for one month. It is to be hoped that the Magistrate in future would make punishment fit the crime."

Criminal Appeal No. 290 of 1952.—A Magistrate acquitted a grocery merchant selling coffee-powder for the reason that the "certificate has not been tendered in evidence," although the certificate had been enclosed with the charge sheet. The High Court set aside the acquittal and convicted the accused holding that the Magistrate under Section 16 (2) of the Act should have used in evidence the certificate of the Government Analyst. The following is an extract from the High Court judgment:—

This is an appeal preferred by the State against the acquittal of K. Thoulath Khan charged for an offence under Section 20 of the Madras Prevention of Adulteration Act, 1918, in C.C. No. 2137 of 1951 on the file of the Sub-Magistrate of Rayachoty.

On evidence of the four witnesses examined for the prosecution, viz., P W. 1, Sri K. Venkata Krishnan, Health Inspector, Rayachoty, P.W. 2, T. Ramanna, peon of the Health Inspector, P.W. 3, V. Bala Subbiah, Maistry under the Sanitary Inspector and P.W. 4, Sri D. Dastagiri Sab, the Sanitary Inspector, Rayachoty, it was found that this accused was in possession of coffee powder kept for sale in his shop on 6th June 1951 which was found to be adulterated.

The coffee powder seized after observing all the formalities prescribed under the Act was sent to the Public Analyst and it was found by him to contain 10 per cent of adulteration.

The learned Sub-Magistrate acquitted the accused on two grounds, viz., that the report of the analyst did not constitute evidence and secondly that there was a discrepancy between the evidence of P.W. 1 and P.W. 4.

In my opinion the acquittal by the lower court cannot be supported because in regard to the report of the Public Analyst he should have acted under Section 16 (2) of the Prevention of Adulteration Act and used in evidence the certificate of the Government Analyst. If either the accused asked for it, or the Magistrate had any doubt on that matter he ought to have called upon the analyst to prove the same. But neither the one nor the other was the case in the lower court. It was not the accused's case that this coffee powder did not contain any adulteration, and the magistrate did not consider that he must examine the analyst if he had to accept the conclusion of the analyst. Turning to the discrepancy it is more apparent than real. P.W. 1 says that the coffee powder was taken when a demand for the same was made and P.W. 4 says that coffee powder was asked as a sample. The evidence of both was that coffee powder was seized from the shop of this accused at the material time and in fact the case for the accused, through D.W. 1 was that he was present when P.W. 4 came to the accused's shop and accused was holding a Garden Coffee Powder packet in his hand and showing it to P.W. 4 saying that the packet was not in the shop and that he was getting it from the house and that the packet bore × the company's mark.

The acquittal by the lower court is set aside and the accused is convicted as charged and sentenced to pay a fine of Rs. 30 or in default to suffer rigorous imprisonment for a fortnight.

Criminal Appeal No. 383 of 1952.—An oil vendor was acquitted in the lower court on the plea that the vendor represented to the Sanitary Inspector that the adulterated gingelly oil was kept for "Lighting Purposes" although the

tin was clearly labelled in Tamil as "சுத்தமான எண்ணை—நல்லெண்ணை" (pure gingelly oil). The High Court set aside the acquittal and convicted the merchant. The following is an extract from the High Court Judgment:—

This is an appeal against the acquittal preferred by the State of Madras in S.C. No. 1407 of 1951 on the file of the Additional First-Class Magistrate, Coonoor.

The facts are.—P.W. 1 the Sanitary Inspector, Coonoor Municipality, went to the Coonoor market on 22nd November 1951 to take sample of gingelly oil. First he went to one Mudiyappa Mudaliar P.W. 2 and asked whether he had gingelly oil in his shop. He said that he did not have gingelly oil for the time being. Then P.W. 1 the Sanitary Inspector went to the shop of the accused and asked for sample of gingelly oil. The accused is stated to have hesitated in the first instance to give sample. On the Sanitary Inspector insisting on taking samples of gingelly oil the accused drew some oil from a tin on which there was the label bearing the words "சுத்தமான எண்ணை—நல்லெண்ணை". P.W. 1 took the sample in three bottles. One bottle was given to the accused and the two bottles were taken by the Sanitary Inspector. By mistake the Inspector had written-castor oil instead of gingelly oil on the bottle which was given to the accused. The superscriptions on the bottles in his possession were corrected. When he sent to the accused to have the correction made on the bottle the accused refused to give the bottle. After this the accused wrote a letter to the Health Officer. Ex. P. 1 which is in the following terms: "To-day at about 11-30 a.m. one Sanitary Inspector named Nanjan came to my shop at Market Coonoor and took groudnut oil for analysis. He got my signature on the form also. But subsequently I came to know on the bottle which was given to me that he has written as castor oil. So I actually gave him only groundnut oil and not castor oil. This is for your information . . . . ."

Copy of this letter had been sent to the Municipal Councillor Ward No. XI. Then when the sample bottles were sent for chemical analysis they were found to contain a mixture of groundnut oil and gingelly oil 50 per cent and 50 per cent. Then the accused was prosecuted under rule 29 read with rule 27-A of Section 20 of the Madras Prevention of Adulteration Act. On coming to court the accused had made a right about turn and pleaded that the sample taken from his shop was a mixture of oils and that it was kept there for his own private use for lighting purposes.

The learned Magistrate acquitted the accused on the ground that the mixing of the gingelly oil with groundnut oil and selling it is groundnut oil did not constitute an offence under the Act.

In appeal I am of opinion that the acquittal by the lower court cannot be supported either on the footing of the case of the accused in the first instance, or his case in the court at the time of the trial or the case evolved for him by the Magistrate. In the first place the accused stated that he did not supply castor oil but only groundnut oil. This statement had not been stuck to when the accused came to the court where his case was that he had composite oil, as a mixture of all oils and that it was not intended for sale but he had kept for his own use for lighting lamps. Both these defences are ridiculous. Coonoor if an electrically lit place and there is no reason why he should make use of composite oil for lighting purposes. Then on analysis, the sample was found to be a perfect mixture of groundnut oil and gingelly oil and it could not be said that it was for private consumption because it was kept in the shop with an inviting label "சுத்தமான எண்ணை நல்லெண்ணை". On the other hand if it was not intended for sale why should it be kept in the shop along with other goods. The oil tin was displayed on the counter, for purpose of sale to the people for household consumption. So the plea of the accused put forward in the court was not only belated but also ridiculous on the face of it. Coming to the finding of the Magistrate the learned magistrate has apparently overlooked the provisions of Rule 29 and 27-A of Section 20 of the Madras Prevention of Adulteration Act. Therefore looked at from any point of view the accused was clearly guilty of the offence charged; and had committed the offence under Rule 29 read with rule 27-A of Section 20 of the Madras Prevention of Adulteration Act.

In the result the order of the acquittal is set aside and the accused is convicted as charged. But taking into consideration the fact that the offence took place in 1951 and that the adulteration was not worse than what it was and which often it is I sentence him to pay a fine of Rs. 35.

Criminal Appeal No. 378 *of* 1952.—The son of a merchant who sold smooth pea flour adulterated with Lak Dhall floor was acquitted by a Magistrate on the ground that the father was responsible and not the son. The High Court set aside the acquittal and convicted the son observing "he (the son) must have been in the shop for the purpose of carrying on sales on behalf of his father and as his servant". The Honourable High Court Judge also observed "A servant is equally liable because if the law were otherwise every master would try to keep himself out of the way and escape liability." The following is an extract from the High Court Judgment.

"This is an appeal preferred by the State against the acquittal by the learned Sub-Magistrate, Badvel, in C.C. No. 1811 of 1951."

The facts are.—On information received the Health Inspector P.W. 1 went to the bazaar at Badvel on 29th June 1951 at about 9 a.m. and inspected the house and shop of the accused and his father and on finding the accused there asked him to keep open the godown which is situated a little away from the shop and he among other things found there smooth pea flour with which are now concerned here. The Health Inspector took sample of pea flour and sent it to the Public Analyst for analysis and it was declared as adulterated with lak dhall flour (kesari dhall). It was a mixture of lak dhall of about 80 per cent with bengalgram flour of 20 per cent and it also contained an artificial water soluble yellow colouring matter derived from coal tar. In as much as sale or possession for the purpose of sale under any description of artificially coloured Bengalgram flour and redgram flour is an offence punishable under Rule 29 read with Rule 28-D of the Madras Prevention of Adulteration Rules issued in G.O. No. 680, P.H., dated 24th February 1950, as amended in G.O. No. 1613, Health, dated 5th May 1950, this accused was charged for an offence punishable under rule 29 read with rule 28-E of the Madras Prevention of Adulteration Rules issued in G.O. No. 3082, Health, dated 1st September 1950.

The two points taken before me for sustaining the acquittal are that the father of the accused was the owner of the shop and not the accused and that the proper person who should be proceeded against is the father and not the son.

In my opinion this contention cannot be accepted because under sub-clause (*d*) of Section 5 of the Madras Prevention of Adulteration Act every person who offers for sale any food which is not up to the standard of purity prescribed by the (Provincial Government) is punishable. So what we have to see in the present case is whether this accused stored or offered for sale this substance in controversy. A person who is working in a shop on behalf of the owner as his employee is certainly one who will come within the meaning of the "person offering for sale the articles exhibited there". It is not stated that the accused was there for his health. On the other hand he must have been in the shop for the purpose of carrying on sales on behalf of his father and as his servant. It has been laid down in a long line of decisions the most notable of which is the English decision of SHERRAS v. De RUTZEN (1985–Q.B. 918 (921) in which Wright J. has collected and classified the interesting English decisions on the subject and the Supreme Court decision of Hariprasada Rao, v. the State (1951 M.W.N. 374 Cr. 102) and which entire case law has been set out by me in KASI RAJAH v. STATE reported in 1952 M.W.N. Cr. 277. A servant is equally liable because if the law were otherwise every master would try to keep himself out of the way and escape liability. The argument that the accused has passed his School-Final examination and that there are differences between him and his father in private life are neither here nor there. On the particular date in question this accused was working in the shop on behalf of his father. Therefore, the accused is certainly a person coming within the meaning of the sub clauses (*b*) and (*d*) of section 5 of the Act.

Therefore, the acquittal by the Sub-Magistrate cannot be supported and is hereby set aside and the accused is convicted as charged. Taking into consideration the various mitigating circumstances the accused is sentenced to pay a fine of Rs. 35. Time for payment of the fine is six weeks from the date of the receipt of this order in the lower Court.

Criminal Appeat No. 380 *of* 1952.—The real owner of a shop lives in some other place and his servant is for all practical purposes transacting the business of the shop. When the servant was charged he pleaded that the butter was brought by some one and placed in his show case. The Sub-Magistrate acquitted him. The High Court set aside the acquittal and convicted the servant and passed strictures on the narrow view taken by the Sub-Magistrate. In this judgment reference is made to a number of previous High Court Judgments on the question of "Sale" which will be of great assistance to sampling Inspectors. The following is an extract from the High Court Judgment:—

"This is an appeal preferred by the State against the order of the acquittal made by the Additional First Class Magistrate, Coimbatore, in C.C. No. 446 of 1951."

The facts are.—On 11th June 1951, Sanitary Inspectors Natarajan and Hussain Khan went to the shop of K. V. R. Annamalai Chettiar in Rajah Street, Coimbatore. This proprietor was absent and in fact he is stated to live at Perundurai. The accused Shanmugam who is an employee in the shop was present. In the show case in front of the shop there was a tin of butter. Sanitary Inspector Natarajan purchased for the purpose of analysis half a pound of butter from that tin and paid for it. The butter was divided into three parts and the formalities prescribed under the Madras prevention of Adulteration Act were followed. The butter sent to the Government Analyst, Guindy, was found by the latter to be adulterated with 8·1 per cent of excess water. Thereupon the proprietor of the shop Annamalai Chettiar and the employee Shanmugam have been separately charge-sheeted for an offence under Section 5 (1) (*d*) of the Prevention of Adulteration Act.

The defence of this accused Shanmugam was that the butter in question had been brought to the shop by one Marappan and he had left the shop to go to the Coffee Club and before his return a portion of this butter was acquired as a sample and that this fact was mentioned to the Sanitary Inspectors and that Marappan had executed a letter of warranty. In support of this plea the mahazar witness and Marappan were examined as D.Ws. 1 and 2. The learned Additional First-Class Magistrate acquitted this Shanmugham on the ground that it was not proved beyond reasonable doubt that accused sold the butter or offered the same for being sold.

This conclusion cannot be supported because the earlier view of this court in *Public Prosecutor* v. *Srinivasa Rao* (AIR 1939 Mad. 541) and In re *Bellamkonda Kanakayya* (1942–II. MLJ. 172) that sale of sample to a Sanitary Inspector is not a sale has been considered and dissented from in three subsequent decisions by Kuppuswami Iyer J in *Public prosecutor* v. *Narayan Singh* (1944 M.W.N. Cr. 131) by Govinda Menon J. In *Public prosecutor* v. Ramachandraya (1948–I. M L.J. 117) and by me in *Public prosecutor* v. *Dada haji Ebrahim Helari* (1952 II M.L.J. 565). In these circumstances there was undoubtedly a sale in this case.

The Additional First-Class Magistrate not content with this wrong construction of law had laid down the following proposition which shows his plain unfittedness or at least complete necessity for refitting himself to discharge his Magisterial duties: "Further even if it is taken that P.W. 1 effected the purchase, he is essentially to be treated as an accomplice. It is essential that his version should be corroborated by some untained testimony. Mr. Hussain (the other Sanitary Inspector) who is also alleged to be with P.W. 1 is only another limb of the same department . . . In the circumstances stated above there is not sufficient evidence regarding the sale by the accused."

I have fully discussed the entire case-law relating to the definition of the term "accomplice" in my judgment in Cr.R.C. No. 1129/1951 and the term accomplice under the Indian law applies only to principles as defined in sections 34 to 38 and 149, I.P.C., and abettor as defined in sections 107 and 108, I.P.C. The accessory after the fact pure and simple who was not in any way concerned in the original offence cannot be classified as an accomplice under the Indian law, whatever be the position under the English law. Valid exceptions to the rule there may, however be, such as in the case of subsequent possessor of stolen property who may be an accomplice witness against the thief even if he is an accessory after the fact within the meaning of the expression, for illustration (a) to section 114 of the Indian Evidence Act permits presumptions of theft from subsequent possession. In other words, the general principle deducible is that an accomplice must sustain such a relation to the Criminal Act that he could be jointly indicated with the accused though this is subject to several modifications with which we are not concerned here. The law of accomplices does not recognize "practically accomplices" or "more or less accomplices". Mere informants or spies or detectives who pretend to concur in the commission of the crime and involuntary participants in a crime as a result of pressure and without MENS REA cannot be classified as accomplice. These principles are deducible from the following Privy Council and Madras Cases: Mahadeo v. King AIR 1936 PC 242, Srinivasa mall Bairolya v. Emperor AIR 1947 PC 135; Ramaswami Gounden v. Emperor 27 M. 271-2 weir 803, 14 M.L.J. 226; Sattarkhan v. Emperor AIR 1939 M-283. 1938. MWN. 962. Venkadu v. Emperor AIR 1939 M. 266 1938—MWN. 1272. Venkatiah v. Emperor 1937 Madras Criminal Cases 27 (D.B.). This Sanitary Inspector who did nothing more than to discharge his duties, cannot by the wildest stretch of imagination be described as an accomplice and therefore no corroboration was required for accepting his testimony.

Then in regard to the letter of warranty, though the Magistrate has not considered it I have listened to arguments concerning the same and find that this would not in any way protect this accused because he did not invoke the procedure prescribed for relying upon warranty set out in section 6 (2) (a) of the Act and secondly it is not the case for this Shanmugham that the butter had been purchased and that he is relying upon warranty to escape the consequences of a charge for adulteration. On the other hand his case is that it was left in the show-case of the shop by Marappan and that Marappan had gone to a coffee-club and that the sample was acquired before Marappan returned. This story itself is incredible for the simple reason that if the purchase had not been made why should the butter not purchased be kept in the show-case thereby leading the public to believe that it stood there offered for sale. The testimony of the mahazar witness is not worth anything because, he has obviously been gained over and he now figures as a defence witness. Therefore the point regarding warranty and the point regarding the butter being Marappans butter also fail.

I have also in my judgment in C.A. No. 379 of 1952 acquitted the employer on the ground that he has used due diligence to enforce the execution of the Act and that what was committed was without his knowledge, consent or connivance. Section 6 (3) of the Act clearly lays down that in such circumstances, the employer shall be acquitted and the said other person, viz., the employee shall be convicted.

In the result the acquittal by the lower Court is set aside and the accused is convicted as charged and taking into consideration the circumstances of this case, he is fined Rs. 30 or in default to undergo simple imprisonment for a period of two weeks; time for payment of fine is six weeks from the date of receipt of this judgment in the lower Court and collection of the fine must be intimated to this Court in due course.

Criminal Appeal No. 528 *of* 1952.—When a merchant sold the ghee from an open tin, he pleaded warranty defence and the Magistrate acquitted the accused.

On appeal the High Court set aside the order of acquittal and convicted the vendor. The following is an extract from the High Court Judgment:—

This is an appeal preferred by the State against the order of acquittal made by the learned Town Sub-Magistrate, Coimbatore, in C.C. No. 33 of 1952.

The facts are.—P.W. 1, Sanitary Inspector on 23rd October 1951 went to the accused's shop took a sample of ghee from the open tin in the said shop for sampling purposes and gave the notice Exhibit P-1 to the accused about this. Exhibit P-2 is the cash bill for the purchase of sample ghee. The sample ghee was divided into three parts, one was given to the accused, one was sent to the Analyst and the third was sent to the M.H.O. The Analyst found that the ghee was adulterated with 17·0 per cent foreign fat. On the accused being charged he put forward the plea that it is true that he sold the ghee but that the ghee was purchased from D.W. 1 under the warranty Exhibit D-2 and to which D.W. 1 speaks. The learned Sub-Magistrate came to the conclusion that in as much as the accused sold only what he purchased from D.W. 1 on the strength of Exhibit D-2 he could not be convicted for selling adulterated ghee and acquitted him.

There can be no doubt that this acquittal is contrary to law because the lower Court failed to note that the warranty under Section 6 of the Act could not be invoked as the article sold was not in the same state in which it was purchased. In this case what was purchased was a closed tin of ghee and what happened thereafter was that the tin was opened and the ghee inside was taken out and sold in retail. Therefore, the letter of warranty Exhibit D-2 would not constitute any protection for this accused.

In the resnlt, the acquittal is set aside and the accused is convicted as charged and taking into consideration the circumstances of the case, he is fined Rs. 25 or in default to undergo simple imprisonment for one month. Time for payment of fine is six weeks from the date of receipt of this judgment in the lower Court and the Sub-Magistrate should report the collection of the fine in due course.

Criminal Appeal No. 570 *of* 1952.—When a ghee hawker was charged for having in his possession for sale adulterated ghee the Sub-Magistrate acquitted him stating that there was no independent evidence and the Sanitary Inspector has not prepared a mahazar. On appeal, the High Court convicted the vendor holding that "*there is no provision of law for preparing a mahazar*" and the Magistrate should believe the respectable Sanitary Inspector's evidence. The following is an extract from the High Court Judgment:—

This is an appeal which has been preferred by the State against the acquittal of the respondent (accused) in C.C. No. 217 of 1952 on the file of the Stationary Sub-Magistrate, Tadpatri.

The facts are.—P.W. 1 the Sanitary Inspector of Tadpatri Municipality was moving about on the morning of 3rd November 1951 at 7-30 a.m. While he was near the Ranee Rest House where the municipal labourers were living, he saw the accused carrying a tin to the bazaar. The Sanitary Inspector stopped him, questioned him and learnt from the accused that he was taking ghee in the tin to sell it in the bazaar. Thereupon he purchased a seer of ghee for Re. 1-4-0 obtained the receipt Exhibit P-1 and divided the ghee into three parts and put them in bottles. He gave one bottle to the accused, kept one bottle with him and sent the third bottle to the Chemical Examiner for analysis. The Chemical Examiner's report Ex. P-2 is to the effect that the ghee contained 61·0 per cent foreign fat.

On coming to court the defence of this accused was that he was not taking the ghee for the purpose of selling and this has found acceptance at the hands of the learned Sub-Magistrate who acquitted the accused on the following grounds:—

"Crucial point in this case is the selling of adulterated ghee. There is absolutely no evidence to show that the accused was selling adulterated ghee. The only evidence on this point is that the accused said to P.W. 1 that he

was going to sell it. But the accused denied having said that. The proper course would have been that P.W. 1 should have prepared a Mahazar for what the accused had said. There is no such Mahazar and no other independent evidence. P.W. 1 says that the accused was taking the tin to the bazaar for selling it and that he admitted all that on his mere asking. This looks a little unnatural. The first thing is no ghee seller dares to pass by the side of the Sanitary Inspector for selling ghee and the second is the ready acceptance of the accused of the offence before him. There is also no evidence to show that the accused is a dealer in ghee that he has a shop or a fixed place or locality where he sells ghee. The accused says that he was taking it for his consumption from the bazzar to his house."

In putting forward these reasons, the learned Sub-Magistrate overlooked the circumstances under which P.W. 1 met this accused, the terms of the receipt Exhibit P-1 and the fact that in court it was natural for the accused to deny that he was taking the ghee for sale if he were to escape the consequences of the Analyst's report. It is surprising that the Sub-Magistrate should state that he would not believe the Sanitary Inspector unless a Mahazar was prepared. *There is no provision of law for preparing a Mahazar.* Besides if he were not going to believe the respectable Sanitary Inspector, would his evidence become better if suppose two *Namkevaste* persons are got hold of by the Sanitary Inspector to sign mahazar. This would not be a very difficult operation for a Sanitary Inspector to undertake if he were the wicked and unscrupulous person he is made out to be. It is also surprising that the Sub-Magistrate thought that no ghee seller would ever pass by the side of a Sanitary Inspector. On the other hand it is only when people are caught and the ghee is found to be adulterated then they have got to fear the consequences of selling adulterated ghee and not when they pass a Sanitary Inspector with an inocuous article like ghee in a tin. Finally the Sub-Magistrate concluded his arguments by stating that there is no evidence to show that the accused is a dealer in ghee and that he has a shop or a fixed place or a locality where he sells ghee. On the other hand, ghee is sold as is known to us by itinerant people who do not run a shop but collect the ghee in and around their place, carry it on their heads in baskets and sell it to the people of the locality. That is why rule 28 itself contemplates two sets of persons, viz., persons selling or having in their possession for the purpose of sale or for use as an ingredient in the preparation of an article of food for sale a mixture of ghee or butter and any substance. Therefore, the grounds put forward by the Sub-Magistrate for acquitting this accused are without any substance.

In the result, the acquittal is set aside, and the accused is convicted as charged and he is fined Rs. 25 or in default undergo one month's simple imprisonment.

Criminal Revision Case No. 875/1952.—In one case for preventing the Inspector from taking a milk sample, the Sub-Magistrate fined the accused only Rs. 5. On appeal the fine was enhanced to Rs. 25 by the High Court. One of the grounds put forth by the defence thet "Milk is not food but only a drink" was not accepted by the High Court since according to the definition in the Act "Food" includes "Drink" also. The following is an extract from the High Court Judgment :—

"The respondent has been convicted under Section 14 (3) of the Madras Prevention of Adulteration Act and sentenced to a fine of Rs. 4 only. The offence is punishable with fine not exceeding Rs. 100. This revision is filed by the State for enhancement of sentence. The learned Advocate for the respondent contends that milk is not food but only drink and that the Act does not apply. But the definition of food in the Act includes drink also. There is therefore no substance in the contention. No other reason is shown for not enhancing the sentence which is inadequate. The sentence is enhanced to Rs. 25 in default two weeks simple imprisonment."

