

REPORT OF THE KING INSTITUTE OF PREVENTIVE MEDICINE, GUINDY, FOR THE PERIOD FROM 1st APRIL 1951 TO 31st MARCH 1952

STAFF.

GAZETTED OFFICERS.

Director.

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

Assistant Directors.

Dr. M. K. K. Menon, M.B.B.S.

Dr. M. Narayana Pai, M.B.B.S. (Officer in charge of Biological Control) now on deputation to United Kingdom from 23rd February 1952.

Dr. Y. S. Narayana Rao, holding additional charge from 24th February to 16th March 1952.

Dr. K. Dattatreyalu, M.B.B.S., from 17th March 1952.

Dr. N. R. Ratnakannan, M.B.B.S., on deputation from 1st July 1951; post kept in abeyance and a Civil Assistant Surgeon's post was created.

Dr. M. R. Natarajan, M.D., holding the post.

Dr. C. Sriramachandra Rao, M.B.B.S., D.P.H., on deputation from 6th May 1951, *f.n.*

Dr. T. Raghavan, M.B.B.S., from 6th May 1951, *f.n.*

Dr. M. W. Williams, M.B.B.S., deputed for higher studies on 2nd September 1949, *a.n.*

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

Civil Assistant Surgeons.

Dr. Dinker Babu Rao, M.B.B.S.

Dr. C. W. Chacko, on study leave for two years with effect from 5th October 1950, *a.n.*

Dr. V. Krishnamurthy, M.B.B.S.

Dr. C. S. Balasubramaniam, M.B.B.S.

Dr. K. Dattatreyalu, M.B.B.S., up to 16th March 1952 inclusive.

Dr. N. Sundararajan, M.B.B.S.

Dr. Md. Jaffar Khan, M.B.B.S., up to 21st September 1951, *f.n.*

Dr. K. Appu Kurup, L.M.P., L.O.

Dr. S. Francis Xavier, M.B.B.S.

Dr. S. R. A. Babu, up to 5th June 1951, *a.n.*

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REPORT OF THE

Dr. M. R. Natarajan, up to 30th July 1951.

Dr. D. M. Lingayya.

Dr. N. V. Gangadharan, L.M.P.

Dr. P. Ramaswamy.

Dr. T. S. Kasturi.

Dr. K. S. Balasubramaniam, L.M.P.

Dr. K. G. Verghese up to 4th April 1951.

Dr. T. S. Srinivasa Rao, from 26th April 1951 to 13th June 1951.

Dr. N. Narayanan, L.M. & S.

Dr. S. Venkataswamy, L.M.P.

Dr. Venkatachalapathy Shetty, M.B.B.S., from 21st May 1951.

Dr. G. D. Shenoy, M.B.B.S., D.G.O., from 13th May 1951.

Dr. D. V. Ramamurthi, M.B.B.S., from 30th June 1951, a.n.

Dr. K. S. Ramaswamy, M.B.B.S., from 7th July 1951, a.n.

Dr. M. Vatsala, M.B.B.S., D.G.O., from 21st July 1951.

Dr. Sunithi Rangan, M.B.B.S., from 21st September 1951.

Dr. Ambujamma Natarajan, M.B.B.S., from 6th October 1951.

Dr. K. Venugopalan, from 21st March 1952, f.n.

Department of Water Analysis.

Chief Water Analyst Sri P. V. Seetharama Ayyar, M.A.

Assistant Analyst (Water Bacteriology and Chemistry) .. N. Swaminathan, B.Sc., A.I.I.Sc.

Assistant Analyst (Water Biology) .. K. G. Veeraraghavan, M.Sc.

Department of Anti-toxin.

Bio-Chemist Dr. P. Seshagiri Rao, D.Sc.
Drugs Chemical Assistant Kumari R. J. Irani, B.Sc. (Hons.), M.Sc.,
M.S. (Lis.)

Government Analyst Section.

Government Analyst Sri S. Narayana Ayyar, M.A., A.I.I.Sc.,
F.R.I.C.

Deputy Government Analyst Y. G. Doraiswamy, M.Sc., A.R.I.C.

Senior Assistant to Government Analyst .. K. R. Srinivasan, M.A., F.R.I.C.

Do. .. K. Narayanaswamy, M.A., A.R.I.C.

Do. .. M. Krishnamurthy, M.Sc.

Do. .. P. Nataraja Sarma, M.A., from 21st
September 1951.

KING INSTITUTE OF PREVENTIVE MEDICINE, GUINDY

Sterile Solution Section.

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

Office establishment.

Lay Secretary and Treasurer—

Sri V. Srinivasan, B.A., up to 11th October 1951, a.n.

Sri G. T. Harimurthi, M.A., from 11th October 1951, a.n.

NON-GAZETTED OFFICERS.

Veterinary Assistant Surgeons.

Sri E. R. Nagarajan.

Sri 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 T. Seethapathy Rao, B.Sc. (Hons.).

Government Analyst's Section .. „ G. Balasubramanian, B.Sc. (Hons.).

„ M. V. Narayanan, B.Sc. (Hons.).

„ C. S. Raghunathan, B.Sc. (Hons.).

„ K. Kuppuswamy, M.Sc.

„ V. Seshagiri Rao, B.Sc. (Hons.).

„ P. Athmaraman, B.Sc.

„ K. Balasubramanian, B.Sc. (Hons.).

„ K. Ramachandran, M.A.

„ N. Srinivasan, M.A.

„ S. A. Subramanian, M.Sc.

„ M. R. Gopalan.

Solution Section „ V. V. Krishna Rao.

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of Preventive Medicine
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Department of Anti-toxin—

Junior Chemical Assistant .. Sri S. Srinivasa Raghavan, B.Sc.
 Additional Chemical Assistant .. „ P. S. Parameswaran.
 Vaccine Lymph Section Junior „ Munuswami Raju.
 Assistant.

OFFICE.

NON-GAZETTED OFFICERS.

Manager Sri S. Gopala Ayyar.
 Librarian „ V. Srinivasa Ayyangar.
 Permanent Accountant 1, Cashier 1, Clerks, Upper Division, 3, Clerks, Lower Division, 14, Typists 4, Stenographers 2, Telephone attendants 2, Attenders 2 and Peons 9.
 Temporary Clerk, Upper Division, 1, Clerks, Lower Division, 6, Typists 2, Attenders 2 and Peon 1.

LABORATORY STAFF.

Permanent Sample-takers 4, Technicians 7, Laboratory Attendants, I grade, 14, Laboratory Attendants, II grade, 33, Compounder 1, Peons 44 and Technical Assistant 1.
 Temporary Technical Assistant 1, Sample-taker 1, Technicians 12, Laboratory Attendants, I grade, 20, Laboratory Attendants, II grade, 21, Algae collector 1 and Peons 34.
 Miscellaneous staff Photo Artist 1, Overseer 1, Assistant Overseers 4, Mechanic 1, Deputy Overseer 1, (temporary), Electrician 1 (temporary).

I.C.M.R. STAFF.

(1) Filterable Viruses Enquiry.

Dr. G. N. V. Krishnan, Assistant Research Officer (from June 1951 to end of March 1952).

2. Sri K. N. Gopalan, Research Assistant.

One Senior Laboratory Assistant, One Laboratory Attendant and 2 Peons.

(2) Filariasis Enquiry.

Dr. L. Yogeswari, M.Sc., Ph.D., Research Assistant, from 11th October 1951 to 31st March 1952.

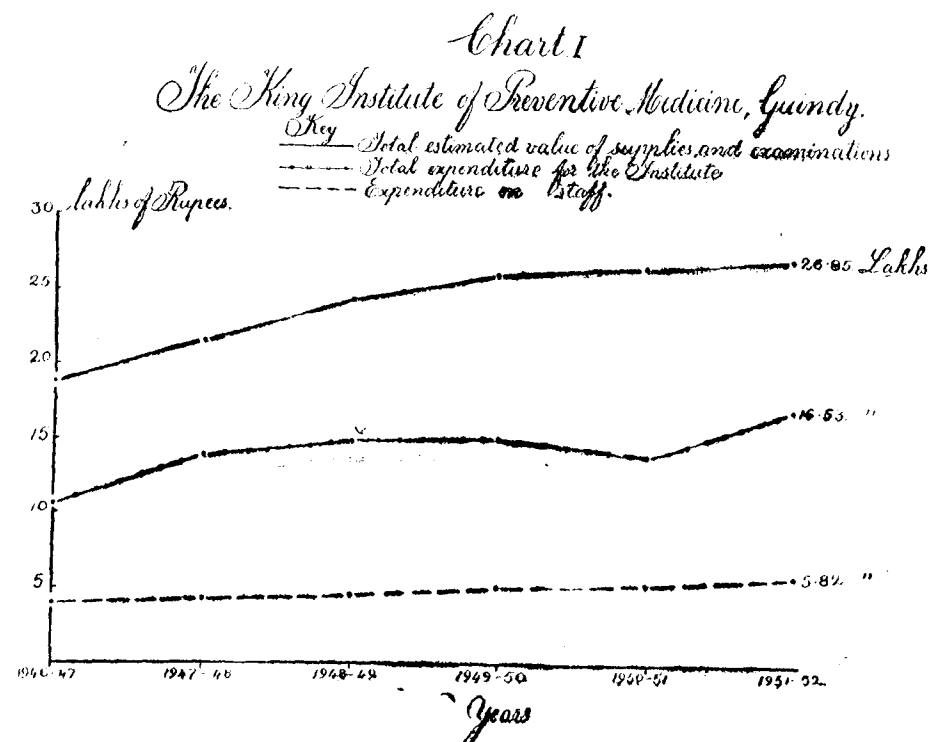
Laboratory Assistant 1, from 18th June 1951 to 31st March 1952.
 Laboratory Attendant 1, from 5th July 1951 to 31st March 1952.

GENERAL REVIEW.

The following graph clearly shows how the work of the Institute is gradually increasing. It also shows that—

(1) There has been an increase in gross profits of Rs. 65,000 this year over that of last year.

(2) The graph shows that the total expenditure has gone up by nearly 2 lakhs and that there is a drop in the total expenditure last year. This is due to payment of about Rs. 1,70,000 towards the cost of the sera, etc., relating to the purchases made in 1949-50 and 1950-51. The delay in payment is due to the difficulties in arranging for foreign exchange that is necessary. Otherwise the curve of total expenditure would have also been a flat one.



Finance.—The total expenditure for the year amounted to Rs. 16,53,363 (see Table I) including the amounts borne by other departments on Institute accounts. The total cash receipts by way of sale-proceeds of sera vaccines and collection of payments for services rendered amounted to Rs. 2,89,996. The difference (i.e.) Rs. 13,63,367 represents the net cost of the Institute debitable to State revenues. It has been pointed out however that most of the biologicals manufactured in the Institute such as vaccine lymph, bacterial vaccines, A.T.S sterile solutions, etc., and anti-toxins 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 as shown in Statement 3 of Table I would amount to Rs. 26,84,655. The difference between the estimated receipts and the estimated expenditure (i.e.) Rs. 10,31,292 represents the net profit to Government.

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

- (1) A new animal house has been almost completed and will shortly be handed over to the Institute.
- (2) Construction of an overhead R.C. tank at the old filter beds in the Institute premises for storing Adyar river water for gardening.
- (3) Construction of an infiltration gallery with a collecting well in the pumping station of King Institute at Ekaduthangal.
- (4) Provision of a shed to house Britannia boiler alongside the Media Room.
- (5) Provision of barbed wire fencing with door for the coal yard.
- (6) Extension of the Water Analysis Laboratory by enclosure of the verandas with doors and windows on three sides of the main Laboratory. Gas and water connexion are under completion.

Though a sum of Rs. 20,300 was sanctioned by Government in G.O. Rt. No. 68, Health, dated 25th January 1952, by increasing the monetary limit under minor works of the Institute, the works approved by the Director of Medical Services and Government could not be carried out on account of late receipt of above Government Orders.

The following works have to be completed at an early date :—

- (1) Construction of additional urinal to the staff of the Institute.
- (2) Fencing the compound of the Institute.
- (3) Construction of a shed for vertical boiler.
- (4) Improvements to the Director's quarters.

II. *Additional Staff.*—One Librarian on Rs. 140—5—180—10—250 (in lieu of the permanent post on Rs. 80—125).

One counter section assistant (clerk, lower division) on Rs. 45—3—60—2—90.

One Attender on Rs. 24—35.

One peon on Rs. 18—1—25.

(Sanctioned in G.O. Ms. No. 1132, Health, dated 3rd April 1951.)

One Senior Assistant to Government Analyst for analysis of drugs.

One Junior Assistant to Government Analyst for analysis of hospital samples of diet samples.

One upper division clerk in lieu of a lower division clerk. (Sanctioned in G.O. No. 3119, Health, dated 10th September 1951.)

One clerk, lower division, for the Diagnostic section.

Do.

for the Packing section.

(Sanctioned in G.O. Ms. No. 140, Health, dated 17th January 1952.)

One Junior Assistant, Vaccine Lymph section, from 1st April 1951 keeping in abeyance the second post of Civil Assistant Surgeon in the Vaccine Lymph Section sanctioned in G.O. No. 2473, Health, dated 2nd August 1952.

Seven additional syces for the Anti-toxin department sanctioned in G.O. Ms. No. 2521, Health, dated 16th July 1951.

III. *Revision of scales of pay.*—Some anomalies have been rectified after repeated requests and some are still pending.

Assistant to Gas maker.—Scales of pay raised from Rs. 18—1A—25 to Rs. 24—1—30 with effect from 11th April 1951 sanctioned in G.O. Ms. No. 1278, Health, dated 11th April 1951.

Sample taker.—Scale of pay raised from Rs. 55—4—95 to Rs. 60—3—90—4—130 from date of order sanctioned in G.O. No. 4068, Health, dated 28th November 1951.

Representations have been made to Government regarding the very poor salaries of the *Calf Watchmen, Syces and Thotis* and in spite of the financial stringency, I hope the Government will be pleased to accept my recommendations and issue early orders, as it is essential that the above categories of workers should get a living wage.

Vaccine Lymph section.—It has been the main concern of the department to build up a good stock of vaccine as the stock on hand was depleted to a very large extent by a heavy demand during the previous year. Fortunately, there being no cattle epidemics, a quantity of about 13·05 million doses vaccine was manufactured, the figure being the largest for any single year so far. The supply during the year was about 8 million doses. The potency of the vaccine issued has been satisfactory, the case success and insertion success in primary vaccinations for the entire province being 91·4 per cent and 76·9 per cent respectively.

New strains of seed vaccine were obtained from the vaccine institutes, Belgaum and Bangalore, and a strain of vaccinia was also raised from the dry lymph received from Paris. These strains were used in the manufacture of vaccine and found to be satisfactory as revealed both by the quantity of vesiculation in calves and by the field results of vaccinations performed.

Low temperature cabinets capable of maintaining a temperature of about minus 20° C were installed during the year, thereby assuring the potency of the vaccine when stored for longer periods.

It has not been possible to conduct any special work during the year as all the efforts were directed in stepping up production of vaccine.

Diagnostic department.—There was a decrease in the number of specimens received for microscopical, cultural and agglutination tests, as compared to last year figures. This was mainly due to a low incidence of cholera in the State this year and consequent decrease in the number of specimens of faeces received for cultural tests. The number of blood specimens received for seriological tests was almost the same as for last year. The demand for Khan Antigen is increasing year by year. The heavy demand for Media could not be met with in full and early arrangements have to be made for the construction of the proposed Service Block.

Prophylactic and Therapeutic Vaccine section.—6·4 million doses of cholera vaccine was manufactured and 5·8 million doses were supplied this year. The incidence of plague was very low and there was a demand for only 71,420 c.c. of plague vaccine which was obtained from Haffkine's Institute, Bombay, and supplied. 1·5 lakh doses of T.A.B. Vaccine was also issued this year to the various institutions in this State. The Therapeutic Vaccine section has continued to supply the vaccines required for therapeutic use, the autovaccines, the various live cultures, the bacterial suspensions and the high titre sera.

Solution section.—The demand for the various sterile solutions is increasing year by year and every effort was made this year to meet these demands to the maximum extent possible. The present accommodation is insufficient to manufacture large quantities of these solutions and it is proposed to reorganize this section so as to meet the entire requirements of the hospitals of this State, when more accommodation is available.

Department of anti-toxin.—There were 61 horses at the end of the year for the production of therapeutic serum to the various medical institutions of this State. As the demand for tetanus anti-toxin continued to be high, a large majority of these horse-were assigned for the production of anti-tetanic serum. The department still suffers for want of additional stable accommodation as the entire needs of the State for serum could be met with only by still further increasing the total number of horses under serum production. The work turned out by this department has been very considerable inasmuch as 2,084 litres (nearly 351 gallons) of anti-toxic plasma were subjected to chemical purification and processing. The report of the department shows that biological standardizations were conducted on 308 samples of tetanus anti-toxin and 28 samples of gas gangrene anti-toxin. Experimental work on the nutritional requirements of *Cl. tetani* had continued unabated. Another noteworthy feature is that the unitage of tetanus anti-toxin for standardization and labelling was brought in conformity with the latest regulations governing the subject issued by the Expert Committee on Biological Standardization of the World Health Organization.

Blood Bank.—The Blood Bank department at this Institute is mainly the processing centre for the liquid plasma and for the manufacture of Blood Groupin Diagnostic Sera, as it is the only source of supply of the above. Besides, it is also

centre for training of medical officers deputed by this State, other States, and the Railways. Intensive training programme is carried out periodically for training medical officers to open more blood banks and to man the blood banks that are already functioning in other hospitals. There are at present 19 blood transfusion centres operating in the State, inclusive of three in the city. To augment the supply of plasma to the institutions wherein there are no facilities for acceptance of blood donations, the Mobile Blood Bank Unit of this Institute is sent to collect blood donations from the inmates of the different jails in the State. Blood Bank also takes part in the Exhibitions in the district as well as in the city wherever they are held to educate the public about the importance of blood transfusion and the dire necessity to donate blood. According to the Central Supply Scheme for supplying blood transfusion equipment, this department functions as a feeder in essential blood bank equipment to all the blood banks in the districts and in the city. Periodical inspection of the blood bank is made by the Assistant Director (Blood Transfusion) to co-ordinate the working and to suggest improvements for the efficient working of the blood banks. Special test on blood for Rh. factor and cold agglutinins are being undertaken here.

Department of Biological Control.—This laboratory examines with reference to standards laid down in the Drugs Act, 1940, and the rules thereunder all the samples of drugs prepared in this Institute as well as samples received from State hospitals, private practitioners, firms within the Madras State and also outside the State. The total number of tests performed during the period 1951-52 was 6,268 as compared with 5,348 tests done during 1950-51.

The work of the department is considerably handicapped for lack of necessary equipment, appliances and accommodation.

The male frog test for pregnancy which was started here as a piece of research work has now become a matter of routine work inasmuch as samples of urine are being received daily not only from Government institutions (State and Central) but also from private practitioners. The tests are charged at Rs. 5 for private practitioners, Central Government institutions and paying patients of State hospitals.

Inoculation against Yellow Fever.—King Institute is the only centre in South India where inoculations against Yellow Fever could be had. These inoculations are given free of charge. During the year 197 inoculations were given.

Inoculations against Typhus Fever.—During the year 29 inoculations against Typhus Fever were given free of charge.

Department of Water Analysis and Algae Control.—The volume of work relating to the analysis of water carried out at this department increased during the year under report, owing to intensive search for new drinking water sources, as a result of the failure of rains over many parts of the State. Eight thousand nine hundred and three samples of water were tested for their suitability for use for drinking and domestic purpose as compared with 8,306 during 1950-51. Samples of water from 172 water supplies were examined three times during the year, the sources representing the municipal, the panchayat, the jail, the railway and other institutional supplies in the State. The analysis of samples submitted to meet emergent needs was carried out and reports sent expeditiously.

Besides testing water samples for drinking purposes, the department undertook the analysis of 89 samples of water for various industrial uses, and 90 samples of bleaching powder, alum and other water-supply chemicals.

Problems connected with the growth of micro-organisms (algae and aquatic animal plankton) and aquatic weeds in water supplies were studied with special reference to their effect on filtration, chlorination and other water treatment processes. In this connexion, 672 samples of water and organic growths were examined, wherever necessary. Control measures to suit the prevailing specific conditions were devised and adopted with success. As in previous years, the department rendered technical assistance to the Madras Corporation authorities, the matter of algicidal treatments to the Red Hills lake, during the year under report.

Pilot plant experiments were conducted at the Water Purification Research Station, Kilpauk, on problems connected with pre-chlorination, and its effect on slow sand filtration. The advantages shown to result from pre-chlorination are (1) a purer filtered water, free from objectionable taste and odours, (2) greater facility in filter operation and (3) increased length of run of filters with resultant economy in maintenance. In the course of these experiments, over 3,000 tests were carried out on samples of water, micro organisms, etc.

A survey of the bacteriological quality of the utensils used in hotels and restaurants in the City was carried out at the request of the Hotel Sanitation Committee. The degree of bacterial cleanliness that could be achieved by a simple practicable washing procedure was also studied. This is, as far as we are aware, the first survey of its nature carried out in India and the techniques evolved would prove of practical value in conducting similar studies at other centres, in the determination of standards of bacterial purity of vessels in restaurants and other eating houses.

A fuller account of the work carried out by the department relating to the aspects of water purification referred to above is given in the sectional report. The nature of work carried out in the Department of Water Analysis and Algae Control would be apparent from a perusal of the report. The stature that this department has grown into in recent years is indicated by the fact that it is now called upon to undertake important analytical work also on behalf of the Government of India in the Ministry of Transport, Ministry of Industry and Supply and the Ministry of Commerce, besides fulfilling its routine function of exercising a quality supervision of protected drinking water-supplies in the State.

With regard to the latter, the water-supplies in the State are at present examined thrice every year. Water is a prime necessity of life. But at the same time, it can, unless strictly safeguarded, also be the vehicle for the spread of calamitous epidemics. Considered from this point of view, the present frequency of examination would seem to be totally inadequate. The number of times each supply is tested must of necessity be increased. For, nothing can demonstrate conclusively the absolute purity and safety of a drinking water-supply except critical bacteriological and chemical analysis. All other indices of safety, as for example, the test for residual chlorine, are but valuable guides for a reasonable assumption of hygienic safety. A much larger organization and staff than available at present would be needed, if the frequency of analytical examination is to be increased. The importance of increasing the number of times each supply is examined would be apparent from the fact that over the last three years, the municipal and panchayat board water-supplies have shown but little improvement in quality. 32.8, 32.8 and 33.3 per cent of samples drawn from municipal water-supply system were below the standard of bacterial purity required of a protected water-supply in the years 1949-50, 1950-51 and 1951-52 respectively. During the same period, the corresponding figures for the panchayat board water-supplies are 34.4, 41.9 and 27.0 per cent. This points directly to the need for a thorough check up of each water-supply to spot causes leading to the unsatisfactory quality of the water as supplied for drinking and the institution of suitable corrective measures. In all water-supplies, only a few, if any of the samples tested should fail to conform to approved standards of quality. For, in this field of public health and disease prevention, the margin of safety is but small and allows little room for compromise. This was the main aim and purpose with which the Government were approached as early as 1948 through the Water and Sewage Purification Committee for the formation of a mobile water-supply analytical unit. This team would work on the spot to detect sources and nature of contamination and assist the concerned Regional Public Health and the Engineering authorities to determine and carry out the needed improvements. Obviously, this is a tedious task, but one which of necessity must be carried out, if the benefits of a protected water-supply are to be fully derived by those whom it is intended to protect. The proposal for the formation of a mobile water-supplies analytical inspectorate has so far not materialized.

An investigation on the chemical quality of seven more artesian wells in the lignite bearing areas of South Arcot was carried out during the year. These investigations showed that the artesian well waters do not have any special medicinal properties and so may not prove suitable for commercial exploitation. Other field investigations carried out by the department related to the sterilization of new water supply mains at Visakhapatnam, Chodavaram and Kumbakonam and to a study of the chemical quality of the new Kozhikode water-supply, especially as regards its iron content.

Proposals have been submitted to Government for conducting a pilot plant trial at Guntakal, on the use of alum impregnated paddy husk carbon for the removal of fluorine from drinking water. These experiments would be carried out on the Guntakal railway water-supply with the assistance of the Railway authorities who have promised to provide the necessary filter plants, etc., at their cost.

The Water and Sewage Purification Committee met four times during the period under report. The progress of the experiments carried out at the Research Station, Kilpauk, the occurrence of iron in the Kozhikode water-supply derived from certain infiltration wells and methods required for removing it, proposals for conducting a large-scale experiment on breakpoint pre-chlorination and its influence on slow sand filtration utilizing two of the filters at the Madras Corporation Water Works were some of the more important subjects considered by the Committee at its meetings.

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

Library.—The library has continued to be used by the members of the institute staff, Research Officers of the Indian Council of Medical Research, officers of the B.C.G. Vaccine Laboratory and a few members of the Public Health, Medical, Veterinary and Public Works Departments stationed in the City. During the period under report 192 volumes of books and 103 volumes of bound journals were added to the stock bringing the total to about 10,855 volumes. The institute is indebted to the Director of the Red Cross Store Department, Hospital Services Section, New Delhi, for a free gift of one hundred volumes of books on literary subjects.

That the extremely limited accommodation now available for the library and reading room is inadequate has been brought to the notice of the authorities and pages of our reports these 15 years. It is high time that measures are kindly taken to revive the construction of a new library block originally approved before the War and sanctioned also in 1939.

Staff meeting.—The weekly meetings of the scientific staff were held regularly. In addition to the usual reviews of articles appearing in journals, special talks were given as follows:—

(1) Dr. P. Seshagiri Rao.—A talk in Telugu under the series "Plantation Produce" from All-India Radio, Madras, on 22nd November 1951 on Kobbari Aharamu (Coconut—its food value).

(2) Dr. P. Seshagiri Rao.—A talk in Telugu under the same series from All-India Radio, Madras, on 21st February 1952 on Arati-Aharapu Viluva (plantain—its food value).

(3) Dr. P. Seshagiri Rao.—A talk in Telugu under the auspices of the Madras Government Information and Publicity Section on 26th March 1952 on "Blood Transfusion helps to save Human Life."

(4) Dr. K. S. Ramaswamy.—A talk from All-India Radio, Madras, on 8th February 1952 on "Blood Transfusion saves Human Life".

Educational.—Laboratory attendants and technicians training courses were continued during the year under report. Twelve (12) candidates have undergone training in the Laboratory Attendants Course, among them eleven (11) candidates have come out successful. For Laboratory Technicians Course eleven (11) candidates are under training and the final examinations are to be held on 15th and 16th September 1952.

The following candidates were given training in one or other branches of work of this institute, as indicated:—

1. *Combined Course of Clinical Pathology and Bacteriology.*

1. Dr. R. Balachandran, D.M.S., Salem—Three months.
2. Sri J. K. Govindarajulu, B.Sc., Tuticorin—Three months.
3. Sri A. Panchala Reddy, B.Sc. (Phar.), Vepery, Madras—Three months.
4. Kumari I. Nalini, Government of India Trainee, from Maharaja's College, Ernakulam—One year.
5. Dr. K. Subramaniam, L.M.P., L.O., Medical Officer, Madurai Municipality.

2. *Training in Water Bacteriology.*

Sri M. O. Sundararajan, B.Sc., Triplicane, Madras—One month.

3. *Practical training for students of Technology, Andhra University, Waltair.*

1. Sri G. V. Appa Rao.
2. Sri M. V. Jogayya.
3. Sri V. Ramachandran.
4. Sri G. V. Appa Rao Pantulu
5. Sri P. Ramachandramurthy.
6. Sri T. Janardana Sarma.

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

1. Sri V. Srinivasan, Deputy Overseer, Mental Hospital, Madras—for one month—G.O. Ms. No. 1485, Health, dated 28th April 1951.
2. Sri T. V. Venkatesan, Laboratory Assistant, Erskine Hospital, Madurai—two months—G.O. Ms. No. 1597, Health, dated 9th May 1951.
3. Sri K. S. Sambandam, Laboratory Assistant, Government Tuberculosis Sanatorium, Tambaram—one month—G.O. Ms. No. 2352, Health, dated 3rd July 1952.

A fellow of the Indian Council of Medical Research, Mr. K. C. Abraham, M.A., has been permitted to do research work at this institute for two years on payment of a fee of Rs. 120 per annum from July 1951.

Dr. M. Damodaran, a candidate undergoing Diploma in Clinical Laboratory Science Course at the Madras Medical College, was posted to work at the King Institute, Guindy, for three months from 1st April to 30th June 1951 by the Dean, Madras Medical College.

IV. *List of distinguished visitors.*—The institute was honoured during the year by the visits of:—

- (1) The Hon'ble Sri B. Gopala Reddi, Finance Minister, Government of Madras.
- (2) Dr. A. Strongilloides, Rochester, New York, United States of America.
- (3) Dr. Carroll L. Birch, University of Illinois, Chicago, United States of America.
- (4) Dr. A. Thomas, Lady Hardinge Hospital, New Delhi.
- (5) Dr. A. G. Basu, Lt.-Col., A.M.C., Adviser in Pathology, Southern Command, Bangalore.
- (6) Dr. U. Nair, Capt., A.M.C., Pathologist, Military Hospital, Madras.
- (7) Dr. Peter G. Krag, Serology and Laboratory World Health Organization, Geneva.
- (8) Dr. M. V. Ramanamurthi, Deputy Director of Medical Services, Madras.

- (9) Dr. P. S. Raman, Senior Pathologist and Second Physician, General Hospital, Johore, Malaya.
- (10) Dr. Alan Gregg, Rockefeller Foundation, New York City.
- (11) Dr. C. V. Ramachandani, Deputy Director-General of Health Services, New Delhi.
- (12) Dr. W. G. Rake, Squibb Institute for Medical Research, New Brunswick.
- (13) Dr. Michael Heidelberger, College of Physicians and Surgeons, Columbia University, New York.
- (14) Dr. Eli Cheruire, Department of Tropical Public Health, Harvard School of Public Health, Boston, Mass, United States of America.
- (15) Dr. J. M. Tripod, Reader in Pharmacology, University Lausanne, Ciba, Research Laboratories, Basle, Switzerland.
- (16) Dr. P. Maccallum, Emeritus, Professor of Pathology, University of Melbourne, Australia.

PART I—ROUTINE WORK.

VACCINE LYMPH SECTION.

Charge: Dr. N. R. Ratnakannan, M.B.B.S. (1st April to 30th June 1951).
Dr. M. R. Natarajan, M.D. (30th June 1951 to 31st March 1952).

1. *Manufacture and issue of vaccine lymph.*—The year under report commenced with a meagre stock of 47,529 ml. of 1 in 7 dilution glycerinated lymph. This low stock position was due to the increased demand from the entire State, in spite of a satisfactory production during the previous year. During the year, under report, the production was stepped up as much as possible and fortunately there being no interruption in the production due to disease among the calves, etc., a quantity of 452,928 ml. of 1 in 7 dilution of glycerinated lymph was manufactured. This figure is the largest quantity so far manufactured in any single year, the previous maximum being 321,252 during the year 1944-45. Lack of sufficient number of calf-sheds was one of the main difficulties encountered for increased production and to a certain extent the extra production was made possible by the sanction of two temporary calf-sheds and six temporary calf-watchmen. The average yield per calf was 30.6 gms. as compared with 30.2 gms. of last year.

A total quantity of 272,526 ml. of 1 in 7 dilution vaccine lymph was issued during the year, and the closing balance at the end of the year was 227,931 ml.

All the batches of vaccine were treated by bubbling chloroform vapour for purifying the vaccine; and tested for purity, toxicity and potency and issued to the field only after the requisite standards prescribed were satisfied.

Seed lymph.—As a result of frequent interruption in the manufacture of vaccine due to the prevalence of foot and mouth disease among the calves during the past three years among the possible causes for the continued incidence of this disease, the possibility of contamination of the seed lymph in use with foot and mouth disease virus was also considered and it was decided to employ new strains of seed vaccine. Further it was expected that the quality of vesiculation in calves and the results of vaccination in the field would improve by this change. This did have the desired effect. Two strains from Vaccine Institute, Belgaum, one strain from Vaccine Institute, Bangalore, and one strain from the Dried Vaccine from Paris, were passed through the usual seed cycle and these four strains were used in the routine manufacture during the year. All the four strains behaved quite satisfactorily and proved better in respect of the quality of vesiculation and yield of crude pulp in calves.

2. *Potency of vaccine lymph.*—The potency of all batches of vaccine were satisfactory at the time of issue both by laboratory tests on calves and by results of primary vaccinations of children in the Test Range. During the year 172 batches of vaccine have been issued and tested in the Test Range prior to taking these batches for issue to the field. In all 1,608 primary vaccinations were verified with a case success rate of 98.2 per cent and an insertion success rate of 93.4 per cent.

3. *Analysis of result statements received from the districts, municipalities, Corporation of Madras, etc.*—

As has been mentioned in the last year's report, the result statements received for vaccine supplied during the calendar year 1951 was taken into consideration for analysis—

(a) *Total vaccinations and types (Table II).*—Result statements were received for 7,482,524 vaccinations performed in the State. Of this 15 per cent were primary, 1 per cent secondary and 84 per cent re-vaccinations.

(b) *Primary vaccinations (Tables II and III).*—A total number of 884,544 primary vaccinations were verified with the following results:—

	Cases success, 1951-52.	Rate 1950-51.	Insertion success, 1951-52.	Rate, 1950-51.
	PER CENT.	PER CENT.	PER CENT.	PER CENT.
Corporation of Madras ..	99.9	99.8	91.3	90.3
Municipalities ..	98.0	96.8	87.9	85.8
Districts ..	89.8	80.6	74.2	59.8
State as a whole ..	91.4	83.8	76.9	64.0

The figures of case success rates and insertion success rates are higher than that of last year especially in the case of the districts which have shown a marked rise. Even so the figures for the districts continue to be lower than that of Corporation of Madras and the municipalities. So the probable factors affecting these figures, viz., (a) the number of days of exposure of the despatched vaccine to atmospheric temperature and (2) the technique of vaccination in rural areas and proper check on the vaccinator's work has to be stressed upon.

(c) *Re-vaccinations.*—Returns were received for 3,974,731 re-vaccinations which were verified and the success rate was 12.3 per cent as compared with 10.1 per cent the previous year. The success rate in the Madras Corporation, municipalities and districts were 4.8 per cent, 13.7 per cent and 12.1 per cent, respectively.

4. *Lymph unaccounted for.*—Printed result statement forms in which the results of vaccinations are sent by the field health staff to this institute have not been available in time and hence the submission of the results have not been satisfactory. Results have been received only for about half the quantity of the vaccine supplied and results for nearly 4 million doses are yet due from the field health staff. From the figures furnished by the Director of Public Health, it is noted that about 2 million primary vaccinations and 12 million re-vaccinations have been performed in the State thus accounting for nearly 7.9 million doses out of a supply of 8.6 million doses of vaccine lymph. So the actual figure of lymph unaccounted for is only about 7.9 per cent.

5. *General.*—It has been the aim, during the year, mainly to step up production as much as possible, to reach the target of 2 lakhs millilitres of vaccine by the end of March 1952, after meeting out the demands of the State. So it had not been possible during this year for continuing the special work taken up last year, viz.—

- (1) Trial of sheep as vaccinifer in the production of vaccine lymph.
- (2) Role of anti-biotins in the purification of vaccine lymph, etc.

DIAGNOSTIC DEPARTMENT.

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

This year the Diagnostic Section had examined 9,655 specimens received for microscopical culture and agglutination tests from the various Government hospitals, Local Fund and Mission hospitals and private practitioners in this State, as against 13,459 specimens examined last year. This decrease was mainly in the specimens of faeces received for cultural tests as the incidence of cholera was low this year. Ninety-eight thousand four hundred and seventy-nine blood specimens were received for serological tests and reported the number being more or less the same as that of last year. This department had also manufactured and supplied the antigens required for the serological tests. The demand for Khan antigen was very heavy this year and 5,102 c.c. of the antigen was supplied as against 3,691 c.c. supplied last year. One hundred and forty-one specimens were received for Histopathological examination and reported. The details of the tests done in the diagnostic department, analysis of the sources from which the specimens for serological tests were received are shown in Tables IV and IV-A. The demand for media continued to be heavy and the staff had to work extra hours to meet this heavy demand. The present accommodation and equipment are not sufficient to manufacture the full requirements of media and the manufacture could be augmented when the proposed service block is constructed and equipped. The statement showing the supplies of media made to other laboratories are shown in Table V—Miscellaneous.

PROPHYLACTIC AND THERAPEUTIC VACCINE SECTIONS.

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

This section had manufactured 6.4 million doses of cholera vaccine and supplied 5.8 million doses. 6.5 lakh doses was sold to other States. This section had also manufactured 1.33 lakh doses of T.A.B. vaccine and supplied 1.5 lakh doses. The demand for plague vaccine was low this year, and 71,420 c.c. of plague vaccine was issued. The plague vaccine was as usual obtained from the Haffkin Institute, Bombay. The therapeutic vaccines supplied this year amounted to 57,826 doses as against 76,000 doses supplied last year. Four hundred and eighty doses of auto vaccines were prepared and supplied. This section had also manufactured and supplied to the laboratories both in this State and in other States, bacterial suspensions, live cultures and specific high titre sera for different organisms. The detailed statement of the supplies made are shown in Table V.

STERILE SOLUTION SECTION.

This section had manufactured and supplied the various sterile solutions (shown in Table V—Miscellaneous) to State Hospitals, Mission and Local Fund Medical Institutions. As usual the demand for glucose solution continued to be on the increase. Every effort was made to meet the heavy demands to the maximum extent possible. The supply of special solutions like Ringer lactate, N/2 saline 5 per cent Glucose normal saline, etc., for use in General Hospital, Madras, were also continued.

One thousand two hundred and fifty bulbs of dysentery bacterio-phage were manufactured and 1,072 bulbs were issued during the year. This product is very popular in the City and the demand is increasing in spite of the various sulphadiazine drugs now available in the market for the treatment of bacillary dysentery.

DEPARTMENT OF ANTI-TOXINS.

Charge : Dr. M. K. Krishna Menon, M.B.B.S.

1. Veterinary Section.

The total number of horses maintained in this institute for production of therapeutic sera at the beginning of the year was 45. Of these, 4 died and

3 were destroyed and 23 were added, thus making a total number of 61 at the end of the year. A large majority of these horses were assigned for the production of anti-tetanic serum, and the rest for anti-gas gangrene and anti-scorpion serum. The number of horses under immunisation and bleeding and the quantity of blood drawn are shown in detail in Tables I and II :—

TABLE I.

Name of toxin.	Number of horses under immunization and bleeding.	Number under immunization but not bled.	Total.
Tetanus	38	19	57
Perfringens	2	1	3
Scorpion	..	1	1

TABLE II.

Name of anti-toxin.	Quantities of blood drawn in litres.
Tetanus	3,206.25
Perfringens	101.25
Total	3,307.50

2. Anaerobic Section.

Toxigenic strains of *Clostridium tetani*, *Clostridium perfringens* (Welchii), *Vibrio septique* and *Clostridium oedematiens* are maintained both in the dry state as well as in the semi-solid medium. Toxicity and purity of the cultures are tested every six months. Particular care is taken to maintain Hæmolytic strains of *Vibrio septique* cultures. On the 1st March 1952 toxic strains of the four cultures were received from the National Institute for collection of type cultures, London. Work is now under progress to determine the comparative toxigenicity of these cultures.

The following amounts of toxins were manufactured during the year under report :—

	LITRES.
Tetanus toxin	792
Gas-gangrene toxin (perfringens)	112

Biological Standardization.

Three hundred and eight samples of tetanus anti-toxin and 28 samples of gas-gangrene (Perfringens) anti-toxin were standardized during the year under review. These include tests on sera purchased from outside. Owing to paucity of mice the work of the Standardization Laboratory was considerably affected. Standardizations were done with other animals like Guinea pigs and pigeons. At present experiments are being conducted with squirrels.

Extra Departmental Activities.

The following samples were received from the undermentioned hospitals for investigation of contamination with *Cl. tetanus* and *cl. welchii*.

	Samples.	Results.
(a) Superintendent, King Cotton Swab, Gauze, Silk-wormgut, Silk-treat. (for <i>Cl. tetani</i>).	George Hospital.	No <i>Clostridium tetani</i> isolated.
(b) Superintendent, Government Headquarters Hospital, Cuddalore.	Gauze and Catgut. (for <i>Cl. tetani</i>).	Do.