Criminal Appeal No. 832/1953.—Frequently vendors are acquitted by Magistrates when they merely plead warranty defence, without observing the requirements of warranty as per Section 6 of the Act and Rule 35. Another instance is given below where the High Court set aside the lower court's order of

acquittal and convicted the accused. The following is an extract from the High Court Judgment :—

"The facts of the case are not in doubt. In January 1952, P.W. 1 an Inspector of Central Tea Board visited Dharmavaram in the course of his duties. On suspicion that adulterated tea was being sold he visited the shop of the accused who are the respondents here, and had a sample taken. This was on 17th January 1952. On examination by the Government Analyst, it was found that the "Tea" contained not more than 15 per cent genuine and that the rest was foreign leaf. The accused was prosecuted under Section 5 (1) (*d*) of the Madras Prevention of Adulteration Act. They pleaded that they had purchased this "tea" from a firm called Reliance and Co. in Mangalore and that they sold the "tea" in the same condition as that in which they had received it. The learned Magistrate thought that this was a sufficient answer to the charge and acquitted the accused. In doing so he overlooked the provisions to Section 6 (2) (*a*) (iii) which run thus :—

"Provided that such defence shall be open to the vendor only if he has within seven days of the service on him of the summons sent to the local Executive Officer, a copy of the warranty with a written notice stating that he intends to rely on it and specifying the name and address of the person from whom he received it and has also sent a like notice of his intention to that person".

Provided further that a warranty given by a person resident in any area in which this Act is not in force shall be a defence to the vendor only if the vendor proves to the satisfaction of the Court that he had taken reasonable steps to ascertain and did in fact believe in, the accuracy of the statement contained in the warranty."

It is clear in this case that the requirements of these provisos had not been complied with. The order of the Sub-Magistrate acquitting the accused is therefore erroneous. Mr. Srinivasa Rao argued that the prosecution is incompetent because the Health Inspector of Dharmavaram who initiated the prosecution, had not been vested with the requisite power under the Act. The appeal was adjourned in order to ascertain whether this contention was correct. The learned Public Prosecutor had also placed before me a copy of the requisite authority. It follows that this objection must fail. The appeal is allowed. The acquittal of the respondent is set aside and they are convicted under Section 5 (1) (*d*) of the Act and sentenced to pay fine of Rs. 50 each. In default of payment they will undergo simple imprisonment for one month.

X. ANALYSIS OF DRUGS.

The drugs analysed in the Government Analyst's Laboratory are received from *three sources.*

(i) *Under the Drugs Act.*—Drugs requiring chemical analysis are analysed by the Government Analyst (Foods and Drugs) while those under Schedule C of the Madras Drugs Rules, 1945, requiring Biological Assay are dealt with by the Government Analyst (Drugs Special) of the King Institute ;

(ii) from the Government hospitals and other Government institutions; and

(iii) from private individuals and firms.

The number of drugs received under the above *three* categories is given below in Table XIV along with the figures for the two previous years :—

TABLE XIV.

Number and category of drugs analysed in the Government Analyst Laboratory.

	1952-53.	1951-52.	1950-51.
Under the Drugs Act	92	67	79
From Government hospitals and other Government institutions	275	161	99
From private individuals and firms	17	24	24
Total ..	384	252	202

was going to sell it. But the accused denied having said that. The proper course would have been that P.W. 1 should have prepared a Mahazar for what the accused had said. There is no such Mahazar and no other independent evidence. P.W. 1 says that the accused was taking the tin to the bazaar for selling it and that he admitted all that on his mere asking. This looks a little unnatural. The first thing is no ghee seller dares to pass by the side of the Sanitary Inspector for selling ghee and the second is the ready acceptance of the accused of the offence before him. There is also no evidence to show that the accused is a dealer in ghee that he has a shop or a fixed place or locality where he sells ghee. The accused says that he was taking it for his consumption from the bazzar to his house."

In putting forward these reasons, the learned Sub-Magistrate overlooked the circumstances under which P.W. 1 met this accused, the terms of the receipt Exhibit P-1 and the fact that in court it was natural for the accused to deny that he was taking the ghee for sale if he were to escape the consequences of the Analyst's report. It is surprising that the Sub-Magistrate should state that he would not believe the Sanitary Inspector unless a Mahazar was prepared. *There is no provision of law for preparing a Mahazar.* Besides if he we are not going to believe the respectable Sanitary Inspector, would his evidence become better if suppose two *Namkevaste* persons are got hold of by the Sanitary Inspector to sign mahazar. This would not be a very difficult operation for a Sanitary Inspector to undertake if he were the wicked and unscrupulous person he is made out to be. It is also surprising that the Sub-Magistrate thought that no ghee seller would ever pass by the side of a Sanitary Inspector. On the other hand it is only when people are caught and the ghee is found to be adulterated then they have got to fear the consequences of selling adulterated ghee and not when they pass a Sanitary Inspector with an inocuous article like ghee in a tin. Finally the Sub-Magistrate concluded his arguments by stating that there is no evidence to show that the accused is a dealer in ghee and that he has a shop or a fixed place or a locality where he sells ghee. On the other hand, ghee is sold as is known to us by itinerant people who do not run a shop but collect the ghee in and around their place, carry it on their heads in baskets and sell it to the people of the locality. That is why rule 28 itself contemplates two sets of persons, viz., persons selling or having in their possession for the purpose of sale or for use as an ingredient in the preparation of an article of food for sale a mixture of ghee or butter and any substance. Therefore, the grounds put forward by the Sub-Magistrate for acquitting this accused are without any substance.

In the result, the acquittal is set aside, and the accused is convicted as charged and he is fined Rs. 25 or in default undergo one month's simple imprisonment.

Criminal Revision Case No. 875/1952.—In one case for preventing the Inspector from taking a milk sample, the Sub-Magistrate fined the accused only Rs. 5. On appeal the fine was enhanced to Rs. 25 by the High Court. One of the grounds put forth by the defence that "Milk is not food but only a drink" was not accepted by the High Court since according to the definition in the Act "Food" includes "Drink" also. The following is an extract from the High Court Judgment:—

"The respondent has been convicted under Section 14 (3) of the Madras Prevention of Adulteration Act and sentenced to a fine of Rs. 4 only. The offence is punishable with fine not exceeding Rs. 100. This revision is filed by the State for enhancement of sentence. The learned Advocate for the respondent contends that milk is not food but only drink and that the Act does not apply. But the definition of food in the Act includes drink also. There is therefore no substance in the contention. No other reason is shown for not enhancing the sentence which is inadequate. The sentence is enhanced to Rs. 25 in default two weeks simple imprisonment."

Criminal Appeal No. 832/1953.—Frequently vendors are acquitted by Magistrates when they merely plead warranty defence, without observing the requirements of warranty as per Section 6 of the Act and Rule 35. Another instance is given below where the High Court set aside the lower court's order of

acquittal and convicted the accused. The following is an extract from the High Court Judgment:—

"The facts of the case are not in doubt. In January 1952, P.W. 1 an Inspector of Central Tea Board visited Dharmavaram in the course of his duties. On suspicion that adulterated tea was being sold he visited the shop of the accused who are the respondents here, and had a sample taken. This was on 17th January 1952. On examination by the Government Analyst, it was found that the "Tea" contained not more than 15 per cent genuine and that the rest was foreign leaf. The accused was prosecuted under Section 5 (1) (*d*) of the Madras Prevention of Adulteration Act. They pleaded that they had purchased this "tea" from a firm called Reliance and Co. in Mangalore and that they sold the "tea" in the same condition as that in which they had received it. The learned Magistrate thought that this was a sufficient answer to the charge and acquitted the accused. In doing so he overlooked the provisions to Section 6 (2) (*a*) (iii) which run thus:—

"Provided that such defence shall be open to the vendor only if he has within seven days of the service on him of the summons sent to the local Executive Officer, a copy of the warranty with a written notice stating that he intends to rely on it and specifying the name and address of the person from whom he received it and has also sent a like notice of his intention to that person".

Provided further that a warranty given by a person resident in any area in which this Act is not in force shall be a defence to the vendor only if the vendor proves to the satisfaction of the Court that he had taken reasonable steps to ascertain and did in fact believe in, the accuracy of the statement contained in the warranty."

It is clear in this case that the requirements of these provisos had not been complied with. The order of the Sub-Magistrate acquitting the accused is therefore erroneous. Mr. Srinivasa Rao argued that the prosecution is incompetent because the Health Inspector of Dharmavaram who initiated the prosecution, had not been vested with the requisite power under the Act. The appeal was adjourned in order to ascertain whether this contention was correct. The learned Public Prosecutor had also placed before me a copy of the requisite authority. It follows that this objection must fail. The appeal is allowed. The acquittal of the respondent is set aside and they are convicted under Section 5 (1) (*d*) of the Act and sentenced to pay fine of Rs. 50 each. In default of payment they will undergo simple imprisonment for one month.

X. ANALYSIS OF DRUGS.

The drugs analysed in the Government Analyst's Laboratory are received from *three sources.*

(i) *Under the Drugs Act.*—Drugs requiring chemical analysis are analysed by the Government Analyst (Foods and Drugs) while those under Schedule C of the Madras Drugs Rules, 1945, requiring Biological Assay are dealt with by the Government Analyst (Drugs Special) of the King Institute;

(ii) from the Government hospitals and other Government institutions; and

(iii) from private individuals and firms.

The number of drugs received under the above *three* categories is given below in Table XIV along with the figures for the two previous years:—

TABLE XIV.

Number and category of drugs analysed in the Government Analyst Laboratory.

	1952-53.	1951-52.	1950-51.
Under the Drugs Act	92	67	79
From Government hospitals and other Government institutions	275	161	99
From private individuals and firms	17	24	24
Total ..	384	252	202

During the year under review there has been a further increase in the number of drugs analysed, compared with previous years. Three hundred eighty-four samples were examined as against 252 in 1951–52 and 202 in 1950–51. Government have sanctioned *one* additional post of Senior Assistant to cope with the increase in work, but no addition has been made to the very limited accommodation at the disposal of the Government Analyst. In order to enforce *stricter* control over the manufacture and sale of drugs, Government have appointed a number of Regional Drug Inspectors. But if the full benefits of the Drugs Act are to be enjoyed by the public, it is necessary that every drug that is manufactured and sold in the State should be brought under analytical control. The vital role of the analytical laboratory in the overall set up of drug control should be duly recognized and improvement in its facilities and in the status of its scientific staff should not be grudged.

Details about the number and nature of drugs received during the year are given in Table XV. Particulars of the samples reported as satisfactory and unsatisfactory are given in Tables XVI and XVII, respectively.

Table XV.

Particulars of drugs received under the Drugs Act.

	1952–53.					
	Total received.	Number not analysed.	Genuine.	Number below standard.	Number pending.	Percentage below standard.
	(1)	(2)	(3)	(4)	(5)	(6)
Proprietary preparations	41	6	17	16	2	48·6
Pharmaceutical preparations	51	1	20	30	..	60·0
Others	1*	..	..	..	..	..
Total ..	93	7	37	46	2	54·2

* Nagore Ammal Sogai Maruntha.

Table XVI.

Detailed particulars of proprietary drugs and pharmaceutical preparations under the Drugs Act reported satisfactory.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)
1 Tonic syrup of minerals and Vitamin B. 1.	Ferrous sulphate. Maganese sulphate. Total Phosphorous (P). Vitamin B-1.
2 Syrup Zingiberis B.P. 1948	Alcohol content.
3 Malt Extract with Shark Liver Oil ..	Vitamin A.
4 Eucalptus Oil I.P.L. 46	Specific gravity at 15·5°/15·5°. Optical rotation. Refractive Index at 20° solubility. Phellandrene and Aldehydes. Cineole content.
5 Santonin and Calomel 1/2 gr. each ..	Santonin. Calomel (Mercurous Chloried).
6 Cetagen tablets	Vitamin C (ascorbic acid),
7 Tinctura Opii (Campharate B.P. 48) ..	Morphine, calculated as anhydrous morphine, Benzoic acid and alcohol content.

Table XVI—*cont.*

Detailed particulars of proprietary drugs and pharmaceutical preparations under the Drugs Act reported satisfactory—cont.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)
8 Magnesii sulphas B.P.	Mag sulphate, Mg. SO_4 7 H_2O. Reaction, arsenic, iron lead. Zinc and chloride.
9 Eosinol	Pot. Iodide, Pot. Bromide. Ephedrine hydrochloride. Liq Arsenicalis.
10 Anti-streptococcal tablets	Melting point. Sulphanilamide content. Arsenic lead, and iron.
11 Tinctura Ipecacuanhae B.P. (Vinum Ipecacac).	Total alkaloids of ipecacuanha calcuted as Emetine. Alcohol content.
12 Websters phosphatum	Total hypophosphites as H_3PO_2. Calcium hypophosphite. Mag. hypophosphite. Glycerine.
13 Ramani's Baby Gripe	Sodium citrate. Sodium bicarbonate. Glycerin.
14 Anapyrin tablets	Acetyl Salicylic acid. Caffeine citrate. Phenacetin. Codeine phosphate.
15 Tinc. Aurantii B.P.	Alcohol content.
16 Tinc. Limonis B.P.	Do.
17 Tinctura Belladonnae B.P.	Alkaloids of belladonna herb calculated as hyoscyamine alcohol content.
18 Tinctura Opii camphorata B.P. ..	Morphine calculated as anhydrous morphine. Benzoic acid. Alcohol content.
19 Liquor strychine Hydrochlor B.P. ..	Strychnin $C_{21}H_{22}O_2N_2$. Alcohol content.
20 Asthmovin	Sodium iodide. Caffeine. Ephedrine hydrochloride. Coal tar dye.
21 Olive oil B.P.	Acid value. Iodine value. Refractive index at 40° C. Saponification value. Weight per ml. at 20°.
22 Glucose solution 50 per cent—25 c.c. ..	Dextrose.
23 Gluc-Vitamin D	Calcium gluconate. Vitamin C. Alcohol content.
24 Pot. Citras U.S.P. XIII	Solubility, identification. Free alkali, Tartarate. Heavy metals. Loss on drying at 180°. Pot. Citrate $K_3C_6H_5O_7$ on sample dried at 180°C.
25 Pure Olive oil (Suttons)	Acid value, iodine value. Refractive index at 40° C. Saponification value. Weight per ml. at 20° C.
26 Oleum Olive B.P.	Do.
27 Mehta's cough mixture	Pot. Guaia Col. Sulphonate. Cal. Hypophosphite. Amm. Benzoate, Ephedrine. Hydrochloride Syrups Codeine. Phosphate, Tincture Camphor Co.

TABLE XVI—*cont.*

Detailed particulars of proprietary drugs and pharmaceutical preparations under the Drugs Act reported satisfactory—cont.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)
28 Tinctura Cardamom Co. B.P. 1948 ..	Alcohol content. Coaltar dye present.
29 Spirituous Aetheris Nitrosi B.P. 1948 ..	Ethyl Nitrite, $C_2H_5O_2N$. Weight per ml. at 20° C. Alcohol content. Acidity.
30 Ascorbic acid (Vitamin C—50 mgms.) ..	Ascorbic acid (Vitamin C).
31 Calcidex	Calcium Hypophosphite. Potassium Guaiacol sulphonate. Glycerin.
32 Liquor Arsenicals B.P.	Arsenic Trioxide, As_2O_3.
33 Eucalyptus oil	B.P. Tests.
34 S R. Milk of Magnesia	Mag. Hydroxide. Arsenic, lead and sulphate.
35 Spirituous Aetheris Nitrosi B.P. 1948 ..	Ethyl Nitrite $C_2H_5O_2N$, alcohol content Acidity.
36 Do. ..	Do.
37 Calcium Gluconate 10 c.c. (10 per cent).	Calcium Gluconate.

TABLE XVII.

Particulars of Proprietary and Pharmacopoeial preparations under the Drugs Act reported unsatisfactory.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)	Strength declared on label or B.P. requirements. (3)	Result of analysis. (4)
1 Calomel (Hydrarg Sub Chloride).	Mercurous chloride.	0·25 gr.	19·2 per cent deficient.
2 Haemozyme (Liver Extract B Complex Restorative).	Vitamin C ..	50·0 mgs.	..
	Cal. Glycerophosphate.	2·0 grs.	..
	Ferrous chloride equivalent to Ferri et Amm. Citras.	15·0 grs.	58·6 per cent deficient.
3 Becophos (Patent).	Vitamin B-1 ..	10·0 mgs.	23·0 per cent deficient.
	Ascorbic acid ..	30·0 mgs.	..
	Sod. Glycerophosphate.	0·5 gr.	..
4 Vitagol Compound.	Vitamin A	1000 I. Units ..	326·0 per cent excess.
	Vitamin B-1 ..	1332 I. Units ..	..
	Vitamin C	400 I. Units ..	..
	Cal. Glycerophos ..	3·0 grs.	..
	Ferri et Amm. Citras	4·0 grs.	..
5 Meclovits (Multivitamin tablets).	Vitamin A	399 I. Units ..	..
	Vitamin C	11·9 mgs.	..
6 Vin. Ipecacuanhae B.P. 1914.	Alcohol content ..	Not less than 19·1 per cent v/v of Ethyl Alcohol.	
	Total alkaloids of Ipecacuanhae calculated as emetine.	0·1 per cent w/w ..	100·0 per cent deficient.

TABLE XVII—*cont.*

Particulars of Proprietary and Pharmacopoeial preparations under the Drugs Act reported unsatisfactory—cont.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)	Strength declared on label or B.P. requirements. (3)	Result of analysis. (4)
7 Garbhani (declared as Ayurvedic).	Mag. Sulphate ..	3·4 percent	Contains allopathic ingredients not declared.
	Alcohol	1·5 per cent.	
8 Spirituous Aetheris Nitrosi B.P.	Ethyl Nitrite $C_2H_5O_2N$.	Not less than 1·25 per cent w/v and not more than 2.5 per cent w/v of ethyl nitrite.	48·0 per cent deficient.
	Alcohol content ..	84 to 87 per cent v/v of Ethyl Alcohol.	
9 Tr. Ipecacuanhae (Messrs. Spencer & Co., Ltd.).	Alcohol content ..	20 to 24 per cent v/v of ethyl alcohol.	5·4 per cent deficient.
	Total alkaloids of Ipecacuanhae calculated as emetine.	0·095 to 0·105 per cent w/v.	47·4 per cent deficient.
10 Tr. Ipecacuanhae (Messrs. Alfred Berg & Co. (India), Ltd., Madras.	Alcohol content ..	20 to 24 per cent v/v of ethyl alcohol.	28·5 per cent excess.
	Total alkaloids of Ipecacuanhae calculated as emetine.	0·095 to 0·105 per cent w/v.	21·1 per cent deficient.
11 Spirituous Aetheris Nitrosi B.P. 1932.	Ethyl nitrite ..	Not less than 1·25 per cent w/v and not more than 2·5 per cent w/v of ethyl nitrite.	59·2 per cent deficient.
	Specific gravity 15·5/15.5.	0·838 to 0·842.	
	Alcohol content ..	84 to 88 per cent v/v of ethyl alcohol.	3·0 per cent deficient.
12 Bi-del-compound.	Total Glycerophosphate & Phosphates as P.	0·455 per cent w/v.	117·8 per cent excess.
	Free phosphate as P_2O_5.	Nil.	Found 1·3 per cent.
13 Spirituous chloroform B.P. 1948.	Alcohol content ..	84 to 87 per cent of ethyl alcohol.	..
	Wt. per ml. at 20°C.	0·856 to 0·862 g ..	Found only 0·848 grs.
14 Reso Cough Syrup (without Ephedrine).	Ammonium Benzoate.	2·5 grs.	57·2 per cent deficient.
	Pot. iodide ..	12·0 grs.	21·3 per cent deficient.
15 Bio-Sarasa (iodised Sarasaparilla).	Sod. salicylate ..	30·0 grs.	14·3 per cent deficient.
16 Elixir Provitone.	Ferri et Amm. citrate.	20·0 grs.	..
	Cal. Glycerophosphate.	4·0 grs.	..
	Total Phosphorous as P_2O_5.	0.176 grs.	..
	Vitamin B-1 ..	389 mgs.	95·1 per cent deficient.
17 Liquid Extract of Kamala.	Alcohol content ..	88·1 per cent v/v was present.	..

TABLE XVII—*cont.*

Particulars of Proprietary and Pharmacopoeial preparations under the Drugs Act reported unsatisfactory—cont.

Serial number and name of drug.	Name of the ingredients estimated.	Strength as declared on label or B.P. requirements.	Result of analysis.
(1)	(2)	(3)	(4)
18 Tinc. Zingiberis Mitis P.B.	Alcohol content ..	88 to 90 per cent v/v.	..
	Total solids ..	Not less than 0·45 per cent.	0·08 per cent w/v was present.
19 Tinc. Limonis P.B.	Alcohol content ..	48 to 54 per cent w/v.	
	Coal tar dye present		
20 Tinc. Zingiberis B.P.	Alcohol content ..	88 to 90 per cent v/v.	
21 Spirituous Aetheris Nitrosi B.P. 1932.	Ethyl Nitrite ..	Not less than 1·25 per cent w/v and not more than 2·50 per cent w/v of ethyl nitrite.	91·0 per cent deficient.
	Alcohol content ..	84 to 88 per cent v/v of ethyl alchol.	9·5 per cent deficient.
22 Elixir Vitamin B Complex.	Thiamine hydrochloride ..	30·0 mg.	17·6 per cent deficient.
	Riboflavin.	2·0 mg.	
	Nicotinic acid ..	100·0 mg.	
	Alcohol	14 to 15 per cent v/v.	
23 Tinc. Capsici B.P.	Alcohol content ..	57 to 60 per cent v/v.	
	Alcohol soluble extractive.	1·0 to 1·25 per cent of w/v as calculated from the figures for capsicum BP.	65·0 per cent deficient.
24 Tinc. Cardamomi Co., B.P.	Alcohol content ..	52 to 57 per cent v/v.	
	Cochineal	Absent	
25 Spirituous Aetheris Nitrosi B.P. 1948.	Ethyl Nitrite ..	Not less than 1·25 per cent w/v and not more than 2·5 per cent w/v of ethyl nitrite.	91·0 per cent deficient.
	Alcohol content ..	84 to 87 per cent v/v of ethyl alcohol.	36·3 per cent deficient.
26 Linimentum Saponis B.P.	Soap	8 per cent w/v of soft soap.	61·1 per cent deficient.
	Industrial methylated spirit.	61 td 65 per cent v/v.	
27 Tinc. Benzoin Co. B.P.	Total Solids ..	Not less than 18·0 per cent w/v,	65·0 per cent deficient.
	Alcohol content ..	70 to 77 per cent v/v of ethyl alcohol.	Contains only methyl alcohol.
28 Spiritus Aetheris Nitrosi B.P.	Ethyl Nitrite ..	Not less than 1·25 per cent w/v and not more than 2·5 per cent w/v of Ethyl Nitrate.	40·0 per cent deficient.
	Alcohol content ..	84 to 87 per cent v/v of Ethyl alcohol.	5·8 per cent deficient.
29 Tinc. Zingiberis B.P.	Alcohol content ..	88 to 90 per cent v/v.	6·0 per cent deficient.
	Total Solids ..	0·45 per cent w/v as calculated from powdered ginger B.P.	77·8 per cent deficient.
30 Tinc. Pruni Vieginiane B.P.	Alcohal content ..	45 to 50 per cent v/v.	40·8 per cent excess.
	Glycerine	10·0 per cent v/v ..	100·0 per cent deficient.
31 Tinc. Zingiberis B.P.	Alcohol content ..	88 to 90 per cent v/v.	6·4 per cent deficient.

TABLE XVII—*cont.*

Particulars of Proprietary and Pharmacopoeial preparations under the Drugs Act reported unsatisfactory—cont.

Serial number and name of drug.	Name of the ingredients estimated.	Strength as declared on label or B.P. requirements.	Result of analysis.
(1)	(2)	(3)	(4)
32 Tinc. Aurantii B.P.	Alcohol content ..	73 to 78 per cent v/v.	13·7 per cent deficient.
33 Tinc. Zingiberis Mitis B.P. 1948.	Do. ..	88 to 90 per cent v/v.	28·8 per cent deficient.
34 Tinc. Aurantii B.P. 1948.	Do. ..	73 to 78 per cent v/v.	10·5 per cent deficient.
	Coal tar dye present'		
35 Spirituous Chloroformi B.P.	Do. ..	84 to 87 per cent v/v ethyl alcohol.	8·1 per cent deficient.
	Weight per c.c. at 28°C.	0·856 to 0·862 g ..	Found 0·878.
36 Tinctura Hyoscyami B.P.	Alkaloids of Hyoscyamus calculated as Hyoscyamine.	0·0045 to 0·0055 per cent v/v.	84·4 per cent deficient.
	Alcohol content ..	66 to 71 per cent v/v.	..
37 Siris Cough Mixture.	Pot. Guaiacol Sulphonate.	15·0 gr.	
	Cal. Hypophosphite	5·0 gr.	0·263 per cent w/v.
	Amm. Benzoate	1·5 gr.	..
	Excess Benzoic acid (free and combined.	present	
38 Tinctura Buchu B.P.C. 1934.	Alcohol content ..	55 to 59 per cent v/v.	..
	Coal tar dye present.		
39 Tinctura Valerianæ Simplex B.P.C. 1934.	Alcohol content ..	55 to 58 per cent v/v.	..
		Coal tar dye present.	
40 Tinctura Zingiberis B.P.	Alcohol content ..	88 to 90 per cent v/v.	
	Total Solids ..	0·45 per cent w/v ..	55·5 per cent deficient.
	Coal tar dye present)		
41 Nervital ..	Ferri et Amm. Citras.	13·0 gr.	54·9 per cent deficient.
42 Spirituous Aetheris Nitrosi B.P. 1948.	Ethyl Nitrite $C_2H_5O_2N$.	Not less than 1·25 per cent w/v and not more than 2·5 per cent w/v of Ethyl Nitrate $C_2H_5O_2N$.	98·2 per cent deficient.
43 Spirituous Aetheris Nitrosi B.P.	Ethyl Nitrite $C_2H_5O_2N$)	Do.	..
	Weight per ml at 20°.	0·833 to 0·837 g ..	Found 0·845 g.
	Alcohol content ..	84 to 87 per cent v/v of Ethyl Alcohol.	2·5 per cent deficient.
44 Liq. Ext. of Kamala.	Alcohol content ..	70·0 per cent v/v ..	
	Total Solids ..		
	Coal tar dye present.		
45 Do.	Alcohol content ..	..	..
	Total Solids ..	..	..
	Coloring matter (Coal tar dye present.)	..	..
46 Tinctura Scillæ B.P. 1941.	Alcohol content ..	52 to 57 per cent v/v.	
	Alcohol soluble extractive.	6·5 per cent w/v calculated from the percentage of alcohol (60 per cent soluble extractive for Scillæ B.P.	77·0 per cent deficient.

The spotlight this year (1952–53) is on Tinctures and other alcoholic galenicals which have assumed great importance in view of the Prohibition Act. It is an open secret that alcohol coloured with Coal Tar Dye intended for the delection of the alcohol addict is sold under the name of the B.P. and B.P C. tinctures. Racketeers in this lucrative line have displayed remarkable initiative and have exhumed obsolete recipes. Out of 40 of these tinctures examined this year only nine were genuine. These tinctures are a problem for the Analyst; for, in the case of many of them the Pharmacopoeias have prescribed no standards other than alcohol content, so that an unscrupulous drug manufacturer can bottle alcohol and sell it as a tincture, and with some outdated pharmacopoeia as his authority and the services of a lawyer make the analyst look silly. Most of the tinctures received this year have been reported as *Unsatisfactory* on the ground that they contained coal-tar colors; but there is a clamour for a *Carte Blanche* in the use of colour in foods and Drugs and it remains to be seen whether the only legal ground on which we have been able to control what is to all intents and purpose *ersatz* liquor will vanish.

The whole question of tinctures should, in my opinion, be reviewed. The majority of these preparations are a relic of the past when therapeutics was in a primitive stage and they have now outlived what little utility they possessed at any time. It would be no exaggeration to say that with the exception of Ergot, Opium Ipecac and a few other alkaloidal tinctures, these alcoholic preparations may be thrown down the sink and medicine would be none the poorer thereby. One wonders whether any doctor nowadays prescribes Tr. Capsici or Cubeba or Buchu and when one finds such preparations flooding the market, it is almost a certainty that they are not intended for therapeutic use. It is necessary to impose severe restrictions on the manufacture of these tinctures. It is also necessary to carry out investigations on such of those tinctures for which the Pharmacopoeias do not prescribe any means of identification or assay with a view to fixing analytical standards such as Specific gravity, total solid content, etc.

Among proprietory preparations examined this year under the Drugs Act three samples were difficient in Vitamin B, Becophos (23 per cent), Provitone (95·0 per cent and Elixir Vitamin B Complex (17·6 per cent). Manufacturers would be well advised to investigate the stability of Vitamin B-1 under their conditions of manufacture and devise methods of conserving it. A sample of bi-del-compound contained a considerable quantity of free phosphoric acid which was not declared on the label. This was probably intended to keep one of the ingredients, calcium glycerophosphatem in solution. Whatever the purpose, the presence of every ingredient whether potent or not should be disclosed to help the analyst in his task.

A sample of unusual interest was "Garbhani" described as "Ayurvedic", "non-alcoholic" and "a special combination of very effective allopathic drugs whose properties were hitherto unknown". (The allopathic drug turned out to be Magnesium Sulphate (15·0 gr. per oz.). This ideal tonic for all expectant mothers contained in addition 1·5 per cent v/v of alcohol. Another drug called "Nagore Ammal Sogai Marunthu" from Nagore was found to consist of about two parts of iron oxide and one part of silica with a trace of manganese di-oxide. Preparations of this nature are a menace to the public, but they are a problem for the drug analyst because they enjoy the immunity afforded to Ayurvedic and Unani medicines under the Act. Nor can they be classified as poisons. Advocates of the indigenous systems of medicine would do well to ponder over this aspect of the question and devise standards of purity for the so called indigenous drugs so that sand or rust may not be sold to the public as Ayurvedic specialities.

Drugs from Government hospitals and other Government institutions.

Of two hundred and seventy-five drugs received from Government hospitals and Government institutions, 266 were analysed. Particulars of these are given in Table XVIII.

TABLE XVIII.

Drugs received from Government hospitals and Government institutions.

Serial number and name of drug. (1)	Name of the ingredients estimated. (2)	Strength as per B.P. or as declared on the label. (3)	Result of analysis. (4)
	Government General Hospital, Madras.		
1 Paraffin Molle Flavum.	Solubility. Acidity. Fixed Oils. Resin and Sap. Foreign matter. Yellow coloring matter and Ash.	....	Conforms to B.P. Specifications.
2 Olive Oil ..	Solubility .. .. Acid Value. Iodine Value. Refractive index at 40°. Sap. Value	....	B.P. Quality.
3 Pot. Citras ..	Solubility .. Oxalate Tantarate Chloride Acidity Sulphate	....	Does not conform to B.P. Specifications.
4 Liq. Saponis Aetheris.	Alcohol ..	5·0 per cent	325·3 per cent excess.
B.P.C. 1949 ..	Oleic Acid	0 per cent	.. 85·2 per cent deficient.
	Alcohol	70 [illegible]	.. 2·7 per cent deficient.
5 Tr. Benzoin Co B.P. ..	Total acids. Balsamid	4·92 per cent	.. 97·5 per cent deficient.
6 Urea Stibamine.	Tests for Identity purity and Assay for Antimony.	....	Conforms to I.P.L. Standards (38·9 per cent.
7 Pot. Citras ..	Chloride .. .. Tartarate. Assay.	....	Does not conform to B.P. Specifications.
8 Mist. Quinine Sulph.	Quinine Sulphate .. Acid Su ph. dil ..	10·0 grs. .. 15·0 min. ..	.. Correct. .. 76·0 per cent excess.
9 Mist. Tota Quinine,	Total Quinine .. Acid Hydrochloric dil.	5·0 grs. .. 10·0 min. ..	.. 26·0 per cent deficient. .. 36·0 per cent deficient.
10 Mist. Carminativa.	Soda Bicarb .. Spt. Am. Arom. ..	15·0 grs. .. 15·0 min. ..	.. 62·0 per cent deficient. .. 58·0 per cent deficient.
11 Mist. Asthmatica.	Pot. Iodide .. Pot. Bromide ..	5·0 grs. .. 10·0 grs. ..	.. Correct. .. 12·0 per cent deficient.
12 Mist. Carminativa.	Sod. Bicarb .. Spts. Amm. Arom.	15·0 grs. .. 15 0 min. ..	.. 62·0 per cent deficient. .. 53·3 per cent deficient.
13 Atropine Solution.	Atropine Sulphate.	1/100 gr. in 1 c.c. ..	Correct.
14 Atropine Injection.	Do. ..	Do. ..	Do.
15 Mist. Alk. Belladonnæ.	Quantity insufficient for complete analysis.		
	Government Stanley Hospital, Madras.		
16 Mist. Quinine Sulphas.	Quinine Sulph. .. Citric Acid	5·0 grs. .. 10·0 grs. ..	.. Correct. .. 54·0 per cent deficient.
17 Mist. Kaolin et Bismuth.	Bismuth Carb .. Soda Bicarb .. Kaolin	10·0 grs. .. Do. .. Do. ..	.. 60·0 per cent deficient. .. 48·0 per cent deficient. .. 26·0 per cent deficient.
18 Mist. Ferri et Amm. Citras.	Ferri et Amm. Citras. Glycerin	15·0 grs. .. 15·0 min. ..	.. 19·0 per cent excess. .. 18·0 per cent excess.

TABLE XVII.—*cont.*

Drugs received from Government hospitals and Government institutions.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)	Strength as declared on label or B.P. requirements (3)	Result of analysis. (4)
	Government Royapetta Hospital, Madras.		
19 Mist. Tota Quinine.	Tota Quinine ..	5·0 grs.	60·0 per cent excess.
	Acid Sulph. dil ..	10·0 ms.	2!7·0 per cent excess.
20 Mist. Soda Salicylas.	Soda Salicylas ..	10·0 grs.	23·4 per cent excess.
	Soda Bicarb ..	Do.	Correct.
	Spts. Amm. Aromatic.	15·0 ms.	24 0 per cent deficient.
21 Mist. Soda Iodide (Dis.)	Sod. Iodide ..	10·0 grs.	17·0 per cent deficient.
	Soda Bicarb ..	Do.	Correct.
	Spts. Amm. Aro.	10·0 mins.	40·0 per cent excess.
22 Mist. Ferri et Amm. Citrae (Dis.)	Ferri et Amm. Citras.	15·0 grs.	Correct.
23 Mist. Sod. Iodide (Wards).	Sod. Iodide ..	10·0 grs.	Do.
	Soda Bicarb ..	Do.	31·0 per cent excess.
	Spts. Amm. Aro. ..	10·0 ms.	38 0 per cent excess.
24 Mist. Ferri et Amm. Citras (Wards).	Ferri et Amm. Citras.	15·0 grs.	Correct.
25 Mist. Pot. Bromide (Ward).	Pot. Bromide ..	10·0 grs.	16.0 per cent excess.
26 Mist. Pot. Bromide (Dis).	Do. ..	10·0 grs.	Do.
27 Mist. Oleum Ricini (Ward).	Oleum Ricini ..	1 dram	Correct.
28 Do. Ward).	Do. ..	1 dram	14·0 per cent deficient.
29 Mist. Diaphortica (Dis.)	Pot. Nitras ..	5·0 grs.	Correct.
	Sol. of Amm. Citrate.	2 fl. dms.	100·0 per cent deficient.
	Spts. Amm. Arom.	10·0 mins.	437·0 per cent excess.
	Spts. Aetheris Nitrosi.	Do.	90·0 per cent excess.
30 Do. (B. Ward).	Pot. Nitras ..	5·0 grs.	82·0 per cent excess.
	Soln. of Amm. Citrate.	2 fl. dm.	100·0 per cent deficient.
	Spts. Amm. Arom.	10·0 mins.	440·0 per cent excess.
	Spts. Aetheris Nitrosi.	Do.	70·0 per cent excess.
31 Mist. Calci Chloride (Dis.)	Cal. Chloride ..	10·0 grs.	36·0 per cent deficient.
32 Do. (B. Ward).	Do. ..	Do.	32·0 per cent deficient.
33 Mist. Carminativa (Dis.)	Soda Bicarb ..	10·0 grs.	Correct.
	Spts. Amm. Arom.	10·0 mins.	23·0 per cent deficient.
34 Mist. Carminative (B. Ward).	Soda Bicarb ..	10 0 grs.	Correct.
	Spts. Amm, Arom.	10·0 Mins.	19·0 per cent deficient.
35 Mist Asthmatica (Dis).	Pot. Iodide. ..	2·5 grs.	16·0 per cent deficient.
	Pot. Bromide ..	5·0 grs...	Correct.
	Amm. Carb.. ..	3·0 grs.	20·0 per cent deficient.
36 Mist. Asthmatica (B. Ward).	Amm. Carb. ..	3·0 grs.	20 per cent deficient.
	Pot. Iodide.. ..	2·5 grs.	Correct.
	Pot. Bromide ..	5·0 grs.	Do.
37 Mixture Quinine Sulphate (Dis).	Quinine Sulph ..	5·0 grs.	Do.
	Acid Sulph dil ..	10·0 M.	207·0 per cent excess.
38 Mixture Quinine Sulphate (Dis) (A. Ward).	Quinine Sulph ..	5·0 grs.	Correct.
	Acid Sulph dil ..	10·0 M.	203·0 per cent excess.

TABLE XVIII.—*cont.*

Drugs received from Government hospitals and Government institutions.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)	Strength as declared on label or B.P. requirements. (3)	Result of analysis. (4)
	Government Royapetta Hospital, Madras—cont.		
39 Mixture Bromide (Dis).	Pot. Bromide ..	7·5 grs.	Correct.
	Sod. Bromide ..	7·5 grs.	Do.
40 Mixture Bromide (Dis) (A. Ward).	Pot. Bromide ..	7·5 grs.	Do.
	Sod. Bromide ..	7·5 grs.	Do.
41 Potassi Iodide (Dis).	Pot. Iodide.. ..	10·0 grs.	Do.
	Sod. Bicarb.. ..	10·0 grs.	15·0 per cent deficient.
	Spts. Amm. Arom.	10·0 M.	14·0 per cent deficient.
42 Potassi Iodide (Dis) (A. Ward).	Pot. Iodide.. ..	10·0 grs.	Correct.
	Sod. Bicarb ..	10·0 grs.	15·0 per cent deficient.
	Spts. Amm. Arom.	10·0 M.	Correct.
	Government Hospital for Women and Children, Egmore, Madras.		
43 Mist. Carminativa	Soda Bicarb ..	10·0 grs.	Correct.
	Spts. Amm. Arom.	10·0 Ms.	Do.
44 Mix. Soda Salicylas.	Soda Salicylas ..	5·0 grs.	39·0 per cent excess.
	Soda Bicarb ..	5·0 Ms.	30·0 per cent excess.
	Spts. Amm. Arom.	5·0 Ms.	Correct.
45 Glucose Solution Ampoules.	Dextrose	25·0 per cent ..	Satisfactory.
46 Calcium Gluconate ampoules.	Calcium Gluconate	10·0 per cent	Do.
47 Normal Saline Ampoules.	Sodium Chloride ..	0·89 to 0·91 per cent (B.P. Limits).	Do.
48 Vit. Bl. Ampoules	Vitamin B. 1 ..	25·0 mgs/c.c.	Do.
49 Vit. C Ampoules	Sod. Ascorbate ..	100 mg/c.c.	15·2 per cent deficient.
50 Olive Oil	Conforms to the B. P. specifications.		
51 Mist. Ferri et Amm. Citras.	Ferri et .. .. Amm. Citras ..	10·0 grs.	19·0 per cent excess.
52 Mist. Ferri Sulphas.	Ferri Sulphas Exsc.	1·5 grs.	33·0 per cent excess.
	Acid Sulph. dil ..	5·0 Ms.	18·0 per cent excess.
53 Vitamin C (Tablets).	Vitamin C	50·0 mgs/tab	Satisfactory.
54 Vitamin C (Amps)	Do.	100·0 mgs/c.c. ..	21·0 per cent deficient.
55 Vitamin B. Amps.	Vitamin B. 1 ..	25·0 mgs/c.c.	Satisfactory.
56 Vitamin B Complex Tablets.	Do. ..	3·0 mgs.	21·0 per cent deficient.
	Vitamin B-2 ..	0·5 mgs.	46·0 per cent excess.
	Nicotinamido ..	2·5 mgs.	45·2 per cent deficient.
57 Paraldehyde ..	Does not conform to B. P. specifications.		
58 Do. ..	Conforms to B. P. Specifications.		
59 Mist. Ferri et Amm. Citras.	Ferri et .. .. Amm. Citras. ..	5·0 grs.	Correct.
60 Mist. Influenza..	Soda Salicylas ..	10·0 grs.	18·0 per cent deficient.
	Soda Bicarb ..	10·0 grs.	33·0 per cent deficient.
	Total Ammonia as NH_3 (calculated) ..	18·0 grs.	20·6 per cent deficient.
61 Mist. Soda Salicylas.	SodaSalicylas ..	5·0 grs.	Correct.
	Soda Bicarb ..	5·0 grs.	Do.
	Spts. Amm. Arom.	5·0 Mins.	Do.
62 Yeast Tablets ..	Thiamine .. .. Hydrochloride ..	0·1 mg. .. .. Per gram	90·2 per cent deficient.

TABLE XVIII—*cont.*

Drugs received from Government Hospitals and Government Institutions—cont.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)	Strength as per B.P. or as declared on the label. (3)	Result of analysis. (4)
	Government Hospital for Women and Children, Egmore, Madras—cont.		
63 Mist. Influenza ..	Soda Salicylas ..	10·0 grs.	12·0 per cent deficient.
	Soda Bicarb ..	10·0 grs.	Correct.
	Total ammonia calculated from the amounts of Amm. Carb. Liq. Amm. Acetatis, Spts. Am. Arom. in the mixture.	18·0 grs.	16·7 per cent excess.
64 Mist. Ferri et Amm. Citras.	Ferri et. Amm. Citras.	.. .. .. 10·0 grs.	59·0 per cent deficient.
65 Mist. Influenza ..	Soda Salicylas ..	10·0 grs.	59·0 per cent excess.
	Soda Bicarb ..	10·0 grs.	59·0 per cent excess.
	Total ammonia per oz. from Amm. Carb Liq. Am., Acetatis (dil) and Sp. Am. Aromaticus.	18·0 grs.	70·0 per cent excess.
66 Ferri et Amm. Citras.	Iron Ammonium Citrate.	10·0 grs.	30·0 per cent deficient.
67 C-B. Complex Tablets.	Vitamin C	20·0 mg.	100·0 per cent deficient.
	Kasturba Gandhi Hospital for Women and Children, Madras.		
68 Mist. Ferri et. Amm. Citrate.	Ferri et Amm. Citrate.	15·0 grs.	Correct.
69 Mist. Oleum Morrhauae.	Deficient in oil to the extent of 29·0 per cent ; A mixture of Sharkliver oil and Groundnut oil and not Cod Liver oil.		
70 Sharkliver Oil ..	A mixture of Sharkliver oil and Groundnut oil.		
71 Trilene	The quantity sent was only 2 ounce which was insufficient for all the tests to be conducted.	....	....
72 Aether ..	Satisfactory ..	....	....
73 Mix Quinine Sulph.	Quinine Sulph ..	5·0 grs.	31·0 per cent deficient.
	College of Indigenous Medicine, Madras.		
74 Cocaine Hydrochloride.	Found to be a mixture of 33·8 per cent Cocaine Hydrochloride and 66·2 per cent Sodium Bicarbonate.	....	....
	Government Raja Sir Ramaswami Mudaliar Lying-in Hospital, Madras.		
75 Mist. Quinine Sulphate.	Quinine Sulph ..	6·67 grs.	28·0 per cent deficient.
76 Mist. Heporal.	Shark Liver Oil ..	1 dram	50·0 per cent deficient.
	Cal. Lactate ..	10 grs.	23·0 per cent excess.

TABLE XVIII—*cont.*

Drugs received from Government Hospitals and Government Institutions—cont.

Serial number and name of drugs. (1)	Name of ingredients estimated. (2)	Strength as per B.P. or as declared on the label. (3)	Result of analysis. (4)
	Government Dispensary, Saidapet, Madras-15.		
77 Quinine Mix ..	Quinine Sulph ..	5·0 grs.	Correct.
78 Mist. Sodii Salicylas.	Soda Salicylas ..	10·0 grs.	16·0 per cent excess.
	Soda Bicarb ..	10·0 grs.	Correct.
79 Mist. Quinine.	Quinine Sulphate ..	5·0 grs.	Do.
	Acid Sulph. dil ..	....	....
80 Mist. Soda Salicylas.	Soda Salicylas ..	10·0 grs.	Correct.
	Soda Bicarb ..	10·0 grs.	Do.
81 Mist. Pot. Iodide.	Pot. Iodide ..	5·0 grs.	22·0 per cent excess.
	Soda Bicarb ..	10·0 grs.	Correct.
	Spts. Amm. Arom.	20·0 ms.	76·5 per cent deficient.
	Diagnostic Section, King Institute, Guindy.		
82 Calcium Gluconate	Calcium Gluconate.	5·0 per cent	Correct strength.
83 Calcium Gluconate	Do.	5·0 per cent	Do.
84 Calcium Gluconate	Do.	5·0 per cent	Do.
	Assistant Director (Stores), King Institute, Guindy.		
85 Hydrochloric Acid.	Does not satisfy the B.P. Requirements.	....	....
86 Aether Pharmaceutical.	Does not conform to B.P. Specifications.	....	....
87 Aether ..	Satisfactory.	....	....
88 Distilled water.	Conforms to B.P. Specifications.	....	....
	Government Analyst (Drugs Special), King Institute, Guindy.		
89 Sodium Citrate Ampoules ..	Sodium .. .. Citrate	.... 3·0 per cent	.... Correct.
90 Nikethamidum.	Standard quality.	....	....
91 Calcium Gluconate ..	....	10·0 per cent ..	Standard quality.
92 Quinine Bi-Hydrochloride.	The Strength is 3·5 grs. per ml.	....	....
93 Pentothal Sodium.	Satisfactory.	....	....
	Director of Medical Services, Madras.		
94 Sulphamezathine Tablets ("A")	Conforms to the B.P. Addendum 1951 requirements for Tabellae Sulphadimidine.	....	....
95 Sulphamazathine Tablets ("B").	Do.	....	