	Samples.	Results.
(c) Superintendent, Tuberculosis Sanatorium, Tambaram.	Wound scrapings and gauze soaked in post operative wound (for Cl. welchii).	Cl. welchii not isolated.
(d) Local Fund Dispensary, Cumbum, Madurai district.	One ampoule of quinine bihydrochloride (for Cl. welchii).	Cl. tetani not isolated.
(e) Superintendent, Government Headquarters Hospital, Guntur.	Catgut and piece of cotton (for Cl. tetani).	Do.

Special work.

The results of the various experiments conducted on the nutritional requirements of Cl. tetani and Cl. welchii were incorporated into the regular method for production of toxins. In harvesting the culture the preliminary method of clarification by rag-pulp filtration was partially replaced by centrifugation. This ensured a minimum loss in the filtration of toxin. In producing the peptic digest both for Cl. tetanus experiments were conducted to shorten the period of digestion with a view to produce a medium containing proteins in partially digested condition and ensuring the presence of a certain amount of native proteins. The aim of the experiment was to study the toxic and antigenic values of the resulting filtrates.

As a result of these studies, it has been possible to produce tetanus toxin of high potency.

Studies were conducted on the flocculation phenomena of tetanus toxin—Anti-toxin mixtures with a view to its adoption for standardizing anti-toxin or to determine the Lf value of toxins.

The unitage of the tetanus anti-toxin for standardization was brought in conformity with the latest regulations governing the subject issued by the Expert Committee on Biological Standardization of the World Health Organization.

The production of scorpion toxin was taken up again this year. Egyptian scorpion stings were procured and the toxin prepared from them was used for immunizing the horse. Studies are also being conducted on the toxicity of some local scorpions.

For the production of gas-gangrene (welchii) anti-toxin, the toxin employed for the immunization of the horses is manufactured from Type A strain of Cl. welchii maintained in this laboratory. Work is now under progress for manufacturing the toxins of Cl. septique and Cl. Oedematis with a view to prepare polyvalent gas-gangrene anti-toxin in the horse.

Serum concentration section.—This year no increase in the production of sera could be shown as concentration work had to be suspended for nearly a period of four months partly due to the low stocks of plasma at that time and partly due to the installation of the pre-cooling equipment, which covered nearly more than half the period stated above. In spite of this, efforts were made to maintain the level of production of the different anti-sera as that of last year. This has been achieved by processing larger quantities of plasma to the tune of 100 litres per unit concentration, particularly during the latter part of the year under review.

The total quantity of anti-toxic plasma processed during the year under report amounts to 2,084 litres (approx. 351 gallons). This comprises the two types of anti-toxic plasma—anti-tetanus and anti-perfringens. As usual, tetanus anti-toxin formed the major part. As for perfringens Anti-toxin, the quantity of immune plasma processed this year is slightly less than that of last year.

Apart from the usual routine work, investigations have been carried out with a view to explore methods by which higher levels of concentration of sera could be achieved. The technique of ultra-filtration seemed to be very handy in this respect. Acetic-collodion membranes of different porosity have been prepared from a good quality Collodion, 'Nicol' brand, supplied by I.C.I., Ltd. Preliminary experiments on the filtration of anti-sera through these ultra-filters gave a three-fold increase in concentration, the losses in potency being practically negligible. After repeated trials a suitable concentration of acetic-collodion has been arrived

at for the preparation of the membranes intended for the concentration of Antitoxic Pseudoglobulins. The efficiency of ultra-filtration was followed by determining the three constants—the total solids, protein Nitrogen and Potency in the Biologicals under examination. Further work is in progress to standardise conditions for the preparation of suitable collodion membranes for the production of high-titre Antigens also by the same technique of ultra-filtration.

From time to time, such modifications as are necessary in the existing methods of processing immune plasma for getting good quality sera are being incorporated consistent with the advances made in recent years in the concentration and refining of Therapeutic Sera in general. Here, it may be of interest to note that one such modification that has been recently introduced in the process of concentration relates to the addition of Sodium Pyrophosphate in the initial stages of the concentration. This substance has got the reputation of protecting the sera from being contaminated with iron—the usual causative agent for imparting colour to Anti-sera.

Improvements have also been made on the laboratory side of the section by way of additional equipment, e.g., large-scale centrifuge (M.S.E.), electrically operated and thermostatically regulated hot air oven, large-scale stainless steel tanks, water distillation stills, etc.

The total amount of 2,084 litres of Antitoxic plasma comprising the two types of Antitoxins has been processed in the following quantities under each head:—

Type of Antitoxic Plasma.	Volume of Plasma processed LITRES,
1 Tetanus	1,987
2 Gas Gangrene (Perfringens)	97

BLOOD BANK SECTION.

Charge.—Dr. C. S. Ramachandra Rao, M.B.B.S., D.P.H., Assistant Director (Blood Transfusion)—1st April 1951 to 5th May 1951.

Dr. T. Raghavan, M.B.B.S., Assistant Director (Blood Transfusion)—6th May 1951 to 31st March 1952.

Assisted by: Dr. N. Sundararajan, M.B.B.S., Civil Assistant Surgeon.
Dr. S. Venkataswami, Civil Assistant Surgeon.

There are 18 Blood Banks all over the State including those in the City State Hospitals. The 18th Blood Bank was opened at the Government Headquarters Hospital, Ootacamund, during this year.

The mobile blood bank unit was sent to accept blood donations from the inmates of jails at Vellore, Tiruchirappalli and Madras.

The Blood Bank took part in Exhibitions, Park Fair and Exhibitions and Royapettah Y.M.C.A. Carnival in the City, Kumbakonam and Tirunelveli for popularizing blood donations. Blood was taken at the Exhibition stalls from voluntary donors to convince the visitors about the simplicity and harmlessness of blood donation. Blood pressure of the visitors was taken at the Exhibition stall and was immediately informed them. The Wasserman and Kanun results of blood were communicated to them later on. Instructive charts and models were displayed at the Blood Bank stalls to educate the public.

Training in Blood transfusion and Resuscitation work was given to eight medical officers. Radio talks were given at All-India Radio in all State languages for popularizing Blood Banks.

Blood Bank equipments for the Blood Transfusion Service to the medical Institutions in the State, are being supplied by the Central Supply Scheme, King Institute, Guindy.

The work done by Blood Bank section during the year 1st April 1951 to 31st March 1952 is given below :—

I. Blood—

(1) Number of blood bottles received	.. ..	2,862
(2) Amount of blood used for processing	.. ..	804 litres.
(3) Amount of blood issued	.. ..	1 litre.

II. Plasma—

(1) Balance of plasma from previous year	.. ..	63.5 litres.
(2) Amount of plasma processed	.. ..	385.0 "
(3) Amount of plasma in litres issued	.. ..	261.5 "

III. High titre-blood grouping sera—

A	.. ..	2,694 c.c.
B		2,692 c.c.
O		2,629 c.c.

IV. Donors received by the bank—

Voluntary blood donors paid		843
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V. Exhibitions—

Number of Exhibitions and Propaganda work undertaken at outside Stations.	3
Number of Exhibitions and Propaganda work undertaken in City.	2
Radio talks in all state languages	English, Tamil, Telugu and Malayalam.

VI. Jails visited for blood collection—

- 1 Madras Penitentiary.
- 2 Central Jail, Vellore.
- 3 Central Jail, Tiruchirappalli.

DEPARTMENT OF BIOLOGICAL CONTROL.

Charge : Dr. M. Narayana Pai, M.B.B.S.—From 1st April 1951 to 22nd February 1952, Dr. Y. S. Narayana Rao, M.B.B.S., D.T.M. (Cal.), D.B. (Lon.)—from 22nd February to 16th March 1951 and Dr. K. Dattatreyalu, M.B.B.S.—From 16th to 31st March 1952.

Pharmacologist : Dr. K. Dattatreyalu—From 1st April 1951 to 16th March 1952.

Bacteriologist : Dr. V. Krishnamoorthy, M.B.B.S.—Throughout the year.

Chemical Assistant : Miss R. J. Irani—Throughout the year.

Total number of tests performed during the year 1951-52 was 6,268 as compared with 5,348 tests done during the year 1950-51. The work of the department has been steadily increasing as shown below :—

1948-49	.. ..	437
1949-50	.. ..	1,562
1950-51	.. ..	5,348
1951-52	.. ..	6,268

Sterility Tests.

The total number of specimens received and examined for sterility tests during the year was 2,187 as compared with 2,036 during the year 1950-1951. Out of 2,187 specimens tested for sterility, only 31 specimens were found to be contaminated and hence reported not sterile. These comprised of 17 biological products manufactured at the King Institute, Guindy, 11 specimens received from City and mufassal hospitals, 2 from other institutions and 1 specimen of novocaine received from outside the State (Travancore).

A few samples of interest are noted below : (1) A specimen of novocaine 4 per cent in 0.5 per cent saline was received here from a Hospital outside this State. It was reported that injection of the sample intrathecally resulted in meningitis. On examination we isolated Freidlander's Pneumobacillus from the above specimen.

(2) An ampoule of Quinine dihydrochloride (manufactured by a Calcutta firm) was received here from a mufassal dispensary stating that a patient developed tetanus after taking injection. It was examined here but Cl. tetanus was not isolated from the sample.

Pyrogen Test.

We received during the year 413 specimens as against 319 specimens during the year 1950-1951. Out of these, 5 specimens were pyrogenic. This comprised 3 specimen prepared in this Institute, 3 sent by the Inspector of Manufacturing Concerns in Drugs (Schedule C and C-1) and 1 specimen of distilled water from a manufacturing firm (local).

The following specimens were of interest : (1) A specimen of glucose solution prepared from a sample of glucose with a previously passed pyrogen free distilled water was sent here to be tested for the purity of glucose. On trial we found that the specimen of glucose solution was pyrogenic and so the chemical was not used for preparation of pyrogen, free glucose solution.

(2) Three samples (i) 3 per cent sodium citrate ; (ii) double-distilled water and (iii) 12.5 per cent glucose solution, all manufactured by local manufacturing concerns were sent by the Inspector of Manufacturing concerns in Drugs. They were found to be pyrogenic and hence were declared unsuitable for parenteral use.

(3) A manufacturing firm of the City sent us distilled water for pyrogenic test. The contents were found to be pyrogenic. We advised some modifications in the design of the still and when they sent it back to us as per our advice, it was found to be pyrogen free.

Chemical Analysis.

Two hundred and sixty-one specimens were examined under this heading as against 282 specimens in 1950-1951.

Out of these specimens 20 were not of standard quality. These comprised 1 experimental specimen from the King Institute, Guindy, 12 from City and mufassal hospitals, 1 from a private firm and 5 from the Inspector of Manufacturing Concerns in Drugs and 1 from the Central Institute, Kasauli.

A few interesting cases are given below : (1) Samples of Sodium citrate 3 per cent in 25 c.c. (of different batches) manufactured by a local firm were sent to this department for analysis by the Medical Officer, Blood Bank, General Hospital, Madras. The ampoules contained 3.8 per cent sodium citrate in 25 c.c. The label on all the ampoules showed 3.8 per cent with figure 0.8 struck off thus (3.8). Evidently the firm wanted to dispose off the existing stock as per the specifications given by the Hospital.

(2) One sample of sodium citrate 3 per cent in 25 c.c. was sent to this department by the Medical Officer, Blood Bank, Government General Hospital. (This was manufactured by a local firm.) On analysis, the sample was found to contain sodium iodide instead of sodium citrate and upon an enquiry in the Blood Bank it was found that 15 bottles of blood collected from donors clotted when mixed with this solution.

M:

(3) A specimen of Vitamin C ampoules manufactured by a Bombay manufacturing concern and labelled as 100 milligram of Vitamin C per 1 c.c. was sent here for analysis by a local Hospital. On assaying, the sample was found to contain only 35 milligrams of Vitamin C per c.c. instead of 100 milligrams claimed on the label by the manufacturers.

Toxicity Tests.

Two thousand one hundred and thirty-seven specimens were examined under this head during the year under report as against 1,086 in 1950-51. On testing these specimens on experimental animals 6 were found to be toxic; out of these, 5 were received from outside the State and one from the Medical Officer, Madras City Police. 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.	1950-51	..	..	..	1,086
1949-50	..	..	..	85	1951-52	..	..	..	2,137

Interesting specimens in this series.—(1) Papain hydrolysate manufactured by an institute outside Madras State was received here for testing the suitability of the specimen for intravenous use. We found that it can be administered orally but not intravenously.

(2) A sample of "Dial" was sent to us by a Civil Assistant Surgeon of a mufassal hospital finding it to be very toxic with these remarks, "The patients on whom some of these ampoules were used, were found to become restless and collapsed shortly afterwards. This was noticed definitely in three cases." The above sample when injected into experimental animals (dogs, rabbits, guinea pigs, white rats) has been found to be non-toxic in doses up to 8 times the proportionate maximum therapeutic dose.

(3) A sample of Quinine dihydrochloride in 1 c.c. ampoules manufactured by an Indian firm in Kanpur and referred to us by the Medical Officer, City Police, was found to be locally toxic to guinea-pigs.

Anti-toxin Potency Test.

Forty-three specimens were tested in this series and 4 out of these were found to be below standard.

Biological Assay of Digitalis.

Forty tests were done and out of these 4 samples were found to be not satisfactory.

Interesting cases.—One sample of Tr. Digitalis (B.P.) sent by a Calcutta firm and another sample of Tr. Digitalis sent by a Bangalore firm, both for biological assay by frog method were found to be highly toxic to frogs. Both the samples were sent to the Professor of Pharmacology, Madras Medical College, for a parallel test by the cat method and his report on the two specimens corresponded with the report on the frog test conducted by this department. We found out that the leaves from which the latter tincture was prepared were not from "Digitalis purpurea".

Penicillin Assay.

Penicillin assays were done on 10 specimens.

Penicillin sensitivity tests were done on three specimens, and out of these one specimen was found to be penicillin resistant.

Miscellaneous Tests.

Tests of opacity, identity and serological tests with high titre sera.—Nine hundred and thirty-seven Anti-cholera vaccines and 39 anti-T.A.B. vaccines were tested under this head and were found to be satisfactory.

Vaccine Lymph.

Twenty-six specimens were tested for bacterial count, colony count and safety tests and found to be satisfactory. All the specimens were from King Institute, Guindy.

Catgut.—Sixty-five specimens of Catgut sutures received from a private firm were tested for absorbability in animals and found to be satisfactory.

A specimen of Marmite Paste, a specimen of Novastab and Protein hydrolysate (six specimens) which were received from different hospitals were found to be not satisfactory.

Male Frog Test for Pregnancy.

Thirty-nine specimens of urine received from Women and Children Hospital, Egmore, Madras and Kasturba Gandhi Hospital, Triplicane, Madras, and private medical practitioners were examined and out of these 13 were positives.

Research.—Please refer under Researches.

Financial.

A sum of Rs. 1,580 was realised as fees for examination of specimen from private firms for the year 1951-52 as against Rs. 825 for the year 1950-51.

It will be seen that the value of the tests performed in the year 1950-51 and 1951-52 if charged at the usual rate fixed by the Government under the Drugs Act, will amount to Rs. 1,43,376 and Rs. 1,96,335, respectively.

A detailed statement of the work done by this department is appended in Table IX.

Despite lack of suitable equipment to conduct many special tests and want of accommodation, the work of this department has been increasing as compared to previous years.

DEPARTMENT OF WATER ANALYSIS AND ALGAE CONTROL.

Charge: Sri P. V. Seetharama Ayyar, M.A., Chief Water Analyst.

General.—A detailed account of the function and scope of the department of Water Analysis and Algae Control has been given in the Annual Report for the year 1949 to 1950.

The year under report was remarkable for the continuation—the fifth year in succession—of the drought over a large part of the State. This created unprecedented conditions of water scarcity. The affected areas were especially the districts of Anantapur, Cuddapah, Chittoor, Chingleput, Coimbatore and the City of Madras. Intensive efforts were made by the Army, Government and private agencies, for securing water by digging new wells and deepening the existing ones.

In the City of Madras, restrictions had to be imposed in the supply of drinking-water. The meagre supply that could be obtained with much difficulty from the Red Hills Lake, was to some extent augmented by taking water from wells sunk along the route of the conduit and in many parts of the City including the foreshore. A very large number of industrial and commercial concerns and private individuals were compelled by necessity to dig new wells and bore wells to obtain their requirements of water, both for drinking and for non-domestic industrial purposes.

In the above circumstances, there was naturally a large influx of water samples for test to determine their suitability for drinking as well as for a variety of other purposes. The analysis of these special samples is a very exacting and time-consuming procedure, as their suitability for many kinds of use at the same time has to be determined even in the absence of adequate facilities, for specific corrective treatment. It was only under considerable strain on the analytical staff, and not without some consequent sacrifice of the work relating to applied research and

academic investigations, that the department was able to meet this sudden and heavy pressure of work. A request for the temporary addition to the staff of one Junior Water Analyst and one Typist Clerk was therefore made.*

Difficulties experienced during the previous years owing to the lack of sufficient accommodation for the Water Analysis Laboratories, were relieved to some extent during the year under report, by enclosing the verandahs on two sides and converting these into laboratories. This can at best be but a measure of expediency. The need for laboratories specially designed and equipped for the performance of the functions of the different sections of the Water Analysis department will continue to be felt.

The year began with 169 protected water-supplies in the State listed for periodical examination. These water-supplies were tested, as in the previous years, thrice during the year. The water-supply to Chodavaram, Malampuzha and Kasturba Gandhi Hospital were added to the list during the year, bringing the total to 172. At each water-supply, samples for analysis were collected from the source, before and after purificatory treatment and from selected points on the distribution system. The collection of samples, and their transportation schedule were so co-ordinated that the samples reached the laboratory within forty-eight hours or less after collection. It is the invariable practice adopted by this laboratory to preserve in ice, samples of water for bacteriological examination during transport, to ensure the change in bacterial population to the minimum during that period.

Table VIII gives the number of protected water-supplies which are now under periodical quality supervision, with details regarding the nature of the source, method of purification adopted, etc. Reports based on the results of each examination together with suggestions for improvements to quality, wherever found necessary, were sent to the Sanitary Engineer to Government, the concerned Engineering and Public Health officers of the locality, the Director of Public Health as well as to the Executive Engineer (Public Health) of the region in which the particular water-supply is situated. The soundness of the principle by which supervision over drinking-water quality is exercised through an agency independent of the controlling and maintenance authorities, has been amply justified by the prompt and ready response that has always been forthcoming from the Sanitary Engineering and the Public Health Departments to the opinions and suggestions contained in the analytical reports.

The analytical work relating to the examination of samples of water collected from the protected water-supplies in the State as well as the testing of chemicals used in water purification is carried out free of charge. No fee is levied for examination made of samples received in connection with investigations on water supply schemes connected with Governmental agencies or for field investigations, algae control measures, etc., carried out in connection with protected water supplies. The analysis of samples drawn from Railway station water-supplies is also carried out free of charge at present. This has been the practice over many years past when the Railway authorities issued as a reciprocal measure, free second-class passes for the Institute water-sample takers and carried their sampling boxes, etc., freight free. The free examination of railway station water-supplies has been continued even after the cancellation of free passes by the Railway. The subject of Railway station water-supplies was discussed at a meeting of the Water and Sewage Purification Committee, held on 18th August 1948. It was then resolved that considering the importance of many railway stations from the point of view of pilgrim traffic or as centres of business, fairs and festivals, the railway station water-supplies should be periodically tested for hygienic purity and that the present list of railway supplies should be enlarged to include 36 more stations. The Health, Sanitation and Hygiene Committee of the Government of India (The Raman Committee) stressed the importance of regular examination of Railway station water-supplies and recommended that the entire cost for drawing samples and analysing them should be borne

* These appointments have since been sanctioned.

by the Railway administration; but no cost need be met by the Railway for technical advice at high levels. The Committee also recommended the restoration of the free travel facilities to the Institute sample-takers. The Railway Board, however, approved the recommendations of the Committee only as regards the desirability of regular analysis of drinking-water at every station to be carried out at Guindy. At its meeting held on 9th August 1951, the Water and Sewage Purification Committee resolved to recommend to Government that the analysis of railway water-supplies should be charged for at the usual rates, as in the case of other examinations carried out on behalf of the Government of India with the necessary charges required to cover expenditure incurred in the collection and transport of water samples from the Railway stations. Proposals regarding an appropriate scale of fees to be levied with respect to these examinations and the additions to the analytical staff that would be needed, if the department should undertake the examination of Railway supplies in addition to the existing number, have already been submitted to the Director of Medical Services. The scientific control by periodic analysis of the purity and the safety of the Railway drinking-water-supplies is a measure, which is essential for safeguarding the health of the general population and the large travelling public. In consideration of this, the analysis of the Railway water-supplies has been continued uninterrupted and done still free of charge, pending decision on the latter question by the concerned authorities.

The progress with regard to the scheme for the establishment and working of a semi-large-scale pilot plant at Guntakal for removing fluorides from drinking-water has been rather slow. Plans and estimates have been prepared and it is learnt, approved by the Railway administration, for the erection and maintenance of the experimental filters and the necessary auxilliary structures. The sanction of the Government to the proposal for the appointment of the required analytical and laboratory staff for carrying out the experiments at Guntakal is awaited. It is hoped that the work will be commenced as early as possible after Government approve the scheme and sanction the necessary expenditure.

Statistical Data.—The total number of samples of water analysed during the year under report was 8,903 as compared with 8,306 in the previous year. The number of samples which were taken during the year from the protected water-supplies in the State and tested for their bacteriological, chemical and physical features was 4,761. The number tested during the previous year was 4,559. The number of samples of water analysed in connexion with investigations on new urban and rural water-supply schemes at the request of the Sanitary Engineer, other departments of Government and local bodies was 247. The corresponding figure for the previous year was 103.

The number of water samples received for analysis from private sources showed an increase of 40 per cent during the year under report, owing to the intensive exploration for additional sources of water-supply following a long period of drought. The number examined under this head was 483 as compared with 344 during the previous year. It may be mentioned here that these examinations are paid for. The fee realised in the year under report was Rs. 5,070, while a sum of Rs. 4,035 was received as analytical fees during 1950-51.

Seven hundred and thirteen samples of water for biological growths were assayed in the Water Biology Laboratory and in the field for the estimation and identification of algal and other organisms in connexion with both routine water examination and the application of systematic algal control measures.

In connexion with the Research work on water purification problems carried out at the Experimental Station, Kilpauk, 1,897 samples of water were analysed for their physical, bacteriological and chemical features. In addition, 1,350 tests were carried out to determine the dose of chlorine added to prefiltration water and the residual chlorine content in regard to the experiment undertaken at this station. Besides, the analysis of 6 samples of bleaching powder and 88 samples of microscopical organic growths in pre and post-filtration waters and in filter sands was also carried out.

Total ..	12	11	14	67	128	55	32	104	20
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Two hundred and seventy samples of water were sent by private bodies and Government institutions for chemical analysis to determine suitability for drinking. Four of these contained excessive amounts of sodium bicarbonate (over 50.0 parts per 100,000). The use of such waters for drinking is likely to cause digestive disturbances. Fifty-six samples contained excessive amounts of sulphates in solution, likely to produce a laxative effect and on prolonged use, perhaps even diarrhoea. Seventy-five samples contained fluorides in excess of 1.5 parts per million, which is the limit of tolerance in drinking water-supply.

Five samples of water were tested to determine suitability for building construction purposes. The presence in water of high amounts of sulphates and chlorides is undesirable for this purpose. The presence of these salts affects adversely proper setting and the solidity of concrete. They cause besides corrosion of iron materials. Two of the samples were declared unsuitable for building purposes.

Forty-four samples of water were tested for suitability for use in boilers as against 26 in the previous year. Most of these waters were found to require some form of treatment to render them fit for this purpose. Methods for treatment were recommended based on laboratory trials. It is regrettable that this year also, not a single report was received from the concerned parties or from the State Boiler Inspecting agencies regarding the adoption of the methods recommended and the results obtained in actual practice.

Out of 57 samples of bleaching powder taken from the stock in use at the Water Works in the State, only 2 were of good quality and contained 20 per cent and 16 per cent of available chlorine. The rest of the samples contained chlorine ranging from a trace to 10 per cent. This shows vividly the difficulty that is generally met with in chlorinating water-supplies with bleaching powder solution due to the deterioration in quality of the powder on keeping.

A specimen of scale found in the radiator of a Diesel generator cooling system was received for analysis. The scale was composed mainly (77 per cent) of calcium carbonate, iron and small amounts of magnesium carbonate.

A sample of staple fibre, which was reported to have been damaged by salt water, was received for test. It was found that the fibre contained 0.6 per cent of sodium chloride.

Section of water biology.—Samples of water collected on a routine basis from the protected water-supplies in the State, which are derived from lakes, impounded reservoirs, tanks, rivers, streams and wells were examined microscopically to determine the nature and composition of the biological growths present in them. A similar examination was carried out also on samples sent for analysis in connexion with investigations on new water-supplies and by private bodies. The purpose and aim of such an examination has been given in detail in the annual report for the year 1949-50. It may be added that the success of any measure adopted to restrict the growth of undesirable and troublesome algal growths in the water-supply depends to a considerable extent upon early detection of the conditions, which would favour rapid multiplication of the organisms and the application of timely control measures. Wherever the analytical data and available information indicated that the algal abundance is likely to be prolonged or troublesome, necessary measures for algicidal treatment were determined by both laboratory and field test, and it was applied to the water, as far as circumstances would permit, under the technical guidance of the Water Biologist.

The total number of samples examined microscopically during the year was 672, of which 83 samples were taken from Red Hills lake water, Madras, in connexion with experiments at the research station and the algicidal treatment to this lake water.

A systematic programme of algal control measures is now adopted at 17 water-supplies in the State with beneficial results. The aesthetic quality of the water-supply has been maintained and the interference with filtration by local growths of algae on filters minimised to a great extent.

At stations where algal troubles are sporadic in nature, control measures were undertaken whenever the need for it was shown by the observational and analytical results.

A detailed biological assay was made at the request of the Sanitary Engineer of samples of the tank water at Kakinada, after filtration through various grades of micromesh filters. This was required in connexion with certain experiments on "Filtrability Index" carried out at Kakinada.

Some interesting observations appear worth recording. A sample of water drawn from the bottom scour of Ralliah Reservoir at Coonoor, in September 1951, contained the colonial green algae *Dictyosphaerium pulchellum* wool in such abundance as to render the water bright greenish in colour. At the same time, the algae occurred in much smaller intensity at the surface layers of the reservoir. It is usual for algal organisms to occur in greater abundance near the surface of the water than at the deeper portions of a reservoir, where they are not likely to thrive owing to the insufficiency of sunlight.

A rather uncommon amoeboid protozoan was noticed to occur in the flowing water of the Cauvery at Mayuram in March 1952. This organism *Hyalosphaeria* Sp. is an amoeba with a compressed pyriform shell, with the organism attached to the inner surface of the shell by protoplasmic processes.

A sample of organic growths found in a tap water at Trichur (T.C. State) was sent for identification by the Health Officer of the Municipality. These growths were found to consist of a large number of phyllopod crustacea, probably a species of *Limnadiidae*. These inhabit stagnant waters, and feed upon suspended organic debris, diatoms, other algae and protozoa. The local water works authorities were advised to check up the performance of the filters and to scour the pipe lines with heavily chlorinated water.

The occurrence of various species of iron bacteria is being frequently noticed, as larger number of samples from different localities are examined microscopically. A species of *Crenothrix* was found in a sample of borewell water from Sathur taluk and *Gallionella* in a well in Tiruvallur. A sample of water sent for analysis from another well in Bellary, was noticed to possess a light pink colour, and it was heavily laden with algae. Microscopic examination of the sample showed that the organisms comprised almost of a pure culture of the blue green algae *Merismopedia*. The cells of the algae were coloured pink, probably owing to the introduction into the well of coloured tannin or resinous material from decaying vegetation, etc.

Specimens of a fresh water polyzoa belonging to the order *Phylactoleamata* (probably *plumatella tanganyikae* Rousselet) were collected from a drinking water cistern in a school at Kodaikanal. These organisms occur in shady places in still or sometimes in running water. The colony consists of a series of delicate dark brownish tube-like animals united together. They feed on the microscopic organisms in the water, especially diatoms. These organisms produce what are known as "winter buds" or statoblasts, which have a thick chitinous shell. In the specimen examined, the statoblasts had a broad ring of air cells enabling it, when released, to float at the surface of the water. They are capable of withstanding adverse conditions of existence, and developing into new individuals under favourable conditions.

Municipal and panchayat board water-supplies.—Sixty municipalities and 17 panchayats possess protected water-supplies at present. The surface (i.e., rivers, streams, impounded reservoirs, lakes and tanks) and underground (i.e., wells, bore wells, infiltration galleries, etc.) water resources of the State are utilized at present in approximately equal measure to provide protected drinking water-supply to these municipalities and panchayats. It is interesting to note that out of a total daily supply of about 44.8 million gallons by all the municipal and panchayat board water-supply undertakings, nearly 20.0 million gallons are derived from underground sources while 24.8 million gallons are drawn from surface sources. The wide range in the magnitude of the water-supply undertakings could be judged from the fact that the Madras City is supplied with a daily average of about 15 million gallons

(in 1951-52) while Ramachandrapuram Panchayat at the other end has an average daily supply of only 1,000 gallons; 45 out of the 60 municipal towns and one panchayat have a supply exceeding 1.0 lakh of gallons per day.

As regards bacterial purity, the underground sources generally yield a water of fair to excellent quality. One hundred and thirteen out of 155 samples (72 per cent) collected at the source showed on examination the presence of coliform bacteria in volumes ranging from 10 c.c. to over 60 c.c. The wells at Dindigul, Palayamkottai, Kosgi and Theni, the infiltration wells at Cuddalore, Proddatur and Vijayavada and the infiltration galleries at Cuddalore, Pollachi, Tiruchirappalli, Tanjore and Vizianagaram yielded water which was generally poor in bacterial quality.

Compared with the underground sources, the surface waters were found to show evidence of heavy bacterial and organic pollution. This is only to be expected, as these waters are subject to contamination from surface washings, during periods of rainfall and from aquatic life. Forty-seven out of 75 (62.6 per cent) of the samples collected from surface sources showed the presence of coliform bacteria in quantities less than 1.0 c.c. while only 4 samples (2 from Coonoor, one bacteriological point of view. Among the different types of surface sources, a better quality of water was derived from sources such as lakes, storage tanks, and impounded reservoirs than from rivers and streams, due to improvement in bacterial quality that occurs during storage and settlement under tropical conditions.

The treatment given to the surface waters to render them fit for drinking purposes consists of alum coagulation, settlement, filtration through rapid gravity filters followed by chlorination at Bodinayakanur, Cochin, Erode, Rajahmundry, Mettupalayam and Mettur Dam. Pressure filters are in use at Chidambaram, Palacole, Masulipatnam and Pudukkottai. Purification by filtration through slow sand filters followed by chlorination is carried out at Eluru, Kakinada, Kurnool, Madras, Adoni, Salem, Periyakulam and Ramachandrapuram.

The water-supply to Coonoor, Coimbatore, Kodaikanal, Kozhikode, Palni, Gudalur, Kotagiri, Pannaikadu, Tiruttani and Tirumalai is purified by chlorination alone, while no treatment is applied to the water taken from the upland reservoirs supplying drinking water to Ootacamund.

In regard to the 48 municipalities and panchayats which derive their supply from ground water sources of almost satisfactory initial purity, all but 11 supplies have adopted systematic chlorination as a measure of safety against water borne diseases.

For purposes of chlorinating the water-supply, automatic apparatus using liquid chlorine is used in 21 water works, while the rest chlorinate the supply with the aid of manually controlled drip-feeding equipment using bleaching powder solution. The use of automatic apparatus is being gradually extended, to replace the manually operated equipment. Whatever type of apparatus is used, the aim in degree and extent of initial pollution and the improvements effected through sedimentation and filtration, wherever such procedures are also adopted. The nated and purified potable water, is the absence from the water of organisms belonging to the coliform group of bacteria in 60 c.c. volumes of the sample tested. Judged from this point of view, out of 230 samples of chlorinated water collected at the various headworks during the year under report, 196 or 86 per cent of the samples were of satisfactory quality indicating proper and adequate chlorination. A fair proportion of the 14 per cent of unsatisfactory samples were from water-supplies, which used manually controlled drip feeding equipment.

These apparatus often present much difficulty in regulating the dosage of chlorine used. Besides, only unstabilized bleaching powder is obtainable now in the Madras market, which tends to lose its potency rather rapidly after the

original containers are opened. Yet, another factor which undoubtedly contributes to this somewhat unsatisfactory state, is the human element, which still remains the weakest link. For, a skilled operator will secure acceptable results even under unfavourable circumstances, whereas an unskilled or a negligent one may fail to use even adequate facilities in a satisfactory manner.

The chief producer of bleaching powder is Mettur Chemical and Industries Limited, Mettur Dam. This firm has been advised by the Water and Sewage Purification Committee to explore the possibilities of manufacturing stabilized bleaching powder. In the meanwhile, they have, it would appear, made the necessary arrangements for marketing bleaching powder in small conveniently sized containers, which would be specially suitable for small water-supplies, as for jails, railway stations, etc. Wherever necessary, the water-supply authorities have been advised to store the bleaching powder in tightly stoppered screwcap earthenware jars, in order to prevent loss of chlorine during storage.

During the year under report, 729 samples of water were collected from the service taps in the municipalities and panchayats and tested for their hygienic quality. The following statement shows the number of samples which were found unsatisfactory* in each group of supply divided according to the type of treatment adopted.

Type of supply.	Number of supplies.	Number of samples tested.	Number of samples unsatisfactory.	Percentage unsatisfactory.		
				1951-52.	1950-51.	1949-50.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Municipal water-supplies.						
Untreated	11	110	35	31.8	35.9	47.3
Chlorinated only	33	321	119	37.1	32.1	37.9
Filtered and chlorinated ..	16	168	49	29.1	32.1	13.7
Total	60	599	203	34.0	32.8	32.8
(2) Panchayat Board water-supplies.						
Untreated	1	9	0	0	47.6	50.0
Chlorinated only	14	109	35	33.0	44.6	32.3
Filtered and chlorinated ..	2	12	0	0	9.0	39.0
Total	17	130	35	27.0	41.9	34.4

* The emphasis here given to the consideration of the "unsatisfactory" samples is designed to guard against complacency. Progress in quality maintenance is more readily judged by the progressive dwindling of the percentage of unsatisfactory samples.

Thirty-four per cent of the samples taken from municipal distribution taps were below standard from the bacteriological point of view. The corresponding figure in the case of panchayat board water-supplies was 27.0 per cent. It will be seen that the overall position as regards the municipal water-supply continues more or less unaltered compared with the previous year, while there has been an improvement in the case of the panchayat board water-supplies. Taking into consideration only those supplies, which are subjected to some form of purification including chlorination, it would be seen from the table that out of 610 distribution samples tested, 203 or 33.3 per cent were unsatisfactory while only 14 per cent of the samples collected at the headworks were below the standard of bacterial quality required of a chlorinated water-supply. This fall in quality in the distribution system should be regarded with concern. It is the aim of a protected water-supply, not only to produce constantly a water which is hygienically safe,

and aesthetically satisfactory but also to distribute it to its consumers with its quality unimpaired. The pollution that occurs in transit may be due in large measure to growths that occur inside pipe lines, and in subsidiary storage reservoirs. In mains subject to negative pressure, this deterioration in quality would be of special significance. Therefore, care should be taken to guard against transit pollution. Thorough washing down and flushing with heavily chlorinated water of service reservoirs which may be taken out for cleaning and regulated and systematic scouring of the pipes would eliminate to a large extent the re-contamination of the water in its passage through the distribution system. Whether the existing practice of scouring of the distribution mains is adequate for the intended purpose as regards velocity and pressure, is a matter for investigation by the concerned engineering authorities. The deterioration in the pipe lines has been particularly noticeable in the case of the water-supply to Coonoor, Cuddalore, Cuddapah, Dindigul, Kodaikanal, Madras, Saidapet, Nagapattinam, Pollachi, Tanjore, Tiruchirappalli, Kotagiri, Manapparai, Pannaikadu, T.T. Devasthanam, Adoni, Bodinayakanur, Eluru and Salem.

Jails, Certified Schools, etc.—The water-supplies to 25 jails, certified schools and vigilance homes were tested thrice during the year under report. The supplies to these institutions were satisfactory as judged by the results of analysis. The supplies to bleaching powder used in jails was often found of poor quality due to long and improper storage, arrangements have now been made by the Mettur Chemical and Industrial Corporation to market bleaching powder in small sized containers to suit the specific needs of these jails and similar small water-supplies.

Other institutions.—The water-supplies to 12 Government institutions, colleges and camps are now under periodical analytical control (Table VIII). The water-supplies to the State Hospitals in Madras City are also tested periodically.

The supplies to the Medical College, Vellore, and the Government House, Guindy and Ootacamund, were of good quality.

The water-supply to Glenmorgan and Singara Hydro-Electric Supply Camps continued to be of poor quality. Recommendations were made by the Institute as early as 1950 for making proper arrangements for chlorinating the water-supplies to Glenmorgan and Singara Hydro-Electric Camps to render them bacteriologically safe. But these have not yet been carried out and the supplies remain still in an unsatisfactory state.

The water-supply to Annamalai University has been the subject of unfavourable remarks regarding quality for some years past. Here again, while a periodical free examination is carried out as a routine and reports sent to the concerned authorities of the University, little attempt appears to have been made by the latter to improve the quality of the supply and make it conform to standards required of a protected water-supply.

The Makampuzha project camp water-supply was included in the list for routine examination this year. The supply is drawn from an infiltration gallery laid in the bed of the "Makampuzha". The gallery is about 145 feet long. The water is pumped to a single compartment stone masonry reservoir, situated on a hillock at a distance of about 2 furlongs from the pump house. Provision has also been made to supply water to the camp directly without storage. The supply is chlorinated in the reservoir, using bleaching powder solution. An automatic apparatus (Vitri chlorinator) would be installed soon.

Railway station water-supplies.—The water-supplies to 54 railway stations on the Southern Railway and the Eastern Railway systems are under routine periodical examination. Orders of Government are still awaited for the inclusion in this list of some more important railway station supplies. Ten railway stations derive their supply from the neighbouring municipality.

At ten railway stations, automatic chlorinating apparatus, using liquid chlorine, has been provided for purifying the water-supply. A distinct improvement in the hygienic quality of the water-supplies at many of these stations was noticed during the year under report, indicating strict supervision by the concerned authorities.

over chlorination procedures adopted. However, at some stations (Arkonam, Bowringpet, Vijayavada, Kozhikode, Cannanore, Kumbakonam, Nidamangalam, Naupada, Walajah Road, Vizianagaram, Tiruvannamalai, Chingleput and Sriakulam), chlorination continues to be somewhat inefficient. Suggestions regarding necessary improvements have been made in the analytical reports for bringing these supplies also to a satisfactory state of purity. At Ongole railway station, a common main carries both the loco and the drinking water-supply. The former is of poor chemical quality. Due to faulty operation of the regulating valves, the two waters frequently get mixed up, affecting adversely the quality of the drinking water-supply.

A proprietary product known as " Chloroston " is used for sterilizing the water-supply to Srikakulam, Naupada and Vizianagaram stations on the Eastern Railway. This has not yielded satisfactory results. It has been recommended that these water-supplies may be treated either with liquid chlorine, using an automatic apparatus or with bleaching powder solution with the aid of a McLeod's box as at many stations on the Southern Railway.

Water and Sewage Purification Committee.—There were four meetings of the Water and Sewage Purification Committee during the year under report on 9th August 1951, 25th August 1951, 17th September 1951 and 16th February 1952.

At its meeting held on 9th August 1951, the Committee reviewed the results of the experiments carried out on pre-chlorination of the Red Hills lake water using the Break Point method prior to sand filtration. The Committee was of the opinion that this method had yielded promising results and offered yet another solution for the elimination of sulphuretted hydrogen from the filtrates from sand filters. They, however, considered it necessary to try out the method on a full plant scale in two of the Corporation sand filters. It was also resolved to carry out an experiment at Kilpauk, on chloramination as a pre-treatment method prior to sand filtration.

The Committee met again on 25th August 1951, to consider a report from the Sanitary Engineer regarding the occurrence of iron in the water derived from the infiltration wells of the Kozhikode Water-supply, which had been almost completed. The Committee resolved to defer action in the matter pending a thorough field investigation of the problem by an analytical unit deputed from the King Institute.