TABLE XVIII—*cont.*

Drugs received from Government Hospitals and Government Institutions—cont.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)	Strength as per B.P. or as declared on the label. (3)	Result of analysis. (4)
	King George Hospital, Visakhapatnam.		
96 Mist. Pot. Iodide.	Pot. Iodide ..	10·0 grs.	13·0 per cent excess.
	Amm. Carb. ..	4·0 grs.	62·5 per pent excess.
97 Mist Alkalinc. Diuretica ..	Pot. Citras ..	15·0 grs.	31·0 per cent deficient.
	Soda Bicarb ..	10·0 grs.	15·0 per cent deficient.
98 Mist. Pot. Bromide.	Pot. Bromide ..	5·0 grs.	Correct.
	Amm. Bromide ..	5·0 grs.	Do.
99 Tincture Digitalis ..	Alcohol	65–70 per cent	4·6 per cent deficient.
100 Tr. Quinine Ammoniata ..	Quinine	2 per cent w/v (limits 1·9 to 2·1 per cent..	14·3 per cent excess.
	Sulphate		
	Ammonia as NH_3 ..	1 per cent w/v (limits 0·9 to 1·05).	22·0 per cent deficient.
	Alcohol Content ..	55 per cent 54 per cent v/v.	Correct.
101 Mist. Quinine. Sulphas ..	Quinine		
	Sulphas	7·5 grs.	Correct.
	Acid Sulph. dil ..	10 Ms.	Do.
102 Mist. Soda Salicylas ..	Soda Salicylas ..	10 grs.	Do.
	Soda Bicarb ..	5 grs. ..	Do.
103 Mist. Pot. Iodide.	Pot. Iodide ..	10·0 grs.	Do.
	Amm. Carb ..	4·0 grs.	Do.
104 Mist. Diaphoretica.	Pot. Nitras ..	10·0 grs.	Do.
	Spts. Aetheris Nitrosi.	20·0 Mins.	Do.
	Liq. Amm. Acetas dil.	2 drams.	Do.
105 Mist. Triple Sulph.	Quinine Sulph	2 gr.	Correct.
	Ferri Sulphas	2 grs.	85 per cent excess.
	Acid Sulph dil	10 grs.	58 per cent excess.
	Mag. Sulphas ..	1 dram	Correct.
106 Vitamin B-1 (A).	Vitamin B-1 ..	50·0 mgs.	Standard quality.
107 Vitamin B-1 (B).	Vitamin B-1 ..	50·0 mgs.	do.
108 Vitamin B-1 (C).	Vitamin B-1 ..	5·0 mgs.	do.
109 Mist. Quinine Sulphas.	Quinine Sulph. ..	7·5 grs.	Correct.
	Acid Sulph. dil ..	10·0 Mins.	69·0 per cent excess.
110 Mist. Alkaline Diuretica.	Pot. Citras ..	15·0 per cent grs.	Correct.
	Sod. Bicarb ..	10·0 grs.	Do.
111 Mist. Pot. Bromide.	Pot. Bromide ..	5·0 grs.	Do.
	Amm. Bromide ..	5·0 grs.	Do.
112 Mist. Soda Salicylas.	Soda Salicylas ..	10·0 grs.	Do.
	Soda Bicarb ..	5·0 grs.	Do.
113 Mist. Hepatica.	Quinine Sulph	2·0 grs.	Do.
	Amm. Chloride	20·0 grs.	Do.
	Acid Nitro hydrochloride dil.	10·0 mins.	Do.
114 Mist. Pot. Iodide.	Pot. Iodide ..	10·0 grs.	Do.
	Amm. Carb. ..	4·0 grs.	49·0 per cent excess.
115 Mist. Alkaline Belladonna.	Sodi Bicarb ..	20·0 grs.	Correct.

TABLE XVIII—*cont.*

Drugs received from Government Hospitals and Government Institutions—cont.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)	Strength as per B.P. or as declared on the label. (3)	Result of analysis. (4)
	King George Hospital, Visakhapatnam—cont.		
116 Mist. Pot. Iodide.	Amm. Carb ..	4·0 grs.	27·5 per cent excess.
	Pot. Iodide. ..	10·0 grs.	Correct.
117 Mist. Soda Salicylas.	Sod. Salicylate ..	10·0 grs.	Do.
	Sod. Bicarb ..	5·0 grs.	Do.
118 Mist. Quinine Sulph.	Quinine Sulphate	7·5 grs.	Do.
	Acid Sulph dil.	10·0 mins.	156·0 per cent excess.
119 Mist. Triple Sulph.	Quinine Sulphate	2·0 grs.	55·0 per cent deficient.
	Ferri Sulphas ..	2·0 grs.	15·0 per cent deficient.
	Acid Sulph dil ..	10·0 mins.	57·0 per cent deficient.
	Mag. Sulphas ..	1.0 dram.	14·0 per cent deficient.
120 Mist. Soda Salicylas.	Soda Salicylate ..	10·0 grs.	28·0 per cent deficient.
	Sod. Bicarb ..	5·0 grs.	22·0 per cent deficient.
121 Mist. Pot. Bromide.	Pot. Bromide ..	5·0 grs.	26·0 per cent deficient.
	Amm. Bromide ..	5·0 grs.	22·0 per cent deficient.
122 Mist. Alkaline Diuretica.	Pot. Citrate ..	15·0 grs.	41·2 per cent deficient.
	Sod. Bicarb ..	10·0 grs.	Correct.
123 Glucose 25 per cent 25 c.c.	Dextrose ..	25 per cent w/v	Satisfactory.
	Heavy metals ..	Conforms to U.S.P. Limits.	
124 Vitamin B. Complex tablets.	Vitamin B-1 ..	5·0 mg.	28·0 per cent deficient.
125 Mist. Quinine Sulphas.	Quinine Sulphate	7.5 grs.	22·7 per cent deficient.
	Acid Sulph dil ..	10·0 Ms.	76·0 per cent excess.
126 Mist. Quinine Sulphas.	Quinine Sulphas.	7·5 grs.	14·7 per cent excess.
	Acid Sulph dil ..	10·0 Ms.	22·0 per cent excess.
	Government Pentland Hospital, Vellore.		
127 Mist. Quinine OP.	Quinine Sulphas ..	5·0 grs.	32·0 per cent deficient.
	Acid Sulph dil ..	5·0 mins.	11·0 per cent excess.
128. Mist. Soda Salicylas.	Soda Salicylas ..	10·0 grs.	Correct.
	Sod. Bicarb ..	10.0 grs.	67·0 per cent deficient.
	District Medical Officer, Ramanathapuram.		
129 Mist. Soda Salicylas.	Sod. Salicylate ..	5·0 grs.	104·0 per cent excess.
	Sod. Bicarb ..	5·0 grs.	16·0 per cent excess.
130 Mist. Asthmatica.	Pot.Iodide ..	3·0 grs.	200·0 per cent excess.
	Amm. Carbonate.	2·0 grs.	145·0 per cent excess.
	Pot. Bromide ..	5·0 grs.	42·0 per cent deficient.
	Civil Assistant Surgeon, Government Hospital, Amalapuram.		
131 Mist. Diaphoretica,	Spts. Aetheris Nitrosi. ..	10·0 mins.	470·0 per cent excess.
	Liq. Amm. Acetatis Fortis.	20·0 mins.	Correct.
	Pot. Citrate ..	10 grs.	67·0 percent deficient.
132 Mist. Asthmatica.	Pot. Iodide ..	5 grs.	24·0 per cent excess.
	Sod. Bromide ..	115 grs.	Correct.
	Amm. Carb ..	10 grs.	48·0 per cent excess.
133 Mist. Carminativa.	Sod. Bicarb ..	15 grs.	Correct.
	Spts. Amm. Arom.	15 mins.	Do.

TABLE XVIII—*cont.*

Drugs received from Government Hospitals and Government Institutions—cont.

Serial number and name of drugs. (1)	Name of ingredients estimated. (2)	Strength as per B.P. or as declared on the label. (3)	Results of analysis. (4)
	District Medical Officer, Kurnool.		
134 Mist. Oleum Ricine.	Castor Oil ..	2 drams.	72·0 per cent deficient.
135 Mist. Quinine.	Quinine Sulph ..	5·0 grs.	30·0 per cent excess.
	Erskine Hospital, Madurai.		
136 Mist. Quinine Sulphas.	Quinine Sulphas ..	10·0 grs.	13·0 per cent deficient.
137 Tr. Ipecac contained in green bottle.	Alcohol content.	20 to 24 per cent v/v.	50·0 per cent excess.
	Total alkaloids of Ipecacuhae calculated as emetine.	0·095 per cent w/v ..	72·6 per cent deficient.
138 Tr. Ipecac (2nd bottle).	Alcohol content ..	.. ..	10·0 per cent deficient.
	Total alkaloids of Ipecacuanha calculated as emetine.	Contains a coal tar dye.	4·2 per cent deficient.
	Director of Industries and Commerce, Madras.		
139 Strychnine ..	Does not conform to B.P.C. Specifications.		
	Government Headquarters Hospital, Ootacamund.		
140 Mist. Quinine Sulphate.	Quinine Sulph. ..	10 grs.	Correct.
	Acid Sulph. dil. ..	10 mins.	93·0 per cent excess.
141 Mist. Pot. Iodide.	Pot. Iodide ..	20 grs.	51·5 per cent deficient.
	Sod. Bicarb ..	20 grs.	48·0 per cent deficient.
	Spts. Amm. Arom.	20 mins.	Correct.
142 Mist. Quinine Sulph.	Quinine Sulph. ..	10 grs.	14·0 per cent deficient.
	Acid Sulph. dil. ..	10 mins.	13·0 per cent excess.
143 Mist. Pot. Iodide.	Pot. Iodide ..	20 grs.	21·5 per cent deficient.
	Spts. Amm. Arom.	20 mins.	43·0 per cent excess.
	Sod. Bicarb ..	20 grs.	59·0 per cent deficient.
144 Mix. Quinine Sulph.	Quinine Sulph. ..	10 grs.	Correct.
	Acid Sulph. dil. ..	10 mins. .. .	24·5 per cent excess.
145 Mist. Pot. Iodide.	Pot. Iodide ..	20 grs.	15·5 per cent excess.
	Sod. Bicarb ..	20 grs.	40·5 per cent excess.
	Spts. Amm. Arom.	10 mins.	76·0 per cent excess.
146 Mist. Ferri Sulph.	Ferri Sulph. Exs. ..	4·0 grs.	12·5 per cent deficient.
	Acid Sulph. dil. ..	5·0 mins.	32·0 per cent excess.
147 Mist. Pot. Iodide.	Pot. Iodide ..	20·0 grs.	Correct.
	Sod. Bicarb ..	20·0 grs.	Correct.
	Spts. Amm. Arom.	20 mins.	31·5 per cent deficient.
148 Mist. Quinine Sulph.	Quinine Sulph. ..	10·0 grs.	Correct.
	Acid Sulph. dil. ..	10·0 mins.	31·0 per cent excess.
149 Mist. Carminativa.	Sod. Bicarb ..	20·0 grs.	Correct.
	Spts. Amm. Arom.	20·0 mins.	23·0 per cent deficient.
150 Mist Stimulant Exp.	Ammoni Carb ..	10·0 grs.	Correct.
	Spts. Aetheris Nitrosi.	40·0 mins.	Do.
151 Mist. Sodi Salicylas.	Sodi Salicylas ..	20·0 grs.	15·5 per cent excess.
	Sodi Bicarb ..	20·0 grs.	Correct.
152 Mist. Pot. Iodide.	Pot. Iodide ..	20·0 grs.	Do.
	Sod. Bicarb ..	20·0 grs.	Do.
	Spts. Amm. Arom.	20·0 mins.	Do.

TABLE XVIII—*cont.*

Drugs received from Government Hospitals and Government Institutions—cont.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)	Strength as per B.P. or as declared on the label. (3)	Result of analysis. (4)
	Government Headquarters Hospital, Ootacamund—cont.		
153 Mist. Stimulant Exp.	Amm. Carb ..	10·0 grs.	Correct.
	Spts. Aetheris Nitrosi.	40·0 mins.	Do.
154 Mist. Carminativa.	Sod. Bicarb ..	30·0 grs.	Correct.
	Spts. Amm. Arom.	10·0 mins.	18·0 per cent excess.
155 Soda Salicylas.	Sodi Salicylas ..	40·0 grs.	Correct.
	Sod. Bicarb ..	40·0 grs.	25·3 per cent deficient.
156 Mist. Ferri et Amm. Citras.	Ferri Amm. Citras..	10·0 grs.	Correct.
157 Mist. Soda Salicylas.	Sod. Salicylas ..	10·0 grs.	Do.
	Sod. Bicarb ..	10·0 grs.	Do.
158 Mist. Diaphoretica.	Pot. Citras ..	20·0 grs.	89·5 per cent excess.
	Liq. Amm. Acet. Fortis.	15·0 mins.	69·0 per cent excess.
159 Mist. Asthmatica.	Amm. Carb ..	3·0 grs.	50·0 per cent excess.
	Pot. Iodide ..	5·0 grs.	14·0 per cent excess.
	Pot. Bromide ..	10·0 grs.	43·0 per cent deficient
160 Mist. Quinine Sulphas.	Quinine Sulphate ..	10·0 grs.	Correct.
	Acid Sulph. dil. ..	25·0 ms.	70·0 per cent excess.
161 Mist. Pot. Iodide.	Pot. Iodide ..	20·0 grs.	43·0 per cent deficient
	Soda Bicarb ..	20·0 grs.	59·0 per cent deficient
	Spts. Amm. Arom.	20·0 ms.	12·5 per cent deficient
162 Mist. Bismuth.	Soda Bicarb ..	20·0 grs.	30·5 per cent excess.
	Bismuth Carb ..	20·0 grs.	Correct.
163 Mist. Pot. Iodide (Double Strength.)	Soda Bicarb ..	20·0 grs.	20·0 per cent deficient
	Pot. Iodide ..	20·0 grs.	24·0 per cent deficient
	Spts. Amm. Arom.	30·0 ms.	35·3 per cent deficient
164 Mist. Carminativa.	Sod Bicarb ..	20·0 grs.	Correct.
	Spts. Amm. Arom.	20·0 ms.	Do.
165 Mist. Soda Salicylas (Four Strength).	Soda Salicylas ..	40·0 grs.	Do.
	Soda Bicarb ..	40·0 grs.	40 2 per cent deficient.
	Government Hospital, Rajahmundry.		
166 Mist. Quinine Sulph.	Quinine Sulph. ..	10·0 grs.	Corrrct.
	Acid Sulph. dil. ..	15·0 mins.	78·0 per cent excess.
167 Mist. Asthmatica.	Pot. Iodide ..	5·0 grs.	22·0 per cent deficient.
168 Mist. Quinine Sulphate.	Quinine Sulph. ..	10 grs.	Correct.
	Acid Sulph. dil. ..	15·0 mins.	56·7 per cent excess.
169 Mist. Pot. Iodide.	Pot. Iodide ..	15·0 grs.	20·0 per cent deficient.
	Soda Bicarb ..	10·0 grs.	21·0 per cent deficient.
	Government Headquarters Hospital, Kakinada.		
170 Mix Ipecocopia.	Tr. Scillae ..	10·0 mins.	Correct.
	Tr. Senegae ..	10·0 mins.	Do.
171 Mist. Ferri et Amm. Citras.	Ferri et. Amm. Citras.	10·0 mins.	Do.
		10·0 grs.	Do.
	Acid Nitro Hydro Chloric.	10·0 mins.	55·0 per cent deficient
172 Mix Carminativa.	Soda Bicarb ..	10·0 grs. ..	32·0 per cent excess.
	Spts. Amm. Arom.	5·0 mins.	20·0 per cent deficient.
173 Mist. Quinine Sulph.	Quinine Sulph. ..	10·0 grs.	73·0 per cent deficient.
	Acid Sulph. ..	10·0 mins.	Correct.
174 Mist. Quinine Sulph.	Quinine Sulph. ..	10·0 grs.	71·0 per cent deficient.
	Acid Sulph. dil. ..	15·0 mins.	70·0 per cent deficient.

TABLE XVIII—*cont.*

Drugs received from Government Hospitals and Government Institutions—cont.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)	Strength as per B.P. or as declared on the label. (3)	Result of analysis. (4)
	Government Headquarters Hospital, Kakinada—cont.		
175 Mix. Asthmatica.	Pot. Bromide ..	5·0 grs.	24·0 per cent deficient.
	Pot. Iodide ..	5·0 grs.	Correct.
176 Mix. Alkaline Diuretica.	Soda Bicarb ..	10·0 grs.	43·0 per cent deficient.
	Pot. Citras ..	10·0 grs.	50·0 per cent deficient.
177 Mix. ferri et Amm. Citras.	Ferri et Amm. Citras ..	10·0 grs.	24·0 per cent deficient.
178 Mix. dispensed by compounder.	Ferri et Amm. Citras ..	10·0 grs.	27·0 per cent deficient.
179 Mist. Quinine Sulph.	Quinine Sulph ..	5·0 grs.	32·0 per cent deficient.
	Acid Sulph dil ..	10·0 mins.	27·0 Excess.
180 Mist. Asthmatica.	Sodi Bromide ..	15·0 grs.	36·7 per cent deficient.
	Sodi Bicarb ..	15·0 grs.	21·3 per cent deficient.
	Amm. Carb ..	10·0 grs.	58·0 per cent deficient.
181 Mist. Carminativa.	Sod Bicarb ..	10·0 grs.	12·0 per cent deficient.
	Spts. Amm. Arom.	5·0 mins.	Correct.
182 Mist. Quinine Sulphas.	Quinine Sulphate ..	3·0 grs.	16·6 per cent deficient.
	Acid Sulph dil ..	5·0 mins.	46·0 per cent deficient.
183 Mist. Alkaline Diuretica. ..	Pot. Bicarb ..	10·0 grs.	38·1 per cent deficient.
	Pot. Citrate ..	10·0 grs.	Correct.
184 Mist. Pot. Iodide.	Pot. Iodide ..	10·0 grs.	17·0 per cent deficient.
	Soda Bicarb ..	10·0 grs.	19·0 per cent deficient.
	Spts. Amm. Arom.	10·0 mins.	44·0 per cent deficient.
185 Mist. Soda Salicylas.	Soda Salicylas ..	10·0 grs.	17·0 per cent excess.
	Soda Bicarb ..	10·0 grs.	36·0 per cent excess.
186 Mist. Sedative Exp.	Soda Bicarb ..	5·0 grs.	46·0 per cent excess.
187 Mist Sed. Exp.	Soda Bicarb ..	20·0 grs.	Correct.
	Tinc. Opii Camphorata.	20·0 ms.	32·5 per cent deficient.
188 Mist. Soda Salicylas.	Soda Salicylate ..	20·0 grs.	Correct.
	Sod. Bicarb ..	20·0 grs.	Do.
189 Mist. Alkaline Diuretica.	Pot. Citrate ..	20·0 grs.	25·5 per cent excess.
	Pot. Bicarb ..	20·0 grs.	37·5 per cent deficient.
190 Mist. Cinchona Febrifuge.	Cinchona febrifuge.	5·0 grs.	Correct.
	Acid Sulph dil ..	5·0 mins.	80·0 per cent deficient.
191 Mist. Sodil Salicylas.	Sodi Salicylas ..	10·0 grs.	Correct.
	Sodi Bicarb ..	15·0 grs.	62·0 per cent deficient.
192 Mist. Oleum Ricini.	Oleum Ricini ..	1·5 drams.	Correct.
193 Mist. Bismuth.	Soda Bicarb ..	5·0 grs.	98·0 per cent deficient.
	Bismuth Carb ..	5·0 grs.	Correct.
194 Mist. Chinchona febrifuge.	Cinchona febrifuge.	5·0 grs.	Do.
	Acid Sulph dil ..	5·0 mins.	71·0 per cent deficient.
195 Mistura Quininæ.	Quinine Sulph ..	3·0 grs.	Correct.
	Acid Sulph dil ..	5·0 mins.	32·0 per cent deficient.
196 Mistura Tota Quininæ.	Tota Quinine ..	3·0 grs.	27·0 per cent deficient.
	Acid Sulph dil ..	5·0 mins.	276·0 per cent excess.
197 Mist. Ferri perchloride.	Tr. Ferri per chloride.	5·0 mins.	32·0 per cent excess.
	Acid Nitro Hydrochloric.	10·0 mins.	Correct.
198 Mist. Asthmatica.	Pot Iodide ..	5·0 grs.	100·0 per cent deficient.
	Sodi Bromide ..	10·0 grs.	Correct.
	Amm. Carb ..	3·0 grs.	43·3 per cent deficient.

TABLE XVIII—*cont.*

Drugs received from Government Hospitals and Government Institutions—cont.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)	Strength as per B.P. or as declared on the label. (3)	Result of analysis. (4)
	Government Headquarters Hospital, Kakinada—cont.		
199 Mist. Sodi Salicylas.	Soda Salicylas ..	10·0 grs.	18·0 per cent deficient.
	Soda Bicarb ..	10·0 grs.	36·0 per cent deficient.
200 Mist. Quinina Sulphas ..	Quinine Sulphate ..	10·0 grs.	11·0 per cent deficient.
	Acid Sulph dil ..	15·0 mins.	96·0 per cent excess.
201 Mist. Influenza.	Soda Salicylas ..	5·0 grs.	22·0 per cent deficient.
	Soda Bicarb ..	10·0 grs.	Correct.
	Liq. Amm. Acetas.	30·0 mins.	Correct.
	Spts. Amm. Arom.	10·0 mins.	18·0 per cent deficient.
202 Mist. Oleum Ricini.	Oleum Ricini (Castor Oil).	2·0 drams	20·0 per cent deficient.
203 Mist. Diaphoretics.	Sod. Acetas ..	10·0 grs.	Correct.
	Spts. Aetheris Nitrosi.	15·0 mins.	66·7 per cent excess.
	Liq. Amm. Acetas.	1 dram	64·0 per cent deficient.
204 Mist. Diaphoretica.	Pot. Nitrate ..	10·0 grs.	100·0 per cent deficient.
	Soda Bicarb ..	10·0 grs.	57·0 per cent deficient.
	Spts. Amm. Arom.	5·0 grs.	32·0 per cent excess.
	Liq. Amm. Acetats.	30 mins.	Correct.
	Spts. Aetheris Nitrosi.	10·0 mins.	84·0 per cent excess.
205 Mist. Soda Salicylas.	Soda Salicylas ..	10·0 grs.	123·0 per cent excess.
	Pot. Bicarb ..	15·0 grs.	41·0 per cent excess.
206 Mist. Quinine..	Quinine Sulphate ..	10·0 grs.	Correct.
	Acid Sulph dil ..	13-1/3 mins.	18·8 per cent excess.
207 Castor Oil Emulsion.	Castor Oil ..	2 dms.	Correct.
208 Mist. Carminativa.	Soda Bicarb ..	5·0 grs.	62·0 per cent deficient.
	Spts. Amm. Arom.	5·0 mins.	28·0 per cent deficient.
209 Mist. Sed. Exp.	Soda Bicarb ..	5·0 grs.	67·0 per cent deficient.
210 Mist. Soda Salicylas.	Sodii Salicylas ..	5·0 grs.	38·0 per excess.
	Sodii Bicarb ..	5·0 grs.	78·0 per cent deficient.
211 Mist. Quinine Sulphas.	Quinine Sulphas ..	10·0 grs.	18·0 per cent deficient.
	Acid Sulph dil ..	15·0 mins.	16·7 per cent deficient.
212 Mist. Sodii Salicylas.	Soda Salicylas ..	20·0 grs.	12·5 per cent deficient.
	Soda Bicarb ..	20·0 grs.	21·5 per cent deficient.
213 Mist. Triple Sulph.	Quinine Sulphas ..	2·0 grs	Correct.
	Ferri Sulphas Exsc.	2·0 grs	55·0 per cent excess.
	Mag. Sulphas ..	60·0 grs.	18·3 per cent deficient.
	Acid Sulph dil ..	10·0 mins.	Correct.
214 Mist. Carminativa.	Spts. Amm. Arom.	10·0 mins.	Correct.
	Soda Bicarb ..	10·0 grs.	Correct.
215 Mist. Sodii Salicylas.	Sodi Salicylas ..	10·0 grs.	16·0 per cent deficient.
	Sodi Bicarb ..	10·0 grs.	24·0 per cent deficient.
216 Mist. Diaphoretica.	Pot. Nitrate ..	5·0 grs.	Correct.
	Spts. Amm. Arom.	10·0 grs.	67·0 per cent excess.
	Spts. Aetheris Nitrosi.	10·0 mins.	102·0 per cent excess.
	Liq. Amm. Acc. dil.	30·0 mins.	16·7 per cent excess.
217 Mist. Quinine Sulphate.	Quinine Sulphas ..	5·0 grs.	Correct.
	Acid Sulph dil ..	10·0 mins	14·0 per cent deficient.
218 Mist. Alkaline Diuretica.	Soda Bicarb ..	10·0 grs.	Correct.
	Sod. Acetate ..	10·0 grs.	34·0 per cent deficient.
219 Mist. Carminativa.	Sod. Bicarb ..	10·0 grs.	Correct.