The meeting of the Committee on 17th and 18th September 1951 was held at Kozhikodé in connexion with the investigations on the presence of iron in the Kozhikode new water-supply. Field tests carried out by the King Institute on samples of water drawn from the infiltration wells under actual pumping conditions showed that the wells yielded a water containing iron above the permissible concentration for a protected water-supply system. A recommendation was made for removing the iron from the water before supplying it to the consumers. The problem was examined by the Committee in all its aspects. It was resolved that the removal of iron from the water should form an essential procedure before the water-supply scheme can be brought into use. As regards the method to be adopted for iron removal, the Committee recommended treatment with lime and alum followed by settlement for about 6 hours and filtration. In view of the fact that it had already taken many years to complete the scheme and further delay in bringing it into commission should be avoided, the Committee suggested that provision for filtration may be taken up later, if found necessary and for the present, lime and alum treatment followed by settlement alone may prove adequate.

Arising from this, it was considered important by the Committee, that besides the normal quality tests on representative water samples made in regard to investigations on new water-supply schemes, further confirmatory analyses should also be carried out in co-ordination with the progress of the execution of the schemes at all important phases.

Total ..	12	11	14	67	128	55	32	104
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Experimental Filter Station, Kilpauk.—The main research carried out at the station during the year under report related to (1) the application of the Break Point method of chlorination to the Red Hills lake water prior to sand filtration, (2) chloramination of the Red Hills lake water prior to sand filtration, and (3) mechanical filtration followed by sand filtration.

(1) *Break Point Chlorination of Red Hills lake water.*—This is a continuation of the experiment started in May 1950. Complete details of the scientific principles involved, the experimental procedure adopted, and a discussion of the results obtained have been given in the reports of the Water and Sewage Purification Committee for the half-years ending 31st December 1950, 30th June 1951 and 31st December 1951. The results have also been briefly summarized in the annual report for the year 1950-1951. The results obtained during the year under report generally confirm the findings made earlier, viz., that pre-treatment with chlorine by the Break Point method increases the quantity of water filtered per unit area of filter surface cleared, yields a coliform free filtrate and prevents the development of sulphuretted hydrogen in the filters.

(2) *Chloramination of Red Hills lake water prior to sand filtration.*—The development of chloramination in the purification of drinking-water supplies started primarily for the purpose of overcoming taste and odour troubles which arose when certain types of waters were treated with chlorine alone.

When chlorine is added to a water containing ammonia nitrogen, it combines with it fairly rapidly to form chloramines. This reaction results in the formation of different types of compounds depending upon the pH of the water. At low pH values (5-6.5) dichloramine is formed. At a pH of 7.0, about equal proportions of dichloramine and monochloramine are formed. At pH 8.4 and above, only monochloramine appears to be formed.

It has been generally accepted that the sterilization action of chloramine is slower than chlorine. Hence, a longer contact time needs to be provided to effect efficient bacterial kill when chloramine treatment is employed.

In the case of filtered waters, it is usual to add the chlorine first and after a definite pre-determined time, ammonia is added in order to convert the residual chlorine into chloramine. By this means, the benefit of the initial rapid bactericidal action of chlorine is obtained. As chloramine is more stable than chlorine, it persists in the water in the distribution lines, and subsidiary storage reservoirs, thus helping to safeguard against pollution from unforeseen sources.

In the case of waters before filtration, it appears to be more advantageous to add the ammonia first and then chlorine. This is so because long contact times are generally obtainable and a high chloramine residual could be maintained through the purification system. It has the additional advantage that even when exposed to sunlight in open filters, chloramine is not so nearly affected by the actinic rays of the sun as is chlorine.

The dose of ammonia nitrogen and chlorine adopted in the experiment carried out at Kilpauk was 0.5 part per million of ammonia N, and 1.5 parts per million of chlorine. The ammonia N in the form of ammonium sulphate solution was added to the water first and then bleaching powder solution. The chloraminated water was fed to a sand filter worked at 8 inches vertical per hour.

The chloraminated water fed to the sand filter was free from coliform organisms at all times tested. The filtered water was also free from coliform organisms.

The filtered water showed a high residual chloramine content, during the first few runs of the sand filter (from 0.5 to 1.0 part per million). Subsequently, however, the residual chloramine content of the filtered water tended to decrease and at the time of the preparation of this report, it was only a trace. The causes for this gradual reduction are being studied.

The adoption of chloramine treatment to the raw water before filtration has helped to increase the period of run of the filter as compared with another filter receiving untreated water. In this respect, chloramination appears to be equally as effective as Break Point Chlorination.

(3) *Mechanical filtration followed by slow sand filtration.*—As already reported, this experiment was designed with a view to obtaining data on the performance of a slow sand filter, when it is fed with water from which the suspended organic and mineral impurities have been previously removed. This was done by alum treatment, settlement and mechanical filtration. It is expected this experiment would yield useful information about the behaviour of the sand filter on receiving micro-mesh strained Red Hills lake water.

The experiment was started early in September 1951. In the beginning, the sand filter became clogged very quickly, the first three runs being only of 8, 32 and 22 days respectively. On investigation, it was found that small amounts of aluminium were present in the filtrate from the mechanical filter and that formed a gelatinous mat on the sand filter. This was perhaps due to defects in the structure and design of the settlement basins which were available for use. The difficulty was overcome by extending the settlement period and reducing the rate of filtration through the mechanical filter. Then the secondary sand filter showed runs of 69 and 63 days. During the same period, the length of run of the control sand filter averaged 28 days.

The filtrate from the mechanical filter was clear and colourless (turbidity below 5.0 parts per million) and contained a small number of thin needle shaped blue green algae (*Anabaenopsis, oscillatoria*) together with a few diatoms. When this clear water was fed to the sand filter, it was observed that a luxuriant growth of green algae soon developed both on the surface of the sand and on the submerged walls of the filter. The turbidity of the sand filtered water was generally below 1.0 part per million. It showed over 80 per cent improvement in coliform content over the raw water and a reduction of 37 per cent in organic matter content as compared with the raw water. The filtrate contained even near the end of the run of the filter, small amounts of oxygen in solution (about 0.5 to 1.5 ppm) whereas the filtrate from a control sand filter receiving raw water direct was devoid of dissolved oxygen within a few days of the start of each run.

The secondary sand filter did not produce any hydrogen sulphide.

The experiment is being continued.

Field investigations.—(1) *Sterilisation of water mains.*—(a) *Chodavaram Panchayat* (Sri P. V. Seetharama Iyer, M.A.).—The protected water-supply to Chodavaram Panchayat Board (population 13,000), Visakhapatnam district is derived from an infiltration well, about 38 feet deep. The water is pumped to an elevated R.C. reservoir of two concentric compartments, each of 12,500 gallons capacity. Drinking water is supplied to the town through 20 public taps. Arrangements have been made to chlorinate the supply with the aid of an automatic apparatus, using liquid chlorine.

Before the water-supply was placed in commission, the entire distribution system was sterilized with a heavy dose of chlorine (14/15-11-51). 25.0 parts per million of chlorine was added to the water in the elevated reservoir, and the chlorinated water was drawn into the distribution system, as well as into the pumping main. The strong solution of chlorine was allowed to remain in the pipes for nearly 14 hours, at the end of which period samples taken from the distribution taps still showed a residual chlorine content varying from 10.4 to 12.8 parts per million. The pipe-lines were then flushed out with fresh well water. Bacteriological tests carried out on samples drawn from a tap in the pumping station and from taps in the town showed that there was no fall in quality in the water as it traversed the pipe lines, indicating conditions of cleanliness inside the pipes.

(b) *Visakhapatnam Municipality* (Sri K. G. Veeraraghavan, M.Sc.).—The new mains laid in connexion with the extension of the water-supply distribution system of the Visakhapatnam Municipality to the areas in Daba Gardens, Assam Gardens, etc., were sterilized on 11/12-8-51. The new pipe system extends to a length of

4.5 miles and consists of 8 inches, 6 inches and 4 inches diameter pipes. There are 15 street taps in the area served.

Bleaching powder solution was pumped into the main through a small pipe fitted into the main at the start. For this purpose a pressure testing pump was used. At the same time, the sluice valve was opened allowing a regulated flow of water into pipe line. The strength of bleaching powder solution and the rate of addition of the solution to the water entering the mains were adjusted to give a dose of 25.6 parts per million of chlorine in the water. The strongly chlorinated water was allowed to stay in the pipes overnight, and was then flushed out with fresh water. After sterilisation and flushing, bacteriological examinations were carried out in the field laboratory on the water as it entered the new mains; and as it flowed out of the street taps. The results of the tests showed that the water did not suffer any degradation in bacterial quality during passage through the pipes, signifying that the mains had been effectively sterilized.

The mains pressure testing apparatus proved fairly suitable for injecting chlorine solution into pipe lines. It would, however, be more advantageous if the Sanitary Engineering Department could make available for this purpose a portable injector type apparatus using liquid chlorine.

(c) *Kumbakonam Municipality* (Sri K. R. Ramaswami, B.Sc.).—The new mains in Zone III of Kumbakonam Municipality were sterilized with bleaching powder solution between 13th and 17th April 1951 at a strength of 60 parts per million of chlorine held in the mains overnight. The mains were then thoroughly flushed out with fresh water and samples drawn from the distribution taps for bacteriological examination at the field laboratory. The results proved that the pipe lines had been satisfactorily sterilized. Samples of water drawn from taps on this section during subsequent routine periodical examination have yielded good results.

Investigation on Coonoor Water-supply (Sri P. V. Seetharama Iyer, M.A.).—The bacterial and aesthetic quality of the Coonoor Water-supply has been the subject of adverse comment in a series of reports. An investigation was therefore carried out to ascertain the causes for this deterioration in the quality of the water-supply.

It was noticed during the investigation that tree felling operations carried out periodically over a part of the catchment area, employing a large labour force may constitute a potential source of undesirable pollution of the Ralliah Reservoir. This reservoir water ordinarily supports a heavy growth of algae. Owing to the insufficiency of soil coverage in the catchment, heavy rains wash down mud into the reservoir, rendering the water discoloured and turbid. As the water is slightly acidic in reaction, it tends to corrode iron pipes, and hence particles of iron compounds occur in the tap water.

The Bandami Reservoir water was more clear and less discoloured than the water of Ralliah. Also, it supports fewer algal organisms. Algal control treatment for both reservoirs on a planned basis was therefore recommended, so that the low forms of animal and vegetable life may not increase and become a pronounced nuisance.

It was also recommended that the water-supply to Coonoor should be filtered to get rid of the vegetable and other organic growths and suspended impurities in the water drawn from the two reservoirs.

Arrangements for chlorinating the supply were also not entirely satisfactory and efficient. The provision of an automatic chlorinator was considered as early as 1938 but has not yet materialized. The present arrangement of dripping bleaching powder solution into a break pressure tank suffered from the serious handicap that the correct dosage could not be measured and tests for residual chlorine were not carried out. There was likelihood of unchlorinated water entering the supply mains.

It was recommended that pending the installation of an automatic apparatus, using liquid chlorine, an improved drip feed system may be adopted and the dosage regulated by frequent daily tests for residual chlorine on the treated water allowing for a contact time of one hour. Suitable taps need to be fixed at proper places on the mains to draw samples for residual chlorine tests.

(2) *Investigation of the probable causes for the death of six persons in a well in Cuddapah district* (Sri K. G. Veeraraghavan, M.Sc.).—An investigation was carried out in November 1951, on the probable causes for the death on 19th May 1951 of six persons who descended into a well in Peramvaripalle, hamlet of Pondalur village, Rajampet taluk, Cuddapah district. The first of the six who descended into the well to recover a copper pot would appear to have lost consciousness on reaching near the water surface and to have fallen into the water and died. The rest were men who went in to rescue the earlier victims. The whole unfortunate episode occurred within about half an hour. Post-mortem examination of the bodies revealed nothing unusual or peculiar. A hurricane lantern lowered into the well on 17th September 1951 was put out. But on another occasion, the lamp was unaffected. Again some weeks later, when the experiment was tried, the lamp was extinguished. This would appear to show that at certain times, the air in the well near the surface of the water becomes charged with carbon dioxide or depleted of its normal proportion of oxygen.

The well was about 42 feet deep, square in shape (sides 8 feet long) with about 4 feet of water. The water was clear and colourless. The bottom sediment was mainly sandy, with a large amount of precipitated calcium carbonate crystals.

Chemically, the water was moderately hard (mostly temporary hardness) with a low chloride content and a high bicarbonate content (46.5 parts per million as calcium carbonate).

Samples of the air inside the well a few feet from the water surface were collected with the aid of an apparatus designed for the purpose and analysed at the spot to determine its characteristics. It was found that the sample contained almost the same concentration of carbon dioxide as that present in the open air in the vicinity of the well and at Rajampet itself. There was no hydrogen sulfide or methane in the sample. At the time of the investigation, a lantern lowered into the well continued to burn and a small fowl suffered no ill effects when lowered inside.

No direct clue could therefore be obtained regarding the causes for the death of the six people. Nevertheless the occurrence of large amounts of calcium carbonate in the sediment at the bottom of the well and the presence of high amounts of bicarbonate in the water are significant. It seems highly probable that under some conditions—changes in temperature, or variation in atmospheric pressure due to rains, etc., there is an evolution of carbon dioxide from the bicarbonates, which become converted into the insoluble carbonate and sink down. It may also happen perhaps that some of the carbon dioxide may go back into solution, reconvert the carbonate into bicarbonates and thus a cycle may be established in which at intervals, the water breathes out carbon dioxide. The problem requires further study.*

(3) *Kozhikode Water-supply Scheme* (Sri N. Swaminathan).—At the instance of the Sanitary Engineer, an investigation was carried out on the quality of the water from the five infiltration wells sunk in the bed of the Elathur river in connexion with the new water-supply scheme. The five wells are located in a row, along the river-bed, above 225 feet apart and are inter-connected. Samples were drawn from each well, and from the tap in the pumping station, representing a mixture of the well waters. These samples were analysed on the spot to determine their iron content, manganese, pH, alkalinity and free carbon dioxide content. A full chemical analysis on these samples was later carried out at the institute.

All the samples were clear and colourless when taken, but turned hazy and opalescent on keeping. They were alike in reaction with a pH ranging from 6.0 to 6.5. They contained fairly large amounts of free carbon dioxide and so are likely to exert a deleterious action on unprotected iron pipes. The samples did not contain manganese in solution. They contained excessive amounts of iron in solution, ranging from 0.26 to 0.68 parts per 100,000 which is above the permissible limits for a potable public water-supply.

* A similar incident occurred on 26th May 1952 at Tennerikuppam village near Poonamallee. No investigation could be carried out, as the well was filled up soon after the accident.

Owing to the presence of iron, the water had an unpleasant chalybeate taste. The iron in solution became precipitated when the water was kept in bottles and exposed to air. When such deposition occurs inside pipe lines and storage tanks, it is likely to favour the growth of certain biological growths like the iron bacteria, crenothrix, leptothrix, etc. Moreover, iron containing waters are unsuitable for use for many common industries.

It was therefore considered essential that the iron should be removed from the water before it is supplied for drinking and other domestic and industrial purposes.

(4) *Mineral Water Investigation, South Arcot* (Sri A. S. Hariharan, B.Sc.)—A brief account of the investigation on the chemical quality of eleven artesian wells in South Arcot district has already been given in the annual report in the year 1950-51. During the year under report, the investigations were continued and the waters of seven more wells were elaborately tested for their chemical characteristics. In the course of these investigations, besides the usual field analytical tests, special tests were also made on some samples to ascertain the presence of coal and marsh gases.

These wells vary in depth from 210 to 515 feet and they tap the springs below the lignite strata. They are lined with iron pipes mostly six inches diameter taken down to nearly within 4 to 5 feet of the bottom.

All the well waters are acidic in reaction and have a low total dissolved solids content (24.0 to 53.6 parts per 100,000) with a bicarbonate alkalinity varying from 11.3 to 39.3 parts per 100,000. They all contain magnesium and calcium bicarbonates and in some, small amounts of sodium bicarbonate are also present.

The well waters contain practically no oxygen in solution. They are however fairly rich in dissolved carbon dioxide (13.4 to 21.8 parts per 100,000) and small bubbles of the gas are given off when the water is collected and kept in a bottle. The waters contain iron in solution. So, they are clear and colourless when freshly drawn from the well, but on exposure to air, the iron compound precipitates out, turning the water hazy and discoloured in appearance. Moreover, the iron imparts a styptic or astringent taste to these waters.

The only important and noteworthy feature of these artesian well waters is the presence of fairly large amounts of carbon dioxide in solution. Even so, the amount of this gas present should be considered low, when compared with the well known Vichy springs in France and the Appolinaris springs in Germany. These latter contain carbon dioxide in as high concentrations as 85.0 parts per 100,000. It would therefore seem that the South Arcot artesian well waters are not particularly distinct to be characterized as alkaline or medicinal waters and worthy of any form of large-scale commercial exploitation. Still, it is likely that the use of these waters for drinking purposes, for long periods may have some beneficial effect, for it is known that carbon dioxide in water helps to stimulate the appetite and soothe irritable conditions of the stomach, while iron in solution in its bivalent form is useful in anaemia.

PART II—RESEARCHES.

FILTERABLE 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, Dr. (Miss) L. Yogeswari and Sri K. N. Gopalan.]

A. Influenza.

Throat-washings from two cases of clinical influenza were cultured for the presence of influenza virus. Up to five passages into the amniotic sac of the developing chick, no evidence of the presence of influenza virus was obtained. Serological tests on sera obtained from the cases confirmed the absence of influenza virus infection.

B. Vaccinia and Variola.

Two strains of variola maintained on the chorioallantoic membrane of the developing chick have passed from the 18th to the 46th passage and from the 1st to 24th passage respectively.

Strains of vaccinia virus have passed from the 175th to 202nd and 94th to 102nd egg passages.

Comparison of the protective value of different types of vaccine lymph and variola virus against smallpox.—The immunity of monkeys protected last year with (1) seed vaccine lymph, (2) dry vaccine lymph, (3) membrane vaccine lymph and (4) membrane variola was challenged with a membrane strain of variola at intervals of 3, 6, 9 and 12 months. The results are given in the table appended.

In this pilot experiment, only four monkeys were vaccinated with each type of lymph and the protection afforded by them against smallpox was tested by challenging the protection by vaccinating one monkey of each group with smallpox virus at intervals of three months. From the table it is seen that all these four lymphs protect monkeys against smallpox for at least 12 months, the maximum period during which the immunity was tested. Further experiments using larger number of monkeys will be undertaken this year in order to test the persistence of immunity over longer periods.

C. Lymphogranuloma venereum.

The need for the manufacture of an antigen for the diagnosis of Lymphogranuloma venereum was keenly felt, because of non-availability of the antigen in India and the difficulty experienced in obtaining sufficient quantities from abroad. With the kind co-operation of Dr. R. V. Rajan, Dean, Government General Hospital, Madras, and Dr. P. N. Rangiah, Venereal Specialist, Government General Hospital, Madras, and Dr. P. Natesan, Venereal Specialist, Government Stanley Hospital, Madras, attempts were made to prepare yolk sac skin test antigen for the diagnosis of Lymphogranuloma venereum.

Different methods were tried for the preparation of the antigen from the yolk sac cultures :—

- (1) Differential centrifugation.
- (2) Treatment with :
 - (i) Ether.
 - (ii) Chloroform.
 - (iii) Toluene.
 - (iv) Dilute Hydrochloric acid.

The antigens so prepared were tested on cases with proper controls but no specific reactions were obtained. Further work is in progress.

To meet the immediate demands till success is achieved in the preparation of yolk sac antigens, the preparation of human pus (Frei's) antigen was undertaken and 750 doses of the antigen prepared and 475 doses were issued. Apart from meeting the demands of the private practitioners and hospitals of this State, the antigen has been supplied to Dr. R. B. Tampi, World Health Organization Venereal Diseases Demonstration Team, Simla, Army Medical College, Poona, and to others outside the Madras State. The effects of 0.3 per cent carbolic acid on the antigen was studied. It was noted that carbolic acid in a concentration of 0.3 per cent has no deleterious effect on the antigen up to eight months, the period of observation. Frei's antigen kept at room temperature for two weeks was still found to be potent on testing.

TABLE.

Monkey No.	Material used for primary vaccination.	Interval.	Reaction due to challenging with variola.
135	Seed Vaccine lymph	3 months.	Reaction of immunity.
136	Do.	6 months.	Do.
137	Do.	9 months.	Accelerated take.
138	Do.	12 months.	Reaction of immunity.
139	Dry lymph	3 months.	Do.
140	Do.	6 months.	Do.
141	Do.	9 months.	Accelerated take.
142	Do.	12 months.	Reaction of immunity.
145	Membrane lymph	9 months.	Do.
144	Membrane variola	6 months.	Do.
148	Do.	12 months.	Do.

FILARIASIS 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
Dr. (Miss) L. Yogeswari.]

The work on filariasis suspended in March 1950 was revived in June 1951. It is noted that the rate of *Conispiculum* infection in *Calotes* is low this year compared with that noted in the past. As seen from the table below, the *Conispiculum* infection in *Calotes* is getting progressively reduced since 1947 when our observation commenced.

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

Year.	Number of cases examined.	Number infected.	Percentage infected.
1947	653	252	38.6
1948	2,811	961	34.2
1949	2,315	677	29.2
1950	..	..	..
1951	802	189	23.6

Though the quantity of the worms collected during the year is not sufficient for the preparation of a fair quantity of the antigen, small quantities of male and female antigens have been prepared and work on the trials of the antigen in the early diagnosis of human filariasis continued.

EDIBLE BRACKISH WATER BIVALVES AND THEIR BEARING ON HUMAN DISEASES.

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

Three types of edible bivalves occur in the back-waters of Madras—the edible oyster, and two venerid clams *Meretrix* and *Tapes*. Of these, the clam *M. casta*, occurs in very large numbers and are fished extensively and consumed. Observations in the field have shown the outbreak of cholera-like diseases during the fishing season of these clams and hence this study was undertaken into the bearings of clams on human bowel diseases, especially cholera.

Non-agglutinable vibrios were recovered from clams collected from Adyar and also from the water. Clams have been kept in the laboratory and either fed on or inoculated with suspensions of an *Inaba* strain of cholera vibrio and this has been subsequently recovered from clams up to 3 days and from the water for a longer period. The recovered strains did not differ from the original in their antigenic and biochemical reactions or haemolytic activity. Efforts are being made to keep the clams alive in the laboratory for a longer period.

DEPARTMENT OF BIOLOGICAL CONTROL.

MALE FROG TEST FOR PREGNANCY.

(Dr. M. Narayana Pai and Dr. K. Dattatreya.)

Male frog test for diagnosis of early pregnancy was performed in continuation with last year's work. The comparison was made between this test and Friedman's test and it was found that the two were identical regarding the results. In four cases the results were not conclusive as the frogs died within a few minutes after the injection owing to the toxicity of the urine and a technique is being worked out to eliminate this toxicity. In all the cases where the frogs survived the male frog test was found to correlate the clinical findings of the cases. The test therefore promises to be of great value as very often suitable rabbits are not available for Friedman's test. Further, the result can be obtained within a few hours (one to three hours) as against two to three days required for the Friedman's test. The test has become popular among the private medical practitioners of the City from whom a number of samples of urine for testing for early pregnancy have been received.

CAT GUT ABSORBABILITY TEST.

(Dr. M. Narayana Pai, Dr. V. Krishnamoorthy and Dr. K. Dattatreya.)

We are also doing the digestive method of absorbability of cat gut in pancreatic extract and are comparing it with the implantation in the thigh muscles of the rabbit (for absorption test by animal method). It is too early to evaluate the results as the number of specimens are few.

DEPARTMENT OF WATER ANALYSIS.

THE PRESENT STATUS OF DISH-WASHING—PROCEDURES ADOPTED IN HOTELS AND RESTAURANTS—A BACTERIOLOGICAL ASSAY.

(Dr. Y. S. Narayana Rao, Sri P. V. Sootharama Ayyar and Sri K. R. Ramaswami.)

The Government of Madras constituted a committee in October 1950 to consider the question of cleanliness and sanitation in hotels, canteens and other catering establishments in the State and make recommendations for the removal of defects and deficiencies, with a view to secure adequate standards of cleanliness, sanitation and quality of the edibles sold in such premises. In the course of the preliminary discussions, the committee felt the need for a bacteriological study of the present methods adopted for cleaning and handling of glassware, dishes and other utensils used in establishments serving food, drinks and beverages in the City. This was the genesis of the present investigation and the main purpose of the survey carried out was to determine how far the present dish-washing methods were satisfactory from the hygienic point of view and to suggest practicable and feasible methods for the improvement of the procedures in vogue.

The arrangements now existing in many of the small hotels for washing and cleaning used utensils are very primitive, inadequate and far from hygienic. The general practice is to give the vessels a preliminary wash in a tub or sink of water and then a final rinse in clear water. The water in the tub is not changed often enough; it becomes dirty with the accumulation of food residues in the tub. No detergent is ever used. Even where hot water is used for a final rinse, very often the water is not sufficiently hot to destroy the bacterial organisms adhering to the vessels.

Eight samples of the wash water from the tubs in different hotels were collected and analysed bacteriologically. The samples had high bacterial counts ranging

Total	12	11	14	67	128	55	32	104	36
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from 20,200 to 3,720,000 per c.c. and showed the presence of coliform organisms in volumes varying from 0.1 c.c. to 0.0001 c.c. The main types of bacterial organisms isolated from the water comprised *Streptococcus*, *Staphylococcus*, aerobic chromogenic bacteria. The water may be regarded in its bacterial quality as equivalent to dilute sewage!

As regards the utensils themselves, unwashed plates showed a bacterial colony count of 2 to 4 million per plate. The counts were lower for cups and tumblers, presumably because hot beverages are generally served in these. Used spoons carried a very heavy bacterial load. It is worth noting that while the existing methods of washing bring about only a small degree of reduction in the bacterial content of the utensils, actually in some instances, the washed utensils kept ready for re-use were bacteriologically more heavily contaminated than those prior to washing. This reveals the insanitary condition under which the washing and cleaning is now carried out.

Some experiments were carried out to determine the degree of cleanliness of the vessels that could be effected through the adoption of simple and practicable improvements to the dish-washing procedure. These consisted of a preliminary thorough rinse in clean water, followed by dipping in a solution containing a germicidal detergent* for a very short time and a final treatment for half a minute with hot water at a temperature of 80° C or above. A total of 178 samples were collected and tested bacteriologically in this connexion.

With the above simple procedure, it was found that the washed plates and other utensils were thoroughly clean and bacteriologically of satisfactory quality. The method would appear to be adequate to keep the total bacterial count per utensil below 500.

The standard prescribed in America is a total colony count of 100 per cleaned utensil. The method suggested would also appear to be effective in destroying all coliform bacteria. The vessels washed under the experimental conditions did not show the presence of coliform bacteria; this may be taken as evidence of the absence of pathogenic organisms also. The procedure outlined above was recommended for general adoption.

LIST OF PAPERS CONTRIBUTED BY THE MEMBERS OF THE STAFF AND ATTACHED ENQUIRIES UNDER INDIAN COUNCIL OF MEDICAL RESEARCH PUBLISHED IN JOURNALS DURING THE PERIOD APRIL 1951-MARCH 1952.

1. Seshagiri Rao, P. and Giri, K. V. The interaction of Vitamin C with Urease. (Proceedings of the Indian Academy of Sciences, Volume XXXV, No. 3, March 1952 (Section B), pages 132-142.

2. Krishnan, G. N. V. Prophylactic Immunization against Cholera (Calcutta Medical Review, Volume 18, No. 4, April 1951, pages 143-145).

THE KING INSTITUTE, GUINDY, MADRAS-5,
16th February 1952.

Y. S. NARAYANA RAO,
Director.

* A product that would clean the vessel and at the same time destroy the bacterial organisms. They are however ineffective in destroying aerobic spore forming bacteria in the strengths generally used.

TABLE I.

Statement No. 1—Expenditure (actuals)—1951-52.

	RS.	A.	P.
(a) King Institute, Guindy—			
1 Pay of officers	1,49,136	0	0
2 Pay of establishments	1,83,056	0	0
3 Travelling allowance and other compensatory allowances.	83,303	0	0
4 Dearness allowance	1,18,911	0	0
5 Pay of menials	4,044	0	0
6 Telephone charges	1,370	0	0
7 Books and periodicals	821	0	0
8 Service postage and telegrams	43,499	0	0
9 Cleaning charges and office expenses	5,785	0	0
10 Rates and taxes	21,288	0	0
11 Electric current charges	15,211	0	0
12 Customs duty	98,624	0	0
13 Dearness allowance to menials	7,478	0	0
14 Other contingencies	58,378	0	0
15 Purchase of serum	2,93,922	0	0
16 Instruments and chemicals	2,66,598	0	0
17 Purchase and feed of calves and other animals	1,74,310	0	0
18 Motor car maintenance charges	6,956	0	0
Total ..	15,32,690	0	0
(b) Administration of Drugs Act, 1940—			
1 Pay of officers	22,619	0	0
2 Pay of establishments	3,833	0	0
3 Travelling allowance	4,685	0	0
4 Dearness allowance	5,490	0	0
5 Apparatus and office furniture	584	0	0
6 Other charges including feed of animals	2,352	0	0
Total ..	39,563	0	0
(c) Amount borne by 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 ..	16,53,363	0	0
Deduct—Net receipts (actuals) ..	2,89,996	0	0
Net cost to State funds ..	13,63,367	0	0

Statement No. 2—Actual Receipts.

1 Sale-proceeds of sera and vaccine	1,67,333	0	0
2 Recoveries of overpayments—Bacteriological laboratories.	754	0	0
3 Collection of payments for services rendered—			
(i) Collections from local bodies for analysis of samples of food.	57,745	0	0
(ii) Other Receipts	43,463	0	0
4 Miscellaneous—Bacteriological laboratories	22,367	0	0
Deduct—Refunds—Bacteriological laboratories ..	1,666	0	0
Net actual receipts ..	2,89,996	0	0

5A

Total ..	12	11	14	67	128	55	32	104	86
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REPORT OF THE

TABLE I—cont.

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

	RS.	A.	P.
1 Bacteriological and chemical examinations	4,97,211	0	0
2 Bacteriological vaccine supplies	5,90,292	0	0
3 Value of cultures and antigens, etc.	95,703	0	0
4 Vaccine lymph	5,42,235	0	0
5 Sera	5,91,294	0	0
6 Value of examinations done under the Drugs Act	1,96,335	0	0
Total ..	25,13,070	0	0

Government Analyst Section.

Food—

1 Contribution from local bodies working the Madras Prevention of Adulteration Act.	93,340	0	0
2 Value for analysis done for Government institutions ..	66,930	0	0
3 Fees received from unofficial sources for analysis of food samples.	2,410	0	0

Drugs—

4 Value for drug samples analysed for hospital samples and under the Madras Drugs Rules.	8,130	0	0
5 Fees received from unofficial sources for analysis of drug samples.	775	0	0
Total ..	1,71,585	0	0

Grand total value of Receipts .. 26,84,655 0 0

Deduct—Expenditure .. 16,53,363 0 0

Net value of Profits .. 10,31,292 0 0

TABLE II.

Type of vaccinations (1st January to 31st December 1951).

Serial number and type of vaccinations.	Total number of cases verified.	Total number of cases not verified.	Total.	Percentage of each type to the total cases done.
1 Primary	884,544	237,395	1,121,939	15.0
2 Secondary	74,436	..	74,436	1.0
3 Re-vaccinations	3,974,731	2,311,418	6,286,149	84.0
Total ..	4,933,711	2,548,813	7,482,524	

	Cases.	Percentage of each type to the total quantity issued.
1 Total quantity of vaccine lymph issued at four insertions per dose.	8,675,770	..
2 Total quantity of vaccine lymph used for vaccinating cases in 1, 2 and 3 calculation at four insertions per case ..	4,339,428	50.02
3 Total vaccine unaccounted for	4,336,342	49.98

TABLE III.

Primary, secondary and re-vaccination results
(1st January to 31st December 1951).

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

Serial number and district.	Primary vaccination.				Re-vaccination.				
	Case success.		Insertion success.		Total cases.	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	16,298	99.6	61,708	92.6	31,911	27.8	29,095	68,304	47.6
2 The Nilgiris	4,426	98.7	17,497	94.7	21,594	14.5	8,292	34,812	39.7
3 Chittoor ..	28,830	96.9	105,345	83.2	83,468	21.9	57,322	167,620	34.7
4 Anantapur ..	13,637	96.7	50,170	87.1	30,136	12.2	18,074	61,847	66.6
5 North Arcot.	44,322	94.3	168,170	84.8	106,251	13.5	84,633	235,207	56.9
6 Malabar ..	46,015	93.8	181,583	81.3	227,275	15.2	147,827	421,147	54.3
7 Chingleput ..	20,791	92.9	79,238	78.9	82,396	14.1	49,642	152,829	55.5
8 Tiruchirappalli.	43,969	91.5	172,705	76.5	97,853	18.4	133,053	274,875	60.5
9 Madurai ..	38,320	91.2	149,170	80.8	139,223	13.8	114,119	291,572	38.8
10 Tirunelveli ..	20,856	90.5	82,056	63.6	65,425	15.5	51,632	137,913	36.0
11 Bellary ..	20,847	90.4	99,287	75.3	79,156	11.3	69,292	141,017	36.8
12 Salem ..	58,432	90.3	227,706	74.5	203,318	8.9	229,732	491,482	31.8
13 West Godavari	24,928	90.3	187,506	75.3	308,857	10.2	287,540	640,406	44.6
14 South Arcot	45,999	90.0	151,590	76.2	109,061	12.7	127,404	275,470	47.8
15 Tanjore ..	39,105	89.5	129,979	72.9	145,023	11.5	93,561	271,633	35.8
16 East Godavari.	33,049	89.1	58,907	71.6	60,538	9.2	41,185	116,949	66.9
17 Kurnool ..	15,228	87.8	58,907	73.6	59,158	10.0	49,714	122,177	75.9
18 Guntur ..	18,305	87.7	50,471	68.3	38,820	10.4	74,672	130,124	55.6
19 Ramasathanpalam.	16,632	87.6	65,653	66.6	226,267	11.6	262,237	522,075	61.3
20 Coimbatore ..	33,571	86.8	129,873	69.4	83,793	10.4	68,744	173,998	52.7
21 Krishna ..	21,461	85.6	82,726	68.0	91,362	9.5	67,462	193,984	30.0
22 Nellore ..	35,160	84.1	138,192	64.7	307,778	11.2	201,881	573,378	56.3
23 Visakhapatnam.	63,719	83.2	248,125	64.1	109,045	7.2	54,893	184,184	36.5
24 Cuddapah ..	20,248	81.7	79,625	74.2	2,773,213	12.1	2,362,681	5,855,579	49.2
District total ..	719,635	89.8	2,798,236	74.2	2,773,213	12.1	2,362,681	5,855,579	49.2
25 Municipalities.	119,119	98.0	462,629	87.9	963,176	13.7	168,974	1,251,269	82.1
26 Madras Corporation.	45,162	99.9	179,939	91.3	233,574	4.8	88,343	367,579	49.8
27 Other bodies.	578	98.1	2,276	85.6	4,768	18.0	2,751	8,097	98.5
Grand total ..	884,544	91.4	3,443,080	76.9	3,974,731	12.3	2,623,249	7,482,524	49.98

TABLE IV.

PART I.—Statement showing the pathological specimens examined during the year from 1st April 1951 to 31st March 1952.

Serial number.	Part.	Description.	Number examined.	Number positive.	Details regarding positive.
(1)	(2)	(3)	(4)	(5)	(6)
<i>Microscopical and bacteriological tests.</i>					
1	A	Blood films	46	2	Malaria 1 Microfilaria 1 Relapsing fever Spirochetes Leishmania Donovani Other organisms
2	..	Blood red cells, white cells differential counts ..	162	..	Red cells 18 White cells 18
3	..	Blood for total count ..	36	..	Total 36
Total ..	12	11	18	57	128
					55
					32
					104
					36

TABLE IV—cont

PART I.—Statement showing the pathological specimens examined during the year from 1st April 1951 to 31st March 1952—cont.

Serial number.	Part.	Description.	Number examined.	Number positive.	Details regarding positive.
(1)	(2)	(3)	(4)	(5)	(6)
<i>Microscopical and bacteriological tests—cont.</i>					
4	..	Blood for Haemoglobin ..	8	..	..
5	..	Blood for grouping ..	652	..	..
		Group A ..			168
		Do. B ..			190
		Do. O ..			255
		Do. A & B ..			39
5 (a)	..	R.H. Tests ..	25	2	Negative .. 23
6	..	Blood for agglutination tests.	3,869	1,689	Positive .. 2
		Enteric group—			Sal. typhi .. 984
		Sal. paratyphi A.			8
		Do. B.			15
		Do. C.			3
		More than one organism ..			662
		Dysentery group—			B. shiga
		B. flexner ..			..
		Weilfelix reaction—			O × 2 .. 3
		O × 19 ..			1
		O × K ..			5
		More than one organism ..			8
		Malta fever—			Br. abortus
		Br. molitensis ..			..
		Total ..			1,689
		Cold agglutination ..	19	15	Positive .. 15
7	..	Blood for Aldehyde test ..	7	3	Negative .. 4
		.. Blood for Antimony test ..	6	3	....
8	..	Blood for culture ..	339	143	....
		Sal. typhi ..			32
		Sal. paratyphi A.			5
		Do. B.			91
		Do. C.			12
		Other organisms ..			3
		Total ..			143
		Part A, total ..	5,169	1,857	
9	B	Cerebro spinal fluid for cell count ..	30	..	H. tuberculosis .. 3
		Cerebro spinal fluid for other examinations ..	23	3	N. meningitis .. 3
		Cerebro spinal fluid for cultural examinations ..	111	15	D. pneumonia
					H. influenza .. 1
					Other organisms .. 11
		Part B, total ..	164	18	Total .. 18

TABLE IV—cont.

PART I.—Statement showing the pathological specimens examined during the year from 1st April 1951 to 31st March 1952—cont.

Serial number.	Part.	Description.	Number examined.	Number positive.	Details regarding positive.
(1)	(2)	(3)	(4)	(5)	(6)
<i>Microscopical and bacteriological tests—cont.</i>					
10	C	Urine for—			B. Coli 40
		Qualitative	10	..	Enteric 5
		Quantitative	..	..	Other organism .. 25
		Microscopical examination.	18	..	
		Cultural examination ..	84	79	
		Part C, total ..	112	79	Total .. 79
11	D	Faces for microscopical examinations ..	26	8	E. Hystolitica (Vegetative and cystic) .. 1
					Ova 1
					Cellular exudate .. 2
					Others 4
					Total .. 8
		Faces for cultural examinations	2,716	1,072	V. Cholera .. 1,060
					Dysentery group .. 4
					Enteric group .. 6
					Others 2
		Part D, total ..	2,742	1,080	Total .. 1,072
12	E	Pathological fluids or specimens for microscopical examinations.	169	20	M. tuberculosis .. 6
					N. leprae
					N. gonorrhoea
					T. pallidum
					P. pestis 2
					C. diphtheria .. 12
					Others
					Total .. 20
		Cultural examinations ..	1,177	279	M. tuberculosis .. 33
					C. diphtheria .. 10
					Other organisms .. 236
		Part E, total ..	1,346	299	Total .. 279
13	F	Test on animals with specimens or pathological fluids.	122	20	M. tuberculosis .. 1
					C. diphtheria
					Other organisms
					Freidman's test for pregnancy .. 19
		Part F, total ..	122	20	Total .. 20
		Part I, grand total ..	9,655	3,353	

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TABLE IV—cont.

PART II.—Statement showing the number of Histo-pathological specimens examined in the Institute during the year 1951-52.

Non-new growth.	New growth.		Research specimens.
	Benign.	Malignant.	
91	1 Papilloma—Vocal chords. 2 Fibroid—Vetereus. 3 Neurofibroma—Thigh. 4 Glosses Tuma—Left round toe. 5 Hydatidi mole. 6 Keloid—Right ear. 7 Fibroadenoma—Breast. 8 Fibroma—Tetanus. 9 Myxoma—Right Labium Majus. 10 Fibroma—Ear. 11 Lymphogisendo thelino. 12 Polypus. 13 Papilloma—Vagina. 14 Papilloma—Left eye. 15 Haemorrhagic Ovarian Cyst. 16 Fibro adenoma—Left breast. 17 Ovarian Cyst. 18 Fibroma of the skin. 19 Mixd. tumor of the Passlid. 20 Cordoma. 21 Fibro adenoma—Right breast. 22 Polypus. 23 Fibro adenoma—Breast. 24 Ostoma—Right libea. 25 Fibro adenoma—Breast. 26 Papilloma. 27 Wasty growth—Eye.	1 Fibro Carcoma—Right scapula. 2 Melonoma—Slalp. 3 Carcinoma—Left tegumby Lymph owde. 4 Adenocarcinoma—Peritonium. 5 Carcinomoton change in Papelloma of lower lip. 6 Dygeroninoma. 7 Epitheloma—The profuse. 8 Chorion Epitheloma. 9 Lympho sarcoma. 10 Lympho sarcoma—Right vignart region. 11 Epithelina. 12 Dyogerminoma.	11

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

Serial number.	Name of the tests.	Number examined.	Number positive.
1	Number of bloods for Kahn test	62,982	14,318
2	Number of bloods for Wassermann test	33,699	16,209
3	Number of cerebro-spinal fluid for Wassermann test	1,144	596
4	Number of cerebro-spinal fluid for Langer's tests	654	166
Total number of serological tests		98,479	31,289
Total number of bloods received lysed or broken.		1,998	
Total number of bloods found lysed or broken (while testing).		1,354	

TABLE IV-A.
Serology Section, King Institute, Guindy.

Serial number and name of institution.	Kahn test.		Wassermann test.		Cerebro-spinal fluid for Wassermann test.		Cerebro-spinal fluid for Langer's test.		Kahn verifi- cation test.	Paul Bun- nel test.	Kahn nega- tive and Wassermann positive.	Kahn post- live and Wassermann negative.
	Number examined. (2)	Negative. (3)	Positive. (4)	Number examined. (5)	Negative. (6)	Positive. (7)	Number examined. (8)	Negative. (9)	Positive. (10)	Number examined. (11)	Negative. (12)	Positive. (13)
1 General Hospital, Madras (Venereal Department Out- patient).	17,901	11,576	6,325	17,002	9,034	7,968	294	147	147	239	193	46
2 Stanley Hospital, Madras ..	4,500	2,913	1,587	3,127	1,536	1,591	164	80	84	47	33	14
3 Blood Bank (General Hospital, Stanley Hospital, King Institute of Preventive Medi- cine).	6,941	6,066	875	6,419	4,544	1,875	..	..	..	..	..	..
4 Women and Children Hospital, Madras.	6,525	6,068	457	400	85	315	3	1	2	1	1	..
5 Kasturba Gandhi Hospital, Madras.	1,944	1,533	411	381	45	336	4	3	1	..	..	..
6 Ophthalmic Hospital, Madras.	3,101	2,572	529	474	70	404	..	..	..	..	..	..
7 Indian Medicine Hospital, Madras.	614	488	126	108	14	94	3	1	2	1	..	8
8 Mental Hospital, Madras ..	939	816	123	107	28	79	91	39	52	78	54	24
9 Government Royapetta Hos- pital, Madras.	35	33	2	4	2	2	3	2	1	1	1	..
10 Other hospitals in Madras City.	4,253	3,609	644	1,109	481	628	425	200	235	221	161	60
11 Mufassal hospitals (town) ..	14,115	11,121	2,994	2,590	368	2,222	129	63	66	53	37	16
12 Local fund and rural dispen- saries.	606	509	97	73	9	64	..	..	..	..	..	..
13 Primary public health centres.	667	599	68	38	4	34	..	..	..	..	..	..
14 Private practitioners	841	761	80	1,867	1,270	597	28	12	16	13	8	5
Grand total ..	62,982	48,664	14,318	33,699	17,490	16,209	1,144	548	596	654	488	166
												4,058
												1,084

TABLE V.

Statement showing stock position of prophylactic vaccines, cholera, T.A.B. and plague from 1st April 1951 to 31st March 1952.

Serial number and name of vaccine.	Opening balance in c.c.	Receipt from mufassas in c.c.	Manufacture in c.c.	Issues in c.c.	Closing balance in c.c.
(1)	(2)	(3)	(4)	(5)	(6)
1 Cholera vaccine ..	1,092,307	122,739	6,414,427	5,814,011	1,815,462
2 T.A.B. vaccine ..	22,020	601	133,728	151,009	5,340
3. Plague vaccine ..	45,400	Nil.	* 60,000	71,420	33,980

* Received from HadKine's Institute, Bombay.

TABLE V-B.

Statement showing supplies of stock vaccines (polyvalent), etc., auto-genous vaccines, bacterial suspensions, high titre sera and live cultures for the period commencing from 1st April 1951 to 31st March 1952.

Serial number and name of organism.	Stock vaccine doses.	Autogenous doses.
Pyogenic group.		
1 Staphylococcus vaccine ..	5,718	36
2 Streptococcus + Staphylococcus vaccine ..	0,913	6
3 Streptococcus (pyogenic) vaccine ..	1,010	..
4 Streptococcus (phorrrhocal) vaccine ..	1,047	..
5 Streptococcus (filarial) vaccine ..	9,898	..
6 B. acne vaccine ..	350	..
7 B. acne + Staphylococcus vaccine ..	..	..
8 Streptococcus + Strepto Pneumonia + N. catarrhalis + Staphylococcus ..	..	30
9 Streptococcus + Strepto Pneumonia + N. catarrhalis ..	..	6
10 Streptococcus + Pneumococcus + Staphylococcus ..	..	6
11 Streptococcus + Staphylococcus + Diphtheroids ..	..	12
12 Streptococcus + Staphylococcus + B. Acne and diphtheroids ..	..	12
13 Staphylococcus + Phycyanous ..	..	6
14 Staphylococcus + Gram negative bacillus ..	..	6
15 Staphylococcus + B. acne + Diphtheroids ..	..	12
16 Staphylococcus + Diphtheroids ..	..	6
17 Staphylococcus + Diphtheroids + B. coli ..	..	18
18 Gram negative bacillus + Diphtheroids ..	..	6
19 B. Phycyanous ..	..	6
Intestinal group.		
20 T.A.B. vaccine 1 in 4 dilution for protein shock therapy ..	4,062	..
21 T.A.B. vaccine (curative) ..	8,005	..
22 Typhoid vaccine (curative) ..	127	..
23 Enterococcus ..	..	..
24 B. morgani ..	..	12
Genito-urinary group.		
25 Gonococcus vaccine ..	11,026	..
26 Gonococcus compound vaccine ..	1,343	..
27 B. coli vaccine ..	288	..
28 B. coli + Streptococcus (puerperal) vaccine ..	207	..
29 Streptococcus (puerperal) vaccine ..	348	..
30 Streptococcus + Diphtheroids ..	..	..
31 Streptococcus + Staphylococcus + B. coli + B. pseudo carolinus ..	..	6
32 Staphylococcus + Gram negative bacillus ..	..	6
33 B. coli + Enterococcus ..	..	6
Respiratory group.		
34 compound catarrhal vaccine ..	2,911	66
35 Compound influenza catarrhal vaccine ..	30	24
36 Whooping cough vaccine (curative) ..	3,168	..
37 Whooping cough vaccine (prophylactic) ..	1,336	..

TABLE V-B—cont.

Serial number and name of organism	Stock vaccine doses.	Autogenous doses.
Respiratory group—cont.		
38 Streptococcus vaccine ..	..	6
39 Streptococcus + Pneumococcus ..	..	18
40 Streptococcus + Pneumococcus + Diphtheroids ..	..	12
41 Streptococcus + Pneumococcus + Diphtheroids + Staphylococcus ..	..	6
42 Streptococcus + Pneumococcus + N. catarrhalis + Staphylococcus ..	..	6
43 Streptococcus + N. catarrhalis + B. friedlanders ..	..	12
44 Streptococcus + Staphylococcus + Pneumococcus ..	..	6
45 Streptococcus + Pneumococcus + B. friedlanders ..	..	6
46 Streptococcus + Pneumococcus + Diphtheroids + H. influenza ..	..	12
47 Streptococcus + B. Diphtheroids + B. friedlanders ..	..	6
48 Streptococcus + N. catarrhalis + H. influenza ..	..	6
49 Pneumococcus + N. catarrhalis + B. friedlanders ..	..	12
50 Pneumococcus + B. friedlanders ..	..	6
51 Pneumococcus + N. catarrhalis + H. influenza ..	..	..
52 Pneumococcus + N. catarrhalis + H. influenza + Diphtheroids + Staphylococcus ..	..	6
53 Staphylococcus ..	..	12
54 Staphylococcus + Pneumo bacillus ..	..	6
55 Staphylococcus + Diphtheroids ..	..	6
56 Staphylococcus + Diphtheroids + N. catarrhalis ..	..	6
57 Staphylococcus + N. catarrhalis + Pneumococcus + Diphtheroids ..	..	6
Total doses ..	62,367	480
Miscellaneous.		
58 Old Tuberculin (Human) for V.P. tests ..	..	2,751
59 Old Tuberculin (Human) for Mantoux tests ..	..	1,790
60 Live cultures of all organisms ..	..	230
61 Bacterial suspensions ..	..	36,285 c.c.
62 High titre sera ..	..	660 c.c.
63 Reports on kalazar ..	..	2
64 Reports on specimens received for auto-vaccine ..	..	24
65 Kahn antigen ..	..	5,102 c.c.
66 Bullock-heart extract for Wassermann test ..	..	240 c.c.
67 1 per cent Cholesterol solution for Wassermann test ..	..	80 c.c.
68 Anti-sheep amboceptor ..	..	2 c.c.
69 Dysentery bacteriophage ..	..	1,072 × 3 c.c.
70 Distilled water (sterilized) ..	..	10 lb.
71 Distilled water (unsterilized) ..	..	40 "
72 Wassermann capsules 5 c.c. ..	..	116,979
73 Various media ..	..	143,539 tubes and 30,100 c.c.
74 Various sterile materials for obtaining cultures ..	..	2,858 tubes.
75 Sterile solutions 25 per cent glucose 20 c.c. ..	..	162,380 ampoules.
Do. 10 c.c. ..	..	12,063 do.
Do. 5 c.c. ..	..	19,656 do.
76 5 per cent calcium gluconate 5 c.c. ..	..	2,988 do.
77 10 per cent calcium chloride 10 c.c. ..	..	27,078 do.
78 Distilled water 20 c.c. ..	..	6,668 do.
79 Distilled water 10 c.c. ..	..	16,454 do.
80 Normal saline 20 c.c. ..	..	4,978 do.
81 Normal saline 10 c.c. ..	..	1,081 bottles of 540 c.c. each.
82 Special solutions like ringer lactate, etc. ..	..	4,105 ampoules.
83 Miscellaneous solution in ampoules ..	..	..

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TABLE VI.

Statement of therapeutic sera issued during 1951-52, i.e., from 1st April 1951 to 31st March 1952.

Serial number and name of sera.	Stock on 1st April 1951.	Receipts from 1st April 1951 to 31st March 1952.	Issued from 1st April 1951 to 31st March 1952.	Balance on 31st March 1952.
(1)	(2)	(3)	(4)	(5)
1 Anti-anthrax, 10 c.c.	32	Nil.	Nil.	32
2 Anti-gas gangrene, 4,000 units	Nil.	1,023	1,023	Nil.
3 Do. 10,000 units	7,671	2,000	5,512	1,159
4 Anti-scorpion, 1 c.c.	104	6,334	3,187	3,251
5 Anti-streptococcus, 5 c.c.	721	Nil.	562	159
6 Anti-venene, 10 c.c.	35	902	766	171
7 Diphtheria-anti-toxin, 1,000 units	173	Nil.	173	Nil.
8 Do. 10,000 units	4,931	9,102	11,400	2,833
9 Diphtheria prophylactic T.A.F., 1 c.c.	526	180	540	166
10 Do. T.A.F., 10 c.c.	67	30	23	74
11 Do. A.P.T., 0.5 c.c.	143	270	299	114
12 Do. A.P.T., 5 c.c.	193	Nil.	58	135
13 Haemostatic and Neo Haemoplastin, 2 c.c.	3,056	2,512	5,546	22
14 Tetanus-anti-toxin, 15,000 units	54,461	255,396	227,626	82,171
15 Do. 10,000 units	107	7,107	7,214	Nil.
16 Do. 25,000 units	7,245	15,503	16,746	6,002
17 Tetanus toxoid, 1 c.c.	Nil.	50	4	46
18 Do. 5 c.c.	16	20	3	33
	79,421	300,429	280,682	99,168

TABLE VI-A.

Statement showing tetanus anti-toxin purchased in bulk and bulbed in 1951-52.

Serial number and name of sera.	Number of bulbs bulbed
1 Tetanus anti-toxin 10,000 units	785

TABLE VI-B.

Statement showing King Institute of Preventive Medicine, Guindy, products bulbed during 1951-52, i.e., 1st April 1951 to 31st March 1952.

Serial number and name of sera.	Number of bulbs bulbed.
1 Tetanus antitoxin, 1,500 I.U.	45,681
2 Do. 25,000 I.U.	4,176
3 Anti-gas-gangrene, 10 c.c.	859

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.	1,963
2 Chemical examination of water samples from the protected water-supplies.	1,399
3 Water samples for bacteriological examination from investigation sources.	38
4 Do. chemical examination from investigation sources.	122
5 Do. bacteriological examination from private bodies and Government institutions.	213
6 Do. chemical examination from private bodies and Government institutions.	270
7 Do. bacteriological examination for suitability for ice, ice-candy manufacture, etc.	6
8 Do. fluoride estimation	87
9 Water samples examined in connection with mineral water investigation.	11
10 Water samples for vibrio tests	2,220
11 Do. physical test like turbidity, odour, colour, etc.	1,921
12 Field investigation by the staff of Water Analysis department ..	130

(b) Government Experimental Filter Station, Kilpauk, Madras.

1 Water samples for bacteriological analysis	693
2 Do. chemical analysis	82
3 Do. physical tests (colour turbidity and smell)	812
4 Do. estimation of dissolved oxygen, CO_2 and H_2S	134
5 Tests for determination of dose of chlorine for breakpoint chlorination and chloramination.	1,196
6 Determination of residual chlorine content of water samples	16
7 Do. ammonia content in chloraminated water	16
8 Do. fluorine content in samples of water	10
9 Estimation of alum dose	6
10 Samples of bleaching powder for analysis	88
11 Do. biological growths for microscopical examination	

(c) Non-domestic purposes.

1 Water samples for use in boilers	44
2 Do. suitability for ice making, ice-candy, fruit canning, etc.	1
3 Do. agricultural purposes	3
4 Do. cleaning, laundry, etc.	1
5 Do. building construction	12
6 Do. soap manufacture	1
7 Do. washing, cleaning, etc.	8
8 Do. bleaching	1
9 Do. the manufacture of aerated water	5
10 Do. engine cooling	1
11 Do. preparation of pickles and chutney	1
12 Do. air conditioning	2
13 Do. swimming pools	1
14 Do. photo litho work	1
15 Do. preparation of synthetic syrup	1
16 Do. manufacture of cement	2
17 Water samples tested to know their effect on steel and stainless steel	2
18 Water samples for suitability for plumbing, cleaning metals, iron plates, etc.	2
19 Sewage samples and industrial wastes	16

135

TABLE VII—cont.

Department of Water Analysis—cont.

PART I—cont.

WATER SAMPLES—cont.

Serial number and description.

Number
examined.

(d) Algological studies.

1	Microscopical examination of samples of water	564
2	Do. organic growths in filter sand, pipes, sedimentation basins, etc.	149
3	Test for determination of algicides	102
4	Do. residual copper sulphate, chlorine, etc.	78
5	Estimation of dissolved gases in samples of water	136
6	Field tests for estimating pH of water samples	59
7	Do. turbidity, odour, colour, of water samples.	158
8	Do. organic matter in water samples	176
9	Samples of aquatic vegetation for identification	26
10	Do. ooze from lakes and tanks for examination	5

PART II.

MISCELLANEOUS SAMPLES.

Serial number and description.

Number
examined.

1	Bleaching powder for available chlorine	57
2	Alum samples for analysis	1
3	Samples for pH estimation	17
4	Testing of glassware for neutrality	2
5	Staple fibre for analysis	1
6	Determination of alum dose	1
7	Do. lime dose	1
8	Sand for analysis	1
9	Analysis of eucalyptom from milk factory	1
10	Do. scales from Radiator	4
11	Do. rust	2
12	Do. final	1
13	Do. malacose	6
14	Do. cuprous chlorine	1
15	Do. copper sulphate	1
16	Estimation of protein content in broth	2
17	Do. fluorine in bones	8
18	Digestive value of trypsin	5
19	Determination of chlorine dose	1
20	Spot tests for trace elements	1
21	Estimation of catalysis of water	1
22	Boiler scales for analysis	2
23	Reconstituted milk for bacteriological analysis	151
24	Bacteriological examination of rinse water from cleaned and sterilized utensils from the milk factory	48
25	Do. condensed milk	1
26	Soda water and other beverages	3
27	Ice cream samples for bacteriological examination	8
28	Bacteriological examination of water from wash tubs in the city hotels.	8
29	Do. plates, cups, spoons, etc., from city hotels.	164

TABLE VII—cont.

PART III.

SOLUTIONS SUPPLIED.

Serial number and description.

Quantity
supplied in
c.c.

1	Normal sodium hydroxide	18,000
2	N/10 hydrochloric acid	360
3	25 per cent sulphuric acid	180
4	33 per cent acetic acid	60
5	0.01 per cent phenol red	540
6	Benedict solution (qualitative)	1,600
7	Buffered salt solution pH 9.2	3,500
8	Buffered distilled water pH 7.4	1,000
9	10 per cent potassium chromate solution	150
10	Standard iron solution	250
11	N/5 sodium chloride	200
12	1 per cent picric acid	120
13	N/10 silver nitrate	250
14	Methylene blue solution	100
15	Glucose solution	100
16	Pancreatic extract	335,330
17	Wet stains supplied	10,920

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	83	10	14	7	13	25	14
Panchayat boards	17	23	..	9	3	6	3	2
Jails, Borstal and Certified schools and Vigilance Homes.	25	33	2	1	1	16	10	3
Railway stations	54	64	1	3	..	54	5	1
Swimming pools	1	1	..	..	..	1	..	..
Other institutions	15	23	5	8	..	6	3	1
Total	172	227	18	35	11	96	46	21

	Filtration.					Chlorination.			
	Slow sand filter.	Mechanical filter.		Infiltration gallery or well.	Not filtered.	Auto-matic chlorine.	Bleaching powder.		Unchlorinated.
		Pressure.	Gravity.				Mechanical.	Hand controlled.	
(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Municipalities	7	5	5	39	27	23	1	38	21
Panchayat boards	1	..	1	5	16	2	1	19	1
Jails, Borstal and Certified schools and Vigilance Homes.	2	1	..	13	17	7	..	23	3
Railway stations	..	1	4	0	53	17	28	17	2
Swimming pools	..	1	..	..	..	1	..	..	..
Other institutions	2	3	4	4	10	5	2	7	9
Total	12	11	14	67	123	55	32	104	36

REPORT OF THE
KING INSTITUTE OF PREVENTIVE MEDICINE, GUINDY

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

Tabular statement of tests conducted during the year 1951-52.														Amount realised.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	Rs.	Rs.
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 other Government institutions.	Tests done for Inspection of Manufacturing concerns in Juggs.	Tests done for States other than Madras.	Total in the year 1951-52.	Number of specimens found unavailable in 1951-52.	Value of tests if charged in 1951-52.	Total in 1950-51.	Value of tests if charged at the scheduled rate in 1950-51.	Rs.	Rs.	1950-51.	1951-52.
1 Progen tests	376	21	6	..	10	..	413	5	20,050	319	15,950	..	..	..	..
2 Identity tests	1,933	70	79	91	15	2	2,137	31	126,244	2,036	24,432	..	..	..	..
3 Toxicity tests	2,129	7	..	1	5	5	2,137	6	1,06,850	1,086	54,198	..	..	..	..
4 Chemical assays	213	32	2	..	13	1	261	20	7,830	282	8,480	..	..	..	..
5 Bio-assays: Tincture digitalis, digitalis leaves and power digitalis	10	..	30	..	..	..	40	4	900	54	1,296	..	..	..	..
6 Anti-toxin potency tests and bio-assays.	37	1	..	..	..	5	43	4	3,225	25	1,375	..	..	..	..
7 Penicillin assays	9	..	1	..	..	..	10	..	250	12	300	..	..	..	..
8 Penicillin sensitivity tests	2	1	..	..	..	..	3	..	75	11	275	..	..	..	..
9 Prophylactic vaccines: test of opacity, identity and serological tests with R.T.S.	976	..	..	..	..	..	976	..	24,400	1,234	30,550	..	..	..	..
10 Vaccine lymph bacterial content, colony count and safety tests	78	..	..	..	..	..	79	..	1,950	146	3,650	..	..	..	..
11 Mice virulence tests on vibrio cholera strains	6	..	..	..	..	..	6	6	300	21	1,050	..	..	..	..
12 Male frog tests	..	39	..	..	..	..	39	..	195	54	..	..	..	..	..
13 Miscellaneous— (i) Gavage absorbability (ii) Marmite paste—1 (iii) Neosphenamine—1 (iv) Protease hydrolysis—8 (v) C. tetanus contamination—2	..	..	45	..	..	..	65	..	3,250	4	1,040	..	..	..	..
Total	..	..	..	..	..	..	6,363	84	1,96,335	5,348	1,43,376	825	..	..	1,500

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REPORT OF THE GOVERNMENT ANALYST, MADRAS, FOR THE YEAR 1st APRIL 1951 TO 31st MARCH 1952

I. STAFF.

Government Analyst	Sri S. Narayana Ayyar, M.A., A.I.I.S.C., F.R.I.C.
Deputy Government Analyst	Sri Y. G. Doraiswami, M.Sc., A.R.I.C.,
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.
Junior Assistants to Government Analyst.	Sri K. Balasubramanian, B.Sc. (Hons.). ,, 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.). ,, P. Athmaraman, B.Sc. (Hons). * ,, M. R. Gopalan, B.Sc. (Hons). * ,, K. Subbaraman, B.Sc. (Hons). *

The laboratory staff included one technical assistant, three first-grade attendants, two second-grade attendants and seven peons. The office staff consisted of one upper division clerk, one steno-typist, three typists and two clerks.

As a result of increase in the number of drug samples and samples of diet articles from Government hospitals, Government sanctioned the following additional staff :—

One Senior Assistant, one Junior Assistant and one upper division clerk in lieu of one lower division clerk. Sri P. S. Nataraja Sarma was promoted as Senior Assistant for drug analysis from 21st September 1951 in the newly sanctioned post.

Sri Y. G. Doraisami, Deputy Government Analyst, was on earned leave for 8 days from 30th June 1951.

* Acted in leave vacancies.

Sri K. Narayanaswamy, Senior Assistant to Government Analyst, was on earned leave from 3rd April to 16th June 1951, when Sri P. S. Nataraja Sarma, Junior Assistant acted for him.

Sri P. Athmaraman acted as temporary Junior Assistant *vice* Sri P. S. Nataraja Sarma on other duty as Senior Assistant. Sri M. R. Gopalan and Sri K. Subbaraman acted in leave vacancies as Junior Assistants. Sri M. R. Gopalan was appointed temporarily in the newly sanctioned post of Junior Assistant.

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

Sri G. Balasubramanian, for 40 days from 16th July to 24th August 1951.

Sri M. V. Narayanan, for 13 days and extraordinary leave for 17 days from 26th May 1951.

Sri C. S. Raghunathan, for 75 days from 14th August 1951.

Sri V. Seshagiri Rao, for 59 days from 28th January 1952.

Sri K. Balasubramanian, for 58 days from 18th June 1951 and for 8 days from 27th November 1951.

Sri K. Ramachandran, for 13 days from 14th May 1951.

Sri S. A. Subramanian, for 41 days from 19th November 1951.

II. INTRODUCTION.

The Government Analyst's Laboratory analyses food samples received from 238 local bodies under the Madras Prevention of Adulteration Act and drug samples received under the Madras Drug Rules, 1945. It also examined diet articles from Government hospitals and other Government institutions to check their purity and quality. Other Government departments like the Board of Revenue (Civil Supplies), Rationing authorities, the Police, etc., sent food samples for identification required in connexion with contravention of rationing regulations. The laboratory also certifies, as far as practicable, samples intended for exports, sent by private parties, and owing to want of adequate accommodation and other facilities it has been possible to comply with requests from the public for the analysis of foods and drugs to a limited extent only. This is a very unsatisfactory state of affairs. The public are becoming more and more conscious of the part played by wholesome and unadulterated food in national health and welfare. It is also necessary to have analytical control over exported and imported food and drugs.

When the Madras Prevention of Adulteration Act was first introduced in this State in a few municipalities a room in the King Institute was allotted as the Government Analyst's Laboratory and subsequently two more rooms have been provided but in recent years the work has increased enormously both in volume and variety in respect of foods; further no extra accommodation has been provided to cope with the increased work involved in the analysis of hospital food and drug samples and the drugs taken under the Drugs Act.

If adulteration in foods and drugs is to be brought down the Madras Prevention of Adulteration Act should be extended to other panchayats and more samples should be allowed to be taken by the local bodies already working the Act. Drug samples likely to be received from the recently appointed Drug Inspectors have to be analysed and if the insistent demand from private parties for the analysis of foods and drugs has also to be satisfied, construction of one or two additional laboratories is essential.

Provision of more laboratories involves some capital expenditure but this will be recouped by Government's share of fines in food adulteration cases and other analytical fees. Adulteration of food and drugs continues on a large scale and could be put down at any cost to safeguard the consumers' interests.

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.

	1951-52.		1950-51.	
	Number of samples taken.	Number adulterated or unsatisfactory.	Number of samples taken.	Number adulterated or unsatisfactory.
(1)	(2)	(3)	(4)	(5)
Food samples under the Madras Prevention of Adulteration Act.	18,512	8,734	18,651	8,814
Food samples analysed for Government hospitals.	5,286	943	4,945	858
Food samples from other Government departments.	1,161	124	547	101
Food samples from unofficial sources	100	13	71	8
Total (Foods)	25,059	9,814	24,214	9,781
Drugs analysed under the Madras Drugs Rules.	67	20	79	42
Number of drugs analysed for the Government hospitals.	161	70	99	38
Drug samples from unofficial sources	25	5	24	8
Total (Drugs)	253	95	202	88

The total number of food samples and drugs analysed in the Government Analyst's Laboratory during the year under report is 25,059 and 253, respectively, as against 24,214 and 202, respectively, for the previous year showing a small increase of samples under both categories.

The Government of India have circulated a Prevention of Adulteration Bill for criticism and suggestions prior to introduction in Parliament and it is expected that the new Bill will shortly become Law for adoption by the States also.

Government have issued rules under the Madras Prevention of Adulteration Act fixing standards for goat's milk, honey and arrowroot and prohibiting the sale of coffee adulterated with chicory and adulterated tea; but the rule prohibiting coffee-chicory mixtures has been kept in abeyance till 31st March 1953. The addition of saccharin has been prohibited except in food intended for invalids.

III. FINANCE.

The total estimated income is Rs. 1,71,585 and the estimated expenditure is Rs. 1,54,148 showing a profit of Rs. 17,437. The working of the Madras Prevention of Adulteration Act also resulted in a profit of Rs. 1,32,274 being Government's share of the fines realized for offences under the Act, credited to the Judicial Budget.

Analysis of hospital samples in addition to providing a check for quality also brings revenue to Government since the cost of the day's supply relating to an adulterated sample is not paid to the supplier as a penalty.

TABLE II.

Financial statement of the Government Analyst's department for 1951-52.

ESTIMATED RECEIPTS.

Food.

	RS.
1 Contribution to Government from local bodies working the Madras Prevention of Adulteration Act at Rs. 5 per sample	93,240
2 Estimated value for analysis done for Government institutions	66,930
3 Fees received from unofficial sources for analysis of food samples	2,410

Drugs.

4 Value for drug samples analysed for hospital samples and under the Madras Drugs Rules	8,130
5 Fees received from unofficial sources for analysis of drug samples	775
Total, Receipts ..	1,71,585

ESTIMATED EXPENDITURE.

	RS.
1 Salaries and allowances of the staff of the Government Analyst	70,254
2 Superannuation allowance and pension on above	977
3 Proportionate cost of certain common staff of the King Institute	1,200
4 Proportionate cost of management and supervision by the Director of Medical Services and Director, King Institute	926
5 Stores, instruments and chemicals, including gas and water charges	44,091
6 Customs duty	9,862
7 Contingencies	13,810
8 Electric current	1,521
9 Cost of stationery, clothing and printing	322
10 Proportionate charges on cost of audit, maintenance, interest and depreciation on building, electric installation and other plants	11,135
Total, Expenditure ..	1,54,148

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 over the contribution of the local body to Government towards fee for analysis)	1,32,274
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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 all the 99 municipalities (including Madras City) and 140 panchayat boards. Bapatla, Arni and Gudur, which were formerly panchayat boards got the status of municipalities from 1st April 1951. The panchayat boards for which no quota of samples has been fixed are Tirumalai Hills, Avanigadda, Mudukulathur, Sompeta, Lalgudi and Harur. But they sent 16, 36, 22, 40, 52 and 50 samples, respectively, during the year. But Lalgudi Panchayat Board has now been included in the list of panchayat boards sending a quota of 4 samples per month. The Act is in force in the panchayats of Sriperumbudur, Venkateswarapuram and Gunaseelam for the duration of the local festivals only and these sent 22, 5 and 11 samples, respectively. Kanniseri, where the Act is in force, for the cattle fair only, sent no samples as there was no cattle fair during the year.

Of the 239 local bodies working the Act, 238 local bodies send their samples to the Government Analyst's Laboratory at Guindy while the samples from Madras City are analysed at the Food Analyst's Laboratory of the Madras Corporation.

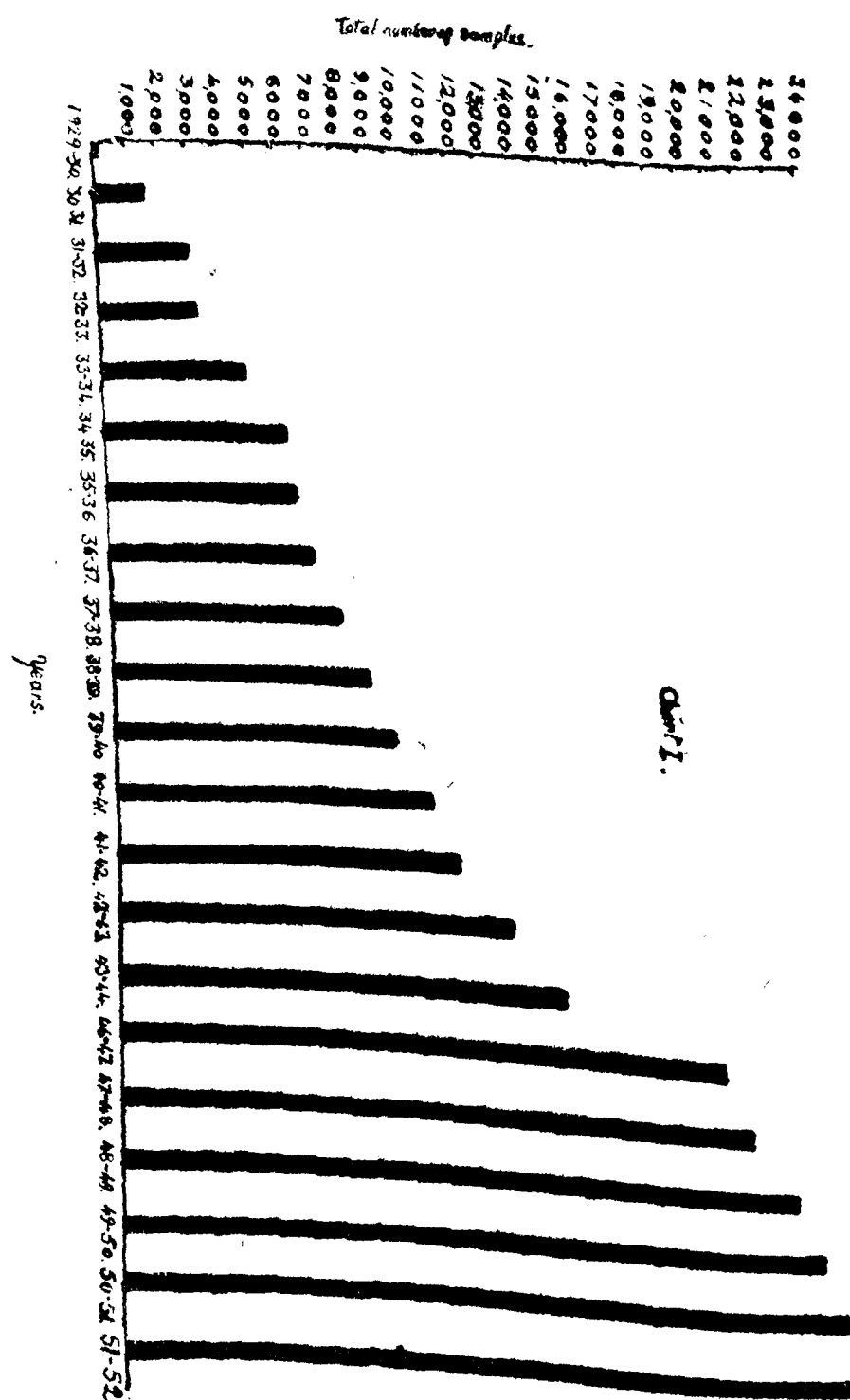
The number of samples analysed under the Act during the year was 23,443 of which 11,306 or 48.2 per cent was adulterated. This includes 4,931 samples analysed by the Public Analyst of the Madras Corporation in the Corporation Laboratory.

Charts I and II illustrate the total number of samples analysed under the Act in the Madras State (including Madras City) and the percentage of adulterated samples in the last 21 years since the Act came into force in 1929.

Table III gives particulars of samples received for analysis from the various classes of local bodies during the year under report. Figures for the previous year have been included for comparison.

Appendix A gives details of the nature of samples sent by the various local bodies (excluding Madras City), the number of samples, number adulterated, etc., grouped under the various districts.

REPORT OF THE



GOVERNMENT ANALYST, MADRAS

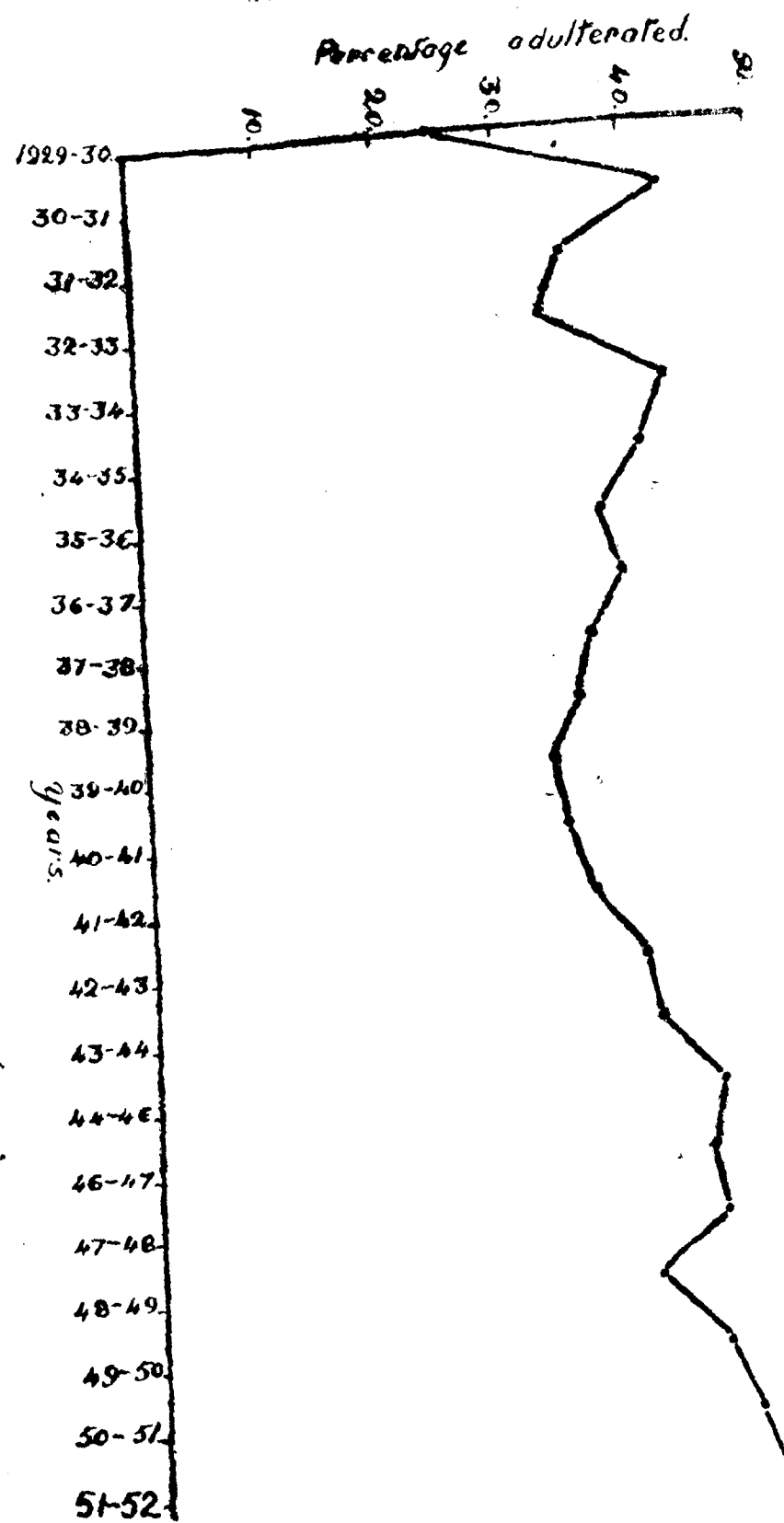


TABLE III.

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

1951-52.				1950-51.			
	Number of samples taken.	Number adulter- ated.	Per centage adulter- ated.		Number of samples taken.	Number adulter- ated.	Per centage adulter- ated.
<i>Municipalities.</i>				<i>Municipalities.</i>			
28 Class A	7,162	3,574	49.9	28 Class A	6,978	3,500	51.5
24 Class B	2,337	1,121	48.0	24 Class B	2,376	1,155	48.6
46 Class C	2,472	1,164	47.1	43 Class C	2,367	1,153	48.7
<i>Panchayat Boards.</i>				<i>Panchayat Boards.</i>			
140 Class D	6,541	2,875	44.0	143 Class C	6,930	2,916	42.1
Total for 238 local bodies analysed in Government Analyst's labora- tory.	18,512	8,734	47.2	Total for 238 local bodies analysed in Government Analyst's labora- tory.	18,651	8,814	47.2
<i>Corporation.</i>				<i>Corporation.</i>			
Madras City	4,931	2,572	52.2	Madras City	5,061	2,387	47.2
Total for 239 local bodies in the State.	23,443	11,306	48.2	Total for 239 local bodies in the State.	23,712	11,201	47.2

Since there has been no further extension of the Act during the last four or five years the number of samples received remains practically the same but the percentage of adulterated samples has increased from 47.2 per cent in 1950-51 to 48.2 per cent during the year under report. This has to be attributed chiefly to the low fines for food adulteration offences. The average fine for the whole State in 1950-51 was Rs. 43 whereas it has gone down to Rs. 36 for the year under report. Reference has been made in the previous Annual Reports to the fact that the merchants readily pay off trivial fines which is an insignificant amount when compared to their enormous profits and that unless the magistrates treat food adulteration offences more seriously and impose deterrent punishments, food adulteration is not likely to decrease.

Some officials working the Madras Prevention of Adulteration Act have suggested that there has been a striking fall in the fines after the separation of the Judiciary from the Executive. In this connection mention may be made of the severe penalties imposed for illicit transport and unauthorized purchase and sale of foodgrains (vide "Madras Information", November 1951, page 15). There is adulteration cases also if adulteration has to be put down. It is interesting to note, that in the other States the sentence imposed is much more severe. For example, in the "Hindu" of 20th October 1951 it was reported that a milkman was fined Rs. 1,000 by the Municipal Magistrate of Surat for selling adulterated milk. In the "Times of India" of 21st November 1951, a Bombay Magistrate is reported to have sentenced three merchants to 4 months' R.I. for selling adulterated ghee. The learned Magistrate observed that "offences under the Bombay Prevention of Adulteration Act should be dealt with much more severely than those under the Prohibition Act". He pointed out "it was difficult to visualise a more dangerous man to society than an adulterator of food-stuffs. The person who consumes a small quantity of liquor ruins society. An adulterator of food-stuffs, on the other hand, can be said to ruin everyone except himself and his family".

In the "Hindustan Times" Evening News of Delhi, dated 27th August 1951, there is a leading article under the caption "Milk and Water", extracts from which are given below:—

"For their milk and water policy nine vendors have been sentenced to fines ranging from Rs. 174 to Rs. 360. It is not the first time that the authorities have attempted to check the sale of adulterated milk and it is perhaps too much to hope that fines on this scale will have a thoroughly deterrent effect on all the guilty milk vendors."