TABLE XVIII—*cont.*

Drugs received from Government Hospitals and Government Institutions—cont.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)	Strength as per B.P. or as declared on the label. (3)	Result of analysis. (4)
	Government Headquarters Hospital, Machilipatnam.		
220 Mist. Sodii Salicylas.	Sodii. Salicylas ..	10·0 grs.	17·5 per cent deficient.
	Sodii. Bicarb ..	5·0 grs.	16·0 per cent excess.
221 Mist. Carminativa.	Sod. Bicarb ..	10·0 grs.	47·0 per cent deficient.
222 Mist. Pot. Iodide	Pot. Iodide ..	5·0 grs.	Correct.
	Soda Bicarb ..	5·0 grs.	12·0 percent deficient.
223 Mist. Specific.	Pot. Iodide ..	5·0 grs.	Correct.
	Liq. Hydrogi perchloride.	30·0 mins.	Correct.
224 Mist. Quinine.	Quinine Sulphate ..	5·0 grs.	Correct.
	Acid Sulph. Dil ..	10·0 mins.	101·0 per cent excess.
225 Mist. Pot. Iodide.	Pot. Iodide ..	5·5 grs.	Correct.
	Soda Bicarb ..	5·5 grs.	Correct.
226 Mist. Soda Salicylas.	Soda Salicylate ..	10·0 grs.	Correct.
	Soda Bicarb ..	10·0 grs.	20·0 per cent deficient.
227 Mist. Alk. Diuretica.	Sod. Bicarb ..	10·0 grs.	Correct.
	Sod. Citras ..	10·0 grs.	48·0 per cent deficient.
228 Mist. Alk. Diuretica.	Sod. Bicarb ..	10·0 grs.	Correct.
	Sod. Citras ..	10·0 grs.	28·0 per cent deficient.
229 Mist. Influenza.	Sod. Salicylate ..	10·0 grs.	Correct.
	Sod. Bicarb ..	10·0 grs.	15·0 per cent deficient.
	Amm. Carb ..	5·0 grs.	16·0 per cent excess.
	Liq. Amm. Acet. Dil.	30·0 mins.	29·7 per cent excesf.
230 Mist. Carminativa.	Sod. Bicarb ..	10·0 grs.	17·0 per cent deficient.
	Spts. Amm. Arom.	10·0 mins.	Correct.
231 Mist. Quinine Sulpas.	Qunin.e Sulphas ..	5·0 grs.	28·0 per cent deficient.
	Acid Sulph Dil ..	10·0 ms.	49·0 per cent excess.
	District Medical Officer, Cuddalore.		
232 Morphine Sulphate (Ampoules).	0·25 gr morphine Sulphate pes c.c.	10·0 min.	Correct strength.
233 Hypodermic tablets Emetine Hydrocloride.	0.5 gr emetine Hydrocholoride per Table.	10·0 min.	Correct strength.
	Government Women and Children Hospital, Tuni.		
234 Mist. Soda Salicylas.	Soda Salicylas ..	5·0 grs.	Satisfactory.
	Soda Bicarb ..	5·0 grs.	Satisfactory.
	R.M. Hospital, Tanjore.		
235 Vitamin B. Complex,	Thiamine Hydrocloride.	9·1 mg	Satisfactory.
	Riboflavin	2·0 mg.	
	Nicotinamide ..	83·0 mg.	
236 Vitaman B. Complex 10 c.c. 1 Vital.	Anseurine Hydrocloride.	25·0 mg. per ml. ..	Satisfactory.
	Riboflnvin ..	2·5 mg. per ml. ..	
	Nicotinamide ..	5 mg. per mile. ..	
	Pyridoxine Hydrocloride.	150 mg.	
237 Novocaine 1·0 percent.	Procaine Hydrocloride.	1·0 per cont ..	Correct strength.

TABLE XVIII—*cont.*

Drugs received from Government Hospitals and Government Institutions—cont.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)	Strength as per B.P. or as declared on the label. (3)	Result of analysis. (4)
	Government Hospital, Udamalpet.		
238 Mist. Quinine Sulphate.	Quinine Sulphate ..	5·0 grs.	16·0 per cent excess.
239 Mist. Soda Salicylas.	Soda Salicylas ..	10·0 grs.	128·0 per cent excess.
240 Evipal Soluble.	Conforms to B.P. Specifications	..	....
	Government Hospital, Gudalur (The Nilgiris).		
241 Mist. Quinine Sulphas.	Quinine Sulphas ..	10·0 grs.	32·0 per cent deficient.
	Acid Sulph dil ..	0·25 gm.	20·0 per cent excess
242 Mist. Ferri Sulphas.	Ferrous Sulph Exs.	3·0 grs.	Correct.
	Glucore solid ..	1·0 dm.	97·0 per cent excess.
	Government Headquarters Hospital, Bellary.		
243 Nupercaine Hypocaric solution (Amp.).	1 in 1,500	1·0 dm.	Correct strength.
	District Health Officer, Tirunelveli.		
244 Multivitamin tablets.	Vitamin A ..	2,500 units	Reported that the tablets may be used up quickly for what they are worth.
	Vitamin B-1 ..	1·0 mg.	
	Vitamin C	37·5 mg.	
	Nicotinic acid amide.	10·0 mg.	
	Government Hospital, Attur (Salem district).		
245 Mistura Quinine Sulphas.	Quinine Sulphas ..	10·0 grs.	Correct.
	Municipal Health Officer, Kozhikode.		
246 Multivitamin tablets.	Vitamin B-1 ..	2·0 mg. ..	....
	Vitamin C ..	75.0 mg. ..	....
	Nicotinamide ..	20·0 mg. ..	....
	District Medical Officer, Madurai.		
247 Quinine Sulphate mixture.	Quinine Sulphate	10·0 grs.	Contains 9·2 grs. per oz. of the mixture.
	District Medical Officer, Coimbatore.		
248 Mist. Quinine Sulphas (OP).	Quinine Sulphate	5·0 grs.	76·0 per cent deficient.
	Acid Sulph dil ..	5·0 min.	24·0 per cent deficient.
249 Mist. Quinine Sluphas (IP).	Quinine Sulphate.	5·0 grs.	80·0 per cent deficient.
	Acid Sulph dil ..	5·0 min.	68·0 per cent deficient.
250 Mist. Sodii Salicylas (OP).	Sodii Salicylas ..	10·0 grs.	24·0 per cent excess.
	Soda Bicarb ..	15·0 grs.	89·0 per cent deficient.
251 Mist. Sodii Salicylas (IP).	Soda Balicylas ..	10·0 grs.	49·0 per cent deficient.
	Soda Bicarb ..	15·0 grs.	73·4 per cent deficient.
	Government Hospital, Tiruvarur.		
252 Nupercaine Solution (Amp.)	....	....	The strength is 1 in 200 as stated on the label.

TABLE XVIII—*cont.*

Drugs received from Government Hospitals and Government Institutions—cont.

The Superintendent of Police, Crime Branch, C.I.D., Madras.

253 Colorless liquid (Bottle A) .. The liquid consists of water with some yellowish brown particles in suspension which gives tests for chloride, sulphate, carbonate and calcium. The suspended matter gives tests for the presence of iron also.

254 Oily liquid (Bottle B) .. The liquid is a mixture consisting of about 25 per cent coconut oil and 75 per cent gingelly oil.

255 Colorless liquid (Bottle C) .. Same report as in S. No. 253.

256 Dark brown liquid (Bottle D). The greenish brown turbid liquid consists of water with some reddish brown particles in suspension which has a strong smell of peppermint and a sweet taste. The suspended matter after filterating consists of *sucrose*, invert sugar and traces of chloride, sulphate and calcium.

257 Colorless liquid (Item 1) .. The slightly turbid liquid with a very pale yellow color and containing some yellowish brown suspended particles had a slightly disagreeable smell. The suspended particles gave tests for presence of iron. The filtrate was water containing soluble matter which did not give tests for calcium, sulphate and chloride. The sample is thus different from Samples "A" and "C" referred to above.

258 Colorless liquid (Item 2) .. Do.

259 Bottle containing colored liquid (Item 3). The colored liquid in the dettol bottle was identified as dettol.

260 Castor oil bottle containing dark red oily liquid (Item 4). The dark red oil liquid in the bottle was identified as bathgate castor oil which is commonly sold as a hair oil.

District Superintendent of Police, Bellary.

261 Epsom salt .. .. .. It is fit for use but the solution must be filtered before use.

District Medical Officer, Tirunelveli.

262 Mepacrine tablets .. .. The tablets on anlysis were found to contain on an average 0·1 g. of Mepacrine Hydrochloride and are suitable for use.

Director of Medical Services, Madras-6.

263 Sulphadiazine tablets .. .. The tablets are found to contain Sulphamerazine and not sulphadiazine. The tablet contains 0·5 g. sulphamerazine on the average.

Serial number and name of drug.	Name of ingredients estimated.	Strength as per B.P. or as declared on the label.	Results of analysis.
(1)	(2)	(3)	(4)
Government Hospital, Ramachandrapuram.			
264 Mist. Sodii Salicylas ..	Sod. Salicylas ..	10·0 grs.	13·0 per cent excess.
	Sod. Bicarb ..	10·0 grs.	Correct.
	Spts. Amm. Arom.	10·0 mins.	Correct.
265 Mist. Pot. Iodide.	Pot. Iodide ..	5·0 grs.	Correct.
	Spts. Amm. Arom.	5·0 mins.	Correct.

The Deputy Commissioner of Police, Crime Branch, Madras-8.

266 Anacin Tablets Genuine "A". The tablets contained in Packet "A" are different in composition from the tablets contained in Packet "B".

267 Anacin Tablets Spurious "B". Do.

The number of drugs received from the Government hospitals and other Government institutions this year was the highest so far, being 275. Most of the samples were mixtures from hospital dispensaries. A few were injections and pharmaceutical preparations of suspected strength or purity. Samples submitted

by the Police in connexion with criminal cases constituted a third category of unusual interest.

The spurious imitation of the proprietary drug Anacin coming under this category sent by the Police was analysed and gave the following figures, the figures for the genuine sample being included for comparison :—

	Figures for Genuine Anacin.	Figures for Spurious product.
	GRS.	GRS.
Quinine	0·25	0·19
Acetyl Salicylic	3·3	0·22
Phanacetin	2·9	Nil
Caffein	0·26	0·03
Sod. Bicarb	Nil	9·1

The predominant ingredient in the spurious product was Sodium Bicarbonate, Phenacetin was absent. Quinine, Acetyl Salicylic acid and Caffein were present in insignificant amounts only. The packet for the spurious drug was in printing and get-up a close imitation of the genuine product.

Ostensible cures for asthma, deafness and dumbness sold to the public by a man who styled himself Dr. Yogacharya Goswami were received from the Police along with a few articles seized from the man who was charged with cheating.

A sample of Strychinine manufactured from Nux Vomica received from the Director of Industries and Commerce, Madras, was found to be substandard.

A sample of Cocaine Hydrochloride from the College of Indigenous Medicine, Madras, was found to be a mixture of one part of Cocaine Hydrochloride and two parts of Sodium Bicarbonate.

A sample of Yeast tablets from the Government Women and Children Hospital, Egmore, Madras, was found to be deficient in Vit. B-1 to the extent of 90·0 per cent. In this connexion, mention must be made of the difference in the standards for Yeast in the B.P.C. and the I.P.L. The former contains 100 microgrammes of Vit. B-1 but the latter only 12 microgrammes per g.

Ampoules of Vitamin B & C, Atropine, Morphine, Novocaine, Nupercaine, Glucose, Calcium Gluconate, Saline, Barbiturates, etc., received from hospitals were analysed.

The percentage of incorrectly dispensed mixtures continued to be high. Deficiency or excess of over 50 per cent of the stated strength in the case of simple ingredients like Soda Bicarb and Acid Sulphuric dil is very common. The Government General Hospital, Madras, sent two mixtures which were short of Soda Bicarb to the extent of 62·0 per cent and a Tr. Benzoin Co which contained practically no Balsamic acid. A Mist. Kaolin and Bismuth from the Government Stanley Hospital was grossly deficient in all three ingredients, Bismuth Carb (60·0 per cent), Soda Bicarb (48·0 per cent) and Kaolin (26·0 per cent). Two samples of Mist. Diaphoretica from the Government Royapettah Hospital were thoroughly unsatisfactory one of the ingredients Ammonium Citrate being totally absent in the mixtures. A Mist. Influenza from the Government Hospital for Women and Children, Egmore, contained excess of Soda Salicylas (59·0 per cent) and Soda Bicarb (59·0 per cent) and Ammonia (70·0 per cent) while another mixture from the same hospital was deficient in ferri et Ammoni. Citras to the extent of 59·0 per cent. Deficiency of Soda Bicarb (63·0 per cent) was noted in a Soda Salicylas mixture from the Pentland Hospital, Vellore. A Sodii Salicylas mixture from Ramanathapuram contained more than twice the stated amount of Sod. Salicylas, while a mixture Asthmatica from the same place showed a 200·0 per cent excess of Pot. Iodide, and 145·0 per cent excess of Ammonium Carbonate and 42·4 deficiency of Pot. Bromide. Castor oil, the main ingredient was deficient to

the extent of 72·0 per cent in a Mist. Oleum Ricini from the Kurnool hospital. Sodium Bicarbonate and Potassium Iodide were found to be grossly deficient in a number of mixtures from the Government Headquarters Hospital, Ootacamund. The same hospital sent a Mist. Diaphoretica which contained 38·0 grains of Pot. Citras instead of 20·0 grains.

The Quinine mixtures from the Government Headquarters Hospital, Kakinada, were deficient in Quinine to the extent of over 70·0 per cent. Gross deficiencies of Sodii Bicarbonate in mixture containing the drug was the rule rather than the exception in the case of this hospital. Total absence of Pot. Iodide in a Mist. Asthamatic and Pot. Nitrate in a Mist. Diaphoretica were noticed as also a 123·0 per cent excess of Soda Salicylas in a Mist. Sodii Salicylas. A similar excess of the same drug was found in a similar mixture from Udamalpet.

Quinine was again deficient to the extent of about 80·0 per cent in the two mixtures from the District Medical Officer, Coimbatore. The other mixtures from the same hospital were deficient in Sodii Bicarb to the extent of 89·0 per cent to 73·4 per cent, the other ingredient in the Mixture Sodium Salicylate also being wrongly dispensed, 24·0 per cent in excess in one case and 49·0 per cent deficient in the other.

Particulars of seventeen drugs analysed for private firms are given in Table XIX.

TABLE XIX.

Drugs from private firms and other sources.

Serial number and name of drug. (1)	Name of ingredient estimated. (2)	Strength as per B.P. or as declared on the label. (3)	Result of analysis. (4)
1 Tr. Ipecacuanhae B.P.	Alcohol content ..	20·0 to 24·0 per cent v/v.	Not of standard quality.
	Total alkaloids of Ipecacuanhae calculated as emetine.	0·095 to 0·105 per cent w/v.	....
2 Ext. Belladonna Rad.	Alkaloids of Belladonnae root calculated as Hyoscyamine.	Contains 4·55 per cent w/w.	....
3 Chlorcform ..	....	B.P.	Does not conform to B.P. requirements.
4 Multimix ..	....	.....	Found to contain 13·25 per cent v/v of Ethyl Alcohol.
5 Normal Saline Amps.	....	....	Found to contain 0·91 per cent w/v of Sod. Chloride.
6 Ext. Ergot Liquidom.	....	....	Does not conform to B.P. standard.
7 Tablet marked I (Anacin).	....	....	Spurious.
8 Tablet marked II (Anacin).	....	....	Do.
9 Ext. Ergot Liquidom.	....	....	Does not conform to B.P. Standard.
10 Tr. Quinine Ammoniata.	....	B.P.C. 1949.	Standard quality.
11 Ext. Ergot Liquid B.P.	....	B.P.	Does not conform to B.P. specifications.

TABLE XIX—*cont.*

Drugs from private firms and other sources—cont.

Serial number and name of drug. (1)	Name of ingredient estimated. (2)	Strength as per B.P. or as declared on the label. (3)	Result of analysis. (4)
12 Utresed ..	Sod. Bromide ..	5·0 grs.	....
	Pot. Bromide ..	5·0 grs.	....
	Vitamin B-1 ..	200 I Units	30·0 per cent deficient.
	Cal. Lactate ..	200 grs.	25·0 per cent excess.
	Coal tar dye. ..	Present	
13 Haemozyme ..	....	....	Standard quality.
14 Sodium Hydrosulphite.	....	....	Contains 99·3 per cent Sodium Hydrosulphite.
15 Ergot of Rye ..	....	B.P.	Conforms to B.P. Standards for Ergot.
16 3 Bundles of Medical Contraceptives.	....	....	Contained 19·34 per cent Quinine Bisulphate as against 7·74 per cent declared on the label.
17 Shark Liver Oil.	....	....	Contained 4,200 I Units of Vitamin A per gramme.

Three samples of liquid extract of Ergot received under this head were found to be practically devoid of the alkaloids of Ergot, but a sample of Ergot of Rye received from the Agent, United Bank of India, Ltd., Georgetown, Madras, was found to be of standard quality. This would show that it is possible to get good raw material for the manufacture of the extract, but the storage of the material, the method of manufacture and the storage of the extract require great care and attention.

XI. MISCELLANEOUS.

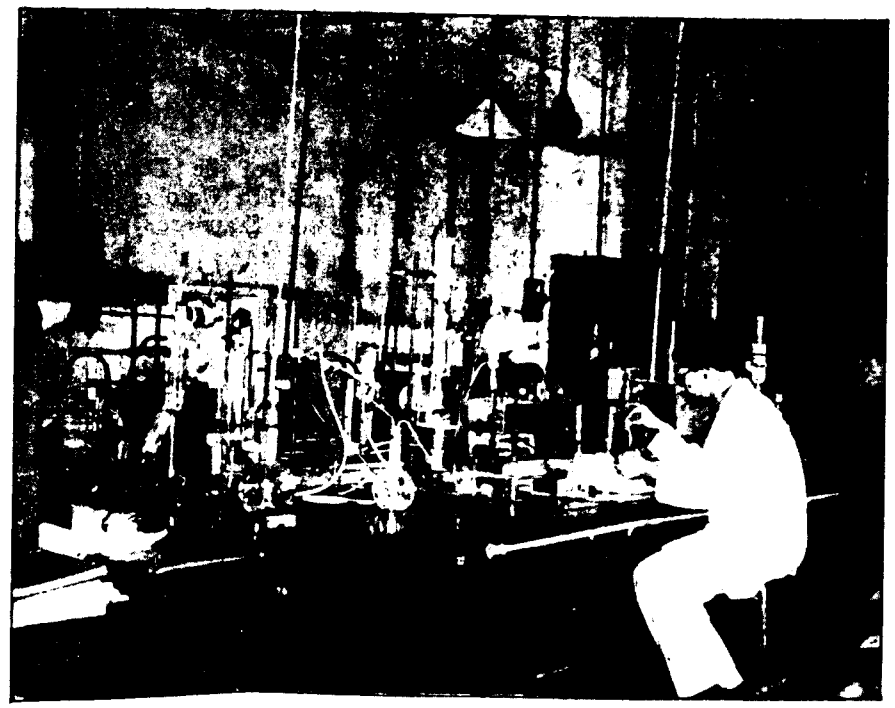
The Government Analyst attended the second and last Meeting of the Agmark Expert Committee at New Delhi on 21st and 22nd July 1952 when the recommendations of the Committee on Agmark Specifications for ghee and butter were finalized.

The Government Analyst attended the Meeting of the Drugs Technical Advisory Board as one of its members on the 7th and 8th October 1952 at New Delhi and a Meeting of the Central Committee for Food Standards at New Delhi on the 13th and 14th January 1953.

S. NARAYANA AYYAR, M.A., A.I.I.SC., F.R.I.C.,
Government Analyst.

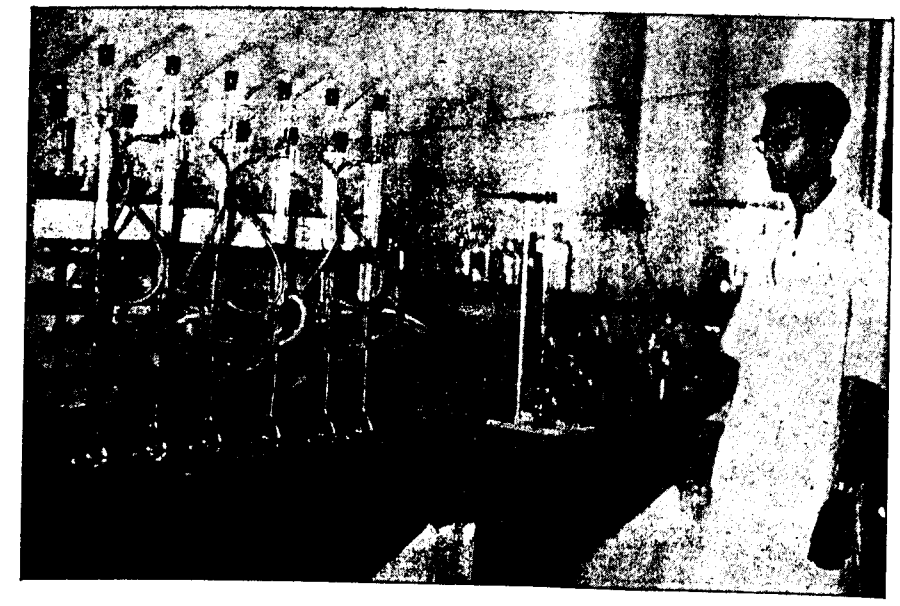
THE KING INSTITUTE, GUINDY, MADRAS-15,
23rd October 1953.

SAMPLE ROOM.

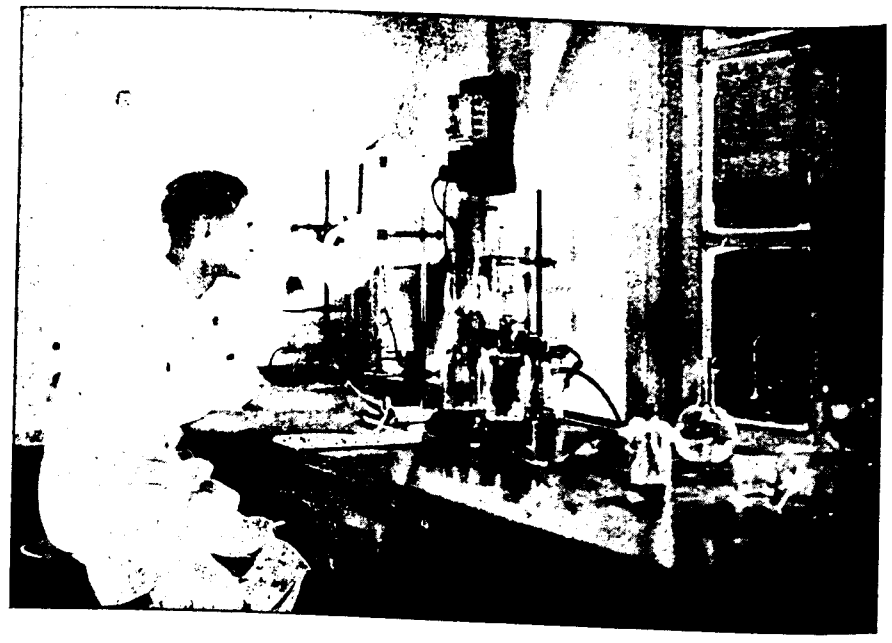


FLUORIMETRIC ASSAY OF VITAMIN B-1.