In the "Hindu" of 19th December 1951, a P.T.I. message from Calcutta, dated 17th December 1951, states:—

"Mr. James N. K. Biswas, Director of the Co-operative Milk Societies Union in Bow Bazar, was to-day sentenced to pay a fine of Rs. 500 by a Municipal Magistrate on a charge of selling adulterated milk. The firm used to supply milk for distribution to poor children to a hospital run by the Calcutta Corporation.

In his judgment the Magistrate observed that "the supply of this adulterated milk to poor children by such a co-operative firm was the most heinous offence that could be thought of. Government should take strong action and see that their reputation was not impaired by the Company's making a show, by printing, that it was run under Government supervision".

The "Hindu" very correctly observed in a leading article of 7th May 1949,—

"While some vendors may be relatively poor folk incapable of paying heavy fines, it is nevertheless a fact that many milk and ghee sellers to-day are doing big business and are not in need of special consideration. The trouble seems to be that non-medical persons, like magistrates, are still not aware of the serious danger that adulteration constitutes to public health and treat it as if it were a technical offence or nuisance."

It may be pertinent to point out in this connection that the Bombay State has recently passed an Amendment Act which provides not only for very heavy penalties but also a term of imprisonment, even for first offences, in food adulteration cases.

When there is no prospect in the near future of the construction of more laboratories on financial grounds, the Act cannot be extended to other areas of the Madras State and permission to increase the quota of samples cannot be complied with. In order to derive the maximum advantage from the permitted quota, the adulterators of foodstuffs should be given deterrent punishment for their anti-social acts so that they change their ways or go out of their business.

The number of extra samples sent by the local bodies has decreased from 1,024 in 1950-51 to 795 during the year under report. The details are given in Table IV.

TABLE IV.

Statement showing the number of extra samples sent by local bodies during the year 1951-52.

Name of municipality.	Number of extra samples.	Name of municipality.	Number of extra samples.
MUNICIPALITIES.			
A Class.		B Class—cont.	
1 Madurai ..	1	20 Erode ..	3
2 Kozhikode ..	2	21 Karaikudi ..	3
3 Coimbatore ..	10	22 Kurnool ..	2
4 Salem ..	90	23 Hospet ..	3
5 Guntur ..	4	24 Tiruppur ..	18
6 Mangalore ..	45		
7 Ootacamund ..	13	Total ..	35
8 Rajahmundry ..	26		
9 Tirunelveli ..	52	C Class.	
10 Bellary ..	2	25 Anantapur ..	1
11 Kancheepuram ..	48	26 Rajapalayam ..	3
12 Kumbakonam ..	21	27 Srivilliputtur ..	1
13 Nagapattinam ..	12	28 Tiruvannamalai ..	1
14 Palghat ..	6	29 Gobichettipalayam ..	2
15 Tuticorin ..	100	30 Guntakal ..	5
16 Pollachi ..	38	31 Kodaikanal ..	12
Total ..	470	32 Mettupalayam ..	2
		33 Srikakulam ..	1
B Class.		34 Srirangam ..	1
17 Adoni ..	3	35 Tindivanam ..	10
18 Chidambaram ..	1		
19 Dindigul ..	2	Total ..	39

TABLE IV—cont.

Statement showing the number of extra samples sent by local bodies during the year 1951-52—cont.

Name.	Number of extra samples.	Name.	Number of extra samples.
PANCHAYATS.			
Anantapur district—		Nilgiris district—	
36 Gooty	4	72 Kotagiri	1
37 Kadiri	8		
38 Ponakonda	4		
North Arcot district—		Ramanathapuram district—	
39 Arcot	3	73 Pallathur	2
40 Arkonam	5	74 Paramakudi	6
		75 Sattur	3
South Arcot district—		76 Ramanathapuram	2
41 Bhuvanagiri	2	77 Rameswaram	1
42 Kallakurichi	9		
43 Panruti	1		
44 Vriddhachalam	17	Salem district—	
Bellary district—		78 Idapadi	2
45 Harpanahalli	8		
46 Yemmiganur	1	Tanjore district—	
Coimbatore district—		79 Pattukottai	3
47 Avanashi	20	80 Papanasam	1
48 Kurichi	11	81 Sirkali	2
49 Satyamangalam	1	82 Tirutturaippundi	13
Chingleput district—		83 Tiruvadamardur	2
50 Alandoor	2	84 Tiruvaiyuru	1
51 Tiruvotiyur	6		
Chittoor district—		Tiruchirappalli district—	
52 Kuppam	7	85 Ariyalur	6
53 Madanapalle Sanatorium	1	86 Jayakondam	1
54 Palmaner	2	87 Kulittalai	2
55 Puttur	1	88 Manappuram	1
56 Vayalpad	3	89 Musiri	2
Cuddapah district—		Tirunelveli district—	
57 Badvel	2	90 Courtallam	18
58 Rajampet	1	91 Kallidaikurichi	1
59 Rayachoti	5	92 Puliyaugudi	10
East Godavari district—		93 Sankarankoil	2
60 Pithapuram	1	94 Tenkasi	1
West Godavari district—		95 Tiruchendur	4
61 Bhimavaram	1	96 Viruvanallur	1
62 Narsapur	7	97 Vickramasingapuram	2
63 Nidadavole	3		
64 Tanuku	4	Visakhapatnam district—	
Guntur district—		98 Narasapatnam	2
65 Mangalagiri	4	99 Porvathipur	1
Krishna district—		100 Yellamanchilli	7
66 Nuzvid	3		
67 Tiruvur	1		
Madurai district—			
68 Cumbum	3		
69 Melur	2		
Nellore district—			
70 Kavali	1		
71 Sullurpet	1		
		Grand Total	795

The number of local bodies (vide Table V) which has sent 75 per cent of the quota and above as milk samples is 50, as against 76 during the previous year.

TABLE V.

Local bodies which have taken more than 75 per cent milk samples of their quota.

Names of places.	Total samples taken.	Milk alone.	Names of places.	Total samples taken.	Milk alone.
(1)	(2)	(3)	(1)	(2)	(3)
Anantapur district—			Ramanathapuram district—		
Tadpatri Municipality	46	38	Pallattur Panchayat	48	40
Dharmavaram Panchayat	48	39	Rameswaram Panchayat	49	47
Kadiri Panchayat	57	45	Sivaganga Panchayat	48	36
			Tiruppattur Panchayat	47	36
North Arcot district—			Salem district—		
Gudiyattam Municipality	48	40	Salem Municipality	378	314
Vaniyambadi Municipality	48	37	Rasipuram Municipality	48	45
Arkonam Panchayat	53	49	Harur Panchayat	50	41
			Namakkal Panchayat	48	43
South Arcot district—			Tanjore district—		
Bhuvanagiri Panchayat	49	41	Kumbakonam Municipality	165	139
Kallakurichi Panchayat	57	53	Mayuram Municipality	96	84
Panruti Panchayat	49	40	Tiruvavur Municipality	48	41
Vriddhachalam Panchayat	65	51	Nannilam Panchayat	47	37
			Papanasam Panchayat	45	37
Bellary district—			Tiruchirappalli district—		
Rayadurg Panchayat	47	35	Lalgudi Panchayat	52	39
			Jayankondam Panchayat	49	37
Coimbatore district—			Tirunelveli district—		
Gobichottipalayam Municipality	50	37	Tirunelveli Municipality	268	221
Kurichi Panchayat	52	45	Palayamkottai Municipality	96	76
			Ambasamudram Panchayat	47	37
Chittoor district—			Courtallam Panchayat	66	52
Tirupathi Municipality	48	37	Kadayanallur Panchayat	48	41
Kuppam Panchayat	55	46	Tiruchendur Panchayat	51	42
Madanapalle Sanatorium	49	49	Vickramasingapuram Panchayat	50	42
Palmaner Panchayat	51	41	Viravanallur Panchayat	49	41
Cuddapah district—			Visakhapatnam district—		
Cuddapah Municipality	96	72	Visakhapatnam Municipality	287	244
			Vizianagaram Municipality	97	87
East Godavari district—			Bheemunipatnam Municipality	48	41
Pithapuram Panchayat	40	31	Yellamanchilli Panchayat	55	42
West Godavari district—					
Eluru Municipality	144	118			
South Kanara district—					
Kasaragod Panchayat	48	36			
Madurai district—					
Dindigul Municipality	98	80			
Kodaikanal Municipality	60	48			

It may be noted that the following 54 local bodies have not sent any ghee samples at all.—Bhuvanagiri, Panruti, Harpanahalli, Avanashi, Satyamangalam, Madanapalle Sanatorium, Palmaner, Puttur, Badvel, Mandapeta, Samalkot, Tenali, Repalle, Kasaragod, Avanigadda, Nandyal, Bodinayakanur, Kodaikanal, Ayakudi, Cumbum, Nilacottai, Sholavandan, Usilampatti, Cochin, Kotagiri, Aruppukottai, Sivakasi, Mudukulathur, Kilakarai, Paramakudi, Sattur, Sivaganga, Tiruppattur, Rasipuram, Dharmapuri, Namakkal, Tiruchengode, Mayuram, Tiruvavur, Nannilam, Papanasam, Sirkali, Tiruvaiyuru, Ariyalur, Lalgudi, Jayankondam, Tiruvaiyur, Ettaiyapuram, Koilpatti, Puliyaugudi, Vickramasingapuram, Veeravanallur, Bheemunipatnam and Salur.

No butter samples have been sent by 161 local bodies and especially from the ghee producing centres—Tadpatri, Tiruppur, Nandyal, Rasipuram and Nellore.

Table VI gives particulars about the nature of food articles, total number and number reported as adulterated during the year under report and during the previous year.

TABLE VI.

Nature of samples taken in 233 local bodies (including Madras City) working the Act in the Madras State.

Nature of sample.	1951-52.			1950-51.		
	Total.	Number adulterated.	Percentage adulterated.	Total.	Number adulterated.	Percentage adulterated.
Milk	14,177	9,083	64.1	15,119	9,253	61.3
Ghee	1,879	610	32.5	1,783	395	22.1
Butter	871	377	43.3	869	280	32.2
Gingelly oil	1,835	173	9.4	1,786	280	15.7
Coconut oil	1,368	78	5.7	1,431	166	11.6
Groundnut oil	409	27	6.6	476	34	7.1
Kusuma oil	16	4	25.0	21	2	9.5
Mineral oil	Nil	..	..	10	3	30.0
Coffee powder	1,230	355	28.9	965	180	18.7
Sweets and other preparations made in ghee.	101	70	69.3	102	67	65.7
Turmeric	201	39	19.4	192	57	29.7
Tea	557	170	30.5	167	42	25.2
Honey	82	11	13.4	68	9	14.3
Dhalls and flours	557	258	46.3	621	385	62.0
Hydrogenated vegetable oils.	30	16	53.3	30	9	30.0
Other unclassified samples.	130	35	26.9	77	39	50.7
Total ..	23,443	11,306	48.2	23,717	11,201	47.2

The percentage of adulterated samples for the Madras State as a whole during last year was 47.2 and it was recorded as the highest figure since the working of the Act began in 1929; but the year under report shows a still further increase in adulteration reaching the figure of 48.2, the highest ever recorded. Although the number of milk samples is slightly less than last year the percentage of adulterated samples is 64.1 as against 61.3 for the previous year. In this connection it is pertinent to note the following remarks of the Government Chemist for Trinidad and Tobago in his Annual Report for the year 1950, when 17 per cent (249 out of 1,453) milk samples were adulterated.

"A figure of 17 per cent of adulteration is still scandalously high for a community that prides itself on being progressive and it is quite apparent that three or four times the present number of milk samples will have to be submitted before adulteration can be reduced to a reasonable figure."

One can readily guess in what scathing terms the Chemist would have described the position with 60 per cent adulteration in milk samples in the Madras State. There has been a noteworthy increase in the percentage of adulterated samples in respect of ghee, butter, coffee powder and tea. The respective figure for the year under report and the previous year, are given in Table VII below. The figures conclusively show that the punishment meted out to the vendors is far from having a deterrent effect.

TABLE VII.

	Percentage adulterated in	
	1951-52.	1950-51.
Milk	64.1	61.3
Ghee	32.5	22.1
Butter	43.3	32.2
Coffee powder	28.9	18.7
Tea	30.5	25.2

On the other hand there has been a slight decrease in adulteration so far as gingelly oil, coconut oil, turmeric and dhalls and flours are concerned.

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

TABLE VIII.

Districts arranged according to increasing order of adulterated samples.

Name of the district.	Rank for the year under report 1951-52.	Percentage of adulterated samples in the year.	Rank for the previous year 1950-51.	Percentage of adulterated samples in 1950-51.
Cuddapah ..	1	31.3	1	34.4
Madurai ..	2	34.4	2	34.5
Ramanathapuram.	3	35.5	4	36.7
Kurnool ..	4	37.6	9	44.6
South Arcot ..	5	39.3	3	34.9
Guatpur ..	6	43.4	8	43.3
North Arcot ..	7	44.2	10	44.7
Tanjore ..	8	44.9	6	39.7
Tiruchirappalli ..	9	45.6	14	48.8
Chittoor ..	10	46.0	7	41.2
Nellore ..	11	46.2	5	39.6
Malabar ..	12	46.3	17	51.8
Nilgiris ..	13	49.3	12	45.4
Bollary ..	14	50.1	18	52.4
Tirunelveli ..	15	50.3	16	51.0
Visakhapatnam.	16	51.4	19	53.8
Chingloput ..	17	51.8	20	54.8
Madras City ..	18	52.2	13	47.2
Krishna ..	19	53.4	11	45.1
Anantapur ..	20	53.5	15	50.7
South Kanara ..	21	55.3	25	67.1
West Godavari ..	22	56.0	23	60.9
Salem ..	23	57.1	21	57.1
East Godavari ..	24	59.0	22	59.5
Coimbatore ..	25	62.0	24	63.3

Madras City, which had the 13th rank with a percentage of adulteration of 47.2 per cent, has deteriorated to the 18th rank with 52.2 per cent adulterated samples. In Nellore, the percentage of adulterated samples has risen from 39.6 per cent to 46.2 per cent. Chittoor shows a rise from 41.2 per cent to 46.0 per cent. Krishna records a rise from 45.1 per cent to 53.4 per cent. In Tanjore the percentage of adulteration has risen from 39.7 per cent to 44.9 per cent.

Some districts which show a slight improvement are: In Kurnool the percentage of adulteration has decreased from 44.6 per cent in the last year to 37.6 per cent during the year and in South Kanara from 67.1 per cent to 55.3 per cent. West Godavari, Salem and Coimbatore still continue to be the worst districts with the percentage of adulteration still exceeding 55 per cent. Krishna, which recorded an improvement in the last year's report, has again deteriorated. The other districts maintain more or less the same level of adulteration.

Cuddapah and Madurai districts, which showed the lowest percentages of adulterated samples during last year, continue to maintain their record during the year also.

Table IX gives particulars of samples taken in Madras City in the Calendar year 1951. There is a slight decrease in the number of samples analysed during the year. The total number of samples analysed by the Madras Corporation Analyst during the year was 4,931 of which 2,572 (52.2 per cent) were adulterated while the total for the previous year was 5,061 of which 2,387 (47.2) per cent were adulterated. Commenting on the high percentage of adulteration, the Health Officer, Madras Corporation, states:

"During the year 1944, the percentage of adulteration was the lowest, viz., 20.7 per cent because the average fine per conviction was the highest, viz., Rs. 59. During the year under report, however, the average fine has come down to Rs. 34 while the adulteration has shot up to 52.2 per cent."

TABLE IX.

Nature of samples taken in Madras City in the calendar year 1951.

Nature of samples.	Number of samples taken.	Number adulterated.	Percentage adulterated.
Milk	2,837	2,157	76.0
Butter	467	142	30.4
Ghee	718	172	24.0
Gingelly oil	320	39	12.2
Coconut oil	234	23	9.8
Groundnut oil	57	3	5.3
Groundnut oil	176	18	10.2
Tea	33	5	15.2
Ghee substitutes	13	5	38.5
Other articles	76	8	10.5
Total ..	4,931	2,672	52.2

Table X gives the nature of samples taken in 238 local bodies excluding Madras City in the Madras State during the year 1951-52 and analysed in the Government Analyst's Laboratory.

TABLE X.

Nature of samples taken in 238 local bodies working the Act in the Madras State during the year 1951-52 and analysed in the Government Analyst's laboratory.

Nature of samples.	1951-52.			1950-51.		
	Total number of samples taken.	Number adulterated.	Percentage adulterated.	Total number of samples taken.	Number adulterated.	Percentage adulterated.
Milk	11,340	6,926	61.1	12,239	7,178	58.7
Ghee	1,161	438	37.7	1,058	313	29.6
Butter	404	235	58.2	394	162	41.1
Gingelly oil	1,515	134	8.8	1,473	241	16.4
Coconut oil	1,134	55	4.9	1,145	133	11.6
Groundnut oil	352	24	6.8	390	30	7.7
Kusumba oil	16	4	25.0	21	2	9.5
Coffee Powder	1,054	337	31.9	769	176	22.9
Sweets made in ghee	101	70	69.3	102	67	65.6
Turmeric	201	39	19.4	192	57	29.7
Tea	524	165	31.5	445	42	20.0
Honey	82	11	13.4	63	9	14.3
Dhalls and flours	557	258	46.3	621	385	62.0
Hydrogenated vegetable oils	17	11	64.7	11	4	36.3
Miscellaneous	54	27	50.0	28	15	66.7
Total ..	18,512	8,734	47.2	18,651	8,814	47.2

V. NOTES ON ADULTERATION.

Milk.—Milk continues to be the most commonly adulterated article of food. Out of 11,340 milk samples received during the year, 6,926 (61.1 per cent) were adulterated as against a total of 12,239 and 7,178 (58.7 per cent) adulterated samples for the year 1950-51 showing that adulteration is on the increase. It may also be noted that the extent of adulteration of milk was very high in some local bodies; for example, all the 38 samples from Nandyal and all the 43 samples from Namakkal were adulterated. Likewise, 40 out of 48 samples from Rasipuram

and 110 out of 151 from Tanjore, were adulterated. The average composition of genuine and adulterated milk analysed during the year is given below; the corresponding figures for the year 1950-51 being given in brackets.

					Fat.	Solids-not-fat.
					PER CENT.	PER CENT.
Cow's milk	..	..	Genuine	..	4.4 (4.45)	9.1 (9.2)
					3.1 (3.5)	5.4 (6.5)
Buffalo milk	..	..	Genuine	..	5.2 (6.6)	9.7 (9.7)
					4.6 (4.8)	6.7 (6.7)
Mixed milk	..	..	Genuine	..	5.7 (5.7)	9.3 (9.6)
					4.2 (4.1)	6.8 (6.6)

The presumptive standards laid down in the Madras Prevention of Adulteration Rules for cow's milk are 3 per cent fat and 8.5 per cent solids-not-fat and for buffalo milk 4.5 per cent fat and 9 per cent solids-not-fat. The average figures for genuine cow's milk during the last few years are 4.7, 4.3, and 4.7 for fat and 9.3, 9.1 and 9.0 for solids-not-fat, while those for genuine buffalo milk are 6.9, 6.2 and 6.7 for fat and 9.7, 9.6 and 9.6 for solids-not-fat. Taking these average figures from bulk samples as the basis, the statutory standards should be deemed to be too low. The figures also show that a solids-not-fat of 8.2 or 8.3, i.e., a figure slightly lower than the statutory minimum does not mean a trivial proportion of added water calculated from a solids-not-fat of 8.5, but a much higher percentage to be calculated from a solids-not-fat figure of at least 9 per cent.

Butter and ghee.—The year under report is noteworthy for a remarkable increase in the adulteration of butter and ghee. Four hundred and four samples of butter were analysed during the year under report of which 235 (58.2 per cent) were adulterated, the corresponding figures for the previous year being 394 and 162 (41.1 per cent), respectively. Of the 235 adulterated samples, 80 contained more moisture than the permitted limit of 20 per cent, 95 contained foreign fat and 60 contained both excess water and foreign fat. It is noteworthy that there is a marked increase in adulteration with hydrogenated vegetable fat. All the butter samples sent by Vellore (3), Cuddalore (3), Bhuvanagiri (3), Mandapeta (3), 21 out of 29 from Tanjore, 19 out of 34 from Coimbatore, 9 out of 17 from Guntur, 20 out of 40 from Chirala, 13 out of 26 from Tenali, 14 out of 17 from Madurai, 6 out of 10 from Kozhikode and 8 out of 15 from Vijayavada, have been found to be adulterated.

It may be interesting to mention that the fat in a sample of butter received from Hospet contained no butter-fat at all, but consisted of hydrogenated vegetable fat only. Out of 1,161 ghee samples, 438 (37.7 per cent) were adulterated; the corresponding figures for the previous year being 1,058 and 313 (29.6 per cent).

All the 3 samples of ghee from Villupuram, all the 5 from Adoni and all the 6 from Alandoor were adulterated. Ten out of 11 from Kallidaikurichi, 22 out of 30 from Tirunelveli, 10 out of 21 from Tiruchirappalli, 5 out of 6 from Tiruvadamurudur, 11 out of 14 from Narasapur, 7 out of 9 from Mangalore and 4 out of 5 from Dindigul, were adulterated.

The considerable increase in adulteration definitely proves that the fines imposed on the merchants in these food adulteration cases do not have any deterrent effect at all.

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

				Reichert.	Moisture.
				VALUE.	PER CENT.
Butter	..	..	Genuine	27.4 (27.7)	17.4 (18.6)
				20.8 (21.5)	23.9 (27.5)
Ghee	..	..	Genuine	27.8 (28.3)	..
				12.1 (12.8)	..

Oils.—It is gratifying to note that there is an appreciable decrease in adulteration in oils. Of 1,515 gingelly oil samples 134 (8·8 per cent) were adulterated, the adulterant being groundnut oil, as against 1,473 and 241 (16·4 per cent) for the previous year. Only 55 (4·9 per cent) out of a total of 1,134 coconut oil samples were adulterated, 46 with groundnut oil and 9 with mineral oil. Adulteration with mineral oil, which was assuming dangerous proportions a few years ago has virtually stopped owing to the measures of control adopted.

Coffee.—There has been an increase in the adulteration of coffee during the year. One thousand and fifty-four samples were received of which 337 (31·9 per cent) were adulterated as against 769 and 176 (22·9 per cent) for the previous year. The common adulterants were chicory, wild date, nahua flower and clearing nut, and sometimes the so-called “chicory” contained no genuine chicory but consisted of substitutes prepared from foreign seeds. The places where heavy adulteration of coffee prevailed during the year under report could be noted from the following data :—

Eleven out of 20 samples from Coimbatore, 8 out of 10 from Pollachi, 9 out of 25 from Mangalore, 8 out of 14 from Vijayavada, 9 out of 17 from Nandyal, 9 out of 13 from Palni, 14 out of 17 from Kozhikode, 17 out of 34 from Ootacamund, 10 out of 16 from Coonoor, 4 out of 5 from Tirunelveli, and 3 out of 4 from Cuddalore were found adulterated.

Tea.—Out of 524 samples, 165 (31·5 per cent) were adulterated and thus a slight increase in adulteration was recorded over that of the previous year when out of 145 samples 42 (29·0 per cent) were adulterated. A large number of samples was taken by the sampling officials at the instance of the Inspectors of Tea Marketing Board. Foreign leaves were commonly used as the chief adulterant made of the fact that 7 out of 17 samples from Mangalore, 6 out of 8 from Kasaragod, 6 out of 7 from Palni and 8 out of 17 from Cannanore were adulterated.

Dhalls and flours.—Out of 557 samples of dhall and flours 258 (46·3 per cent) were adulterated, Kesari dhall and Kesari flour being the common adulterants. The figures for the previous year were 621 and 385 (62·0 per cent). The notable fall in the extent of adulteration shows that prompt methods adopted in seizing suspected stocks are having a salutary effect on the merchants.

Honey.—Eleven out of a total of 82 honey samples were found to be adulterated with cane sugar in the form of jaggery solution.

Turmeric.—Out of 201 samples 39 (19·4 per cent) were adulterated as against a total of 192 samples and 57 adulterated in the previous year. The maximum amount of lead present in the adulterated samples was 120 parts per million.

VI. FINES.

Appendix B gives the number of convictions, fines in analysis and non-analysis cases, maximum, minimum and average fine in each local body. In a few local bodies the number of cases pending disposal in courts is rather large.

The year under report records the average fine of Rs. 36 the lowest during recent years, the average fine for the previous year being Rs. 43. Many sampling Inspectors have stated that the fines have noticeably decreased after the separation of the Judiciary from the Executive. The minimum fines of Re. 1 and Rs. 2 have been imposed in Kozhikode, Palayamkottai, Palacole, Kuppam, Samalkot, Kasaragod, Koilpatti and Narasapatam. It is needless to add that these trivial fines which do not even cover the fee payable to Government by the local body for the analysis cannot be expected to put down adulteration.

The following municipalities and panchayats show a sharp fall in the average fine as compared with the average in the previous year :—

	Average fine in	
	1950-51.	1951-52.
	RS.	RS.
<i>Municipalities.</i>		
Coimbatore	78	63
Salem	32	20
Tanjore	89	61
Nagapattinam	73	62
Chidambaram	55	29
Erode	40	25
Palayamkottai	38	26
Virudhunagar	57	32
Srirangam	59	43
Salur	70	32
Sivakasi	44	26
Tiruvarur	50	32

There has been a substantial decrease in the panchayat board fines as given below :—

	1950-51.	1951-52.
	RS.	RS.
<i>Panchayats.</i>		
Anantapur district—		
Dharmavaram	42	21
Coimbatore district—		
Bhavani	32	19
Chittoor district—		
Palmaner	33	21
Cuddapah district—		
Pulivendla	41	17
West Godavari district—		
Nidadavole	54	25
Madurai district—		
Cumbum	45	31
Melur	35	23
Ramanathapuram district—		
Mudukulathur	40	23
Sattur	50	32
Salem district—		
Idappadi	33	12
Tiruchengode	41	22
Tanjore district—		
Ayyampet	82	54
Nannilam	60	38
Papanasam	61	30
Sirkali	87	47
Tiruchirappalli district—		
Kulittalai	51	35
Visakhapatnam district—		
Parvathipuram	70	42

REPORT OF THE

It may be mentioned in this connection that even in the premier City of Madras the average fine has dwindled to Rs. 34 for the calendar year 1951.

In the following 23 local bodies the total fines collected did not even cover the expenditure incurred by the local body by way of contribution to Government. The number of local bodies in this category was only 18 during last year, but it is noteworthy that Walajapet Municipality and the Panchayat Boards of Uravakonda, Panruti, Nilacottai, Sholavandan, Kandukur, Shevaroy, Ettayapuram and Narasapatnam could not recoup the contribution during the previous year also.

	Contribution to Government.	Fine levied.
	RS.	RS.
<i>Municipalities.</i>		
Bellary	730	677
Virudhunagar	480	415
Proddatur	360	224
Chittoor	240	187
Tiruppattur (North Arcot)	240	95
Walajapet	240	50
<i>Panchayat boards.</i>		
Uravakonda	240	180
Panruti	245	157
Bhavani	240	210
Sriperumbudur	110	90
Madanapalli	240	80
Badvel	250	100
Jammalamadugu	240	150
Pulivendla	240	170
Avanigadda	175	90
Nilacottai	240	230
Sholavandan	240	185
Kandukur	240	70
Kovvur (Nellore district)	240	130
Idappadi	250	65
Shevaroy	240	210
Ettayapuram	240	125
Narasapatnam	250	212

The highest fine of Rs. 225 was imposed in the Panchayat Board of Markapur (Kurnool district), Rs. 225 in Coimbatore, Rs. 205 in Mannargudi, and Rs. 200 in Madurai, Coonoor, Nellore, Nagapattinam, Hindupur, Mettupalayam, Vriddhachalam, Kovvur and Nuzvid. Fines of Rs. 100 and above but less than Rs. 200 were imposed in 89 local bodies during the year as against 74 during the previous year. The following municipalities showed improvement in the average fine:—

	1950-51.	1951-52.
	RS.	RS.
Ootacamund	40	77
Hospet	44	68
Devakottai	34	47
Peddapuram	43	63
Kodaikanal	26	70
Tindivanam	23	48

In a few Municipalities and Panchayat Boards the total fines work up to a substantial sum as shown below:—

	Fine collected.
<i>Municipalities.</i>	
Coimbatore	7 times the contribution.
Visakhapatnam	6 do.
Ootacamund	9 do.
Rajahmundry	11 do.
Mangalore	7 do.
Pollachi	17 do.
Mayuram	7 do.
Srikakulam	6 do.
Gobichettipalayam	7 do.
Mettupalayam	7 do.
Mannargudi	6 do.
Vaniyambadi	7 do.
<i>Panchayat boards.</i>	
Kurichi	7 times the contribution.
Courtallam	6 do.
Sompeta	7 do.

In respect of non-analysis cases 99 local bodies have taken action under Part III of the rules for exposure of food to dust, dirt and flies, for preventing the Sampling Inspector from taking samples [Section 14 (3), etc.].

VII. WORK FOR OTHER GOVERNMENT DEPARTMENTS.

Various Government departments and officials sent 6,450 samples during the year, the largest number in the history of the department as compared with 5,942 for the previous year. The various sources are given in Table XI below and in fuller detail in Table XII.

TABLE XI.
Government departments and number of samples received.

	Number of samples received in	
	1951-52.	1950-51.
(1) Government hospitals	5,286	4,945
(2) Civil Supplies department	544	132
(3) Government Milk Factory	188	152
(4) Rationing department	46	34
(5) Jails	99	96
(6) Industries and Commerce	5	7
(7) Magistrates and Police	84	11
(8) Referee samples sent by Magistrates (at the request of accused)	14	23
(9) Other Madras Government departments	98	83
(10) Government of India departments—		
(a) Railways	38	9
(b) Regional Food Commissioner, etc.	48	..
Total	6,450	5,492

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

TABLE XII.

Number and nature of samples received from the various Government departments during the year 1951-52.

Nature of samples.	Number of samples.	Number adulterated or unsatisfactory.	Nature of samples.	Number of samples.	Number adulterated or unsatisfactory.
(1) Government hospitals.			(3) Government Milk Factory.		
Bread	1,310	215	Reconstituted milk ..	155	3
Milk	1,185	204	Milk powder	15	1
Butter	591	211	Vanaspathi	16	..
Ghee	495	164	Margarine	1	1
Gingelly oil ..	669	59	Tin	1	..
Coconut oil ..	166	..	Total	188	5
Dhall	458	38			
Coffee powder ..	91	10	(4) Rationing department.		
Curry powder ..	65	24	Asafoetida	3	3
Iddlies	14	5	Semolina	2	..
Rice	27	..	Tapioca flour	1	..
Brown sugar and jaggery ..	81	2	Wheat flour	3	..
Tapioca flour ..	1	1	Puttu	1	..
Biscuits	78	4	Iddlies	9	..
Tamarind	22	..	Appa	4	..
Asafoetida	2	..	Dosai	3	..
Arrowroot	11	1	Bread	3	3
Ragi flour	2	2	Biscuits	1	..
Barley flour ..	1	1	Maida	10	..
Washing soda ..	12	..	Badusha	1	..
Cheekoy powder ..	5	2	Sooji, Halwa, Puri, etc. ..	4	..
Total	5,286	943	Vegetable flour ..	1	..
			Total	46	6
(2) Civil Supplies department.					
(a) Fumigated samples—					
Milo	172	..	(5) Jails.		
Wheat	316	..	Milk	34	14
Semolina	4	..	Ghee	29	7
Maida	10	..	Gingelly oil	32	1
Atta	2	..	Bread	1	1
Rice	4	..	Coconut oil	1	..
Blackgram	2	..	Milk powder	1	..
Bengalgram	2	..	Tamarind	1	..
Greengram	6	..	Total	99	23
Wheat bran	1	..			
(b) Other samples—					
Maida	5	3	(6) Industries and Commerce.		
Wheat	1	1	Hydrogenated vegetable oil products of the following brands:—		
Tapioca flour ..	1	1	Asoka	1	..
Flours	5	..	Lion	1	..
Rice	5	..	Dalda	2	..
Milk powder	3	3	Swastik	1	..
Wheat flour	1	..	Total	5	..
Dates	1	..			
Milo	2	..	(9) Other Madras Government departments—cont.		
Sugar	1	..	Wheat	2	..
Total	544	8	Dye	1	..
			Sweet palm juice ..	1	..
			Pepper	1	..
			Total	95	41
			(10) Government of India departments.		
			(a) Railways—		
			Gingelly oil	11	..
			Ghee	1	..
			Colours	2	2
			Dates	1	1
			Pea	1	1
			Milk powder	1	1
			Chicory	20	2
			Tea	1	..
			Total	38	7
			(b) Regional Food Commissioner, etc.—		
			Milo	15	10
			Wheat for moisture content	21	..
			Wheat for fitness ..	4	4
			Rice	5	3
			Total	45	17
			(c) Collector of Customs—		
			Curry powder	3	3

TABLE XII—cont.

Number and nature of samples received from the various Government departments during the year 1951-52—cont.

Nature of sample.	Number of samples.	Number adulterated or unsatisfactory.	Nature of sample.	Number of samples.	Number adulterated or unsatisfactory.
(7) Magistrates and Police.					
Tapioca flour	2	..	Wheat	2	..
Gulabigram	1	..	Dye	1	..
Cholam	1	..	Sweet palm juice ..	1	..
Flour	78	..	Pepper	1	..
Bengalgram	1	..	Transformer oil ..	1	..
Bengalgram flour ..	1	..			
Total	84	..	Total	95	41
(8) Referee samples sent by Magistrates.					
Milk	6	6	(9) Other Madras Government departments.		
Ghee	4	4	(a) Railways—		
Butter	1	1	Gingelly oil	11	..
Bengalgram flour ..	1	1	Ghee	1	..
Coffee powder	2	2	Colours	2	2
Total	14	14	Dates	1	1
(9) Other Madras Government departments.					
Tea	2	2	Pea	1	1
Milk powder	36	23	Milk powder	1	1
Sugar	20	4	Chicory	20	2
Indian chicory	3	..	Tea	1	..
Dhall	1	..	Total	38	7
Cashew nuts	4	4	(b) Regional Food Commissioner, etc.—		
Cholam flour	2	..	Milo	15	10
Condensed milk ..	3	..	Wheat for moisture content	21	..
Tapioca flour	6	7	Wheat for fitness ..	4	4
Rice	9	..	Rice	5	3
Milk sediment	1	..	Total	45	17
Pattani	1	1	(c) Collector of Customs—		
Cholam	1	..	Curry powder	3	3
In the year under report a total of 5,940 samples were examined.					

1. Government hospitals.—During the year under report a total of 5,286 samples of diet articles was received as against 4,945 during the previous year, showing an increase of 341 samples.

Government in G.O. Ms. No. 1279, Health, dated 11th April 1951, issued the following revised specifications for the composition of curry powder for adoption in Government hospitals:—

	LB.	OZ.
Chillies	25	0
Coriander	25	0
Black pepper	3	2
Cumin seed	3	2
Mustard	1	9
Turmeric	1	2
Fenugreek	..	..

Bread.—Of 1,310 samples, 215 were reported as unsatisfactory, 204 for having excess acidity and 11 for having been insufficiently baked.

Milk.—Of 1,158 milk samples, 204 were adulterated, 163 being adulterated with added water, 14 were deficient in milk fat, 27 were adulterated not only with water but were also deficient in fat. The percentage of adulterated samples is 17.2 per cent for the year under report as against 13.7 per cent for last year.

Butter.—Out of 591 samples, 211 were adulterated as against a total of 538 samples and 165 adulterated for the previous year. Ninety-four samples were adulterated with excess water above the permitted limit of 20 per cent, 88 contained foreign fat and 29 were adulterated with both excess water and foreign fat.

Ghee.—Adulteration in ghee continues at the same level as last year. Out of 495 samples received, 112 were adulterated with foreign fat and 52 were reported as unsatisfactory for having a free fatty acid content in excess of the permitted limit 2.5, expressed as oleic acid.

Gingelly oil.—Of 639 samples 59 were reported as unsatisfactory. Twenty-one samples consisted of groundnut oil, 35 were adulterated with varying proportions of groundnut oil and one consisted of 100 per cent sunflower oil, two samples had a high acidity of 11.9 per cent and were certified as unfit for human consumption.

Coconut oil.—All the 163 samples received were found to be genuine.

Dhall.—Of 453 dhall samples, 30 were reported as unfit for human consumption as they were coloured with an artificial dye; three samples consisted of bengalgram dhall, two consisted of Kesari dhall (*Lathyrus Sativus*) and three samples were mouldy and therefore certified as unsatisfactory. By "Dhall" is meant redgram dhall and when dhall is demanded the supply of other dhalls, e.g., bengalgram dhall would contravene the terms of agreement.

Coffee.—Ten out of 91 samples were reported as adulterated, the common adulterants being preparations of mahua flower, roasted wild date seeds, chicory, etc.

Curry powder.—Of the 85 samples, 41 were satisfactory and the remaining 24 were reported as unsatisfactory for the following reasons: 20 samples did not contain all the prescribed ingredients, two contained excessive amount of sand, one contained excessive amount of lead and one contained 33 per cent sodium chloride.

Arrowroot.—Of 11 samples, 10 were of the Maranta variety and were reported as genuine and one consisted of tapioca flour.

Rapi.—The two samples consisted of cholam (sorgum) flour.

Barley.—The only sample declared to be barley consisted of wheat flour.

Asafoetida.—A sample of asafoetida received from the Medical Officer, Government Children's Leprosy Sanatorium, Elapur (Salem district) was found to contain wheat and rice starches. It may be mentioned in this connexion that even well-known brands of asafoetida have been found to be adulterated with starch and fixing of standards appears to be necessary.

2. Civil Supplies department.—Five hundred and nineteen samples of fumigated foodgrain, such as milo, wheat, blackgram, bengalgram, greengram, semolina, Stocks of such fumigated foodgrains are not generally released for consumption till the samples drawn from them are reported as fit.

3. Government Milk Factory.—The Commissioner of Civil Supplies reported that reconstituted milk prepared from skimmed milk powder and deodorised coconut oil in the Government Milk Factory was not very suitable, especially for preparation of coffee and wrote to the Government Analyst that some method should be devised to make the milk more acceptable to the consumers. Thereupon the Government Analyst suggested the use of Vanaspathi (partly hydrogenated vegetable oil) in the place of coconut oil and the suggestion was adopted. No Vanaspathi has been received and it may therefore be presumed that complaints have since been received and the suggestion was adopted. No Vanaspathi has been found to be more suitable for the purpose than deodorised coconut oil. This laboratory continued to supply Vanaspathi containing carotene in the required proportion to the factory and also analysed periodically samples of reconstituted milk to see whether the quantities of skimmed milk powder, water and Vanaspathi were mixed in the proper proportions. During the year a total of 285 lb. of carotenised coconut oil and 539 lb. of carotenised Vanaspathi were supplied to the factory. One hundred and fifty-five samples of reconstituted milk were also analysed. Fifteen samples of skimmed milk powder and 16 samples of Vanaspathi and one sample of margarine were analysed to see whether they are suitable for use in the manufacture of reconstituted milk. One sample of milk powder was reported as unsatisfactory as it left an appreciable amount of insoluble sediment on reconstitution with water.

4. Rationing department.—A total of 46 samples was sent by the Rationing department. Three samples of asafoetida, suspected to be mixed with wheat flours, a rationed article, were found to contain about 70 per cent wheat starch, 17 samples of hotel preparations like puttu, iddley, appa, dosa, etc., sent by Assistant Rationing Officers were found to contain rice, the use of which is prohibited by the rationing rules. A vegetable flour alleged to have nutritive properties and claimed to be a substitute, useful for preparation of biscuits, etc., was actually found to be a mixture of wheat flour and sweet potato flour.

5. Jails.—A total of 99 samples was received from jails. Of 34 milks, 14 were found to be adulterated with water, six out of 29 ghees were adulterated with vegetable fat, one ghee was certified unfit as it had a high free fatty acid content (expressed as oleic acid). Of 32 gingelly oil samples, one was adulterated with groundnut oil. A sample of milk powder taken from a stock offered for sale by a firm in East Africa was sent for analysis by the Inspector-General of Prisons to see whether it was fit for conversion to butter milk. The sample gave the following analytical figures: moisture 2.4 per cent; fat 30.9 per cent and proteins 25 per cent. The sample was an unusual one in that it could not be reconstituted in cold water or warm water but as directed on the label of the container, it dissolved in boiling water. The sample was reported to be suitable for conversion to butter-milk.

6. Industries and Commerce.—Five samples of different brands of hydrogenated vegetable oil products, such as Asoka, Lion, Dalda and Swastik, received from the Director of Industries and Commerce were tested to see whether they comply with the specifications prescribed by the Government of India under the Vegetable Oil Products Control Order.

7. Magistrates and Police.—Eighty-four samples were received from Magistrates at the instance of the Police for identification. These analyses arose in connection with contravention of Rationing Rules and Essential Supplies Regulations. In the case of a sample of Bengalgram, the party alleged that it was imported as Gulabigram, but the sample actually consisted of Bengalgram only. Gulabigram and Kabuligram, occasionally imported from North India, are entirely different from Bengalgram in appearance.

Of the seventy-eight samples of flours received, five were found to be self-raising flour and the rest maida flour.

8. Referee samples sent by Magistrates.—Fourteen samples (six milks, four ghees, one butter, one Bengalgram flour and two coffee powders) were received from Magistrates for referee analysis in contested cases under the Madras Prevention of Adulteration Act. All the samples were found to be adulterated.

9. Other Madras Government departments.—A total of ninety-five samples was received from this source. Thirty-six samples of milk powder were sent by various Health Officers, supplied by the UNICEF intended for free distribution to school children and in famine-affected areas. Twenty-three samples were certified as unfit for human consumption. Twenty samples of sugar were sent by Health Officers out of which four were found to be contaminated with coal and were found to be unfit for consumption as such, but they could be reconditioned by dissolving in water and converting into syrup after filtering off the impurities. Four samples of cashewnuts received from the Municipal Health Officer, Cochin, which formed part of a consignment about to be auctioned by a firm, were found to be contaminated with mineral oil and the firm was directed by the Health Officer not to auction the same.

At the instance of the Government of India, the Municipal Health Officer, Visakhapatnam, sent two samples of damaged tea taken from a consignment which had arrived at Visakhapatnam Harbour. Since the samples proved to be damaged, the Health Officer was instructed not to pass the stock for human consumption.

The Municipal Health Officer, Cuddapah, sent a sample of 'sweet drink' which consisted of a solution of saccharine with added colouring matter and flavouring.

A sample of 'Pathani' sent by the Municipal Health Officer, Dindigul, consisted of sweet palm juice.

A sample of transformer oil received from an Assistant Engineer, Electricity department, had an acid value of 0.6 mgs. of potassium hydroxide per gram of the oil.

10. *Government of India departments*—(a) *Railways*.—Thirty-eight samples consisting of eleven gingelly oils, one ghee, two colours, one dates, one pea, one milk powder, twenty chicory and one tea were sent by the Southern Railway. The Government Analyst, seeing an advertisement in the "Hindu" by the Southern Railway, inviting tenders for the supply of colours for use in Refreshment rooms, called for a specimen of the coloring matter that was required. The color was found on analysis to be Metanil Yellow. The Railway was advised that as this colour is injurious to health its use should be discontinued. Another harmless colouring matter was suggested instead. A similar sample was obtained from the Southern Railway (former M.S.M.) and they have also been similarly advised in the matter. A sample of dates and a sample of pea were certified as unfit for human consumption on account of weevil infestation. A sample of milk powder contained excessive insoluble matter. Two out of 25 samples of chicory were found to be contaminated with mineral acid and were declared unfit for use.

(b) *Food department, Government of India*.—Samples of foodgrains were sent by the Regional Food Commissioner, Madras, the Assistant Directors of Central Storage at Avadi and Visakhapatnam. Of 15 samples of Milo, ten were certified as unfit for human consumption, 21 samples of wheat were, on analysis, found to have a moisture content of 15-16 per cent. All the four samples of damaged wheat and three out of five samples of damaged rice were certified as unfit for human consumption.

Three samples of curry powder received from the Collector of Customs, Madras, were certified as unfit for human consumption on account of the presence of Khesari dhall flour (*Lathyrus Sativus*) to the extent of about 30 per cent.

VIII. FOOD SAMPLES FROM UNOFFICIAL SOURCES.

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

TABLE XIII.

Statement showing samples received from unofficial sources during the year 1951-52.

	Number sent.		Number sent.
Curry powder	5	Indian chicory	1
Salad oil	5	Arrowroot	1
Castor oil	5	Assafetida	2
Castew shell oil	1	Milk	3
Turmeric	2	Butter	3
Groundnut oil	6	Vanaspathi	3
Virilose	1	Hydrogenated ground-nut oil	3
Peas	2	Tobacco seed oil	1
Tapioca flour	1	Oil cake	1
American flour	1	Sweet master	10
True food	1	Tobacco	1
Somolina	1	Fruit essence	2
Skimmed milk powder	4	Sodium sulphide	1
Wattle bark	2	Agmark ghee	2
Tea	3	Milk powder	5
Gingelly oil	1	Tinned foods	7
Dhall	1		4
Ghee	6		
Halwa	1		
Honey	2		
Tapioca flour and sago.	2	Total	100

A total of hundred samples was received from private sources. Five samples of curry powder intended for export were tested for lead and farinaceous matter; generally these contained about 5 per cent common salt. Five samples of salad oil and five samples of castor oil were examined to see whether they conformed to specifications. A sample of Virilose (baly suga) was tested for glucose content and the approximate calorific value. A sample of damaged wattle bark received from a firm was reported as having been damaged by salt water. Five samples of "Agmark" ghee, sent by ghee packers in Probunder, etc., were tested by the Phytosterol Acetate test; one sample was found to be adulterated with foreign vegetable fat. Ten samples of oil cake were analysed for oil and Nitrogen contents. A sample described as SWEET MASTER was found to have moisture 0.1 per cent, dextrose 48.4 per cent, saccharine 47.0 per cent, saccharine sodium 4.9 per cent and acid insoluble 0.1 per cent. A sample of "Indian chicory" sent by a Madras firm consisted of powder prepared from roasted wild date seeds and contained no chicory at all. A sample of arrow-root did not contain the flour derived from Maranta Arundinacea Linn but consisted of tapioca starch (Manihot utilisima). Two samples of asafetida sent by a firm contained respectively only 50 and 70 per cent of the genuine asafetida, the balance being woody matter, a gummy substance and starch; the samples also contained a water soluble colouring matter derived from coal-tar. A sample of Vanaspathi sent by a firm did not conform to the specifications of the Vegetable Oil Products Control Order promulgated by the Government of India in that it had a melting point of 39.5°C against the prescribed limit of 33-37°.

Two samples of tobacco had a moisture content of 12.4 per cent and 13.4 per cent respectively. A sample of fruit essence sent by a Madras firm consisted of normal butyl acetate. The firm also wanted to know whether it could be used for flavouring food. They were informed that it could be so used though it was largely used as solvent in making lacquers, photographic films, etc. Seven samples of milk powder were sent by the Red Cross Society, Madras intended for free distribution to school children, etc.; three were certified fit for use; two were certified as unfit for giving to children; and two were certified as fit for immediate use. Two samples of tinned peas and carrots were found to be satisfactory.

IX. NEW RULES UNDER THE MADRAS PREVENTION OF ADULTERATION ACT.

New rules have been issued by Government in G.O. No. 79, Health, dated 8th January 1952, read with G.O. No. 999, Health, dated 27th March 1952, for the following:—

Rule 15.—Standards for goat's milk or sheep's milk (rule 15) have been fixed, which require that unless proof is adduced to the contrary, genuine sheep or goat's milk should contain at least 3.0 per cent fat, 9.0 per cent solids-not-fat and at least 0.53 per cent nitrogen.

Rule 26-B and 28-A.—Standards have been prescribed for honey and the sale of adulterated honey is prohibited.

Rule 37-E.—Sale or storage of adulterated tea for sale, is prohibited and the plea that the sample was sold to the Sanitary Inspector as adulterated tea would no longer hold good.

Rules 36 and 37.—The addition to food of synthetic sweeteners, such as saccharine, which have no food value, is prohibited and any beverage, etc., to which such sweeteners are added should be labelled as "PREPARED FOR THE EXCLUSIVE USE OF PERSONS SUFFERING FROM DISEASE".

Rule 41.—Since many species of starches are palmed off by merchants under the name of 'Arrowroot', 'Arrowroot' has been defined as the separated and purified starch from the rhizomes of the plant known as MARANTA ARUNDINACEA LINN. It has been laid down that if any other variety of arrowroot is sold it should be distinctly labelled as "NOT SUITABLE FOR INVALID DIET".

N. HIGH COURT JUDGMENTS.

The following are some important High Court Judgments:—

Criminal Revision Cases Nos. 440, 441 and 442 1950.—The plea raised by a milk contractor that he was supplying to the railway refreshment room under the terms of a contract and the adulterant was innocuous were disallowed by the High Court and his conviction was confirmed. The following are extracts from the High Court Judgment:—

These are three connected cases and involve the same points of law for determination. The petitioner in all the three cases is one, Vedantam Ayyangar, a private contractor, who agreed to sell milk to the railway refreshment stall at Sillurpet. The agreement was that the milk supplied by him should be "milk of the best quality and should not be less than 2.3 degrees by the lactometer". He was suspected to be selling milk adulterated with water, in conspiracy with the Manager of the railway refreshment stall, a permanent employee of the railway. So, P.W. 1, a Health Inspector, bought samples of the milk being taken by him to the railway refreshment stall on 23rd April 1948, 14th October 1948 and 3rd March 1949 and after observing all the rules, sent the samples to the Government Analyst who examined them and certified that the samples contained 21 per cent, 24 per cent and 12 per cent water respectively. Vedantam was charged and convicted under rule 27 framed under section 20 (2) (f) of the Madras Prevention of Adulteration Act and sentenced to pay the fine of Rs. 30, in each of these cases, by the Sub-Magistrate, Sillurpet. He appealed to the Sub-Divisional Magistrate, Gudur, who confirmed the conviction and sentences, agreeing with the Sub-Magistrate on all the points, but without any detailed discussion. Hence these revision petitions.

I have perused the records and heard Mr. S. Krishnamoorthi, for the petitioner, and the Public Prosecutor *contra*. Mr. Krishnamoorthi raised four main contentions. The first was that though milk sold by the petitioner to the refreshment stall was adulterated with 21 per cent, 24 per cent and 12 per cent water, it did not fall below 2.3 degrees by the lactometer reading, and so the petitioner had fulfilled the terms of his contract with the railway refreshment stall and should not have been convicted. I cannot agree. Even if the terms of the contract were really fulfilled, the term of the contract with a person is one thing and *liability under the law for an offence* is another. Thus, a person may contract with another for committing a robbery or beating a third party for Rs. 50. The law will have nothing to do with the terms of the contract, and his contract will be of no use. So too, a contract can be of no avail as a defence for selling wine in a prohibition area without a permit. So, the mere fact that the immunity from criminal liability for selling watered milk is pure milk. Nor did the contract say in fact that the milk could be watered, provided the lactometer reading did not go below 2.3 degrees. It expressly stipulated for the supply of *milk of the best quality* which, of course, presupposes that no water should be added. In my opinion, the lactometer reading was put in simply to provide against the possibility of the milk being far below par and very thin and non-greasy milk of a decadent cow or buffalo falling below 2.3 degrees being supplied. Cows and buffaloes like all other females of any species, differ enormously in the quality and quantity of the milk they give. Some give rich and creamy milk, twice as good as some others, while weak and sickly cows and buffaloes, having no grass to eat and eating even paper, for lack of anything better, will give very thin milk indeed. It is to provide against the milk of such cows and buffaloes being supplied that the lactometer reading was evidently put in. So, even the contractual liability would not be discharged by the petitioner unless he proves that he did not add water to the milk; and here, there was clear proof, and indeed it is not disputed—that plenty of water was added to the milk.

The second contention was that water was an innocuous thing added to the milk, and that we add water every day, when giving milk to small babies or when boiling milk for preparing coffee, and that under the proviso (3) to section 5, where

any innocuous material has been added or admixed, and the vendor has clearly brought that fact to the notice of purchaser, he cannot be held liable under the Madras Prevention of Adulteration Act. This contention too must fail. It is not the case of the petitioner that he told the railway authorities that he was adding water to the milk he was selling them. He never told them. The mere fact that a railway employee conspired with him in this crime and passed off the milk as pure milk will, of course, be no notice to the railway by the petitioner that watered milk alone was being sold to them. The fact that the customers were being told by the servants that they could not guarantee that the milk supplied to them was pure and unadulterated with water, will not show that the petitioner told the railway authorities that he was selling only watered milk to them and that they agreed to buy such watered milk. Many a man is warned against pick-pockets, snakes, etc. That will not show that the warning knows, much less has kept, pick-pockets or snakes ready at that time and place. Mere innocuousness of the substance used for adulteration is no excuse for such sale without clearly warning the vendor about the innocuous admixture under the proviso itself. So adding rich animal fat, like pig's lard or beef suet to cow's or buffalo's ghee, sold to a Brahman or high-caste Hindu without warning him, will be an offence of adulteration of ghee under the Act and it will be no answer to produce a medical certificate from a doctor that the beef suet or pig's lard is not only innocuous but is even richer in food value than cow's or buffalo's ghee. The fact that a mother adds water to cow's or buffalo's milk before giving it to her tender babies is irrelevant for our purpose, as the petitioner was not a mother and was not giving watered milk to his babe, but was selling watered milk for making coffee, etc., served to adult railway passengers, passing it off as unwatered and pure milk of the best quality.

Two other contentions raised in the appeal memorandum were rightly not pressed by Mr. Krishnamoorthi before me, namely, sanction under section 270 of the Government of India Act was required (which is untenable, as the petitioner was not a railway servant even by implication, being merely a private contractor for supply of milk for the railway refreshment stall), and that the Health Inspector's supply of milk was not a "sale" or "purchase" as it was not for consumption but for prosecution, and that, in such cases, where Health Inspectors buy milk for testing it and booking the seller for adulterating the milk, the liability for a "sale" under the Prevention of Adulteration Act will not exist (which is also untenable, as a sale is a sale whatever use the purchaser puts the purchased article to).

In the end, therefore, I have no doubt whatever that the convictions of the petitioner were correct and confirm them.

Criminal Appeals Nos. 664 and 662 of 1950.—The Sub-Magistrate dismissed a case on the ground that the Sanitary Inspector had not given expressly his consent in writing in the charge-sheet. Setting aside the acquittal, the Hon'ble High Court Judge observed that when the Sanitary Inspector who has been authorized to file the complaint has signed the charge-sheet there was no further necessity to express his consent in writing. The following are extracts from the High Court Judgment:—

These appeals coming on for hearing this day upon perusing the petitions of appeal, and the record of the evidence and the proceedings before the Sub-Divisional Magistrate, Koilpatti, and the Stationary Sub-Magistrate, Sankaran-koil, and upon hearing the Assistant Public Prosecutor for the appellant in both the appeals and the respondent not appearing person or by advocate the court delivered the following

JUDGMENT.

This is an appeal filed by the State against the acquittal of the respondent by the Sub-Divisional Magistrate, Koilpatti, in Criminal Appeal No. 6 of 1950 on his file. The appeal has been preferred on two grounds, one on a question of fact and the other on a question of law. The question of fact arises in this way. P.W. 1 the sanitary Inspector, Sankaran-koil and P.W. 2, the maistri, employed in the

Panchayat Board, Sankarankoil, were going along a tank-bund on 25th January 1950 at about 11.15 a.m. They saw the respondent coming on the southern bund of the tank with milk in a basket. P.W. 1 is said to have called out the respondent for purposes of taking a sample of the milk. The accused threw the basket and the vessel and ran away. This act of the accused is said to have prevented the complaint from taking a sample of the milk. The lower Appellate Court found that there is no evidence in this case that the accused was in the course of bringing the milk for purposes of sale. The learned Assistant Public Prosecutor canvassed the question of fact and contended that on the evidence disclosed, it is clear that he must have been taking the milk for purposes of sale. I am inclined to accept the finding of facts and hold that there is no proof satisfactory and beyond all reasonable doubts that the accused intended to take the milk for purposes of sale. The appeal could have been disposed of on this point; but in Criminal Appeal No. 622 of 1950, the Magistrate, following the observation of the Subdivisional Magistrate, Koilpatti on the question of law, acquitted the accused and therefore it becomes necessary to consider the question of law, for purposes of Criminal Appeal No. 622 of 1950. The question of law that has been raised is this. The Sanitary Inspector filed the complaint in this case. Under section 3 (1) of the Madras Prevention of Adulteration Act, 1918, the Assistant District Health Officer-in-charge of Tinnevely has delegated his executive powers to the Sanitary Inspector, Panchayat Board, Sankarankoil for that area to exercise the powers of the Executive Adulteration Act 1918. He has by this therefore authorized the Sanitary Inspector to take action in all cases, which fall under the above sections. In pursuance of this, the Sanitary Inspector filed the complaint in this case. But it was contended before the Subdivisional Magistrate that mere filing of the complaint by the Sanitary Inspector is not enough but that he must give his consent in writing for prosecuting the case. The Subdivisional Magistrate has failed to note that the filing of the complaint carries with it the implied consent to prosecute the offender and in cases where the officers themselves have been authorized to file a complaint and when they file the complaint, it is not necessary they should express their consent in writing with regard to the prosecution of these offences. In this case, the Sanitary Inspector is undoubtedly authorized to complain and he is perfectly justified in filing this complaint. There was no further necessity to express his consent in writing. The point of law therefore decided by the Subdivisional Magistrate is wrong; so far as Criminal Appeal No. 664 of 1950 is concerned, I have decided in favour of the respondent on the question of fact, the appeal is therefore dismissed.

But so far as Criminal Appeal No. 622 of 1950 is concerned, as that case was decided only on the question of law, namely that there is no consent in writing for filing the complaint and as I have decided this point against the accused, that appeal must be allowed and the respondent must be convicted. The respondent will therefore be convicted of the offence with which he is charged sentenced to a fine of Rs. 25 in default to undergo 2 weeks simple imprisonment.

The result is that Criminal Appeal No. 664 of 1950 is dismissed and Criminal Appeal No. 622 of 1950 is allowed.

Criminal Appeal No. 911 of 1950.—A prosecution was instituted against a co-operative society for the sale of adulterated milk but the Sub-Magistrate dismissed the case on the ground that there was no sale. Setting aside the acquittal the Hon'ble High Court Judge observed—

There can be no doubt that the learned Magistrate ought to have held that a sale by a co-operative society for consideration amounts to a sale and that even a purchase by a Sanitary Inspector would not make the transaction any the less a sale.

Criminal Appeal No. 479 of 1951.—When a sanitary Inspector wanted to take a sample from a milk vendor, the latter ran into the hotel to which he supplied milk, and handed over the milk to the servant, who poured it in the milk-pan in which milk was already boiling. The prosecution against the milk vendor for preventing

the Inspector from taking a sample, an offence under section 14 (3), was dismissed by the Sub-Magistrate. On appeal the High Court convicted the accused holding that for a prosecution under section 14 (3) no overt act was necessary. The following are extracts from the High Court Judgment:—

This is a criminal appeal filed by the learned Public Prosecutor against the acquittal of the accused under section 14 (3) of the Madras Prevention of Food Adulteration Act.

The short facts are—

P.W. 1, Hari Rao, the Maistri under the Sanitary Inspector and P.W. 2, Ponnuram, the malaria cooly, of the panchayat board, were deputed by P.W. 3, the Sanitary Inspector, on the morning of 12th January 1951 to get hold of persons who were carrying milk for sale and to inform P.W. 3 so that he might take sample of the milk for analysis to detect adulteration. P.W. 1 saw the accused with two chembus of milk when he was going very near the hotel run by one Balakrishna Pillai near the bus stand at Tirukkoilar. P.W. 1 sent word to P.W. 3 through P.W. 2. P.W. 1 too came there when the accused was very near the hotel of D.W. 1, Bulakrishna Pillai. P.W. 3 asked the accused to give a sample of the milk for being sent for analysis. The accused did not give the sample of the milk and was going into the hotel. P.W. 1 and 3 followed him to the hotel. The accused handed over the milk chembus to the servant of the hotel who poured them into the milk pan in which the milk was boiling. The accused when questioned stated that he would give the sample of milk later.

These facts were accepted by the learned second-class Magistrate as having been fully established. He did not believe the defence version, which does not concern us here for the present. The learned second-class Magistrate came to the conclusion that the facts set out above did not make out the preventing contemplated under section 14 (3). His reasons were that in order to bring the offender under that section, some overt act on his part which was calculated to prevent the local executive officer from taking the sample was necessary, and that mere words of refusal would not be sufficient to bring the act under that section. He was of the opinion that in this case the prosecution had not proved any overt act on the part of the accused by which the complainant was prevented from taking the sample.

There can be no doubt that the view taken by the learned second-class Magistrate is hopelessly wrong. On the facts alleged, there can be no doubt that this accused in the manner set out above and which need not be repeated has effectively prevented the local executive officer from taking the sample and for this no further overt act is necessary than what has happened. In other words, the learned second-class Magistrate seems to have thought that unless there was a physical clash and an effective disabling of the executive officer from taking the sample, no offence would be made out. I need not say that this is a very dangerous extension of the plain meaning of the word "prevent" which would certainly take in an act ascribed to the accused in this case.

The learned Public Prosecutor was more bent upon having the legal position cleared up.

Therefore this criminal appeal is dismissed with these observations, which would prevent further mischievous interpretations of this nature in future.

Criminal Appeal No. 669 of 1951.—A merchant sold a preparation of roasted wild date seeds and mahua flower as chicory powder. When the case ended in acquittal, on appeal the High Court held that the view of the Magistrate was wrong. The following is an extract from the High Court Judgment:—

The decision of the lower court that a composition consisting of roasted wild date and mahua flower advertised as chicory powder is not an offence is certainly opposed to common sense and has not even the merit of attracting the ratio decided in *Pyrale Purushotama Das Gupta v. Mohammad Abdulla* (1). The facts of that case were entirely different from the facts of this case. So the learned Public Prosecutor was fully justified in filing this application against the acquittal

because when the roasted wild dates and mahua flower were sold as chicory powder the offenders certainly came within the ambit of section 5 (1) (b) of the Madras Prevention of Adulteration Act.

Criminal Appeal No. 662 of 1950.—When a consignment of Long flour (Kasari flour) was seized and produced by a Sanitary Inspector before a Magistrate, the latter ordered its confiscation, but acquitted the accused. On appeal, the High Court reversed the acquittal order and convicted the accused. The following is an extract from the High Court judgment:—

There is the evidence of P.W. 1 that the accused is the wholesale dealer in respect of the long flour which was admittedly taken from the godown where the accused has stored for sale. That it is adulterated stuff is clear from the report of the analyst. The accused is therefore guilty of the offence under section 5 (1) (b) of the Prevention of Adulteration Act. Taking into consideration, the circumstances that the bags have been confiscated, I think a nominal fine would meet the ends of justice. The accused is therefore fined Rs. 10 in default to simple imprisonment for three days.

Criminal Appeal No. 497 of 1950.—When a co-operative stores was prosecuted for storing for sale adulterated oil, the Magistrate acquitted the stores, overlooking section 5 (2) of the Act which states that "the court may presume that any food like articles for sale has been manufactured or stored by such person for sale". On appeal, the High Court convicted the co-operative stores. The following is an extract from the High Court Judgment:—

In acquitting the accused on the ground that the stock of adulterated gingelly oil mixed with groundnut oil was not kept for sale, the Stationary Sub-Magistrate of Kavali has not applied his mind to the definition "not proved" contained in section 3 of the Indian Evidence Act and secondly he has overlooked the specific presumption set out under section 5 (2) of the Madras Prevention of Adulteration Act.

A fact is said to be proved when, after considering the matters before it, the court either believes it to exist, or considers its existence so probable that a prudent man ought under the circumstances of the particular case, to act upon the supposition that it exists. A fact is said to be "disproved" when, after considering the matters before it, the Court either believes that it does not exist or considers its non-existence so probable that a prudent man ought under the circumstances of the particular case, to act upon the supposition that it does not exist. A fact is said to be "not proved" when it is neither proved nor disproved.

In this case, these articles were all found at a place where articles are sold, and it is not the case for the accused that they kept all these tins of oil for their own health. There is not a little of evidence to support the suggestion that these articles were not intended to be vendible if people in need of this adulterated oil were to come and ask for it. So, the case for the prosecution stood proved in these circumstances.

Section 5 (2) of the Madras Prevention of Adulteration Act clearly lays down that any food found in the possession of a person who is in the habit of manufacturing or storing like articles for sale has been manufactured or stored by such person for sale. In this case that presumption can be safely drawn and considered to stand un rebutted.

Therefore, the acquittal by the lower court is perverse and cannot be supported. It is hereby set aside and the accused are convicted as charged and sentenced to pay a fine of Rs. 25 each.

Criminal Appeal No. 68 of 1951.—When a case was taken up for hearing long after it was filed, the accused contended that it was time-barred. Though the Magistrate set aside the conviction, on appeal, the Subdivisional Magistrate decision of the appellate Magistrate holding that when the prosecution was

instituted in time it was not time-barred. The following is an extract from the High Court judgment:—

The lower Court is wrong in holding that the proceedings were instituted only on 2nd February 1950 and therefore it is out of time. The complaint, dated 24th March 1949 bears the seal of the court, dated 26th March 1949. This is institution of prosecution against the accused. The offence was committed on 2nd March 1949. The prosecution was therefore instituted in time, the time allowed being three months. On the merits, the lower appellate court found that accused 1 removed the vessels. He is therefore guilty. He is convicted under section 10 of the Madras Prevention of Adulteration Act and sentenced to a fine of Rs. 50 in default six weeks' simple imprisonment.

XI. 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 alone are analysed by the Government Analyst while those under Schedules C and C-1 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 as compared with the two previous years:—

TABLE XIV.

Number and category of drugs analysed in Government Analyst Laboratory.

	1951-52.	1950-51.	1949-50.
Under the Drugs Act	67	79	68
From Government hospitals and other Government institutions	161	99	66
From private individuals and firms	24	24	19
Total ..	252	202	153

The number of drugs analysed during the year under report is 252 as against 202 and 153 during the years, 1950-51 and 1949-50, respectively; there has been a considerable increase in the samples from Government hospitals. To cope with the increase in work, the post of an Additional Senior Assistant was sanctioned by Government.

Any further large expansion of work in drug analysis under the Drugs Act or from other sources would be possible only if more accommodation is provided.

Analysis of pharmaceutical preparations clearly indicates that the manufacturers do not exercise proper care in preparing and labelling their proprietary products. The final product does not appear to be analysed by the firms before it is marketed.

Stock mixtures compounded in hospitals were found to be inaccurately dispensed.

Details about the number and nature of the 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.

	1951-52.					
	Total received.	Number not analysed.	Genuine.	Number below standard.	Number pending.	Percentage below standard.
	(1)	(2)	(3)	(4)	(5)	(6)
Proprietary preparations	50	3	27	12	8	25.5
Pharmaceutical preparations	17	..	9	8	..	47.1
Total ..	67	3	36	20	8	36.3

TABLE XVI.

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

Serial number and name of drug. (1)	Name of ingredients estimated. (2)
1 Tinctura Belladonnae B.P.	Alkaloids of Belladonna Herb calculated as Hyoscyamine.
2 Tinctura Lobelia Aotheraea B.P. ..	Alcohol content.
3 A.P.C. Tablets	Weight per ml. at 20° C.
4 Anti-Cataractus Eye Ointment ..	Aspirin.
5 Anti-Corneal Ulcer Eye Ointment ..	Phenacetin.
6 Tinc. Rhei Co B.P.	Caffeine.
7 Liq. Ammonii Acetatis Fortis B.P. ..	Calcium Chloride.
8 Pure Hydrochloric Acid B.P. 1932 ..	Sodium Iodide.
9 Epsom Salt B.P. 1948	Sulphanilamide.
10 Malto Vit	Atropine.
11 Grosal	Dionine.
12 Alumag Liquid	Alcohol content.
13 Siri's Vitamin B complex	Glycerine.
14 Tinctura Camphorae Co B.P. 1948 ..	Reaction.
	Weight per mg. l at 20° C.
	Arsenic.
	Assay.
	Hydrochloric Acid.
	Specific gravity at 15.5°/15.5°.
	Arsenic, Lead, Bromide and Iodide Sulphate, free Chlorine, non-volatile matter.
	Magnesium Sulphate.
	Reaction, Arsenic, Iron, Lead.
	Zinc Chloride.
	Ferri et Ammonium Citras.
	Calcium Glycerophosphate.
	Vitamin A.
	Copper and Manganese Salts.
	Sodium Iodide.
	Sodium Benzoate.
	Ephedrine Hydrochloride.
	Aluminium Hydroxide.
	Magnesium Trisilicate.
	Thiamine Hydrochloride.
	Riboflavin.
	Nicotinic Acid.
	Alcohol.
	Morphine calculated as anhydrous morphine, Benzoic Acid.
	Alcohol content.

TABLE XVI—cont.

Serial number and name of drug. (1)	Name of ingredients estimated. (2)
15 Iodised Sarasaparilla	Pot. Iodide and Liq. Arseni et Hydrargyri Iodide.
16 to 29 Eucalyptus oil I.P.L., 1946 ..	Optical rotation.
	Refractive Index at 20°.
	Cineole content.
	Aldehydes and Phellandrene.
30 Terpecol (Cough Syrup)	Ephedrine Hydrochloride, Potassium Guaiaccol Sulphonate, Vin. Antimoniale, Codeine Phosphate, Terpin Hydrate and Coal Tar dye.
31 Tinctura Belladonnae B.P. 48	Alcohol content, Alkaloids of Belladonna calculated as Hyoscyamine.
32 Ammonii Chloridum B.P. 1948	Ammonium Chloride.
	Loss on drying Non-volatile matter Arsenic, Barium, Iron, Lead and Sulphate.
33 Shemar Liver tonic	Sodium Sulphate.
	Ammonium Chloride.
	Acid Nitro Hydrochloric Dilute.
	Strychnine.
34 Vimarion (Patent)	Vitamin A, Vitamin B-1.
	Riboflavin, Nicotinic Acid and Iron and Ammonium Citrate.
35 Multivitamin Tablets	Vitamin A, Vitamin B-1.
	Vitamin B-2 (Riboflavin).
	Niacinamide and Vitamin C.
36 Ferro Draksho Malt	Ferri et ammonii citras.
	Calcium Gluconate and Alcohol.
37 Jupiter's "Hemophos"	Ferri et Ammon. Citrate.
	Calcium Glycerophosphate.
	Total phosphate calculated as P ₂ O ₅ .
	Strychnine.
38 Shanti Vitamin B complex	Vitamin B-1, Vitamin B-2.
	Nicotinic Acid amide.
39 Liquid Paraffin	Weight per ml. at 20° C.
	Acidity.
	Carbonisable substance, Solid Paraffins and Sulphur compounds.

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 as declared on label or B.P. requirements. (3)	Result of analysis. (4)
1 Taneast	Salol	1.0 gr.	23.0 per cent deficient.
2 Vitagol (Patent Medicine).	Iron Amm. Citras. Cal. Glycerophosphate.	10.0 4.0	28.5 per cent deficient.
3 Resotone	Vitamin B1 Ferri et Amm. Citras.	4.0 mgs. 4.0 mgs.	41.0 per cent deficient.
	Cal. Glycerophosphate.	4.0 grs.	
4 Gripe Dol	Sodium Benzoate Sodium Bicarb Sodium Phosphate.	19.0 mgs. 890.0 mgs. 890.0 mgs.	100 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 ingredients estimated.	Strength as declared on label or B.P. requirements.	Result of analysis.
(1)	(2)	(3)	(4)
5 Eucalyptus oil .. I.P.L., 1946.	Optical Rotation .. Refractive Index at cineole content.	— 5 to + 10.0 .. 20°—1.4580 to 1.4700 Not less than 55.0 per cent w/w of cineole $C_{10}H_{18}O$.	Does not conform to I.P.L. limit tests. Conforms to I.P.L. Standards.
	Aldehydes ..	..	
	Phellandrene ..	..	
6 Eucalyptus oil .. I.P.L., 1946.	Optical Rotation .. Ref. Index at 20° cineole content.	— 5 to + 10.0 .. 1.4580 to 1.4700 Not less than 55.0 per cent w/w of cineole $C_{10}H_{18}O$.	Does not conform to I.P.L. limit tests. Conforms to I.P.L. Standard.
	Aldehydes ..	..	
	Phellandrene ..	..	
7 Utresed ..	Pot. Bromide ..	5.0 grs. ..	88.8 per cent deficient.
	Sod. Bromide ..	5.0 grs. ..	79.2 per cent deficient.
	Cal. Lactate ..	2.0 grs. ..	55.0 per cent excess.
8 Liveritos ..	Sod. Bicarb. ..	5.0 grs. ..	
Gripe Syrup ..	Sod. Benzoate ..	2.5 grs. ..	11.2 per cent excess.
	Sod. Citrate ..	5.0 grs. ..	
9 Spt. Ammon .. Aromat B.P., 1932.	Ammonia ..	2.1 to 2.4 per cent w/v of NH_3 .	
	Carbondioxide ..	1.265 to 1.485 per cent w/v of CO_2 .	
	Specific gravity at 15.5/15.5 ..	0.890 to 0.900 ..	Does not conform to B.P.
	Alcohol content ..	65 to 70 per cent v/v of Ethyl alcohol.	
10 Tinctura Nucis .. Vomicae B.P.	Strychnine ..	0.119 to 0.131 per cent w/v.	10.9 per cent deficient.
	Alcohol ..	43 to 46 per cent v/v. Ethyl alcohol.	3.3 per cent deficient.
11 Tinctura Ipecacuanhae B.P.	Alkaloidal content ..	0.095 to 0.105 per cent w/v.	13.6 per cent deficient.
12 Liq. Bismuth et Amm. Citras B.P.C.	Bismuth ..	5.0 to 6.0 per cent w/v calculated as Bi_2O_3 .	
	Wt. per ml at 20°C. ..	1.083 g to 1.093 ..	Does not conform to B.P.C.
13 Potassium Citras B.P.	Pot. Citrate ..	Not less than 99.0 per cent $C_8H_5O_7K_3H_3O$.	
	Arsenic, Lead, Oxalate, Sulphate, Acidity or Alkalinity.	..	Conforms to B.P. limit tests.
	Chloride and Tartarate.	..	Does not conform to B.P. limit tests.
4 Tinct. Cardamom Co. B.P.	Alcohol ..	52 to 57 per cent v/v of ethyl alcohol.	Coal tar dye present.
15 Tinctura Nucis Vomicae B.P.	Strychnine ..	0.229 to 0.131 per cent w/v.	24.4 per cent deficient.
	Alcohol ..	43 to 46 per cent v/v.	
16 Ext. Ergotae Liq. B.P., 1948.	Total alkaloids of Ergot calculated as Ergotoxine.	Not less than 0.04 per cent w/v.	90.4 per cent deficient.
	Alcohol ..	Not less than 40.0 per cent v/v.	16.7 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 ingredients estimated.	Strength as declared on label or B.P. requirements.	Result of analysis.
(1)	(2)	(3)	(4)
17 Spiritus Aetheris Nitrosi.	Ethyl Nitrite ..	Not less than 1.25 per cent w/v and not more than 2.5 per cent w/v.	
	Alcohol ..	84 to 87 per cent v/v of Ethyl alcohol.	
	Wt. per mg. at 20°C. ..	0.833 to 0.837 g ..	Does not conform to B.P.
	Acidity.		
18 Ferrous Sulph (Exsiccated).	Ferrous Sulphate ..	Not less than 77.0 per cent.	11.6 per cent deficient.
	Oxysulphate ..	..	Does not conform to B.P. limits.

The percentage of unsatisfactory samples continues to be high, being 25.5 for proprietary and 47.1 for pharmaceutical preparations. In the former category, the following glaring deficiencies in active ingredients call for special mention. 23.0 per cent deficiency of salol in "Taneast", 28.5 per cent deficiency of calcium glycerophosphate in "Vitagol", 41.0 per cent deficiency of Vitamin B1 in "Resotone," and 88.8 per cent deficiency of Potassium Bromide and 79.2 per cent deficiency of Sodium Bromide in "Utresed". The last sample incidentally contained a 55.0 per cent excess of Calcium lactate. In a preparation called "Gripe Dol" one of the declared ingredients, namely, sodium phosphate was totally absent. Most of the abovementioned drugs are highly stable and their deficiency shows that proper care is not taken by the manufacturers.

Regarding pharmaceutical preparations, gross deficiency of alkaloids in alkaloidal tinctures and extracts (total absence in some cases) seems to be the rule rather than the exception. When it is remembered that the pharmacopoeias allow fairly wide limits for alkaloid content such deficiency is indeed surprising and justifies the presumption that such tinctures are intended for use as dilute alcohol only. Of particular interest in this connection is Extractum Ergotae Liquidum. A sample of this preparation was found to be over 90 per cent deficient in the active principle, namely, alkaloids of ergot. Other samples of the extract examined in this laboratory from private sources have been found to be similarly deficient and the question arises as to whether any ergot extract manufactured in India is of standard quality. The storage of raw ergot and its extract requires special care, and although the literature warns that extracts over a year old should not be used, manufacturers ignore these instructions and market ergot preparations which have completely lost their potency, showing their extreme callousness for the welfare of women for whom this extract is prescribed after parturition.

In my last report, I drew attention to defects in labelling. The labelling regulations continue to be violated. There was no mention of the content of magnesium hydroxide on the label of a brand of "Milk of Magnesia". A sample of "Tinct. Cardamom Co." contained a coal tar dye which was not declared on the label. "Syrup Thio-calcium" was labelled as a cure for tuberculosis, such a claim being in contravention of rule 106 of the Drugs Rules.

Drugs from Government hospitals and other institutions.

One hundred and sixty-one drugs were received from Government hospitals and Government institutions. Particulars of these are given in Table XVIII.

REPORT OF THE

TABLE XVIII.

Drugs received from Government hospitals and other institutions

Serial number and name of drug.	Name of ingredients estimated.	Strength as per B.P. or as declared on label.	Result of analysis.
(1)	(2)	(3)	(4)
<i>Government General Hospital, Madras.</i>			
1 Sulphur Precipitatum	Ash	Not more than 0.5 per cent. Insoluble matter in carbon disulphide.	Does not conform to B.P. Specifications.
Vitamin "C" Ampoules.	Vitamin C		65.7 per cent deficiency.
3 Oleum Hydrocarpi	Acid value		8.0 mg. Pot. Hydroxide for 1 g. of the substance.
4 Thyroid Tablets	Iodine as thyroxine.		0.062 per cent.
<i>Government Royapet Hospital, Madras-14.</i>			
5 Mist. Alk. Belladonnae (Dispensary).	Soda Bicarb	10 grs./oz.	74.3 per cent deficiency.
6 Do. (B. Ward)	Soda Bicarb	Do.	19.0 per cent deficiency.
7 Mist. Diaphortica (Dispensary).	Pot. Citras	10 grs./oz.	31.9 per cent deficiency.
	Spt. Amm. Aromatiz.	10 mms./oz.	
	Liq. Amm. Acetatis.	1 dr./oz. or 60 mms.	8.5 per cent deficiency.
8 Do. (B. Ward)	Pot. Citras	10 grs./oz.	40.4 per cent deficiency.
	Liq. Amm. Acetatis	1 dr./oz. or 60 mms.	20.0 per cent deficiency.
9 Mist. Asthmatica (Dispensary).	Pot. Bromid.	5 grs./oz.	10.0 per cent deficiency.
	Amm. Carb	3 grs./oz.	60.6 per cent deficiency.
10 Do. (B. Ward).	Amm. Carb	3 grs./oz.	41.6 per cent deficiency.
11 Mist. Diarrhoea	Kaolin	10 grs./oz.	22.8 per cent deficiency.
12 Mist. Triple Bromide (Dispensary).	Amm. Bromide	5 grs./oz.	25.2 per cent excess.
	Pot. Bromide	5 grs./oz.	338.0 per cent excess.
13 Do. (Ward).	Pot. Bromide	5 grs./oz.	12.6 per cent excess.
	Sod. Bromide	5 grs./oz.	14.8 per cent excess.
14 Mist. Ferri et Amm. Citras (Dispensary).	Ferri et Citras.	10 grs./oz.	208 per cent excess.
15 Mist. Tota Quinine (Dispensary).	Tota Quinine	5 grs./oz.	57.4 per cent excess.
16 Mist. Soda Salicylas	Soda Salicylas	10 grs./oz.	36.0 per cent excess.
	Soda Bicarb	Do.	20.0 per cent deficiency.
17 Mist. Quinine Sulph	Quinine Sulphate	5 grs./oz.	88.0 per cent excess.
18 Mist. Heporal	Shark Liver Oil	1 dram/oz.	53.0 per cent deficiency.
19 Mist. Expectorant Stimulant (Dispensary).	Spts. Aetheris Nitrosi.	10 ms./oz.	100.0 per cent deficiency.
20 Do. (A. Ward)	Do.	Do.	Do.