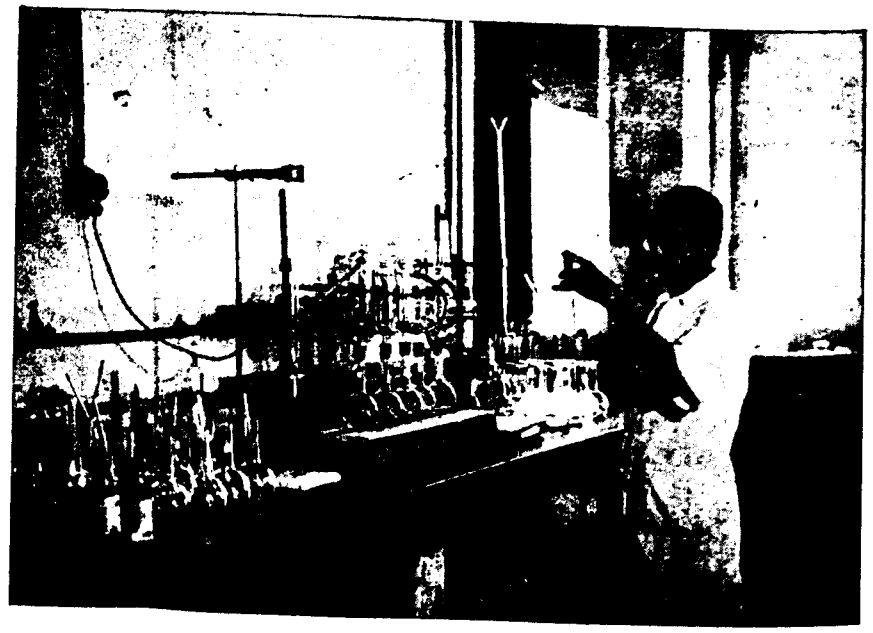
FREEZING POINT OF MILK (Temple Cryoscope)



REICHERT-WOLLNY VALUE OF GHEE

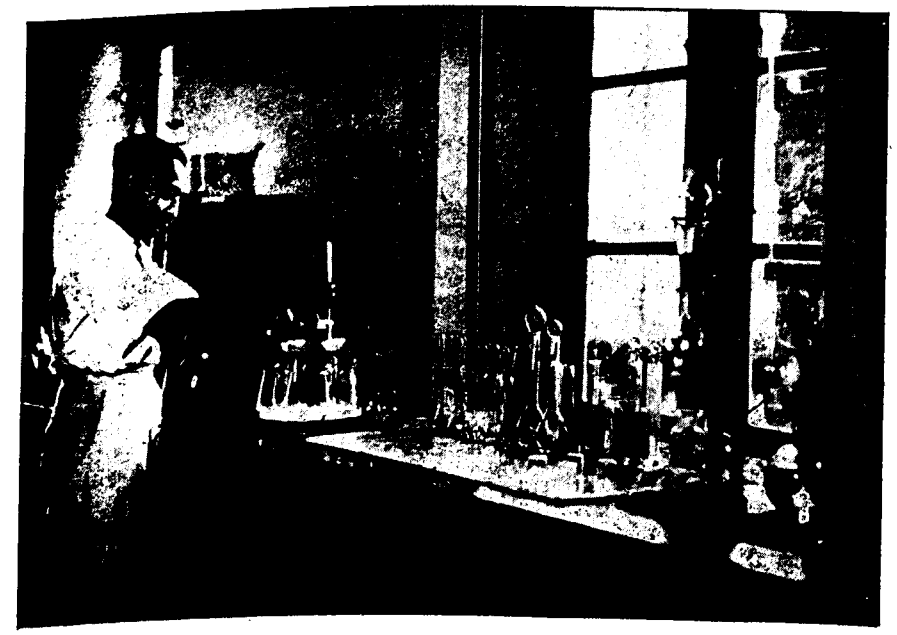


PHYTOSTEROL ACETATE TEST



TURBIDITY TEMPERATURE OF OILS

IDENTIFICATION OF ADULTERANTS WITH THE MICROSCOPE



LEAD ESTIMATION IN TURMERIC

APPENDIX A.

Number of samples received and found adulterated from municipalities and panchayat boards working the Madras Prevention of Adulteration Act during 1952–53.

Serial number and places.		Annual quota of samples.	Grand total.			Milk.		Ghee.		Butter.	
			Total.	Adulterated.	Percentage adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. *Anantapur district.*											
1 Anantapur ..	M.	72	72	57	79·2	51	46	16	11	..	..
2 Hindupur ..	M.	72	72	35	48·6	46	31	2	..	..	..
3 Guntakal ..	M.	48	57	43	75·4	35	28	2	..	..	..
4 Tadpatri ..	M.	48	47	20	42·6	27	11	10	8	..	..
5 Dharmavaram ..	Pt.	48	49	33	67·4	28	24	12	6	..	..
6 Gooty	Pt.	48	48	20	41·7	26	13	8	4	..	..
7 Kadiri	Pt.	48	53	21	39·6	49	18	1	..	..	..
8 Penukonda .	Pt.	48	50	22	44·0	21	13	15	6	..	..
9 Uravatkonda ..	Pt.	48	48	20	41·7	17	15	6	2	..	..
Total	..		496	271	54·7	300	199	72	37	..	..
2. *North Arcot district.*											
10 Vellore	M.	144	144	46	31·9	80	35	16	1	7	4
11 Tiruvannamalai	M.	72	72	37	51·4	62	36	..	..	..	..
12 Tiruppattur ..	M.	48	48	9	18·7	28	6	5	..	..	..
13 Gudiyattam ..	M.	48	48	9	18·8	33	7	2	..	..	..
14 Vaniyambadi ..	M.	48	48	23	47·7	33	18	3	1	1	..
15 Walajapet ..	M.	48	48	5	10·4	11	3	6	2	..	..
16 Ambur	M.	48	48	32	66·6	43	31	4	1	..	..
17 Arni	M.	48	48	27	56·3	23	14	18	13	..	..
18 Arcot	Pt.	48	50	18	36·0	35	12	3	1	2	2
19 Arkonam ..	Pt.	48	52	34	65·4	41	28	4	4	..	..
20 Ranipet ..	Pt.	48	48	26	54·2	34	25	..	..	..	..
Total	..		654	266	40·7	423	216	61	24	10	6
3. *South Arcot district.*											
21 Cuddalore ..	M.	144	145	71	49·0	90	50	4	2	14	11
22 Chidambaram	M.	96	95	30	31·6	45	21	10	1	7	4
23 Villupuram ..	M.	96	95	20	21·1	46	17	2	1	2	1
24 Tindivanam ..	M.	48	48	24	50·0	29	16	7	6	..	..
25 Bhuvanagiri ..	Pt.	48	47	18	38·3	33	15	..	..	4	3
26 Kallakurichi ..	Pt.	48	48	19	40·0	47	19	..	..	..	..
27 Nellikuppam ..	Pt.	48	49	14	28·6	32	9	3	1	1	1
28 Panruti ..	Pt.	48	49	18	36·7	40	15	4	2	..	..
29 Tirukkoyilur ..	Pt.	48	48	11	23·0	24	7	5	3	..	..
30 Vriddhachalam	Pt.	48	60	39	65·0	43	36	2	1	2	2
Total	..		684	264	38·5	429	205	37	17	30	22
4. *Bellary district.*											
31 Bellary ..	M.	144	146	89	60·9	87	63	19	13	5	1
32 Adoni	M.	96	97	57	58·8	59	41	12	4	9	6
33 Hospet ..	M.	96	96	43	44·8	44	24	9	6	14	9
34 Harpanahalli ..	Pt.	48	49	21	42·9	20	13	..	..	18	6
35 Rayadrug ..	Pt.	48	49	16	32·7	26	8	9	6	..	..
36 Yemmiganur .	Pt.	48	46	32	69·5	14	10	29	22	..	..
Total	..		483	258	53·4	250	159	79	51	46	22

Gingelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Tea.		Turmeric.		Miscellaneous.	
Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.
(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
						1	..	1	..	..	..	..	..
		2	..	..	..	11	2	3	..	2	1	5	1
1	..	3	..	..	..	1	..	..	..	..	..	19	15
..	..	..	..	..	..	5	1	..	..	1	..	..	..
..	..	3	..	..	..	6	3	..	..	..	..	..	..
1	..	3	..	1	1	6	1	..	..	1	..	4	1
..	..	2	..	..	..	1	..	..	..	..	..	2	3
..	..	..	..	1	..	8	1	..	..	..	..	3	2
..	..	2	..	2	..	3	1	..	..	3	..	11	2
..	..	6	..										
				4	1	42	9	4	..	7	1	44	24
2	..	21	..										
12	..	4	..	3	..	8	5	5	..	1	..	8	1
												2	..
7	1	1	..	..	..	..	..	..	..	..	..	2	..
5	..	3	..	3	..	..	..	2	2	..	..	..	..
7	..	4	1	..	..	..	..	2	1	..	..	..	..
1	..	2	..	..	..	3	2	3	1	..	..	2	1
22	..	8	..	1	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	1	..	..	..	..	..
3	..	3	..	..	..	..	..	..	..	1	..	..	..
6	2	1	..	..	..	3	1	..	..	..	..	..	..
5	1	..	..	..	..	1	..	1	..	..	..	..	..
4	1	5	..	5	..	..	..	..	..	..	..	..	..
42	5	31	1	12	..	15	8	14	4	2	..	14	2
						3	1	..	..	..	..	..	..
31	7	3	..	..	..	11	1	..	..	..	..	2	1
11	..	6	..	3	2	3	..	1	..	..	..	2	..
22	1	12	..	5	..	1	..	..	..	..	..	4	2
6	..	1	..	..	..	2	..	..	..	..	..	..	..
5	..	1	..	2	..	1	..	..	..	..	..	..	..
..	..	..	..	..	..	5	3	..	..	..	..	..	..
4	..	4	..	..	..	1	..	..	..	..	..	..	..
4	1	..	..	1	..	3	..	..	..	..	..	..	..
9	1	6	..	..	..	..	..	..	..	..	..	2	..
8	..	3	..										
100	10	36	..	11	2	36	5	1	..	..	..	10	3
						5	3	1	..	..	..	16	9
1	..	12	..	..	..	4	3	..	..	1	..	5	2
..	..	4	..	2	1	8	1	..	..	3	..	11	3
..	..	6	..	1	..	6	2	1	..	1	..	1	..
..	..	2	..	..	..	2	..	1	..	1	..	..	..
..	..	9	2	1	..	..	..	..	..	..	..	..	..
..	..	2	..	1	..	..	..	..	..	..	..	..	..
1	..	35	2	5	1	25	9	3	..	6	..	33	14

APPEN

Number of samples received and found adulterated from municipalities during

Serial number and places.		Annual quota of samples.	Grand total.			Milk.		Ghee.		Butter.	
			Total.	Adulterated.	Percentage adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
5. Coimbatore district.											
37 Coimbatore ..	M.	288	295	196	66·5	142	133	22	4	37	13
38 Erode	M.	96	96	61	63·5	71	52	8	3	..	..
39 Pollachi ..	M.	120	123	65	52·8	72	55	..	..	..	..
40 Tiruppur ..	M.	96	110	55	50·6	87	52	..	..	..	..
41 Udamalpet ..	M.	96	97	46	47·4	65	41	7	1	..	..
42 Dharapuram ..	M.	48	49	22	44·9	23	14	1	..	..	..
43 Mettunalayam.	M.	48	48	33	68·8	37	28	3	3	..	..
44 Gobichettipalayam.	M.	48	51	43	64·7	42	29	2	..	..	..
45 Avanashi ..	Pt.	48	58	29	50·0	49	25	..	..	..	..
46 Bhavani ..	Pt.	48	41	15	36·6	24	13	..	..	..	..
47 Kurichi.. ..	Pt.	48	54	35	64·8	49	32	..	..	1	..
48 Satyamangalam.	Pt.	48	48	38	79·2	32	27	..	..	..	..
	Total ..		1,070	628	58·7	693	501	43	11	38	13
6. Chingleput district.											
49 Kanchipuram.	M.	144	193	103	53·4	113	78	13	8	1	..
50 Chingleput ..	M.	48	48	23	48·0	25	17	4	2	1	1
51 Tiruvallur ..	M.	48	74	38	51·4	55	31	1	1	1	..
52 Alandoor ..	Pt.	48	48	22	45·8	37	17	4	3	..	..
53 Maduranthakam.	Pt.	48	50	18	36·0	31	9	4	4	..	..
54 Poonamallee ..	Pt.	48	48	16	33·3	25	7	6	2	..	..
55 Tiruvothiyur ..	Pt.	48	48	17	35·4	14	9	1	..	..	..
56 Sriperumbudur.	Pt.	..	8	3	37·5	4	1	2	1	..	..
	Total ..		517	240	46·4	304	169	35	21	3	1
7. Chittoor district.											
57 Chittoor ..	M.	48	45	17	37·8	24	13	3	1	..	..
58 Tirupati ..	M.	48	48	29	60·4	29	18	4	2	..	..
59 Kalahasti ..	Pt.	48	48	28	58·3	29	22	6	2	..	..
60 Kuppam ..	Pt.	48	52	36	69·2	46	30	4	2	..	..
61 Madanapalle ..	Pt.	48	48	19	39·6	22	8	..	..	..	..
62 Madanapalle (Sanatorium).	Pt.	48	50	34	68·0	38	26	4	1	..	..
63 Palmaner ..	Pt.	48	49	16	32·7	43	14	2	2	..	..
64 Punganur ..	Pt.	48	48	23	48·0	27	19	..	..	..	..
65 Puttur	Pt.	48	48	14	29·2	23	9	..	..	..	..
66 Tirumalai Hills	Pt.	..	16	8	50·0	11	6	..	..	1	1
67 Tiruttani ..	Pt.	48	48	22	45·8	28	20	1	1	..	..
68 Vayalpad ..	Pt.	48	46	9	19·6	23	3	2	2	..	..
	Total ..		546	255	45·0	337	188	26	13	1	1
8. Cuddapah district.											
69 Cuddapah ..	M.	96	96	53	55·2	85	52	3	..	2	1
70 Proddatur ..	M.	72	69	18	26·1	35	15	11	2	4	..
71 Badvel	Pt.	48	48	16	33·3	17	14	2	..	..	..
72 Jammalamadugu.	Pt.	48	45	10	22·2	..	..	15	2	..	..
73 Pulivendla ..	Pt.	48	52	7	13·5	6	2	3	1	..	..
74 Rajampet ..	Pt.	48	48	18	37·5	22	13	..	..	..	..
75 Rayachoti ..	Pt	48	48	27	56·2	27	20	3	..	..	..
	Total ..		406	149	36·7	192	116	37	5	6	1

DIX A—*cont.*

and panchayat boards working the Madras Prevention of Adulteration Act 1952–53—cont.

Gingelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Tea.		Turmeric.		Miscellaneous.	
Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.
(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
				1	..	32	23	17	2	..	..	26	16
						7	4	2	..	..	..	1	1
18	5	..	..	..	..	16	7	15	2	2	..	5	1
4	1	3	..	..	..	7	..	5	1	1	..	2	1
8	..	5	..	..	..	5	1	10	3	..	..	..	..
8	1	..	..	..		9	4	9	3	..	..	..	..
7	..	3	..	..		4	1	3	..	..	..	..	..
4	1	3	..	1	1		1	2	2	1	..	2	1
..	..	..	..	..	..								
..	..	..	..			2	1	4	3	1	..	..	..
		1	..	1	..	7	1	3	1	1	..	..	..
..	..	3	..	1	..	2	2	2	1	..	..	..	..
2	..			..	..	3	2	7	3	1	..	4	3
..	..	..	..	..	..								
1	1	..	..			96	47	79	23	7	..	40	23
52	9	18	..	4	1								
												1	1
				6	2	3	..	..	..	..	..	2	1
46	13	10	1	2	..	1	..	..	..	..	..	8	6
9	2	4	..	1	..	2	..	..	..	..	..	..	..
5	..	1	..	..	..	3	1	..	..	..	..	..	..
3	1	1	..	1	..	6	5	..	..	..	..	1	1
5	..	3	..	4	2	..	..	..	..	..	..	1	1
10	4	2	..	2	..	..	..	..	..	..	..	..	..
15	5	15	2	..	..	..	..	..	..	..	..	13	10
1	1	1	..										
94	26	37	3	16	4	15	6	..	..	..	..		
				2	1	6	..	..	..	3	2	..	..
7	..	..	..	2	..	2	2	..	..	..	..	7	7
3	..	1	..	2	..	..	..	..	..	3	..	5	3
2	1	1	..	..	..	2	1	1	1	..	..	4	2
1	..	..	..	..	..	12	10	1	..	1	..	5	1
3	..	4	..	..	..	3	3	..	..	..	..	4	3
1	1	..	..	..	..								
						2	..	..	..	..	..	..	..
1	..	1	..	..	..	3	1	..	..	2	..	3	2
2	..	3	1	8	..	..	..	..	..	..	..	13	4
6	1	6	..	..	..	..	..	..	..	..	..	2	1
1	..	..	..	1	..	..	..	..	..	..	..	..	..
11	..	3	..	2	..	1	..	1	1	1	..	9	1
..	..	7	1	..	..	5	2	..	..	..	..		
38	3	26	2	17	1	36	19	3	2	10	2	52	24
						1	..	..	..	..	..	..	..
4	..	1	..	..	..	14	..	..	..	..	..	..	..
3	1	2	..	..	..	3	1	1	..	3	..	6	1
3	..	4	..	9	..	8	3	1	..	6	3	9	1
1	1	4	..	1	..	12	1	..	..	3	..	14	3
1	..	8	..	5	..	3	..	..	..	3	..	11	5
4	..	2	..	3	..	5	3	2	..	..	..	4	4
..	..	3	..	4	..								
16	2	24	..	22	..	46	8	4	..	15	3	44	14

APPEN

Number of samples received and found adulterated from municipalities during

Serial number and places.		Annual quota of samples.	Grand total.			Milk.		Ghee.		Butter.	
			Total.	Adulterated.	Percentage adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
9. East Godavari district.											
76 Kakinada ..	M.	288	285	156	54·8	160	130	29	11	3	3
77 Rajahmundry.	M.	216	218	156	71·6	152	139	13	8	2	1
78 Peddapuram ..	M.	72	72	22	30·6	38	17	4	1	2	1
79 Amalapuram ..	M.	96	95	59	63·1	72	52	7	5	..	..
80 Mandapeta ..	Pt.	48	47	22	47·0	12	11	4	..	8	5
81 Pithapuram ..	Pt.	48	45	24	53·3	25	21	2	1	..	..
82 Samalkot ..	Pt.	48	52	18	34·6	26	11	5	4	..	..
83 Ramachandrapuram	Pt.	48	48	23	48·0	13	20	3	..	..	..
84 Razole ..	Pt.	48	48	24	50·0	31	18	5	3	..	..
85 Tuni . ..	Pt.	48	44	23	52·3	23	19	1	..	..	..
Total	..		954	527	55·2	569	438	73	33	15	10
10. West Godavari district.											
86 Eluru	M.	144	144	81	63.1	122	77	11	3	..	..
87 Bhimavaram ..	M.	48	47	24	51·1	22	16	11	4	..	..
88 Palacole ..	M.	48	48	26	54.1	36	23	3	1	..	..
89 Akividu ..	Pt.	48	48	17	35·4	21	10	4	2	..	..
90 Kovvur ..	Pt.	48	48	33	68·8	32	27	5	4	2	2
91 Narasapur ..	Pt.	48	55	33	60·0	32	23	17	8	1	1
92 Nidadovole ..	Pt.	48	48	32	66·6	24	18	3	1	8	7
93 Polavaram ..	Pt.	48	48	10	20·8	6	6	4	..	..	..
94 Tadepalligudem	Pt.	48	48	25	52·1	22	20	4	3	2	1
95 Tanuku ..	Pt.	48	50	29	58·0	28	20	6	3	4	3
Total	..		584	310	53.1	345	240	68	29	17	14
11. Guntur district.											
96 Guntur ..	M.	288	290	133	45·9	135	103	53	13	6	2
97 Ongole	M.	96	96	37	38·5	38	25	34	5	..	..
98 Chirala ..	M.	96	96	51	53·1	24	18	4	3	43	29
99 Tenali	M.	96	96	57	59·4	43	36	3	2	24	15
100 Narasaraopet ..	M.	48	48	12	25·0	5	5	..	..	4	2
101 Bapatla ..	M.	48	59	39	66.0	23	18	29	17	6	4
102 Mangalagiri ..	Pt.	48	48	22	45·8	14	8	5	5	..	..
103 Ponnur ..	Pt.	36	36	58	41·7	10	8	..	..	5	..
104 Nidubrolu ..	Pt.	24	24	13	54·1	3	1	1	1	5	4
105 Repalle ..	Pt.	48	49	14	28·6	22	11	..	..	3	1
106 Sattenapalle ..	Pt.	48	48	6	12·5	4	4	2	..	2	1
107 Vetapalem ..	Pt.	48	44	10	22·7	8	7	5	1	1	1
Total	..		934	409	48·1	329	244	136	47	99	59
12. South Kanara district.											
108 Mangalore ..	M.	216	228	88	38·6	129	74	5	..	..	..
109 Udipi	M.	48	49	20	40·8	30	14	3	..	..	..
110 Kasaragod ..	Pt.	48	48	28	58·3	25	17	7	7	..	..
Total	.		325	136	41·8	184	105	15	7	..	..

DIX A—*cont.*

and panchayat boards working the Madras Prevention of Adulteration Act 1952–53—cont.

Gingelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Tea.		Turmeric.		Miscellaneous.	
Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.
(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
20	..	14	..	5	..	15	1	2	1	1	..	36	10
11	..	15	1	6	1	16	3	..	..	..	..	3	3
5	..	5	..	5	..	4	..	..	..	..	..	9	3
3	..	3	..	..	..	3	1	..	..	..	..	7	1
1	..	5	..	2	..	6	1	..	..	..	..	9	5
5	..	4	..	2	..	2	..	..	..	..	..	5	2
2	..	4	..	1	..	1	..	..	..	..	..	13	3
4	..	1	..	..	..	..	..	..		4	1	6	2
2	..	2	..	3	1	..	..	..	..	1	1	4	1
1	..	3	..	..	..	5	2	..	..	1	..	10	2
54	..	56	1	24	2	52	8	2	1	7	2	102	32
7	..	..	..	..	..	2	1	2	..	..	..	..	..
4	..	3	..	..	..	3	3	..	..	..	..	4	1
4	..	.	..	2	..	2	1	..	..	..	..	1	1
6	..	5	..	..	..	5	4	..	..	..	..	7	1
4	..	3	..	1	..	..	..	..	..	1	..	..	..
1	..	3	..	..	..	1	1	..	..	..	..	..	..
..	..	3	..	..	..	4	2	..	..	..	..	6	4
..	..	10	..	6	..	4	2	..		3	..	15	2
2	..	7	..	..	..	..	..	..	..	2	..	9	1
1	..	3	..	..	..	..	..	..	..	2	1	6	2
29	..	37	..	9	..	21	14	2	..	8	1	48	12
19	2	18	..	14	2	18	4	4	..	5	2	18	5
1	..	5	..	1	..	6	3	1	..	..	..	10	4
3	..	6	..	6	..	3	1	..	..	4	..	3	..
7	..	2	..	3	2	5	1	2	..	1	..	6	1
8	..	12	..	..	..	5	..	1	..	4	1	9	4
..	..	..	..	..	..	..	..	..	..	..	..	1	..
5	1	2	..	2	..	8	3	..	..	2	..	10	5
6	..	2	..	1	..	3	2	..	..	..	..	9	5
1	1	3	1	..	..	3	..	..	..	1	1	7	4
9	..	3	..	..	..	6	1	..	..	..	..	6	1
5	..	16	..	10	..	..	..	..	..	6	1	3	..
4	..	6	..	4	..	2	..	..	..	6	..	8	1
68	4	75	1	41	4	59	15	8	..	29	5	90	30
8	..	27	..	..	..	43	11	11	..	..	..	5	3
..	..	..	..	..	..	5	1	..	..	..	..	11	5
1	..	6	..	..	..	4	4	3	..	..	..	2	..
9	..	33	..	..	..	52	16	14	..	..	..	18	8

APPENDIX A—*cont.*

Number of samples received and found adulterated from municipalities and panchayat boards working the Madras Prevention of Adulteration Act during 1952–53—cont.