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TABLE XVIII—cont.

Drugs received from Government hospitals and other institutions—cont.

Serial number and name of drug.	Name of ingredients estimated.	Strength as per B.P. or as declared on label.	Result of analysis.
(1)	(2)	(3)	(4)
<i>Government Royapet Hospital, Madras-14—cont.</i>			
21 Mist. Diaphoretica (Dispensary).	Pot. Nitrate Spts. Aetheris Nitrosi	4 grs./oz. 10 ms./oz.	47.5 per cent deficiency. 100.0 per cent deficiency.
	Liq. Amm. Acetatis.	1 drachm/oz.	25.0 per cent deficiency.
22 Do. (A. Ward).	Pot. Nitrate Spts. Aetheris Nitrosi	4 grs./oz. 10 ms./oz.	37.5 per cent deficiency. Correctly dispensed.
	Liq. Amm. Acetatis.	1 dr./oz.	20.0 per cent deficiency.
23 Mist. Oleum Ricini (Dispensary).	Castor oil	1 dr./oz.	16.0 per cent deficiency.
24 Do. (Sheds.)	Do.	Do.	45.0 per cent deficiency.
25 Mist. Carminativa (Dispensary).	Soda Bicarb	10 grs.	32.0 per cent excess.
	Spts. Amm. Aromat.	10 min.	28.0 per cent deficiency.
	Sod. Bicarb	10 grs.	24.0 per cent deficiency.
26 Do. (B. Ward).	Spts. Amm. Aromat.	10 min.	46.0 per cent deficiency.
27 Mist. Quinine Sulph (Dispensary).	Quinine Sulphate	5 grs.	26.0 per cent excess.
28 Mix. Heporal (B. Ward).	Shark Liver Oil	1 dram/oz.	37.0 per cent deficiency.
	Do.	Do.	51.0 per cent deficiency.
29 Mist. Ol. Murrhas (Dispensary).	Pot. Nitrate	4 grs./oz.	72.5 per cent deficiency.
30 Mist. Diaphortica (A. Ward).	Spts. Amm. Aromatiz.	10 min./oz.	20.5 per cent excess.
	Pot. Nitrate	4 grs./oz.	Correct.
31 Do. (Dispensary).	Spt. Aetheris	10 min./oz.	Ingredients absent.
	Liq. Amm. Acetatis.	1 dram/oz.	Correct.
32 Mist. Soda Bromide (A. Ward).	Sod. Bromide	10 grs./oz.	16.0 per cent deficiency.
33 Do. (Dispensary).	Do.	Do.	15.0 per cent excess.
The following mixtures were found to be correctly dispensed:— Mist. Ferri et Amm. Citras (2), Mist. Pot. Iodide (2), Mist. Hepatica (1), Mist. Totaquinine (1) and Quinine Sulphate (1).			
<i>Government Mental Hospital, Madras.</i>			
34 Vitamin C Ampoules	Ascorbic acid	100 mgs./c.c.	Correct.
<i>Government Stanley Hospital, Madras.</i>			
35 Mist. Quinine Sulphate			Correctly dispensed.
36 Mixture Carminativa	Soda Bicarb	10 grs./oz.	79.0 per cent deficiency.
37 Mix. Pot. Iodide	Pot. Iodide	5 grs./oz.	40.0 per cent deficiency.
	Spt. Amm. Aromatiz.	10 min./oz.	77.0 per cent deficiency.

TABLE XVIII—cont.

Drugs received from Government hospitals and other institutions—cont.

Serial number and name of drug.	Name of ingredients estimated.	Strength as per B.P. or as declared on label.	Result of analysis.
(1)	(2)	(3)	(4)
<i>Government Raja Sir Ramaswami Mudaliar Lying in Hospital, Madras.</i>			
38 Mist. Special Alkaline Dil.	Pot. Citrate	1 dr. in 3 oz.	36.4 per cent deficiency.
	Pot. Acetate	Do.	32.1 per cent deficiency.
	Sod. Bicarb	Do.	20.8 per cent deficiency.
39 Morphine Sulphate Tablets.	Morphine Sulphate.	0.5 gr.	24.0 per cent deficiency.
40 Morphine Sulphate (Ampoules).	Morphine Sulphate.		Correct.
41 Vitamin C (Ampoules)	Vitamin C		Do.
42 Morphine Sulphate Tablets.	Morphine Sulphate.	0.17 gr.	Do.
43 Vitamin C Tablets	Ascorbic Acid	50 mgs.	18.0 per cent deficiency.
44 5 samples of Vitamin C Ampoules.			Two ampoules contained 81.6 per cent mgs. of ascorbic acid in 2 c.c. The contents of the 3rd ampoule on opening were forced out probably due to decomposition. The fourth measured less than a c.c. probably due to loss through a leak.
<i>Government Kasturba Gandhi Hospital for Women and Children, Madras.</i>			
45 Morphine (Ampoules)	Morphine Sulphate.	0.25 grs./c.c.	Correct.
<i>Government Hospital for Women and Children, Egmore, Madras.</i>			
46 Morphine Sulphate (Ampoules).	Morphine Sulphate.	0.25 grs./c.c.	16.0 per cent deficiency.
47 Oleum Menthapip			Not of B.P. Quality.
48 Mist. Alkaline Diuretica.			Correctly dispensed.
49 Mix. Ferri Sulphas	Ferri Sulphas	1½ grs.	44.7 per cent deficiency.
	Acid. Dil. Sulph.	5 mm.	24.0 per cent deficiency.
50 Mix. Influenza	Soda Bicarb	20 grs./oz.	19.0 per cent deficiency.
	Total Ammonia from Amm. Carb.	24.98 grs./oz.	38.2 per cent deficiency.
51 Mix. Ferri Amm. Citras.	Ferri Amm. Citras.	10.0	38.0 per cent deficiency.
<i>King George Hospital, Visakhapatnam.</i>			
52 Mist. Soda Salicylas	Sod. Salicylas	10 grs./oz.	Correctly dispensed.
	Sod. Bicarb	5 grs./oz.	15.2 per cent excess.
53 Mist. Bismuth	Bismuth Carb	10 grs./oz.	32.0 per cent excess.
	Sod. Bicarb	5 grs./oz.	22.0 per cent excess.
54 Mist. Alkaline Belladonna.	Sod. Bicarb	20 grs./oz.	41.5 per cent deficiency.
55 Mist. Quinine Sulphas	Quinine Sulphas	7.5 grs./oz.	14.2 per cent deficiency.
56 Mist. Soda Salicylas	Sod. Salicylate	10 grs./oz.	32.0 per cent deficiency.
	Sod. Bicarb	5 grs./oz.	26.0 per cent excess.
57 Mist. T.P.S.	Cal. Chloride	10 grs./z.	32.0 per cent deficiency.
58 Mist. Infants Ipecac	Amm. Carbonate	8 grs./oz.	13.8 per cent excess.
59 Mist. Bromide	Amm. Bromide	5 grs./oz.	16.0 per cent excess.
60 Mist. Bromide	Pot. Bromide	5 grs./oz.	26.0 per cent excess.

TABLE XVIII—cont.

Drugs received from Government hospitals and other institutions—cont.

Serial number and name of drug.	Name of ingredients estimated.	Strength as per B.P. or as declared on label.	Result of analysis.
(1)	(2)	(3)	(4)
<i>King George Hospital, Visakhapatnam—cont.</i>			
61 Mist. Sodii Salicylas	Sodii Salicylas	10 grs./oz.	17.0 per cent deficiency.
	Sodii Bicarb	5 grs./oz.	22.0 per cent excess.
62 Mist. Alkaline Diuretica.	Pot. Citrate	15 grs./oz.	37.3 per cent deficiency.
63 Mist. Pot. Iodide	Pot. Iodide	10 grs./oz.	Correctly dispensed.
	Amm. Carbonate	4 grs./oz.	20.0 per cent excess.
64 Mist. Sodii Salicylas	Sodii Salicylas	10 grs./oz.	Correctly dispensed.
	Sodii Bicarb	5 grs./oz.	12.0 per cent excess.
65 Mist. Triple Sulphas	Quinine Sulphas	2 grs./oz.	15.0 per cent excess.
	Ferri Sulphas	2 grs./oz.	185.0 per cent excess.
	Acid Sulph Dil.	10 ms./oz.	18.0 per cent excess.
66 Mist. Triple Sulphas	Mag. Sulphas	1 dr./oz.	Correctly dispensed.
	Quinine Sulphas	2 grs./oz.	Do.
	Ferri Sulphas	2 grs./oz.	85.0 per cent excess.
	Acid Sulph Dil.	10 ms./oz.	20.0 per cent excess.
67 Mist. Bromide	Mag. Sulphas	1 dr./oz.	Correctly dispensed.
	Pot. Bromide	5 grs./oz.	74.0 per cent excess.
	Amm. Bromide	5 grs.	100.0 per cent deficiency.
68 Mist. Quinine Sulph	Quinine Sulphate	7.5 grs./oz.	Correctly dispensed.
	Acid Sulph Dil.	10 ms./oz.	67.0 per cent excess.
69 Mist. Sed. Expect	Pot. Iodide	5 grs./oz.	16.0 per cent excess.
	Pot. Bicarb	15 grs./oz.	14.0 per cent excess.
70 Mist. Diaphoretica	Pot. Nitrosi	10 grs./oz.	45.0 per cent deficiency.
	Liq. Amm. Acetas	2 dm./oz.	20.0 per cent deficiency.
	Dil.		Correctly dispensed.
	Spts. Aether Nitrosi.	20 ms./oz.	Do.
71 Mist. Pot. Iodide	Pot. Iodide	10 grs./oz.	18.6 per cent deficiency.
	Liq. Hydrargi chlor.	30 ms./oz.	128.0 per cent excess.
72 Mist. Quinine Sulph	Acid Sulph Dil.	10 mins.	26.0 per cent excess.
73 Mist. Stimulant Expectorant.	Amm. Carbonate	5 grs.	

The following mixtures were correctly dispensed:—

Mist. Soda Salicylas (3), Mist. Pot. Iodide (8), Mist. Sod. Expectorant (1), Mist. Quinine Sulph (3), Mist. Pot. Bromide (1), Mist. Hepatica (1), Mist. Bromide (1), Mist. Alk. Diuretica (1), Mist. Alk. Belladonna (1) and Mist. Asthmatica (1).

Assistant Director (Diagnostic), King Institute, Guindy.

Four ampoules of 25 per cent glucose solution and 1 ampoule of 5 per cent calcium gluconate and 8 samples (ampoules) of quinine bi-hydrochloride were analysed for the content of quinine bi-hydrochloride.

Assistant Director, Vaccine Lymph Section, King Institute, Guindy.

74 Glycerine

Government Milk Factory, Teynampet, Madras.

Two samples of carotene crystals examined were found to be satisfactory.

Conforms to B.P

TABLE XVIII—cont.

Drugs received from Government hospitals and other institutions—cont.

Serial number and name of drug.	Name of ingredient estimated.	Strength as per B.P. or as declared on label.	Result of analysis.
(1)	(2)	(3)	(4)

Stationary Sub-Magistrate, Poonamallee.

Four samples of "French Polish" received were found to contain varying percentage of alcohol and one sample did not contain alcohol.

The Superintendent, Erskine Hospital, Madurai.

A sample of white powder was identified as Phenyl Salicylate (Salol).

Civil Assistant Surgeon, Government Dispensary, Saidapet.

75	Mist. Quinine Sulphas	Quinine Sulphas	5 grs./oz.	24.0 per cent excess.
76	Mist. Bismuth	Bismuth Carb	20 grs./oz.	25.5 per cent excess.
77	Quinine Mixture	Quine Sulphas	5 grs./oz.	Correctly dispensed.

District Medical Officer, Tanjore.

78	Quinine Mixture	Quinine Sulphate	5 grs./oz.	Correct.
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Inspector-General of Prisons, Madras.

Two samples of Quinine Sulphate 1932 B.P. conformed to the B.P.

The Government Headquarters Hospital, Machilipatnam.

79	Mist. Sodii Salicylas	..	..	Correctly dispensed.
80	Mist. Quinine	Quinine Sulphate	..	Do.
		Acid Sulph Dil.	M. 10	25.0 per cent deficiency.

District Medical Officer, West Godavari, Eluru.

81	Mist. Oleum Ricini	..	..	Correctly dispensed.
82	Mist. Bismuth	Soda Bicarb	5 grs.	98.0 per cent deficiency.
83	Mist. Cinchona Febrifuge	Acid Sulph Dil.	5 mins.	71.0 per cent deficiency.

Twenty-two samples of Multi-Vitamin tablets were received from District Health Officers, etc., to examine their potency and fitness for human consumption.

A few comments on the drugs analysed for hospitals may be of interest. Apart from the usual mixtures and injection, etc., from hospitals, a variety of interesting samples was examined during the year. Among these may be mentioned 22 samples of Multi-vitamin tablets sent by officers of the Public Health Department to see whether they retained the potency and were fit for human consumption. They were found to have undergone varying degrees of deterioration, and it was recommended that they might be used up immediately for what they were worth.

Five samples of what was described as "French Polish" submitted by the Stationary Sub-Magistrate, Poonamallee, were analysed and found to contain 21.0, 84.3, 82.7, 87.1 and 0 per cent of alcohol respectively.

Two samples of Carotene crystals intended to be used by the Government Milk Factory, Teyampet, in the preparation of reconstituted milk were analysed and found to be satisfactory.

Nine samples of Quinine Bi-hydrochloride, four of Glucose and one of Calcium Gluconate ampoules prepared at the King Institute were examined and reported on. A sample of Marmite paste and another of "Novastab" from supplies to the King Institute were found to be unsatisfactory.

The Government General Hospital, Madras, submitted a sample of "Thyroid Tablets" which was found to be of standard quality. The analysis of this sample

led to a critical examination of the I.P.L. monograph on thyroid which was found to be defective. The attention of the I.P.L. committee has been drawn to the error in the standards laid down for thyroid in the I.P.L. 1946.

A white powder sent by the Erskine Hospital, Madurai, for identification was found on analysis to be Phenyl Salicylate (Salol).

A sample of Oil of Peppermint from the Women and Children Hospital was found to be unsatisfactory.

A nostrum called "Nergo" which was examined following a complaint from a private citizen to the Minister for Prohibition was found to contain 11.8 per cent potassium bromide and of 22.3 per cent chloral hydrate. The substance was sold as a Homeopathic preparation by Dr. Annamalai, Homeopathic Physician, Madras-21. This is an instance of what the public can do to expose charlatans who carry on a nefarious trade under the cloak of homeopathy and wilfully poison gullible people.

As regards mixtures from hospitals there was a large increase in the number examined during the year under review. Forty-three per cent of them were found to be incorrectly dispensed and such carelessness displayed in compounding calls for stringent action.

A sample of mist triple bromide from the Royapettah Hospital contained 338 per cent of excess of potassium bromide and a 25.2 per cent excess of ammonium bromide. The same hospital submitted mixtures which showed deficiencies of 74.3 per cent of sodium bicarbonate, 31.9 per cent and 40.4 per cent of potassium citras, 47.5 per cent potassium nitrate, 72 per cent of potassium nitrate and an excess of 88 per cent of quinine sulphate in one mixture and of 57.4 per cent of total quinine in another.

Other hospitals have not fared better. A carminative mixture from the Government Stanley Hospital showed a deficiency of 7.0 per cent of sodium bicarbonate. A mist. Special Alkalinechil from the Government Raja Sir Ramaswami Mudaliar Lying-in Hospital, Madras, was deficient in all three ingredients, potassium nitrate (36.4 per cent), potassium acetate (32.1 per cent), sodium bicarbonate (20.8 per cent). A large number of mixtures from the King George Hospital, Visakhapatnam, were found to be inaccurately dispensed. Two samples of triple sulphas contained ferrous sulphate in excess to the extent of 185 per cent and 85 per cent respectively. A bromide mixture contained an excess of 75 per cent potassium bromide but not a trace of the 5 grs. per ounce of the ammonium bromide supposed to be present.

A bismuth mixture from the Eluru Hospital contained practically no sodium bicarbonate though it was declared to contain 5 grs. of the drug per ounce. Two samples from the Women and Children Hospital, Egmore, Madras, Mist. Ferri Sulphas and Mist. Ferri Ammonium. Citras were deficient in the respective iron compounds to the extent of 44.7 per cent and 38 per cent respectively.

Table XIX gives the number and nature of drugs analysed for private firms.

TABLE XIX.

Name of drug.	Number received.	Name of drug.	Number received.
1 Eucalyptus oil	1	9 Bismuth carbonate	2
2 Sulfaguanidine	1	10 Calcium carbonas	1
3 Sulfapyridine	1	11 Riboflavin	1
4 Glucose	1	12 Ext. Ergotal Liq. B.P.	1
5 Hydrogen per oxide	2		
6 Quinine mixture	1		24
7 Neurona B. complex	1		
8 Sodium hydrosulphite	11		

A sample of Eucalyptus oil from a firm in Ootacamund conformed to the requirements of the I.P.L. 1946 except in respect of optical rotation. The samples of Sulfapyridine, Sulphaguanidine Glucose and 2 samples of Hydrogen per oxide conformed to B.P. standards of purity. The quinine mixture was correctly dispensed.

A sample of Neurona B complex which was said to have been taken from a damaged consignment was analysed and found to be deficient to the extent of 25 to 60 per cent in the following ingredients; Thiamine Hydrochloride, Riboflavin, Nicotinic acid amide, Calcium lactate, Manganese glycerophosphate and alcohol.

Eleven samples of sodium hydrosulphite were found to contain sodium hydrosulphite ranging from 24.9 to 84.0 per cent. Of the two samples of Bismuth carbonate one did not conform to the B.P. requirements in that it was deficient in Bismuth content and had excessive alkalinity; the other sample conformed to B.P.

A sample of calcium carbonate received from a firm did not conform to the B.P. in respect of limit of iron content and matter insoluble in hydrochloric acid.

The ampoules of riboflavin contained 5 mg. of riboflavin. The sample of Ergot Ext Liq. was deficient in total alkaloids to the extent of 62.5 per cent.

XII. MISCELLANEOUS.

The Government Analyst gave evidence for the prosecution in the Sub-Magistrate's Court, Udumalpet, in a case in which the Udumalpet Co-operative Milk Supply Society was charged by Udumalpet Municipality for selling adulterated milk, the case finally ending in the conviction of the society to a fine of Rs. 25.

The Government Analyst also gave expert evidence in connection with O.S. No. 2 of 1950 on the file of Sub-Court, Tiruchirappalli, and O.S. No. 451 of 1950 in the Court of the District Munsif, Tiruchirappalli. These cases related to adulterated ghee samples taken out of the stock supplied by contractors to the South Indian Railway Grain Shops in 1948.

The Government Analyst continued to serve as a member of the Expert Committee appointed by the Government of India to revise the Agmark Standards for ghee and butter and also attended a meeting of the Central Committee for Food Standards at New Delhi in August 1951.

The Government Analyst suggested amendments to the Draft Prevention of Food Adulteration Bill which is to be introduced in Parliament by the Government of India.

A Chemist of the Central Government studied the methods of estimating residual fumigants in food in the Government Analyst's Laboratory for a week after being permitted to do so by the Director of Medical Services.

THE KING INSTITUTE, GUINDY, MADRAS
18th September 1952.

S. NARAYANA AYYAR,
Government Analyst.

APPENDIX A.

Number of samples received and found adulterated from municipalities and panchayat boards working the Madras Prevention of Adulteration Act.

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)
1. Anantapur district.											
1	Anantapur .. M.	72	70	52	74.3	49	44	8	3	..	..
2	Hindupur .. M.	72	72	39	54.1	40	30	7	3	..	..
3	Guntakal .. M.	48	49	31	63.2	20	16	2	3	..	..
4	Tadpatri .. M.	48	46	22	47.8	38	21	2	1	..	..
5	Dharmavaram .. Pt.	48	48	30	62.4	39	26	8	1	..	..
6	Gooty .. Pt.	48	52	29	55.8	33	23	7	3	..	..
7	Kadiri .. Pt.	48	57	32	56.1	45	24	5	4	4	3
8	Panukonda .. Pt.	48	52	15	28.8	8	2	15	3	..	..
9	Uravakonda .. Pt.	48	49	15	30.6	13	9	10	3	..	..
Total ..		495	265	53.5	285	195	64	22	4	3	..
2. North Arcot district.											
10	Veiloro .. M.	144	144	65	45.1	86	51	18	4	3	3
11	Tiruvannamalai .. M.	72	73	35	47.9	48	32	2	..	..	..
12	Tirupattur .. M.	48	49	8	16.3	15	4	8	1	..	..
13	Gudiyattam .. M.	48	48	25	52.1	40	23	5	2	..	..
14	Vaniyambadi .. M.	48	48	31	64.6	37	29	3	1	..	..
15	Walajapet .. M.	48	48	1	2.1	10	1	2	..	..	..
16	Ambur .. M.	48	48	31	64.6	38	29	4	2	..	..
17	Aeri .. M.	48	48	14	29.2	30	10	3	1	1	1
18	Arcot .. Pt.	48	47	17	36.2	32	16	4	..	1	..
19	Arkonam .. Pt.	48	53	40	75.5	49	40	1	..	..	..
20	Ranipet .. Pt.	48	43	22	46.8	34	21	1	..	1	..
Total ..		654	289	41.2	419	256	51	11	6	4	..
3. South Arcot district.											
21	Cuddalore .. M.	144	145	78	53.8	103	70	8	1	4	4
22	Chidambaram .. M.	96	98	34	34.7	32	25	7	2	1	1
23	Villupuram .. M.	96	96	20	20.9	39	15	3	3	1	..
24	Thudivanam .. M.	48	58	24	41.4	38	18	7	3	..	..
25	Bhuvanagiri .. Pt.	48	49	25	51.0	41	22	..	..	3	3
26	Kallakurichi .. Pt.	48	57	29	50.9	53	28	1	..	..	..
27	Nellikuppam .. Pt.	48	48	12	25.0	30	10	2	..	..	..
28	Panruti .. Pt.	48	49	11	23.0	40	11	..	..	..	..
29	Tirukkoyilur .. Pt.	48	48	13	27.1	11	5	5	3	1	1
30	Vriddhachalam .. Pt.	48	65	34	52.3	51	32	2	1	2	1
Total ..		713	280	39.3	438	236	35	13	12	10	..
4. Bellary district.											
31	Bellary .. M.	144	146	60	41.1	62	37	12	2	10	4
32	Adoni .. M.	96	99	65	65.7	42	31	5	5	28	21
33	Hospet .. M.	96	99	45	45.5	41	28	7	3	13	7
34	Harpanahalli .. Pt.	48	51	30	58.8	25	19	..	..	21	10
35	Rayadurg .. Pt.	48	47	20	42.5	35	16	4	1	..	..
36	Yemmiganur .. Pt.	48	49	26	53.1	31	20	15	6	..	..
Total ..		491	246	50.1	236	151	43	17	72	42	..

DIX A.

and panchayat boards working the Madras Prevention of Adulteration Act 1951-52.

Gingelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Turmeric.		Dhalls and flours.		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	..	6	1	..	..	1	..	..	..	..	..	5	4
..	..	6	..	1	..	6	..	..	..	3	..	9	6
1	..	6	..	..	..	5	4	..	..	1	..	14	10
1	..	2	..	..	..	1	..	..	..	..	..	2	..
..	..	..	..	..	..	1	..	..	..	..	..	1	1
..	..	1	..	..	..	1	..	..	..	..	..	6	2
..	..	5	3	..	..	1	..	..	..	..	..	1	1
2	..	4	..	1	..	10	4	..	..	1	..	10	5
..	..	7	..	2	..	7	3	..	..	2	..	8	..
5	..	37	4	5	1	32	11	..	..	..	..	56	29
13	1	6	..	1	..	6	1	..	..	..	..	8	4
8	2	8	..	4	1	..	..	..	..	2	..	1	..
6	..	11	1	5	..	1	..	..	..	2	..	..	..
2	..	..	..	1	..	..	..	..	..	..	..	..	..
1	..	4	..	..	..	1	..	..	..	..	..	1	..
21	..	10	..	2	..	..	..	..	..	2	..	1	..
2	..	2	..	1	..	..	..	..	..	1	..	..	..
6	1	6	..	..	..	2	..	..	..	..	..	..	..
8	1	..	..	..	..	2	1	..	..	..	..	..	..
..	..	1	..	..	..	1	..	..	..	1	..	..	..
4	1	1	..	6	..	1	..	..	..	..	..	..	..
71	6	49	1	20	1	16	5	..	..	11	2	11	4
20	..	6	..	..	..	4	3	..	..	..	..	..	..
39	5	7	..	2	..	8	1	..	..	..	..	2	..
22	..	14	1	6	..	4	..	..	..	..	..	7	1
10	3	..	..	1	..	1	..	..	..	..	..	1	..
3	..	1	..	..	..	1	..	..	..	..	..	..	..
2	1	1	..	..	..	..	..	..	..	..	..	..	..
9	..	4	..	..	..	3	2	..	..	..	..	..	..
1	..	2	..	..	..	3	..	..	..	..	..	3	..
12	..	11	3	1	..	5	1	..	..	..	..	2	..
1	..	3	..	..	..	..	..	1	..	..	..	5	..
119	9	49	4	10	..	29	7	1	..	..	..	20	1
3	..	19	2	4	..	10	2	..	..	2	..	24	13
1	..	7	..	3	..	4	3	..	..	..	..	9	5
3	..	7	..	7	..	7	2	..	..	3	..	11	5
..	..	1	..	..	..	2	..	..	..	..	..	1	1
..	..	6	2	..	..	1	1	..	..	..	..	1	..
..	..	3	..	..	..	..	..	..	..	..	..	..	..
7	..	43	4	14	..	24	8	..	..	6	..	46	24

APPENDIX
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	298	188	63.1	169	137	30	9	34	19	
38 Erode .. M.	96	99	56	56.6	50	37	26	11	1	..	
39 Pollachi .. M.	120	158	121	76.6	100	89	2	2	..	..	
40 Tiruppur .. M.	96	113	59	52.2	70	45	9	..	..	..	
41 Udamalpet .. M.	96	96	46	47.9	57	35	1	..	..	..	
42 Dharapuram .. M.	48	48	21	43.7	29	17	2	..	..	..	
43 Mettupalayam. M.	48	50	39	78.8	33	32	1	1	..	..	
44 Gobichettipala- yam. M.	48	50	36	72.0	37	32	1	..	..	..	
45 Avanashi .. Pt.	48	68	43	63.3	41	26	..	..	1	..	
46 Bhavani .. Pt.	48	45	17	37.8	28	14	1	..	..	..	
47 Kurichi .. Pt.	48	52	45	86.6	45	40	..	..	..	..	
48 Satyamangalam. Pt.	48	49	27	55.1	31	18	..	..	..	..	
Total ..	1,126	698	62.0	690	522	73	23	37	20	..	
6. Chingleput district.											
49 Kanchepuram. M.	144	192	103	53.6	133	92	8	3	..	..	
50 Chingleput .. M.	48	49	21	42.9	31	19	4	1	..	..	
51 Tiruvallur .. M.	48	48	32	66.6	30	24	5	3	1	..	
52 Alandur .. Pt.	48	50	24	48.0	25	12	6	6	..	1	
53 Madurantakam. Pt.	48	48	19	39.6	34	16	3	2	..	..	
54 Poonamallee .. Pt.	48	48	26	54.2	21	15	2	..	..	..	
55 Tiruvottiyur .. Pt.	48	53	26	48.1	12	5	2	..	..	..	
56 Sriperumbudur. Pt.	..	22	9	40.9	7	4	4	3	..	..	
Total ..	510	260	51.8	293	187	34	18	1	1	..	
7. Chittoor district.											
57 Chittoor .. M.	48	47	26	55.3	31	22	1	..	..	..	
58 Tirupati .. M.	48	48	24	50.0	37	21	1	..	..	..	
59 Kalahasti .. Pt.	48	48	26	54.2	25	21	8	4	..	..	
60 Kuppam .. Pt.	48	55	26	47.3	46	20	2	1	..	..	
61 Madanapalle .. Pt.	48	48	21	43.8	22	14	4	2	..	..	
62 Madanapalle (Sanatorium). Pt.	48	49	38	77.5	49	38	..	..	..	..	
63 Palmaner .. Pt.	48	51	17	33.3	41	14	..	..	..	..	
64 Punganur .. Pt.	48	48	19	39.6	20	14	2	..	..	..	
65 Puttur .. Pt.	48	49	19	38.8	34	16	..	..	..	..	
66 Tirumalai Hills Pt.	48	16	4	25.0	2	1	2	1	1	1	
67 Tiruttani .. Pt.	48	49	21	42.9	29	17	1	1	..	..	
68 Vayalpad .. Pt.	48	51	16	31.4	22	10	2	1	..	..	
Total ..	559	257	46.0	358	208	23	10	1	1	..	
8. Cuddapah district.											
69 Cuddapah .. M.	96	96	46	47.9	72	40	6	3	3	1	
70 Proddatur .. M.	72	74	18	24.3	32	16	15	2	1	..	
71 Badvel .. Pt.	48	48	7	14.6	5	..	..	..	..	..	
72 Jammalamadugu. Pt.	48	48	10	20.8	1	1	18	4	..	..	
73 Pulivendla .. Pt.	48	48	10	20.8	1	1	5	2	..	..	
74 Rajampot .. Pt.	48	50	16	32.0	18	8	2	2	..	..	
75 Rayachoti .. Pt.	48	38	19	50.0	18	12	2	1	..	..	
Total ..	402	126	31.3	147	78	48	14	4	1	..	

DIX A—cont.

and panchayat boards working the Madras Prevention of Adulteration Act 1951-52—cont.

Gingelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Turmeric.		Dhalls and flours.		Miscellaneous.*	
Total. (12)	Adulterated. (13)	Total. (14)	Adulterated. (15)	Total. (16)	Adulterated. (17)	Total. (18)	Adulterated. (19)	Total. (20)	Adulterated. (21)	Total. (22)	Adulterated. (23)	Total. (24)	Adulterated. (25)
14	3	5	..	2	1	20	11	..	..	..	..	24	8
2	..	7	..	..	..	5	1	..	..	..	..	8	7
1	..	1	..	..	..	10	8	4	4	..	..	39	17
8	..	5	..	1	..	3	..	..	..	..	..	17	14
5	..	5	..	1	..	12	5	..	..	1	..	14	5
7	2	2	..	..	..	5	1	..	..	1	..	2	1
6	1	..	..	..	..	5	3	..	..	..	..	5	2
2	..	2	..	..	..	2	..	1	..	..	..	5	4
1	..	1	..	..	..	7	3	1	1	1	..	15	13
3	..	..	..	1	..	6	1	..	..	1	..	5	2
3	..	1	..	..	..	2	1	..	..	..	..	5	4
3	..	1	..	..	..	4	1	..	..	1	..	9	8
52	6	29	..	5	1	81	35	6	5	5	..	148	86
30	7	11	..	3	1	7	..	..	..	..	..	..	..
3	1	8	..	1	..	1	..	..	..	..	..	1	..
6	4	5	..	..	..	1	..	..	..	..	..	..	..
10	4	3	..	..	..	3	..	1	1	1	..	1	1
4	1	4	..	3	..	..	..	2	2	1	..	..	..
16	9	3	..	2	..	1	..	2	2	1	..	..	..
6	..	18	15	8	3	2	1	..	..	..	..	3	2
7	1	1	..	1	..	1	..	1	1	..	..	..	..
84	27	53	15	18	4	16	1	4	4	2	..	5	3
6	..	..	..	1	1	3	1	..	..	3	1	2	1
5	..	3	1	..	..	1	1	..	..	..	..	1	1
2	..	2	..	4	..	3	1	..	..	1	..	3	..
7	1	7	..	..	..	8	4	..	..	1	1	4	4
..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	3	1	2	1	2	..	..	..	..	..	3	1
2	..	9	1	4	..	3	..	..	..	1	1	7	3
3	1	3	..	1	..	1	..	..	..	1	..	6	..
5	..	1	..	..	..	2	..	..	..	1	..	2	1
9	3	4	..	2	..	3	..	..	..	..	..	1	..
3	..	6	..	..	..	9	1	..	..	..	..	9	4
42	5	40	3	14	2	35	8	..	..	8	3	38	17
3	..	3	..	..	..	7	1	..	..	..	..	2	1
..	..	7	..	..	..	19	..	..	..	..	..	..	..
3	..	10	..	7	..	3	1	1	1	6	..	13	5
1	..	5	..	..	..	4	..	..	..	9	1	10	4
..	..	8	..	4	..	9	2	3	2	7	1	10	2
3	..	6	1	2	..	4	..	1	1	3	..	11	4
..	..	3	..	5	..	5	3	2	1	1	1	2	1
10	..	42	1	18	..	51	7	7	5	26	3	48	17

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 Kakinda .. M.	288	289	177	61.3	183	163	38	10	1	1
77 Rajahmundry .. M.	216	242	185	76.5	189	174	12	7	1	1
78 Peddapuram .. M.	72	72	24	33.3	29	20	2	2	1	1
79 Amalapuram .. M.	96	96	51	53.1	59	46	5	..	..	..
80 Mandapeta .. Pt.	48	47	21	44.7	19	17	..	..	..	..
81 Pithapuram .. Pt.	48	46	20	50.0	31	15	4	3	3	3
82 Samalkot .. Pt.	48	41	24	58.5	26	22	..	..	..	..
83 Ramachandrapuram .. Pt.	48	43	20	46.5	25	17	5	2	2	1
84 Razole .. Pt.	48	48	25	52.1	22	17	4	1	..	..
85 Tuni .. Pt.	48	48	23	47.9	24	19	1	1	..	..
Total ..	966	570	59.0	607	500	77	26	8	6	6

10. West Godavari district.

86 Eluru .. M.	144	144	93	64.6	118	84	6	2	1	..
87 Bhimavaram .. M.	48	48	31	64.6	24	21	7	5	1	..
88 Palacole .. M.	48	48	30	62.5	32	27	4	2	..	..
89 Akiyida .. Pt.	48	48	8	16.7	15	5	3	1	..	..
90 Kovvur .. Pt.	48	48	30	62.5	33	27	2	1	..	..
91 Narsapur .. Pt.	48	53	39	73.6	37	28	14	11	..	..
92 Nidadavole .. Pt.	48	51	33	64.7	35	29	2	1	1	1
93 Polavaram .. Pt.	48	49	15	29.2	10	9	8	1	..	..
94 Tadepalligudem .. Pt.	48	48	22	45.8	19	16	4	1	..	..
95 Tanuku .. Pt.	48	52	29	56.9	33	26	1	..	2	1
Total ..	589	330	56.0	356	272	54	25	5	3	3

11. Guntur district.

96 Guntur .. M.	288	287	123	42.9	89	70	75	25	17	9
97 Ongole .. M.	96	96	33	34.4	18	11	35	9	1	..
98 Chirala .. M.	96	97	55	56.7	40	28	1	..	40	21
99 Tenali .. M.	96	96	59	61.5	46	43	..	..	26	13
100 Narasaraopet .. M.	48	48	16	33.3	15	14	1	..	2	1
101 Bapatla .. M.	48	16	8	50.0	12	8	1	..	..	..
102 Mangalagiri .. Pt.	48	52	35	67.3	23	18	4	2	..	..
103 Ponnur .. Pt.	24	24	11	45.8	2	2	1	..	3	2
104 Nidubrolu .. Pt.	24	24	8	33.3	5	4	1	1	2	1
105 Repalle .. Pt.	48	47	15	31.9	25	10	..	..	8	2
106 Sattenapalle .. Pt.	48	48	11	22.9	8	7	3	..	3	..
107 Vetapalem .. Pt.	48	48	9	18.8	4	3	6	..	1	1
Total ..	883	383	43.4	287	218	128	37	103	50	50

12. South Kanara district.

108 Mangalore .. M.	216	266	142	53.4	178	113	9	7	1	..
109 Udipi .. M.	48	48	32	66.6	35	27	1	..	..	..
110 Kasaragod .. Pt.	48	48	26	54.2	36	19	..	..	1	..
Total ..	362	200	55.3	249	159	10	7	2	..	..

DIX A—cont.

and panchayat boards working the Madras Prevention of Adulteration Act 1951-52—cont.

Glugelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Turmeric.		Dholls and flours.		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)
18	..	14	..	1	..	6	..	..	..	3	..	25	13
4	1	15	1	8	..	7	..	1	1	3	..	2	1
8	..	11	..	4	..	4	..	..	..	2	..	6	1
10	..	7	..	..	..	7	..	..	..	..	..	8	3
6	..	9	..	4	..	2	1	..	..	1	..	3	..
..	..	1	..	..	..	2	1	..	..	..	..	2	1
2	..	8	1	..	..	2	..	..	..	1	..	2	..
5	..	1	..	2	..	3	..	..	..	..	..	..	..
3	1	2	..	3	1	4	2	3	3	1	..	6	..
1	..	3	..	2	..	5	1	..	..	..	..	12	2
57	2	71	2	24	1	42	7	4	4	11	..	65	21
5	2	1	..	4	2	6	2	..	..	1	..	2	..
4	..	4	1	2	2	..	..	..	..	1	1	5	1
3	..	..	..	2	..	2	..	..	..	..	..	5	1
6	2	15	..	..	..	4	..	..	..	1	..	4	..
6	..	1	..	1	..	3	1	..	..	2	1	..	..
1	..	..	..	..	..	..	..	1	..	..	..	1	..
1	..	4	..	..	..	..	..	1	1	..	..	7	1
7	..	6	..	1	..	7	2	..	..	1	..	8	2
3	..	6	..	1	..	4	2	..	..	3	1	8	2
2	..	1	..	2	..	3	..	..	..	1	..	7	2
34	4	38	1	13	4	29	7	2	2	10	3	47	9
28	2	27	1	11	..	15	5	3	2	7	..	15	9
1	..	11	..	..	..	4	..	..	..	5	3	21	10
1	..	4	..	1	1	1	1	..	..	3	3	6	1
3	..	2	..	4	..	4	2	..	..	4	1	7	..
7	..	12	..	..	..	4	1	..	..	1	..	6	..
1	..	1	..	..	..	1	..	..	..	..	..	..	..
2	1	2	..	..	..	8	5	..	..	2	2	11	7
7	3	2	..	1	..	2	..	4	4	1	..	1	..
1	..	3	..	3	..	2	..	5	2	1	..	1	..
4	..	1	..	..	..	4	1	1	1	..	..	4	1
7	..	9	..	10	1	..	..	..	..	5	2	3	1
4	..	9	..	5	..	3	1	..	..	6	1	10	3
66	6	83	1	35	2	48	16	13	9	35	12	85	32
11	1	18	..	..	..	25	9	1	1	..	..	23	11
..	..	1	..	..	..	4	3	5	1	..	..	2	1
1	..	1	..	..	..	1	1	..	..	..	..	8	6
13	1	20	..	..	..	30	13	6	2	..	..	33	18

APPENDIX

Number of samples received and found adulterated from municipalities during

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)
13. Krishna district.										
111 Vijayavada .. M.	360	360	224	62.2	249	188	21	12	15	8
112 Masulipatnam .. M.	144	144	65	45.1	48	37	43	19	3	1
113 Gudivada .. M.	95	95	39	41.1	55	29	2	1	4	1
114 Avanigada .. Pt.	..	36	4	11.1	5	3	..	..	1	1
115 Jaggayyapet .. Pt.	48	48	36	75.0	35	31	2	2	..	..
116 Nuzvid .. Pt.	48	51	32	62.7	24	19	5	4	..	..
117 Tiruvur .. Pt.	48	49	17	34.7	27	14	5	1	..	..
Total ..	783	417	53.4	443	321	78	39	23	11	..

14. Kurnool district.

118 Kurnool .. M.	96	95	34	35.6	47	24	17	3	..	..
119 Nandyal .. M.	72	72	49	68.0	38	38	..	..	..	..
120 Dhono .. Pt.	48	48	11	22.9	22	5	10	4	..	..
121 Giddalore .. Pt.	48	48	9	18.8	6	4	..	..	..	..
122 Markapur .. Pt.	48	48	14	29.2	15	10	5	1	..	..
Total ..	311	117	37.6	128	81	36	8	..	..	..

15. Madurai district.

123 Madurai .. M.	1,206	1,198	371	31.0	876	310	10	4	17	1
124 Dindigul .. M.	96	98	61	63.5	80	59	5	4	..	..
125 Pahn .. M.	96	96	60	62.5	63	42	4	3	..	..
126 Bodinayakanur .. M.	72	72	29	40.3	49	23	..	..	..	..
127 Kodakkanal .. M.	48	60	14	23.3	48	13	..	..	..	..
128 Periyakulam .. M.	48	48	24	50.0	25	16	3	2	2	2
129 Allinagaram .. Pt.	48	48	21	43.8	20	16	2	1	..	..
130 Ayakudy .. Pt.	48	40	3	7.5	25	3	..	..	..	..
131 Batlagundu .. Pt.	48	48	7	14.6	8	..	3	2	..	..
132 Chinnamanur .. Pt.	48	50	23	46.0	24	18	..	1	..	..
133 Gumbum .. Pt.	48	51	10	19.6	34	5	..	..	..	..
134 Melur .. Pt.	48	50	21	42.0	36	17	4	2	..	..
135 Nilakkottai .. Pt.	48	47	14	29.8	25	11	..	..	..	..
136 Sholavandan .. Pt.	48	50	11	22.0	17	9	..	..	..	..
137 Tirumangalam .. Pt.	48	48	19	39.6	31	18	1	..	..	..
138 Usilampatti .. Pt.	48	48	14	29.2	19	14	..	..	..	..
Total ..	2,052	705	34.4	1,380	574	34	19	19	16	..

16. Malabar district.

139 Kozhikode .. M.	288	290	127	43.8	154	90	33	3	10	6
140 Palghat .. M.	144	143	72	48.6	104	55	3	1	..	..
141 Cannanore .. M.	96	96	57	59.4	47	33	6	3	4	2
142 Cochin .. M.	48	48	11	22.9	10	7	..	..	..	..
143 Tellicherry .. M.	72	72	38	50.0	36	27	13	2	2	..
Total ..	654	303	46.3	351	212	55	9	16	8	..

DIX A—cont.

and panchayat boards working the Madras Prevention of Adulteration Act 1951-52 cont.

Gingelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Turmeric.		Dhalls and flour.		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)
17	5	13	1	13	1	14	8	..	..	8	..	10	1
15	2	11	3	1	..	9	1	6	2	..	..	8	..
11	2	3	..	2	..	10	3	1	..	2	..	5	1
3	..	6	..	6	..	1	..	..	..	4	..	10	..
2	2	5	..	3	..	..	..	..	..	..	..	1	1
9	4	..	..	2	..	5	2	2	2	..	..	4	1
3	1	1	..	4	..	4	1	..	..	..	..	5	..
60	16	39	4	31	1	43	15	9	4	14	..	43	4

..	..	18	3	..	..	5	..	..	..	1	..	7	4
2	..	7	..	..	..	17	9	..	..	1	..	7	2
..	..	8	..	2	..	4	1	..	..	..	..	2	1
3	..	14	..	2	..	9	3	..	..	3	1	7	1
2	..	10	..	5	..	1	1	..	..	4	1	6	1
7	..	57	3	9	..	36	14	..	..	9	2	29	9

115	5	54	..	1	..	105	33	1	..	5	1	14	4
7	1	2	..	..	..	4	..	..	..	..	..	..	..
6	..	1	..	..	..	13	9	..	..	2	..	7	6
6	..	1	..	..	..	8	2	4	2	..	..	4	2
4	..	1	..	1	..	6	1	..	1	..	..	..	..
7	..	3	..	1	..	4	3	1	..	..	..	2	..
6	1	3	..	..	..	8	1	..	..	..	..	9	2
7	..	7	..	1	..	..	..	..	..	..	..	..	..
10	..	7	..	..	..	7	1	1	1	5	2	7	1
13	3	2	1	..	..	2	..	..	..	1	..	6	..
2	..	2	..	1	..	5	2	..	..	3	2	4	1
4	..	2	1	..	..	2	..	..	..	..	..	2	1
9	..	4	..	..	..	5	2	2	1	2	..	..	..
13	..	7	..	8	..	3	2	..	..	..	..	2	..
4	..	2	..	1	..	4	..	..	..	1	1	4	..
13	..	8	..	..	..	3	..	..	..	..	..	5	..
226	10	106	2	14	..	179	56	9	5	19	6	66	17

14	..	6	..	1	..	17	14	..	..	4	..	51	14
4	..	3	..	..	..	11	7	..	..	..	..	23	9
5	..	3	..	..	..	3	2	3	2	..	..	25	15
11	1	20	..	1	..	..	..	..	..	..	..	6	3
2	..	6	..	..	..	1	..	..	..	..	..	12	7
30	1	38	..	2	..	32	23	3	2	4	..	117	48

APPENDIX

Number of samples received and found adulterated from municipalities during

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)
17. Nellore district.										
144 Nellore .. M.	144	144	77	53.5	81	61	29	8	..	..
145 Gudur .. M.	48	48	33	68.8	22	22	6	5	..	..
146 Kandukur .. Pt.	48	48	16	33.3	13	10	23	4	..	..
147 Kovur .. Pt.	48	43	23	53.5	26	19	3	3	..	..
148 Kavali .. Pt.	48	46	18	39.1	18	8	7	3	..	..
159 Nayudupet .. Pt.	48	48	18	37.5	20	15	3	2	..	..
150 Sulurpot .. Pt.	48	49	19	38.8	27	11	2	1	..	..
151 Venkatagiri .. Pt.	48	48	15	31.3	23	12	2	2	..	..
Total ..	474	219	46.2	230	161	75	28	..	..	..
18. Ramanathapuram district.										
152 Virudhunagar .. M.	96	96	26	27.1	45	23	1	..	..	..
153 Karaikudi .. M.	96	99	48	48.5	71	47	2	..	..	..
154 Devakottai .. M.	72	72	29	40.3	40	22	5	4	..	..
155 Rajapalayam .. M.	72	75	29	38.7	39	25	2	..	..	..
156 Srivilliputtur .. M.	72	73	18	24.7	34	12	2	..	..	..
157 Aruppukottai .. M.	48	49	9	18.4	19	7	..	..	2	..
158 Sivakasi .. M.	48	48	16	33.3	31	8	..	..	..	..
159 Mudukulattur .. Pt.	..	22	8	36.4	10	6	..	..	..	..
160 Kilakarai .. Pt.	48	47	10	21.3	28	9	..	..	..	..
161 Kandamur .. Pt.	48	47	11	23.4	25	11	1	..	..	..
162 Pallathur .. Pt.	48	48	13	27.1	40	11	2	1	..	..
163 Paramakudi .. Pt.	48	54	27	50.0	32	21	..	..	..	..
164 Ramanathapuram.	48	50	16	32.0	26	11	2	1	..	..
165 Ramoswaram .. Pt.	48	49	19	38.8	47	19	1	..	..	..
166 Sattur .. Pt.	48	51	19	37.2	43	17	..	..	..	..
167 Sivaganga .. Pt.	48	48	26	54.2	46	26	..	..	..	..
168 Tirupattur .. Pt.	48	47	20	42.6	36	18	..	..	..	..
169 Venkateswaram.	..	5	2	40.0	1	1	..	..	..	..
170 Kanneseri* .. Nil.	..	..	..	..	..	..	..	..	..	..
* For festival only. Total ..	980	348	35.5	613	294	18	6	2	..	..
19. Nilgiris district.										
171 Ootacamund .. M.	216	229	126	55.0	133	83	13	7	..	..
172 Coonoor .. M.	144	144	64	44.4	95	45	7	3	..	..
173 Kotagiri .. Pt.	48	49	18	36.7	37	16	..	..	13	4
Total ..	422	208	49.3	265	144	20	10	14	..	4
20. Salem district.										
174 Salem .. M.	288	378	207	54.8	314	194	12	3	2	1
175 Rasipuram .. M.	48	48	40	83.3	45	40	..	..	..	..
176 Dharmapuri .. Pt.	48	48	23	47.9	21	18	..	..	..	..
177 Harur .. Pt.	..	50	41	82.0	41	39	1	..	..	..
178 Idappadi .. Pt.	48	45	16	35.5	32	13	1	..	..	..
179 Namakkal .. Pt.	48	48	43	89.6	43	43	..	..	..	..
180 Shevaroyas .. Pt.	48	45	9	20.0	32	7	2	..	..	..
181 Tiruchengode .. Pt.	48	48	26	54.2	34	23	..	..	..	..
Total ..	710	405	57.1	562	377	16	3	2	..	1

DIX A—cont.

and panchayat boards working the Madras Prevention of Adulteration Act 1951-52—cont.

Gingelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Turmeric.		Dhalls and flour.		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)
10	1	5	..	1	..	1	..	3	1	3	1	11	5
4	..	5	..	..	..	2	..	..	..	..	..	9	6
..	..	4	..	2	1	1	..	..	..	1	..	4	1
3	..	4	..	1	..	5	..	..	..	..	..	1	1
3	..	2	..	1	..	2	1	..	..	1	..	12	6
6	..	8	..	4	..	..	..	..	..	3	..	4	1
8	4	13	..	1	..	4	..	..	..	..	..	4	..
4	1	13	..	3	..	1	..	..	..	..	..	2	..
38	6	44	..	13	1	16	1	3	1	8	1	47	20
25	1	9	..	7	..	5	..	..	..	..	..	4	2
7	..	10	..	3	..	3	..	..	..	..	..	3	..
7	..	7	..	4	..	5	8	..	..	..	..	4	..
12	1	6	..	1	..	8	2	..	..	..	..	7	1
11	..	5	..	..	..	8	4	1	1	2	1	8	..
8	..	15	..	..	..	3	1	..	..	..	..	4	1
8	1	2	1	1	1	2	2	3	3	..	..	1	..
7	2	4	..	..	..	..	..	..	..	..	..	1	..
5	1	6	..	3	..	1	..	..	..	..	..	4	..
6	..	6	..	1	..	2	..	..	..	..	..	6	3
1	..	2	..	..	..	1	..	..	..	..	..	2	1
3	..	9	2	..	..	8	4	..	..	..	..	2	..
5	..	8	1	..	..	1	..	..	..	..	..	8	3
1	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	1	..	..	..	..	..	..	..	..	..	4	2
1	..	1	..	..	..	..	..	..	..	..	..	..	..
2	..	3	..	..	..	1	..	..	..	..	..	5	2
2	1	2	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..
114	7	96	4	20	1	48	16	4	4	2	1	63	15
8	..	..	..	1	..	34	17	..	..	2	..	38	19
5	1	..	..	1	1	16	10	..	..	..	..	7	..
3	1	1	..	..	..	4	1	..	..	..	..	3	..
16	2	1	..	2	1	54	28	..	..	2	..	48	19
23	4	6	1	2	..	7	2	..	..	4	..	8	2
1	..	2	..	..	..	..	..	..	..	..	..	..	..
6	..	6	..	..	..	4	1	..	..	3	2	8	2
3	..	..	..	2	..	..	..	..	..	2	2	1	..
7	1	2	..	..	..	2	1	..	..	..	..	1	..
3	..	..	..	..	..	1	..	..	..	..	..	1	1
6	..	1	..	..	..	4	2	..	..	..	..	1	..
6	..	2	..	..	..	3	2	..	..	1	..	..	..
55	5	19	1	4	..	21	8	..	..	10	4	21	6

APPENDIX

Number of samples received and found adulterated from municipalities during

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)
21. Tanjore district.										
182 Tanjore .. M.	216	216	134	62.0	151	110	5	3	19	17
183 Kumbakonam .. M.	144	165	73	44.2	139	65	4	3	4	3
184 Nagapattinam .. M.	144	156	34	21.8	84	32	5	3	4	3
185 Mayuram .. M.	96	96	48	50.0	84	15	..	..	3	2
186 Mannargudi .. M.	48	48	21	43.8	31	19	2	1	..	..
187 Tiruvarur .. Pt.	48	48	31	64.6	41	30	..	..	..	..
188 Ayyampet .. Pt.	48	44	21	47.7	24	18	4	2	..	..
189 Nannilam .. Pt.	48	47	17	36.2	37	17	..	..	..	..
190 Papanasam .. Pt.	48	45	9	20.0	37	9	..	..	..	..
191 Pattukkottai .. Pt.	48	51	22	43.1	25	17	4	3	..	..
192 Shirkali .. Pt.	48	50	25	50.0	29	18	..	..	7	7
193 Tiruvaiyaru .. Pt.	48	48	26	54.2	41	26	..	..	..	..
194 Tiruturaiyandi .. Pt.	48	61	31	50.8	44	26	1	1	..	..
195 Tiruvadamardur .. Pt.	48	45	11	24.4	22	4	6	5	1	1
Total ..	1,120	503	44.9	789	436	31	18	36	32	

22. Tiruchirappalli district.										
196 Tiruchirappalli .. M.	336	336	150	44.7	220	124	21	10	8	5
197 Karur .. M.	96	96	42	43.8	67	40	4	1	..	..
198 Pudukkottai .. M.	96	96	38	39.6	61	33	3	3	2	..
199 Srirangam .. M.	48	49	16	32.6	19	9	14	4	4	3
200 Gunaseelam .. Pt.	..	11	6	54.6	6	1	..	..	..	..
201 Ariyalur .. Pt.	48	54	28	51.8	35	24	..	..	..	..
202 Kulittalai .. Pt.	48	53	25	47.2	31	15	6	3	2	1
203 Lalgudi .. Pt.	..	52	27	52.9	39	26	..	..	1	..
204 Jayankondam .. Pt.	48	49	25	51.0	37	21	..	..	..	..
205 Musiri .. Pt.	48	50	26	52.0	35	22	1	1	..	..
206 Manapparai .. Pt.	48	49	30	61.3	33	25	4	3	..	..
207 Turaiyur .. Pt.	48	48	17	35.4	16	10	..	..	..	..
* For festival only Total ..	943	430	45.6	599	350	53	25	17	9	

23. Tirunelveli district.										
208 Tirunelveli .. M.	216	268	198	55.2	221	117	30	22	2	2
209 Tuticorin .. M.	144	244	118	48.4	180	90	3	1	1	..
210 Palayamkottai .. M.	96	96	39	40.6	76	33	5	2	..	..
211 Melapalayam .. M.	48	48	20	41.7	20	12	4	3	..	..
212 Ambasamudram .. Pt.	48	47	26	55.3	37	23	1	1	..	..
213 Courtallam .. Pt.	48	66	42	63.6	52	40	2	1	..	..
214 Ettayapuram .. Pt.	48	47	10	21.3	23	7	..	..	..	..
215 Kalladaikurichi .. Pt.	48	49	31	63.3	33	19	11	10	2	2
216 Kadayannallur .. Pt.	48	48	35	72.9	41	34	2	..	..	..
217 Koilpatti .. Pt.	48	46	19	41.3	22	17	..	..	..	..
218 Puliyaugudi .. Pt.	48	58	25	43.1	41	19	..	..	..	..
219 Sankarankoil .. Pt.	48	50	27	54.0	19	16	1	..	..	..
220 Srivaikuntam .. Pt.	48	47	28	60.0	34	24	3	2	..	..
221 Tenkasi .. Pt.	48	49	26	53.1	29	22	1	..	..	..
222 Vikramasingapuram .. Pt.	48	50	21	42.0	42	18	..	..	..	..
223 Tiruchendur .. Pt.	48	51	23	45.1	42	19	3	2	..	..
224 Viravanallur .. Pt.	48	49	23	47.0	41	22	..	..	..	..
Total ..	1,313	661	5.03	953	532	66	44	5	4	

DIX A—cont.

and panchayat boards working the Madras Prevention of Adulteration Act 1951-52—cont.

Gingelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Turmeric.		Dhalls and flours.		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)
27	3	6	..	..	..	6	..	..	..	..	..	2	1
6	..	4	..	1	..	3	1	..	..	..	..	4	1
45	..	7	..	6	..	5	..	1	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	2	1
10	..	3	1	..	..	2	..	..	..	..	..	..	..
4	..	..	..	..	..	1	..	..	..	..	..	2	1
10	..	2	..	2	..	1	..	1	..	..	..	..	..
5	..	3	..	..	..	2	..	..	..	..	..	..	..
3	..	4	..	..	..	1	..	..	..	..	..	..	..
11	..	8	1	..	..	2	1	..	..	..	..	1	..
6	..	1	..	2	..	5	..	..	..	..	..	1	..
1	..	1	..	..	..	3	..	..	..	..	..	2	..
11	2	1	..	..	..	2	1	..	..	..	..	2	1
7	..	4	..	2	..	3	1	..	..	..	..	..	..
154	5	43	2	13	..	36	4	2	1	..	..	16	5

40	2	17	..	1	..	25	8	..	..	2	1	2	..
10	..	8	..	..	..	7	1	..	..	..	..	..	..
14	1	4	..	..	..	6	1	..	..	..	..	6	..
3	..	1	..	..	..	3	..	..	..	2	..	3	..
..	..	..	..	..	..	..	..	4	4	..	..	1	1
7	..	3	..	..	..	1	..	..	..	..	..	8	4
3	..	1	..	..	..	..	..	6	5	..	..	2	1
3	..	2	..	..	..	1	..	..	..	..	..	6	1
4	2	3	..	..	..	1	..	1	1	..	..	3	1
..	..	3	..	..	..	5	2	..	..	..	..	6	1
1	..	2	..	..	..	6	1	3	1	..	..	..	..
5	1	9	..	..	..	2	2	3	3	..	..	13	1
92	6	53	..	1	..	57	15	17	14	4	1	50	10

2	..	..	..	..	..	5	4	4	2	2	..	2	1
11	..	6	..	3	..	11	4	..	..	..	..	29	23
5	..	..	..	1	..	3	2	..	..	..	..	6	2
9	..	..	..	..	..	2	1	..	..	..	..	13	4
3	..	..	..	..	..	4	1	1	1	..	..	1	..
3	1	4	..	..	..	..	..	..	..	..	..	5	..
3	..	5	..	1	..	11	1	..	..	..	..	4	2
1	..	1	..	..	..	..	..	..	..	..	..	1	..
1	..	2	..	..	..	1	1	..	..	..	..	1	..
8	..	7	..	1	..	1	..	..	..	..	..	7	2
5	..	2	..	..	..	5	4	3	2	..	..	2	..
7	1	..	..	..	..	10	6	..	..	..	..	13	4
5	..	..	..	..	..	1	1	1	1	..	..	3	..
1	..	1	..	..	..	4	1	..	..	1	..	12	3
2	..	1	..	..	..	3	2	1	1	..	..	1	..
2	..	..	..	..	..	3	1	1	1	..	..	..	..
5	1	1	..	..	..	..	..	..	..	..	..	2	..
73	3	30	..	6	..	64	29	11	8	3	..	102	41

APPENDIX

Number of samples received and found adulterated from municipalities during

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	287	204	71.1	244	194	12	4	8	5
226 Anakapalle .. M.	144	144	45	31.2	47	42	4	1	2	1
227 Vizianagaram .. M.	96	97	57	58.8	87	55	1	1	2	1
228 Bheemunipatnam M.	48	48	24	50.0	41	24	..	..	..	..
229 Srikakulam .. M.	48	48	24	49.0	36	22	..	..	..	..
230 Bobbili .. Pt.	48	47	22	46.8	23	17	3	..	..	..
231 Chodavaram .. Pt.	48	47	17	36.2	26	15	4	..	..	..
232 Narasapatnam. Pt.	48	45	14	31.1	26	12	1	..	..	..
233 Palakonda .. Pt.	48	49	16	32.7	17	8	7	..	..	..
234 Parvathipuram. Pt.	48	49	16	32.7	21	16	5	..	..	..
235 Salur .. M.	48	46	20	43.5	21	9	..	..	..	..
236 Sompeta .. Pt.	..	40	28	70.0	31	24	2	1	..	..
237 Yellamanchili. Pt.	48	55	28	51.0	42	24	1	..	5	3
Total ..	1,003	515	51.4	662	162	42	6	15	9	

M. = Municipality.

Pt. = Panchayat Board.

DIX A—cont.

and panchayat boards working the Madras Prevention of Adulteration Act 1951-52—cont.

Gingelly oil.		Coconut oil.		Groundnut oil.		Coffee.		Turmeric.		Dhalls and flours.		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)
11	1	4	..	6	..	1	..	..	..	1	..	..	..
22	..	22	1	30	..	10	..	..	..	1	..	6	..
5	..	1	1	..	..	1	..	..	..	2	1	..	..
..	..	3	..	4	2	..	..	..	..	..	..	2	..
2	..	1	..	3	..	3	2	..	..	..	..	5	1
9	2	1	..	7	1	..	..	..	..	..	..	2	2
1	..	3	..	3	..	8	..	..	..	..	..	3	..
..	..	8	1	1	..	..	..	..	..	..	..	9	6
10	2	2	..	1	..	3	..	..	..	..	..	4	..
10	..	5	..	2	..	2	..	..	..	..	..	10	7
10	2	..	..	1	..	4	2	..	..	..	..	5	3
..	..	1	..	..	..	..	..	..	..	1	..	2	1
1	..	3	..	..	..	1	..	..	..	..	..	2	1
81	7	54	3	61	3	35	4	..	..	5	1	48	20

APPENDIX B.

Statement showing the total amount of fines levied, number of convictions, average fine, etc., in 1951-52.

Name of municipality.	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 1950-51.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
RS.			RS.	RS.	RS.	RS.	RS.	RS.	RS.
MUNICIPALITIES.									
CLASS A.									
1 Madurai ..	71	371	14,490	1,023	15,413	200	5	39	65
2 Vijayavada ..	30	223	5,970	76	6,046	100	10	27	42
3 Tiruchirappalli ..	23	127	3,395	298	3,693	60	15	27	43
4 Kozhikode ..	2	123	3,802	50	3,852	100	2	31	33
5 Coimbatore ..	19	169	10,610	..	10,610	225	5	63	78
6 Kakinada ..	3	174	9,645	..	9,645	100	20	55	65
7 Guntur ..	11	105	6,150	..	6,150	100	10	59	57
8 Salem ..	73	128	3,532	59	3,591	70	5	20	32
9 Visakhapatnam ..	22	182	8,030	30	8,060	80	10	44	47
10 Ootacamund ..	4	121	9,416	30	9,446	60	11	78	40
11 Rajahmundry ..	6	177	1,265	..	1,265	150	10	71	70
12 Mangalore ..	13	127	7,915	..	7,915	150	25	62	67
13 Tanjore ..	2	132	8,070	455	8,525	100	10	61	89
14 Tirunelveli ..	19	127	4,495	60	4,555	75	10	35	36
15 Anakapalle ..	12	33	1,595	50	1,645	100	30	48	44
16 Bellary ..	35	25	677	..	677	55	15	27	34
17 Kancheepuram ..	5	98	3,295	61	3,356	75	15	34	35
18 Coonoor ..	11	52	1,567	..	1,567	200	4	30	30
19 Cuddalore ..	5	72	2,470	..	2,470	75	10	34	26
20 Eluru ..	..	88	3,464	190	3,654	100	5	39	53
21 Kumbakonam ..	9	65	4,072	..	4,072	125	10	63	75
22 Masulipatnam ..	6	59	1,848	5	1,853	100	4	31	27
23 Nellore ..	11	66	2,583	35	2,618	200	8	39	28
24 Nagapatnam ..	1	32	1,995	40	2,035	200	20	62	73
25 Palghat ..	4	67	2,270	15	2,285	100	15	34	45
26 Tuticorin ..	5	113	3,655	45	3,700	100	15	32	32
27 Vellore ..	38	27	1,080	..	1,080	100	15	40	31
28 Pollachi ..	3	118	10,755	175	10,930	75	4	91	51
CLASS B.									
1 Amalapuram ..	..	50	1,711	..	1,711	100	5	34	29
2 Adoni ..	4	60	2,265	..	2,265	60	10	38	33
3 Cannanore ..	3	53	1,635	..	1,635	65	10	31	36
4 Chidambaram ..	10	23	659	..	659	50	10	29	55
5 Chirala ..	6	49	1,525	182	1,707	100	5	32	23
6 Cuddapah ..	2	44	1,220	8	1,228	100	10	28	25
7 Dindigul ..	12	51	1,715	180	1,895	100	5	34	22
8 Erode ..	2	53	1,310	85	1,395	50	10	25	40
9 Gudivada ..	..	37	1,720	5	1,725	90	15	46	50
10 Hospet ..	8	44	3,013	77	3,090	170	20	69	44
11 Karaikudi ..	5	41	1,705	..	1,705	100	10	42	36
12 Karur ..	3	38	1,960	130	2,090	100	15	52	47
13 Kurnool ..	10	24	1,190	40	1,230	100	30	50	30
14 Mayuram ..	2	45	3,555	250	3,805	150	25	79	78
15 Ongole ..	2	30	1,435	30	1,465	100	15	48	55
16 Palni ..	8	52	2,350	113	2,463	100	15	45	44
17 Palayamkottai ..	1	38	1,006	..	1,006	65	1	26	38
18 Pudukottai ..	..	38	2,160	..	2,160	150	20	57	61
19 Tenali ..	13	46	2,150	36	2,186	100	10	47	41
20 Tiruppur ..	2	51	2,282	50	2,332	90	10	40	37
21 Udumalpet ..	1	45	1,185	..	1,185	70	5	40	37
22 Virudunagar ..	13	13	415	30	445	60	20	32	57
23 Vizianagaram ..	15	40	1,685	97	1,782	80	15	42	38
24 Villupuram ..	..	20	950	..	950	100	20	48	59

APPENDIX B—cont.

Statement showing the total amount of fines levied, number of convictions, average fine, etc., in 1951-52—cont.

Name of municipality.	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 1950-51.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
RS.			RS.	RS.	RS.	RS.	RS.	RS.	RS.
MUNICIPALITIES—cont.									
CLASS C.									
Quota 6 samples.									
1 Anur ..	11	41	1,185	56	1,241	70	8	29	34
2 Boakkannur ..	3	26	1,195	25	1,220	100	25	46	50
3 Devtai ..	5	22	1,040	..	1,040	100	25	47	34
4 Hinar ..	9	28	1,220	14	1,234	200	15	44	24
5 Pedayam ..	1	23	1,470	80	1,550	100	25	64	43
6 Nan ..	14	35	1,405	..	1,405	75	20	40	47
7 Progar ..	1	17	224	..	224	20	5	14	20
8 Rajayam ..	2	27	1,080	..	1,080	120	15	40	38
9 Srivittur ..	..	18	595	138	733	100	5	33	33
10 Tellicy ..	1	35	1,190	25	1,215	50	10	34	36
11 Tiruvamalai ..	1	34	935	..	935	70	10	28	40
Quota 4 samples.									
12 Ambu ..	20	11	375	18	393	75	20	34	40
13 Arupptai ..	1	8	225	20	245	45	10	28	29
14 Bhirumam ..	12	19	930	55	985	80	10	49	53
15 Bhoolipatnam ..	2	22	960	..	960	80	25	44	32
16 Coch ..	..	9	375	30	405	40	20	42	32
17 Srikalan ..	..	21	1,655	30	1,685	100	10	69	45
18 Chingit ..	..	21	720	..	720	100	15	34	23
19 Chitto ..	17	8	187	..	187	40	12	23	30
20 Dharapam ..	..	13	670	..	670	60	5	35	43
21 Gobichipalayam ..	7	30	1,780	40	1,820	100	25	59	45
22 Gudiyam ..	14	11	410	40	450	60	20	37	42
23 Guntak ..	..	31	1,035	..	1,035	100	15	33	43
24 Kodaikal ..	1	13	920	100	1,020	100	35	71	26
25 Melapalam ..	1	19	445	..	445	50	5	23	28
26 Mottupiyam ..	13	26	1,810	..	1,810	200	20	70	42
27 Mannardi ..	..	21	1,660	60	1,720	205	25	79	69
28 Narasarpot ..	..	16	685	..	685	100	20	43	39
29 Palakot ..	1	29	1,011	20	1,031	200	1	35	31
30 Periyakam ..	3	21	1,425	2	1,427	100	10	68	52
31 Rasipura ..	2	38	1,135	..	1,135	60	5	30	39
32 Sriranga ..	5	11	475	..	475	75	30	43	59
33 Salur ..	6	14	445	..	445	50	15	32	70
34 Sivakasi ..	..	16	415	..	415	60	5	26	44
35 Tadpatri ..	6	15	415	47	462	35	15	28	33
36 Tindivanam ..	7	16	775	12	787	100	20	48	23
37 Tirupati ..	4	19	970	..	..	150	20	51	39
38 Bapatla ..	1	7	385	50	435	100	25	55	44
39 Tiruvallu ..	3	29	830	..	830	40	15	29	25
40 Tirupattur ..	5	3	95	..	95	40	25	32	44
41 Tiruvavur ..	9	22	690	133	823	60	20	32	50
42 Udipi ..	..	31	1,082	..	1,082	102	10	35	27
43 Vaniyambali ..	..	31	1,705	..	1,705	100	25	55	47
44 Walajahpet ..	..	1	50	..	50	50	50	50	10
45 Arni ..	1	13	320	..	320	40	15	25	38
46 Gudur ..	9	24	515	..	515	40	15	22	25

APPENDIX B—cont.

Statement showing the total amount of fines levied, number of convictions, average fine, etc., in 1951-52—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 in 1950-51.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			RS.	RS.	RS.	RS.	RS.	RS.
PANCHAYAT BOARDS.								
1. Anantapur district.								
1 Dharmavaram ..	1	29	615	..	615	60	121	42
2 Gooty ..	..	28	555	..	555	30	20	30
3 Kadiri ..	..	31	1,480	..	1,480	100	148	41
4 Penukonda ..	1	14	360	..	360	50	26	28
5 Uravakonda ..	..	13	180	..	180	20	13	10
2. North Arcot district.								
6 Arkonam ..	1	39	1,190	100	1,290	75	1 40	33
7 Arcot ..	1	16	645	..	645	125	2 40	29
8 Ranipet ..	1	21	770	..	770	70	2 37	15
3. South Arcot district.								
9 Bhuvanagiri ..	3	22	690	..	690	50	1 31	23
10 Kallakurichi ..	4	24	1,305	..	1,305	100	1 54	32
11 Nellikuppam ..	1	11	382	5	387	65	35	25
12 Panruti ..	..	11	157	..	157	50	14	26
13 Tirukkoyilur ..	1	11	290	36	326	50	25	32
14 Vriddhachalam ..	..	33	1,650	..	1,650	200	2 50	65
4. Bellary district.								
15 Harpanahalli ..	..	30	1,290	..	1,290	100	1 43	30
16 Rayadrug ..	1	19	710	..	710	60	2 37	27
17 Yemmiganur ..	..	25	980	..	980	50	2 39	32
5. Coimbatore district.								
18 Avanashi ..	4	39	1,559	..	1,559	75	1 40	29
19 Bhavani ..	2	11	210	..	210	30	1 19	32
20 Kurichi ..	..	44	2,290	20	2,310	150	1 51	50
21 Satyamangalam ..	14	13	589	..	589	110	2 45	48
6. Chingleput district.								
22 Alandur ..	11	12	370	55	425	40	1 30	18
23 Madurantakam ..	..	18	567	20	587	60	1 32	30
24 Poonamallee ..	4	21	645	..	645	75	1 31	17
25 Tiruvottiyur ..	3	23	640	..	640	50	1 28	25
26 Sriporumbudur ..	6	3	90	..	90	50	2 30	30
7. Chittoor district.								
27 Kalahasti ..	1	24	1,125	..	1,125	100	2 47	38
28 Kuppam ..	..	26	1,086	10	1,096	100	2 42	45
29 Madanapalle ..	18	3	80	..	80	35	1 27	21
30 Madanapalle Sanatorium.	11	27	465	..	465	40	1 17	24
31 Punganur ..	3	14	335	..	335	50	1 24	31
32 Palmaner ..	..	16	341	47	388	100	1 21	33
33 Puttur ..	1	18	676	..	676	60	1 38	31
34 Tirumalai Hills ..	1	2	90	..	90	50	9 45	26
35 Tiruttani ..	4	17	360	5	365	40	1 21	22
36 Vayalpad ..	..	16	720	1	735	100	1 45	50
8. Cuddapah district.								
37 Badvel ..	1	3	100	..	100	50	0 33	27
38 Jammalamadugu ..	4	6	150	..	150	50	5 25	31
39 Pulivendla ..	..	10	170	..	170	40	10 17	41
40 Rajampet ..	..	16	585	..	585	100	10 37	30
41 Rayachoti ..	3	15	490	..	490	75	20 33	29

APPENDIX B—cont.

Statement showing the total amount of fines levied, number of convictions, average fine, etc., in 1951-52—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 1950-51.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			RS.	RS.	RS.	RS.	RS.	RS.	RS.
PANCHAYAT BOARDS—cont.									
9. Elavari district.									
42 Mota ..	..	21	900	..	900	80	20	43	46
43 Kuram ..	3	12	772	..	772	100	25	64	27
44 Sot ..	10	10	257	..	257	50	2	26	24
45 Randrapuram ..	..	18	1,010	..	1,010	100	20	56	35
46 R ..	..	24	1,053	60	1,113	100	20	44	30
47 T ..	..	23	1,075	55	1,130	75	10	47	40
10. Wedavari district.									
48 Ak ..	..	8	330	150	480	100	20	41	47
49 Ko ..	..	30	1,300	..	1,300	200	10	43	49
50 Na ..	..	32	1,200	..	1,200	100	5	38	35
51 Nid ..	14	19	490	..	490	80	10	25	54
52 Polam ..	1	14	495	95	590	100	10	35	45
53 Tadegudem ..	2	20	825	..	825	75	5	41	43
54 Tanu ..	4	23	720	50	770	100	10	31	36
11. Guv district.									
55 Mangiri ..	1	34	1,490	5	1,495	90	10	44	31
56 Ponn ..	..	11	305	..	305	40	15	27	33
57 Nidul ..	..	8	285	..	285	75	20	36	39
58 Ropal ..	..	14	415	..	415	60	15	30	28
59 Satterillo ..	..	10	230	50	280	40	5	23	28
60 Vetapa ..	..	9	330	..	330	50	25	37	20
12. Krisi district.									
61 Avanigla ..	..	4	90	..	90	30	20	23	29
62 Jagaypeta ..	..	36	1,285	..	1,285	60	25	36	31
63 Nuzvid ..	1	31	1,530	210	1,740	200	10	51	23
64 Tiruvu ..	1	15	770	..	770	125	20	51	14
13. South Kara district.									
65 Kasarag ..	..	24	527	..	527	50	2	22	26
14. Kurul district.									
66 Dhone ..	..	11	565	..	565	75	15	51	46
67 Giddalu ..	1	7	240	..	240	50	20	34	43
68 Markap ..	1	30	863	..	863	255	10	66	75
15. Maduri district.									
69 Allinagam ..	13	8	430	..	430	90	25	54	44
70 Ayakudi ..	..	8	330	150	480	100	20	41	36
71 Batlaguru ..	1	6	240	50	290	80	15	40	26
72 Chinnam ..	2	21	690	30	720	100	15	33	40
73 Cumbum ..	..	10	310	..	310	60	15	31	45
74 Melur ..	..	21	480	..	480	40	10	23	35
75 Nilacotta ..	3	10	230	..	230	75	5	23	21
76 Sholavanan ..	7	4	185	..	185	100	25	46	22
77 Tirumanglam ..	..	18	555	..	555	60	10	31	25
78 Usilampati ..	5	9	470	..	470	75	25	52	44
16. Nellore district.									
79 Kandukur ..	12	4	70	..	70	25	5	17	26
80 Kovvur ..	18	3	130	..	130	50	30	43	32
81 Kavali ..	3	15	395	..	395	50	5	26	20

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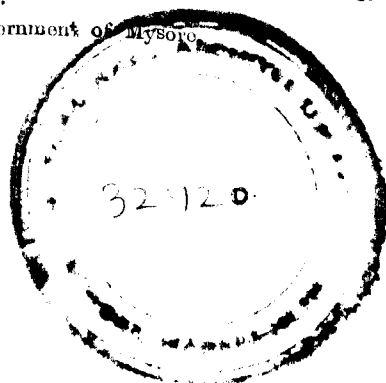
No. 3800, HEALTH, 28TH OCTOBER 1953

6 *General*.—The working of the institute during the year continued to be satisfactory.

(By order of the Governor)

S. A. SUBHAN,
Deputy Secretary to Government (in-charge)

- To the Director of Medical Services, Madras.
 „ the Director of Public Health, Madras.
 „ the Director of Medical Services, Andhra State.
 „ the Sanitary Engineer (through the Chief Engineer).
 „ the Director of King Institute, Guindy (through the Director of Medical Services).
 „ the Presidents of District Boards.
 „ all Executive Authorities of Municipal Councils (through Chairmen).
 „ the Mayor, Corporation of Madras.
 „ the Accountant-General, Madras.
 „ Accountant-General, Andhra State.
 „ the Inspector of Municipal Councils and Local Boards.
 „ the Honorary Director of Indigenous Medicine, Madras.
 „ the Inspector-General of Prisons (through the Home Department).
 „ the Principals of Engineering Colleges.
 „ the General Manager, Eastern Railway (with C.L.).
 „ the General Manager, Southern Railway (with C.L.).
 „ the Librarian, Legislative Assembly Secretariat Library.
 „ the Librarian, Madras Secretariat Library.
 „ the Home Department.
 „ the Director, Pasteur Institute, Coonoor.
 „ the High Commissioner for India in London (with copies for India Office, Ministry of Health, British Museum).
 „ the Madras Medical Association.
 „ the Madras University.
 „ the Andhra 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).
 „ others (vide Appendix to G.O. No. 2594, P.H., dated 26th July 1949).
 „ the Secretary, Public Service Commission, Madras (with C.L.).
 „ the Government of Andhra (Department of Education, Health and Local Administration).
 „ the Government of Mysore.



APPENDIX B—*cont.*

Statement showing the total amount of fines levied, number of convictions, average fine, etc., in 1951-52—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 1950-51.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			RS.	RS.	RS.	RS.	RS.	RS.	RS.
PANCHAYAT BOARDS— <i>cont.</i>									
22. <i>Tirunelveli district—cont.</i>									
123 Kallidaikurichi ..	4	7	1,095	50	1,145	100	10	41	46
124 Kadayanallur ..	12	23	1,280	80	1,360	80	20	56	43
125 Koilpatti ..	8	11	442	..	442	75	2	40	45
126 Puliyangudi ..	..	21	645	..	645	60	5	31	28
127 Sankarankoil ..	..	27	705	103	808	60	15	26	32
128 Srivaikuntam ..	..	28	665	..	665	50	5	24	27
129 Tonkasi ..	3	23	855	25	880	100	5	37	33
130 Tiruchondur ..	5	18	795	..	795	80	25	44	48
131 Vikramasingapuram ..	1	20	475	..	475	40	10	27	32
132 Viravanallur ..	..	22	569	..	569	75	5	26	30
23. <i>Visakhapatnam district.</i>									
133 Chodavaram ..	3	15	550	..	550	50	15	37	22
134 Narasapatam ..	7	7	212	..	212	50	2	30	18
135 Yellamanchili ..	..	28	1,020	..	1,020	80	15	36	30
24. <i>Srikakulam district.</i>									
136 Bobbili ..	2	20	950	671	1,621	100	10	48	60
137 Palakonda ..	..	13	615	35	650	80	25	47	33
138 Parvatipuram ..	..	15	625	245	920	100	5	42	70
139 Sompota ..	1	27	1,536	270	1,806	100	10	57	72



HEALTH DEPARTMENT

G.O. No. 3800, 28th October 1953.

Administration Report—King Institute, Guindy—1951-52—Reviewed.

READ—

From the Director of Medical Services, P. No. 356-M/53, dated
29th September 1953.

Order—No. 3800, Health, dated 28th October 1953.

Recorded.

2. *Vaccine lymph section.*—As there was no outbreak of epidemic among calves, there was no interruption in the production of vaccine lymph, and consequently, the quantity of 452,928 millions of 1 in 7 dilution glycerinated lymph manufactured during the period is the largest quantity for any single year in the past. The average yield per calf was 30.6 gms. as against 30.2 gms. for the previous year. The percentage of lymph unaccounted for showed a marked fall from 38.2 per cent to 7.9 per cent.

3. *Diagnostic department.*—The number of specimens received for microscopical, cultural and agglutination tests from the various sources in this State fell from 13,459 for the previous year to 9,655 in the year under report. There was a heavy demand for Kahn antigen, the quantity issued during the year being 5,102 c.c. as against 3,691 c.c. for the previous year.

4. *Prophylactic and therapeutic vaccine section.*—The quantity of anti-cholera vaccine issued during the year was 5.8 million doses as against 10.5 millions for the previous year. Some of the sterile solutions (like Dysentery Bacteria Phage) which are prepared in this section are very popular, and there is, consequently a heavy demand for them.

5. *Blood bank section.*—An additional blood bank was opened in the Headquarters Hospital, Ootacamund, thus bringing the total number of blood banks in the State from 17 to 18. As usual, the Blood Bank took part in a number of Exhibitions for popularising the Blood Transfusion Service in the State. The number of Medical Officers trained during the year under report was 8.