Serial number and places.		Annual quota of samples.	Grand total.			Milk.		Ghee.		Butter.		Gingelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Tea.		Turmeric.		Miscellaneous.	
			Total.	Adulterated.	Percentage adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
13. *Krishna district.*																									
111 Vijayavada ..	(M)	360	360	196	54·4	250	168	33	15	16	4	19	2	8	..	12	1	8	3	4	..	5	..	5	3
112 Masulipatnam ..	(M)	144	144	74	51·4	89	68	19	3	..	..	19	1	8	..	2	1	5	..	2	1	..	..	..	..
113 Gudivada ..	(M)	96	95	44	46·3	49	33	1	..	8	3	17	4	3	..	..	..	8	1	4	2	1	..	4	1
114 Avanigada ..	(P)	..	31	6	19·3	7	4	1	..	..	..	7	..	5	..	3	..	4	2	..	..	2	..	2	..
115 Jaggayyapet ..	(P)	48	48	23	48·0	34	21	5	2	..	..	4	..	3	..	2	..	..	..	..	..	..	..	..	..
116 Nuzvid ..	(P)	48	43	20	46·5	18	16	1	..	..	..	11	3	1	..	..	..	6	..	..	..	..	..	5	2
117 Tiruvur ..	(P)	48	48	25	52·1	29	19	5	3	..	..	3	..	2	..	1	..	2	2	..	..	..	..	6	1
Total ..		..	769	388	50.4	476	328	65	23	24	7	80	10	39	..	20	2	33	8	10	3	8	..	23	7
14. *Kurnool district.*																									
118 Kurnool ..	(M)	96	97	49	50·5	69	33	16	10	1	..	..	..	4	..	..	..	3	2	..	..	..	..	4	4
119 Nandyal ..	(M)	72	72	42	58·3	22	20	2	1	..	..	1	1	4	..	..	..	21	6	..	..	1	..	21	14
120 Dhone ..	(P)	48	47	20	40·8	28	18	5	2	..	.	1	..	6	..	5	..	1	..	..	..	..	..	1	..
121 Giddalore ..	(P)	48	49	19	38·8	24	14	6	3	..	..	..	..	5	..	3	..	2	2	2	..	1	..	6	..
122 Markapur ..	(P)	48	49	22	45·0	30	20	3	..	..	..	3	..	3	..	1	..	2	..	1	..	1	..	5	2
Total ..		..	314	152	46·2	173	105	32	16	1	..	5	1	22	..	9	..	29	10	3	..	3	..	37	20
15. *Madurai district.*																									
123 Madurai ..	(M)	1,200	1,210	314	25·2	890	276	4	2	10	9	134	4	68	..	4	..	74	17	5	..	7	2	14	4
124 Dindigul ..	(M)	96	96	41	42·7	72	35	5	4	..	..	18	1	1	..	..	..	..	..	..	..	..	..	..	..
125 Palni	(M)	96	96	57	59·4	76	47	3	2	..	..	3	..	1	..	..	..	9	7	2	..	2	1	..	..
126 Bodinayakanur	(M)	72	70	23	32·9	50	18	1	1	..	..	9	..	..	..	..	..	6	2	2	..	..	..	2	2
127 Kodaikanal ..	(M)	48	60	14	23·3	43	10	6	2	1	..	5	..	..	..	1	..	4	2	..	..	..	..	..	..
128 Periyakulam ..	(M)	48	48	27	56·3	22	19	2	..	1	..	6	..	3	..	1	1	13	7	..	..	..	..	..	..
129 Allinagaram ..	(P)	48	48	18	37·5	26	18	..	..	..	..	8	..	4	..	..	..	6	..	4	..	..	..	..	..
130 Ayakudy ..	(P)	48	47	9	19·1	29	8	..	..	..	..	3	..	6	..	6	..	3	1	..	..	..	..	..	..
131 Batlagundu ..	(P)	48	48	8	16·7	3	2	..	..	..	..	9	..	5	..	1	..	8	3	2	..	12	1	8	2
132 Chinnamanur ..	(P)	48	47	8	17·0	19	6	2	..	..	..	8	..	4	..	..	..	3	1	4	..	5	1	2	..
133 Cumbum ..	(P)	48	50	18	36·0	36	13	..	..	..	..	..	..	2	..	..	..	8	5	1	..	2	..	1	..
134 Melur	(P)	48	48	16	33·3	31	12	2	1	..	..	3	..	1	..	..	..	1	..	1	..	5	2	4	1
135 Nilakkottai ..	(P)	48	46	6	13·0	20	5	..	..	..	..	12	..	9	..	..	..	3	1	..	..	2	..	..	..
136 Sholavandan ..	(P)	48	45	19	42·2	29	17	..	..	..	..	11	2	3	..	1	..	1	..	..	..	..	..	..	..
137 Tirumangalam	(P)	48	48	14	29·1	35	12	..	..	..	..	4	..	2	..	..	..	3	2	3	..	..	..	1	..
138 Usilampatti ..	(P)	48	42	16	38·1	30	16	..	..	..	..	6	..	4	..	..	..	..	..	1	..	..	..	1	..
Total ..		..	2,049	608	29·6	1,411	514	25	12	12	9	639	8	113	..	14	1	142	48	25	..	35	7	33	9
16. *Malabar district.*																									
139 Kozhikode ..	(M)	288	288	109	37·8	150	80	32	11	7	3	23	..	4	..	..	..	7	2	36	..	2	1	27	12
140 Palghat ..	(M)	144	147	68	59·8	117	70	3	2	2	1	4	..	..	..	..	..	11	9	5	2	..	..	5	4
141 Cannanore ..	(M)	96	96	35	36·5	61	27	5	..	3	1	3	..	4	..	..	..	5	3	9	..	..	..	6	4
142 Cochin ..	(M)	48	48	18	37·2	18	13	3	2	1	..	9	..	11	..	..	..	..	..	3	..	..	..	3	3
143 Tellicherry ..	(M)	72	72	42	58·3	47	40	7	..	3	..	3	..	2	..	..	..	..	..	4	..	2	1	4	1
Total ..		..	651	292	44·8	393	230	50	15	16	5	42	..	21	..	..	..	23	14	57	2	4	2	45	24

APPENDIX A—*cont.*

Number of samples received and found adulterated from municipalities and panchayat boards working the Madras Prevention of Adulteration Act during 1952–53—cont.

Serial number and places.	Annual quota of samples.	Grand total.			Milk.		Ghee.		Butter.		Gingelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Tea.		Turmeric.		Miscellaneous.	
		Total.	Adulterated.	Percentage adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
17. *Nellore district.*																								
144 Nellore .. (M)	144	143	83	58·0	87	62	20	12	..	..	12	3	2	..	1	..	11	3	1	..	..	..	9	3
145 Gudur .. (M)	48	48	30	62·5	27	27	1	..	..	..	2	2	7	..	1	..	1	1	..	..	1	..	8	..
146 Kandukur .. (P)	48	48	14	29·1	16	9	22	4	..	..	..	..	5	..	2	..	..	..	2	..	..	..	1	1
147 Kovur .. (P)	48	20	5	25·0	3	2	1	1	..	..	1	..	7	..	2	..	3	..	..	..	..	..	3	2
148 Kavali .. (P)	48	52	27	51·9	30	18	7	4	..	..	3	..	5	..	..	..	2	..	..	..	..	..	6	5
149 Nayudupet .. (P)	48	48	19	39·6	23	18	..	..	..	..	7	..	7	..	1	..	2	..	..	..	2	..	6	1
150 Sulurpet .. (P)	48	48	17	35·4	20	12	6	3	..	..	12	1	2	..	2	..	..	..	2	..	..	..	3	1
151 Venkatagiri .. (P)	48	48	22	45·8	31	21	2	..	..	..	..	..	8	..										
Total ..	455	217	47·7	237	169	59	24	..	..	37	6	43	..	10	..	23	5	7	..	3	..	36	13
18. *Nilgiris district.*																								
152 Ootacamund .. (M)	218	222	118	53·2	130	72	9	3	2	..	6	..	..	..	..	..	30	11	10	3	3	2	32	27
153 Coonoor .. (M)	144	144	63	43·7	89	48	8	1	8	2	11	..	..	..	2	1	20	9	6	2	..	..	..	..
154 Kotagiri .. (P)	48	49	13	26·5	41	13	1	..	1	..	1	..	2	..	..	..	2	..	1	..	..	..	..	..
Total ..	415	194	46·8	260	133	18	4	11	2	18	..	2	..	2	1	52	20	17	5	3	2	32	27
19. *Ramanathapuram district.*																								
155 Virudhunagar .. (M)	96	96	13	13·5	39	7	4	1	..	..	27	1	8	1	5	..	8	2	4	..	..	..	1	1
156 Karaikudi .. (M)	96	97	54	55·7	78	51	1	..	1	..	6	..	3	..	1	..	4	1	..	..	..	..	3	2
157 Devakottai .. (M)	72	72	21	29·2	37	19	3	1	..	..	11	..	7	..	5	..	8	1	1	..	..	..	..	..
158 Rajapalayam .. (M)	72	82	34	41·5	58	28	..	..	..	..	9	..	4	..	..	..	6	4	3	..	..	..	2	2
159 Srivilliputtur .. (M)	72	77	18	23·4	38	11	5	1	..	..	13	1	4	..	1	..	5	2	3	..	4	1	6	2
160 Aruppukottai .. (M)	48	46	16	34·8	35	14	2	1	..	..	3	..	4	..	..	..	1	1	..	..	..	..	1	..
161 Sivakasi .. (M)	48	48	18	37·5	37	17	..	..	..	..	3	..	..	..	2	1	1	..	2	..	..	..	..	..
162 Mudukulattur .. (P)	..	18	6	33·3	11	5	..	..	..	..	6	..	..	..	..	..	1	..	..	..	..	..	..	..
163 Kilakarai .. (P)	48	45	3	6·7	35	1	..	..	..	..	3	..	2	1	1	1	1	..	2	..	..	..	2	2
164 Kandanur .. (P)	48	48	18	37·5	42	16	1	..	..	..	2	1	1	..	..	..	1	..	..	..	..	..	2	1
165 Pallathur .. (P)	48	48	17	35·4	37	10	..	..	..	..	1	..	1	..	..	..	1	..	..	..	..	..	1	..
166 Paramakudi .. (P)	48	50	20	40·0	29	16	1	1	..	..	7	1	7	..	..	..	5	2	..	..	..	..	7	6
167 Ramanathapuram. (P)	48	48	19	39·6	28	9	4	2	..	..	4	..	..	..	..	..	1	1	..	..	..	..	..	..
168 Rameswaram .. (P)	48	48	16	33·3	45	14	..	..	..	..	1	1	1	..	..	..	3	2	5	1	..	..	..	..
169 Sattur .. (P)	48	47	14	29·8	35	11	1	..	..	..	2	..	1	1	..	..	3	2	..	..	..	..	..	..
170 Sivaganga .. (P)	48	48	24	50·0	43	21	..	..	..	..	1	..	1	1	..	..	5	..	..	..	..	..	5	2
171 Tiruppattur .. (P)	48	48	9	18·8	29	8	..	..	..	..	7	..	7	1	..	..	..	..	..	..	..	..	..	..
172 Venkateswarapuram. (P)	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
173 Kanneseri .. (P)	..	2	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..
* For festival only. Total ..	969	320	33·0	656	258	22	7	1	..	109	5	52	4	16	2	64	26	19	1	4	1	26	16
20. *Salem district.*																								
174 Salem .. .. (M)	288	373	161	43·2	300	147	7	2	1	1	22	2	7	..	7	..	12	7	..	..	12	..	5	2
175 Rasipuram .. (M)	48	48	33	68·8	45	33	..	..	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..
176 Dharmapuri .. (P)	48	45	34	75·5	37	32	..	..	..	..	2	..	2	..	2	..	..	..	..	..	..	..	2	2
177 Harur .. .. (P)	..	49	35	71·4	33	27	..	..	..	..	2	..	2	..	..	..	1	1	..	..	2	..	12	7
178 Iddapadi .. (P)	48	48	20	41·7	44	19	1	..	..	..	1	..	..	..	1	1	..	..	..	..	..	..	..	..
179 Namakkal .. (P)	48	44	40	90·9	33	32	..	..	..	..	1	..	1	..	1	1	2	2	..	..	..	..	6	5
180 Shevaroys .. (P)	48	51	14	27·5	33	10	1	..	..	..	2	..	..	..	2	..	4	1	1	..	2	..	3	2
181 Tiruchengode .. (P)	48	43	14	32·6	20	11	..	..	..	..	5	..	..	..	..	..	3	2	..	..	1	..	2	1
Total ..	701	351	50·2	545	311	9	2	1	1	42	2	21	..	13	2	22	13	1	..	17	..	30	19

APPENDIX A—*cont.*

Number of samples received and found adulterated from municipalities and panchayat boards working the Madras Prevention of Adulteration Act during 1952–53—cont.

Serial number and places.		Annual quota of samples.	Grand total.			Milk.		Ghee.		Butter.		Gingelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Tea.		Turmeric.		Miscellaneous.	
			Total.	Adulterated.	Percentage adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
21. *Tanjore district.*																									
182 Tanjore ..	(M)	216	216	124	57·4	126	77	16	13	26	23	32	8	7	..	1	..	6	1	..	..	..	..	2	2
183 Kumbakonam ..	(M)	144	168	87	51·8	131	74	5	4	4	3	19	5	2	..	..	..	5	..	..	..	..	..	2	1
184 Nagapattinam ..	(M)	144	153	40	26·1	81	32	10	4	2	2	40	1	13	1	..	..	6	1	..	..	1	1	..	..
185 Mayuram ..	(M)	96	96	52	54·2	60	35	10	8	3	2	9	..	1	..	1	1	8	4	1	..	..	..	3	2
186 Mannargudi ..	(M)	48	48	17	35·4	28	17	1	..	..	..	13	..	6	..	..	..	..	..	..	..	..	..	..	..
187 Tiruvarur ..	(M)	48	48	32	66·6	46	32	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..
188 Ayyampet ..	(P)	48	48	29	60·4	23	18	..	..	..	..	1	..	..	..	1	..	4	2	..	..	..	..	10	9
189 Nannilam ..	(P)	48	48	20	41·7	43	17	..	..	2	2	10	..	..	..	..	..	..	..	..	..	..	..	1	1
190 Papanasam ..	(P)	48	49	13	26·5	41	10	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	2	2
191 Pattukkottai ..	(P)	48	43	11	25·6	11	4	1	..	..	..	3	1	3	..	..	..	1	1	..	..	..	..	..	..
192 Shirkali ..	(P)	48	44	20	45·4	23	13	..	..	5	5	21	6	8	..	2	1	2	1	..	..	..	..	..	..
193 Tiruvaiyaru ..	(P)	48	47	19	40·4	39	17	..	..	..	..	9	..	3	..	1	..	3	1	1	..	..	..	..	..
194 Tirutturaipundi.	(P)	48	53	36	68·0	36	32	1	..	..	..	3	1	3	..	..	..	4	3	..	..	2	..	..	..
195 Tiruvadamarudur	(P)	48	46	11	23·9	27	8	2	1	1	1	10	1	..	..	..	..	3	..	..	..	..	..	2	1
Total ..			1,107	511	46·1	715	356	46	28	43	38	177	23	50	1	7	2	42	14	2	..	3	1	22	18
22. *Tiruchirappalli district.*																									
196 Tiruchirappalli.	(M)	336	334	127	38·0	185	85	21	14	14	6	42	2	19	..	5	1	31	12	1	..	11	3	5	4
197 Karur	(M)	96	96	58	60·4	87	55	3	3	..	..	2	..	2	..	..	..	1	..	1	..	..	..	..	..
198 Pudukkottai ..	(M)	96	96	35	36·5	54	28	3	1	4	1	17	2	8	..	3	1	7	2	..	..	..	..	..	..
199 Srirangam ..	(M)	48	50	34	68·0	27	21	16	9	3	2	..	..	..	..	..	..	1	..	..	..	..	..	3	2
200 Gunaseelam for festival only.	(P)	..	7	6	85·5	5	4	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..
201 Ariyalur ..	(P)	48	48	24	50·0	30	19	1	1	2	1	..	..	..	..	..	..	6	2	..	..	..	..	1	1
202 Kulittalai ..	(P)	48	50	20	40·0	34	14	6	5	3	..	5	..	3	..	..	..	1	..	..	..	..	..	1	1
203 Lalgudi ..	(P)	48	48	21	43·8	37	17	3	3	..	..	5	..	..	..	..	..	1	..	1	..	1	..	1	1
204 Jayankondam ..	(P)	48	48	21	43·8	36	17	..	..	2	1	4	..	..	..	..	..	1	..	..	..	..	..	2	1
205 Musiri	(P)	48	49	31	63·3	37	23	2	2	..	..	7	2	..	..	..	..	4	2	..	..	..	..	4	4
206 Manapparai ..	(P)	48	49	14	28·5	25	8	7	2	..	..	2	..	..	..	..	..	6	4	2	..	..	..	..	..
207 Turaiyur ..	(P)	48	48	19	40·0	18	11	1	..	..	..	6	..	3	..	..	..	5	4	1	..	..	..	2	2
Total ..			923	410	44·4	575	302	63	40	28	11	101	7	44	1	9	2	66	28	6	..	12	3	19	16
23. *Tirunelveli district.*																									
208 Tirunelveli ..	(M)	216	249	118	47·4	187	86	11	3	2	2	..	..	2	..	..	..	19	14	1	..	..	..	24	13
209 Tuticorin ..	(M)	144	210	102	48·6	157	75	4	4	5	2	3	..	1	..	..	..	8	5	5	..	..	..	21	16
210 Palayamkottai.	(M)	96	96	26	27·1	76	19	5	4	1	1	8	..	..	..	..	..	3	2	7	..	..	..	..	..
211 Melapalayam ..	(M)	48	49	20	40·8	32	12	..	..	..	..	4	..	..	..	..	..	4	4	6	1	..	..	5	3
212 Ambasamudram.	(P)	48	49	28	57·1	29	22	..	..	..	..	2	..	..	..	..	..	5	3	1	..	1	..	10	3
213 Courtallam ..	(P)	48	60	28	46·6	34	19	4	3	..	..	3	..	..	..	1	1	2	1	..	..	..	..	9	4
214 Ettayapuram ..	(P)	48	48	13	27·1	22	9	2	1	..	..	6	..	4	..	2	..	9	3	1	..	..	..	..	..
215 Kalladaikurichi.	(P)	48	60	33	55·0	51	29	4	2	2	1	7	..	5	..	..	..	..	..	..	..	..	..	..	2	1
216 Kadayanallur ..	(P)	48	49	32	65·3	34	26	1	..	..	..	1	..	..	..	1	..	3	3	..	..	1	..	10	3
217 Koilpatti ..	(P)	48	48	16	33·3	23	14	1	..	..	..	4	..	3	..	2	1	2	..	1	1	..	..	..	..
218 Puliyangudi ..	(P)	48	48	22	45·9	42	22	1	..	..	..	12	..	7	..	..	..	..	..	1	..	..	..	1	..
219 Sankarankoil ..	(P)	48	48	23	47·9	35	19	1	..	..	..	3	..	..	..	..	..	6	4	..	..	..	..	..	..
220 Srivaikuntam ..	(P)	48	40	16	40·0	21	8	2	1	..	..	5	..	1	..	..	..	3	1	1	..	..	..	7	6
221 Tenkasi ..	(P)	48	48	23	47·9	34	19	..	..	..	..	5	..	1	..	..	..	2	2	4	..	..	..	6	2
222 Tiruchendur ..	(P)	48	51	22	43·1	42	16	2	2	..	..	2	..	..	..	..	..	2	2	..	..	..	..	2	2
223 Vikramasingapuram.	(P)	48	48	28	58·3	44	28	..	..	..	..	3	..	..	..	..	..	2	..	1	..	..	..	..	..
224 Viravanallur ..	(P)	48	51	27	53·0	47	23	1	1	..	..	1	..	..	..	1	1	..	..	..	..	..	..	1	1
Total ..			1,252	577	45·9	910	446	39	21	10	6	70	1	24	..	7	3	71	44	29	2	1	..	91	54

APPEN

Number of samples received and found adulterated from municipalities during

Serial number and places.		Annual quota of samples.	Grand total.			Milk.		Ghee.		Butter.	
			Total.	Adulterated.	Percentage adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
24. *Visakhapatnam district.*											
225 Visakhapatnam.	(M)	288	289	168	58·1	450	160	6	1	13	6
226 Anakapalle ..	(M)	144	133	56	42·1	53	47	2	1	2	1
227 Vizianagaram ..	(M)	96	96	53	55·2	78	41	3	3	..	..
228 Bheemunipatnam	(M)	48	48	11	22·9	40	11	..	..	..	..
229 Srikakulam ..	(M)	48	48	16	33·3	40	15	1	..	..	..
230 Bobbili ..	(P)	48	49	18	36·7	36	17	2	..	..	..
231 Chodavaram ..	(P)	48	45	22	48·8	27	18	2	1	..	..
232 Narasapatnam.	(P)	48	48	17	35·4	23	15	..	..	..	..
233 Palakonda ..	(P)	48	44	5	11·4	21	4	3	..	..	..
234 Salur	(M)	48	47	18	38·3	34	14	1	..	..	..
235 Parvathipuram.	(P)	48	49	25	51·0	29	19	1	..	..	..
236 Sompeta ..	(P)	..	51	22	43·1	32	17	1	..	..	..
237 Yellamanchili.	(P)	48	47	25	53·2	27	21	1	..	3	2
Total ..			994	456	45·9	690	399	23	6	18	9

M. — Municipality. P. — Panchayat Board.

DIX A—*cont.*

and panchayat boards working the Madras Prevention of Adulteration Act 1952–53—cont.

Gingelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Tea.		Turmeric.		Miscellaneous.*	
Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.	Total.	Adulterated.
(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
				2	..	4	1	..	..	..	..	2	..
10	..	2	..	26	3	11	..	5	..	..	..	2	2
17	1	14	1	..	..	2	..	..	..	..	..	11	9
1	..	1	..	4	..	..	..	..	..	..	..	..	..
1	..	3	..	3	..	1	..	..	..	..	..	1	..
2	1	..	..	..	..	..	..	..	..	..	..	4	1
7	..	..	..	4	1	2	..	..	..	..	..	6	1
4	1	..	..	4	..	5	..	..	..	..	..	8	..
3	..	5	2	1	..	1	..	..	..	..	..	10	1
7	..	1	..	..	..	1	..	..	..	..	..	5	4
6	..	..	..	3	..	3	..	..	..	..	..	7	6
5	..	1	..	..	..	..	..	..	..	2	..	12	4
2	1	2	..	..	..	3	1	1	..	..	..	9	1
1	..	2	..	..	..								
66	4	31	3	47	4	33	2	6	..	2	..	78	29

Appendix B.

Statement showing the total amount of fines levied, number of convictions, average fine, etc., in 1952–53.

Names of municipalities.	Number of pending cases.	Number of convictions.	Fines in analysis cases.	Fines in non-analysis cases.	Total fines.	Maximum fine.	Minimum fine.	Average fine.	Average fine in 1951–52.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
MUNICIPALITIES.									
Class A.									
1 Madurai	32	274	12,254	105	12,359	125	15	45	39
2 Vijayavada ..	37	159	4,979	87	5,066	125	15	31	27
3 Tiruchirappalli ..	30	99	2,907	31	2,938	50	15	29	27
4 Kozhikode ..	29	80	2,872	120	2,992	100	10	36	31
5 Coimbatore ..	57	129	8,735	..	8,735	300	20	68	63
6 Kakinada	4	151	6,640	..	6,640	100	20	44	55
7 Guntur	88	45	1,522	..	1,522	70	10	34	59
8 Salem	1	158	4,075	39	4,114	60	15	26	20
9 Visakhapatnam ..	1	166	5,914	30	5,944	100	10	36	44
10 Ootacamund ..	6	109	3,144	50	3,194	150	10	29	78
11 Rajahmundry ..	28	128	10,166	130	10,296	170	30	79	71
12 Mangalore	9	75	5,040	..	5,040	150	35	67	62
13 Tanjore	1	120	8,330	270	8,600	170	20	69	61
14 Tirunelveli ..	13	105	3,259	5	3,264	75	5	31	35
15 Anakapalle ..	19	37	1,345	65	1,410	100	10	36	48
16 Bellary	20	67	2,427	8	2,435	110	17	36	27
17 Kancheepuram ..	2	101	3,630	22	3,652	85	10	36	34
18 Coonoor	2	60	3,058	25	3,083	200	10	51	30
19 Cuddalore	3	68	3,130	63	3,193	125	10	46	34
20 Eluru	28	52	1,317	..	1,317	100	10	25	39
21 Kumbakonam ..	6	80	4,600	..	4,600	125	10	58	63
22 Masulipatnam ..	27	47	1,400	..	1,400	100	10	30	31
23 Nellore	13	70	1,925	88	2,013	75	10	28	39
24 Nagapattinam ..	..	40	3,320	193	3,513	350	25	83	62
25 Palghat	8	79	2,679	..	2,679	136	15	34	34
26 Tuticorin	2	100	3,025	77	3,102	100	10	30	32
27 Vellore	3	35	1,125	132	1,257	50	10	32	40
28 Pollachi	3	59	1,710	..	1,710	100	10	29	91
Class B.									
29 Amalapuram ..	2	54	2,410	..	2,410	100	15	45	34
30 Adoni	3	53	970	..	970	40	15	18	38
31 Cannanore ..	6	29	1,115	50	1,165	60	15	38	31
32 Chidambaram ..	5	25	790	15	805	60	20	32	29
33 Chirala	1	51	2,195	..	2,195	150	20	43	32
34 Cuddapah	17	36	1,030	4	1,034	90	10	29	28
35 Dindigul	7	34	760	69	829	100	5	22	34
36 Erode	1	58	2,110	50	2,160	100	10	36	25
37 Gudivada	6	38	1,982	..	1,982	100	10	52	46
38 Hospet	3	40	1,987	8	1,995	150	10	50	69
39 Karaikudi	4	50	1,392	10	1,402	75	10	28	42
40 Karur	6	52	2,250	244	2,494	88	10	43	52
41 Kurnool	16	33	1,380	..	1,380	100	20	42	50
42 Mayuram	2	49	3,585	..	3,585	215	20	73	79
43 Ongole	1	36	1,505	27	1,532	75	20	42	48
44 Palni	9	47	2,325	65	2,390	105	20	49	45
45 Palayamkottai ..	7	19	525	5	530	50	15	28	26
46 Pudukottai ..	1	34	1,260	..	1,260	100	20	37	57
47 Tenali	..	53	3,355	..	3,355	200	15	63	47
48 Tiruppur	3	51	1,315	..	1,315	75	10	26	41
49 Udumalpet ..	1	45	1,835	..	1,835	100	20	41	40
50 Virudunagar ..	3	10	305	51	356	50	5	31	32
51 Vizianagaram ..	10	43	1,464	106	1,570	100	10	34	42
52 Villupuram ..	..	21	565	20	585	75	10	27	48

Appendix B—*cont.*

Statement showing the total amount of fines levied, number of convictions, average fine, etc., in 1952–53—cont.

Name of municipalities.	Number of pending cases.	Number of convictions.	Fines in analysis cases.	Fines in non-analysis cases.	Total fines.	Maximum fine.	Minimum fine.	Average fine.	Average fine in 1951–52.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
MUNICIPALITIES—*cont.*									
Class B—*cont.*									
53 Anantapur ..	3	50	1,257	90	1,347	50	5	25	29
54 Bodinayakkanur ..	12	10	615	20	635	80	20	62	46
55 Devakottai ..	4	17	665	..	665	75	15	39	47
56 Hindupur	12	23	713	9	722	60	15	31	44
57 Peddapuram ..	1	20	740	..	740	100	15	37	64
58 Nandyal	3	39	1,303	..	1,303	60	15	33	40
59 Proddatur ..	3	15	365	..	365	50	10	24	14
60 Rajapalayam ..	..	33	1,065	..	1,065	70	5	32	40
61 Srivilliputtur ..	3	15	400	105	505	40	15	27	33
62 Tellicherry ..	1	41	1,530	..	1,530	75	15	37	34
63 Tiruvannamalai ..	8	29	980	..	980	60	20	34	28
Class C.									
64 Ambur	28	4	100	..	100	35	15	25	34
65 Aruppukottai ..	..	16	630	82	712	60	30	39	28
66 Bhimavaram ..	1	22	1,180	107	1,287	100	20	54	49
67 Bheemunipatnam.	2	9	322	..	322	85	12	36	44
68 Cochin	1	17	730	4	734	140	5	43	42
69 Srikakulam ..	1	15	800	..	800	110	10	53	69
70 Chingleput ..	1	22	630	..	630	60	5	29	34
71 Chittoor	16	1	40	..	40	40	40	40	23
72 Dharapuram ..	10	10	245	..	245	40	10	25	35
73 Gobichettipalayam.	1	32	1,556	..	1,556	115	25	49	59
74 Gudiyattam ..	5	4	160	30	190	50	30	40	37
75 Guntakal ..	4	39	970	..	970	50	5	25	33
76 Kodaikanal ..	1	13	1,085	40	1,125	125	50	83	71
77 Melapalayam ..	3	17	620	..	620	100	15	36	23
78 Mettupalayam ..	3	30	1,175	..	1,175	60	15	37	70
79 Mannargudi ..	..	17	1,240	9	1,240	260	25	73	79
80 Narasaraopet ..	1	11	445	..	445	100	10	40	43
81 Palacole	9	17	690	20	710	60	5	41	35
82 Periyakulam ..	8	19	1,155	75	1,230	100	25	65	68
83 Rasipuram ..	..	33	1,245	..	1,245	100	15	37	30
84 Srirangam	2	32	1,135	..	1,135	115	15	38	43
85 Salur	2	16	920	175	1,095	150	15	57	32
86 Sivakasi	1	17	435	55	490	40	20	26	26
87 Tadpatri	8	11	390	63	453	50	25	35	28
88 Tindivanam ..	6	18	740	..	740	60	20	41	48
89 Tirupati	3	26	840	..	840	50	15	32	51
90 Bapatla	5	34	1,745	72	1,817	200	15	51	55
91 Tiruvallur	5	32	1,185	..	1,185	100	15	37	29
92 Tiruppattur ..	3	6	130	..	130	50	10	22	32
93 Tiruvarur	1	29	1,210	34	1,244	70	10	42	32
94 Udipi	1	20	445	..	445	76	10	22	35
95 Vaniyambadi ..	3	20	1,130	40	1,170	100	30	56	55
96 Walajahpet ..	2	3	105	..	105	50	25	35	50
97 Arni	8	19	190	..	190	25	5	10	25
98 Gudur	16	14	310	..	310	40	5	22	22

APPENDIX B—*cont.*

Statement showing the total amount of fines levied, number of convictions, average fine, etc., in 1952–53—cont.

Name of panchayat.	Number of pending cases.	Number of convictions.	Fines in analysis cases.	Fines in non-analysis cases.	Total fines.	Maximum fine.	Minimum fine.	Average fine.	Average fine in 1951–52.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
PANCHAYAT BOARDS.									
1. *Anantapur district.*									
1 Dharmavaram ..	7	26	550	..	550	50	15	21	21
2 Gooty	1	19	530	..	530	70	10	28	20
3 Kadiri	6	15	240	..	240	30	5	16	48
4 Penukonda	..	22	1,035	..	1,035	100	10	47	26
5 Uravakonda ..	7	13	497	..	497	56	20	38	13
2. *North Arcot district.*									
6 Arkonam	2	32	2,715	22	2,737	100	10	85	40
7 Arcot	1	16	465	..	465	50	20	29	40
8 Ranipet	1	25	820	..	820	80	10	33	37
3. *South Arcot district.*									
9 Bhuvanagiri ..	6	12	286	..	286	35	10	24	31
10 Kallakurichi ..	3	16	740	..	740	100	15	46	54
11 Nellikuppam ..	2	11	242	..	242	52	10	22	35
12 Panruti	1	17	456	..	456	61	10	27	14
13 Tirukkoyilur ..	3	9	237	40	277	50	12	24	26
14 Vriddhachalam ..	..	39	1,500	..	1,500	100	15	39	50
4. *Bellary district.*									
15 Harpanahalli ..	16	5	240	..	240	60	25	48	43
16 Rayadrug ..	4	12	300	..	300	60	10	25	37
17 Yemmiganur ..	..	29	1,170	..	1,170	50	20	40	39
5. *Coimbatore district.*									
18 Avanashi	..	29	1,050	..	1,050	100	20	52	40
19 Bhavani	2	13	315	..	315	50	10	24	19
20 Kurichi	7	28	1,500	..	1,500	100	20	54	51
21 Satyamangalam ..	1	37	1,771	195	1,966	48	100	25	45
6. *Chingleput district.*									
22 Alandur	16	6	358	..	358	200	7½	60	30
23 Madurantakam ..	3	15	305	333	638	50	5	20	32
24 Poonamallee ..	..	..	..	..	..	..	..	..	..
25 Tiruvottiyur ..	10	7	175	..	175	35	15	25	28
26 Sriperumbudur ..	1	2	50	..	50	25	25	25	30
7. *Chittoor district.*									
27 Kalahasti	3	25	985	30	1,015	60	20	39	47
28 Kuppam	2	34	1,211	15	1,226	90	5	35	42
29 Madanapalle ..	8	11	263	..	263	50	8	24	27
30 Madanapalle Sanatorium.	6	28	540	5	545	75	5	19	17
31 Punganur	8	15	305	..	305	30	5	20	24
32 Palmaner	..	16	765	..	765	70	15	48	21
33 Puttur	1	13	450	..	450	90	20	35	38
34 Tirumalai Hills ..	2	6	150	40	190	50	15	25	45
35 Tiruttani	15	7	175	..	175	60	15	25	21
36 Vayalpad	..	8	235	..	235	75	15	29	46

APPENDIX B—*cont.*

Statement showing the total amount of fines levied, number of convictions, average fine, etc., in 1952–53—cont.

Name of panchayat.	Number of pending cases.	Number of convictions.	Fines in analysis cases.	Fines in non-analysis cases.	Total fines.	Maximum fine.	Minimum fine.	Average fine.	Average fine in 1951–52.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
PANCHAYAT BOARDS—*cont.*									
8. *Cuddapah district.*									
37 Badvel	4	12	205	..	205	50	5	17	33
38 Jammalamadugu ..	5	5	280	..	280	80	20	56	25
39 Pulivendla	..	7	250	..	250	70	20	35	17
40 Rajampet	3	15	445	..	445	50	10	30	37
41 Rayachoti	2	25	1,028	..	1,028	75	20	41	33
9. *East Godavari district.*									
42 Mandapeta	1	21	750	..	750	100	15	36	43
43 Pithapuram ..	..	23	650	..	650	50	10	20	64
44 Samalkot	4	14	670	33	703	100	15	48	26
45 Ramachandrapuram	4	19	715	..	715	150	5	37	56
46 Razole	..	22	935	..	935	100	20	43	44
47 Tuni	..	23	1,065	27	1,092	150	15	46	47
10. *West Godavari district.*									
48 Akividu	2	15	630	..	630	100	20	42	41
49 Kovvur	1	32	1,185	..	1,185	70	10	37	43
50 Narasapur	6	24	764	30	794	120	1	32	38
51 Nidadavole ..	11	21	650	..	650	75	10	31	25
52 Polavaram ..	2	8	255	90	345	50	15	32	35
53 Tadepalligudem ..	4	20	815	..	815	50	30	41	41
54 Tanuku	1	28	730	110	840	50	15	26	31
11. *Guntur district.*									
55 Mangalagiri ..	1	22	1,180	..	1,180	150	20	54	44
56 Ponnur	1	14	430	..	430	40	20	31	27
57 Nidubrolu	2	11	410	..	410	50	20	37	36
58 Repalle	2	12	350	..	350	60	10	29	30
59 Sattenapalle ..	..	6	140	88	228	50	30	23	23
60 Vetapalem	2	8	405	..	405	75	20	51	37
12. *Krishna district.*									
61 Avanigadda ..	4	3	75	..	75	30	15	25	23
62 Jaggayyapeta ..	..	23	660	80	740	80	10	29	36
63 Nuzvid	3	17	1,000	175	1,175	200	10	59	51
64 Tiruvur	4	21	995	..	995	100	5	47	51
13. *South Kanara district.*									
65 Kasaragod	4	24	955	30	985	400	10	40	22
14. *Kurnool district.*									
66 Dhone	..	20	658	..	658	60	5	33	51
67 Giddalur	7	12	640	37	677	75	40	53	34
68 Markapur	..	22	744	..	744	90	7	34	66
15. *Madurai district.*									
69 Allinagaram ..	3	15	448	..	448	53	10	30	54
70 Ayakudi	6	3	125	..	125	50	25	42	41
71 Batlagundu ..	1	7	220	..	220	90	5	31	40
72 Chinnamanur ..	7	1	50	..	50	50	50	50	33
73 Cumbum	1	17	570	..	570	50	15	34	31
74 Melur	..	16	468	..	468	50	8	29	23
75 Nilakottai	2	4	180	..	180	60	35	45	28

APPENDIX B—*cont.*

Statement showing the total amount of fines levied, number of convictions, average fine, etc., in 1952–53—cont.

Name of panchayat.	Number of pending cases.	Number of convictions.	Fines in analysis cases.	Fines in non-analysis cases.	Total fines.	Maximum fine.	Minimum fine.	Average fine.	Average fine in 1951-52.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
PANCHAYAT BOARDS—*cont.*									
15. *Madurai district*—cont.									
76 Sholavandan ..	11	7	305	..	305	75	25	41	46
77 Tirumangalam ..	3	11	240	..	240	50	15	22	31
78 Usilampatti ..	5	11	400	..	400	60	10	36	52
16. *Nellore district.*									
79 Kandukur	..	14	502	21	523	100	21	36	17
80 Kovvur	2	3	75	35	110	25	25	25	43
81 Kavali	3	24	775	..	775	70	10	32	26
82 Nayudupet	..	19	715	200	915	75	20	32	36
83 Sulurpet	1	16	599	..	599	81	6	37	48
84 Venkatagiri ..	2	20	665	..	665	100	20	33	41
17. *Nilgiris district.*									
85 Kotagiri	3	10	705	..	705	200	25	70	51
18. *Ramanathapuram district.*									
86 Mudukulathur ..	1	5	130	30	160	30	15	26	24
87 Kilakarai	1	2	80	..	80	40	40	40	26
88 Kandanoor	17	1	15	..	15	15	15	15	..
89 Pallathur	5	12	233	25	258	35	8	17	26
90 Paramakudi	20	565	..	565	50	20	28	32	
91 Ramanathapuram	19	915	..	915	60	20	48	36	
92 Rameswaram	16	500	..	500	50	20	31	40	
93 Sattur	14	340	..	340	40	10	24	33	
94 Sivaganga	5	17	775	30	805	75	20	47	29
95 Tiruppattur	9	265	..	265	50	15	25	28	
96 Venkateswarapuram	..	..	..	..	..	..	..	..	25
97 Kannisseri	..	..	..	..	..	..	..	..	..
19. *Salem district.*									
98 Dharmapuri	34	2,008	..	2,008	100	10	59	69	
99 Harur	33	1,148	159	1,307	80	12	35	38	
100 Idappadi	5	15	265	..	265	40	10	18	12
101 Namakkal	5	37	807	..	807	60	10	21	26
102 Shevaroys	..	14	455	90	545	100	10	33	30
103 Tiruchengode ..	1	13	335	..	335	60	5	26	22
20. *Tanjore district.*									
104 Ayyampet	..	28	1,225	..	1,225	100	25	49	54
105 Nannilam	..	20	565	..	565	60	5	28	38
106 Papanasam	2	8	270	45	315	50	20	34	30
107 Pattukkottai ..	2	8	295	..	295	50	25	37	35
108 Sirkali	4	16	945	90	1,035	100	15	59	47
109 Tiruvaiyar ..	1	18	925	30	955	100	20	51	34
110 Tirutturaipundi ..	..	36	1,550	40	1,590	100	15	43	51
111 Tiruvadamarudur ..	..	11	640	..	640	100	30	58	91

APPENDIX B—*cont.*

Statement showing the total amount of fines levied, number of convictions, average fine, etc., in 1952–53—cont.

Name of panchayat.	Number of pending cases.	Number of convictions.	Fines in analysis cases.	Fines in non-analysis cases.	Total fines.	Maximum fine.	Minimum fine.	Average fine.	Average fine in 1951-52.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
PANCHAYAT BOARDS—*cont.*									
21. *Tiruchirappalli district.*									
112 Gunaseelam	..	..	..	..	..	..	..	..	..
113 Ariyalur	2	20	558	28	586	50	10	28	22
114 Kulittalai	6	14	555	..	555	100	20	39	35
115 Lalgudi	..	21	620	45	665	60	10	29	37
116 Jayankondam ..	1	20	520	..	520	40	10	26	24
117 Musiri	6	25	592	..	592	70	17	24	46
118 Manapparai ..	1	13	310	37	347	50	10	24	40
119 Turaiyur	..	18	430	..	430	55	10	24	43
22. *Tirunelveli district.*									
120 Ambasamudram ..	..	28	1,135	..	1,135	100	5	40	30
121 Courtallam	4	24	831	..	831	70	10	35	54
122 Ettayapuram ..	10	3	90	..	90	35	25	30	31
123 Kallidaikurichi ..	3	30	1,000	85	1,085	75	10	33	41
124 Kadayanallur ..	..	32	1,127	55	1,182	100	10	35	56
125 Koilpatti	10	6	182	..	182	52	20	30	40
126 Puliyangudi ..	..	21	407	..	407	30	5	19	31
127 Sankarankoil ..	1	22	560	60	620	50	6	25	26
128 Srivaikuntam ..	3	13	220	..	220	30	5	17	24
129 Tenkasi	1	22	647	32	679	60	10	31	37
130 Tiruchendur ..	5	17	535	..	535	50	10	31	44
131 Vikramasingapuram	2	25	915	..	915	75	10	36	27
132 Viravanallur ..	..	27	840	10	850	100	10	31	26
23. *Visakhapatnam district.*									
133 Chodavaram ..	2	20	740	50	790	70	15	37	37
134 Narasapatam ..	..	17	540	35	575	70	10	32	30
135 Yellamanchili ..	3	22	750	..	750	45	15	34	36
24. *Srikakulam district.*									
136 Bobbili	1	16	647	180	827	110	5	40	48
137 Palakonda	2	3	105	..	105	50	5	35	47
138 Parvatipuram ..	1	24	943	165	1,108	100	5	39	42
139 Sompeta	2	20	1,316	110	1,426	150	20	66	57

DEPARTMENT OF HEALTH, EDUCATION AND LOCAL ADMINISTRATION.

(Health)

G.O. No. 1911, 4th June 1955

Administration Report—King Institute, Guindy—1952-53—Reviewed.

D—the following paper :—

From the Director of Medical Services, dated 20th April 1955, No. 143-M/55.

r—No. 1911, Health, dated 4th June 1955.

ecorded.

. *Vaccine lymph section.*—Two hundred and nineteen thousand eight hundred and thirty-eight millions of 1·7 dilution of vaccine was manufactured during the year as against 452,928 millions manufactured during the previous year, as the supply during the year was less when compared with the past few years. Since there had been a few reports about the reaction to vaccination having been a little more pronounced than usual, a dilution of 1 in 10 of the lymph instead of 1 in 7 was tried in the experimental stage and was found to be quite good and the same dilution of 1 in 10 was adopted for general use.

3. *Diagnostic section.*—During the year under report, 16,538 specimens were received for microscopical, cultural and agglutination tests and examined as against 9,655 specimens during the previous year. There was an increase in the number of specimens of blood received for Washermann and Kahn tests, viz., 100,809 as against 98,479 during the previous year.

4. *Prophylactic and therapeutic vaccine section.*—There was a very heavy demand for anti-cholera vaccine during the year. 10·9 million doses of vaccine were supplied as against 5·8 million doses supplied during the previous year. The supply of sterile solutions (injectibles) to the State and Local Fund Medical Institutions was considerably larger than for any previous year.

5. *Blood bank.*—During the year a blood bank was opened in the Tuberculosis Sanatorium, Tambaram. The total number of blood banks in the State was 19. The blood bank units took part in the various exhibitions conducted in the city as well as in the mufassal for popularising blood donations. Training in blood transfusion and resuscitation work was also given to eleven medical officers.

6. *Water analysis section.*—At the beginning of the year under report, there were 168 protected water supply installations listed for periodical examination in order to maintain a check over the hygienic quality of the water. The number rose to 172 at the end of the year.

Analysis of samples of water for use in the Industries (8,928 samples) and al the testing of sewage and trade wastes for the determination of suitable dispos methods, were undertaken by the department.

7. *Food analysis and drug analysis section.*—The Madras Prevention Adulteration Act was in force in the areas of 239 local bodies including th Corporation of Madras. The total number of samples analysed in the laborator during the year under report was 18,252 as against 18,512 in the previous yea The percentage of samples which were found adulterated during the year was 44· as against 47·2 in the previous year.

Adulteration continued to be high in milk though some improvement wa noticeable when compared with the previous year. Adulteration in ghee wa found to be on the increase and that in butter continued to be high.

In the year under report, 384 samples of drugs were analysed as against 25 in the previous year.

8. *Gener*[illegible] The [illegible] of the Institute continued to be satisfactory.

(By o[illegible]er of the Governor)

K. GHULAM MAHMOOD,
Joint Secretary to Government.

To the [illegible]rector of Medical Services, Ma[illegible]as.
„ the Director of Public Health, Mad[illegible].
„ the Sanitary Engineer to Gover[illegible]ent [through the Chief Engineer, P.W.D. (General)
„ the Direc[illegible]r of King Institute, G[illegible]ndy (through the Director of Medical Services).
„ all Presid[illegible]s of District Bo[illegible].
„ all Executive [illegible]s of Municipal Councils (through the Chairmen).
„ the Commissioner, Corporation of Madras (through the Mayor).
„ the Accountant-General, Madras.
„ the Inspector of Municipal Councils and Local Boards.
„ the Inspector-General of Prisons (through Home Department).
„ the Principals of Engineering Colleges.
„ the General Manager, Southern Railways (with covering letter).
„ the Librarian, Legislative Assembly Secretariat Library.
„ the Librarian, Madras Secretariat Library.
„ the Home Department.
„ the Director, Pasteur Institute, Coonoor.
„ the High Commissioner for India (with copies for India Office, Ministry of Health, Britis Museum).
„ the Madras Medical Association.
„ the Madras University.
„ the Annamalai University.
„ the Connemara Public Library, Madras.
„ the Madras Chamber of Commerce, Madras.
„ the Southern India Chamber of Commerce, Madras.
„ the Government Analyst, Madras (Analyst's report only).
„ the Secretary, Public Service Commission, Madras (with covering letter).
„ the Government of Andhra (with covering letter).
„ the Government of Mysore (with covering letter).

Forwarded Librarian. Sects. Lib.

(By order) P.S. Subramanyam
Superintende

S/59