

Report of the Ministry of Health / Colony of Singapore.

Contributors

Singapore. Ministry of Health.

Publication/Creation

Singapore : Government Publications Bureau, [1964]

Persistent URL

<https://wellcomecollection.org/works/r3774633>

License and attribution

This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>



STATE OF SINGAPORE

REPORT OF THE MINISTRY OF HEALTH

for the year ended 31st December, 1964

BY THE ACTING PERMANENT SECRETARY/DIRECTOR OF
MEDICAL SERVICES.



ANN REP
WA28
.JS6
S61
1964

of 1967)



22501293034



STATE OF SINGAPORE

REPORT OF THE
MINISTRY OF HEALTH

for the year ended 31st December, 1964

BY THE ACTING PERMANENT SECRETARY/DIRECTOR OF
MEDICAL SERVICES.



STATE OF SINGAPORE



REPORT OF THE

MINISTRY OF HEALTH

for the year ended 31st December, 1964

Digitized by the Internet Archive
in 2019 with funding from
Wellcome Library

| | |
|-------------------------------|----------|
| WELLCOME INSTITUTE LIBRARY | |
| Coll. | weIMOmec |
| Call | Ann Rep |
| No. | WA28 |
| | .J56 |
| | S61 |
| | 1964 |

CONTENTS

| <i>Chapter</i> | <i>Page</i> |
|---|-------------|
| INTRODUCTION - - - - - | 1 |
| SECTION I — GENERAL | |
| 1 LEGISLATION - - - - - | 5 |
| 2 STAFF WELFARE — DAILY RATED EMPLOYEES - - | 6 |
| 3 STAFF AND TRAINING - - - - - | 8 |
| 4 FINANCE - - - - - | 10 |
| 5 VITAL STATISTICS - - - - - | 11 |
| Population — 1911-1964 - - - - - | 11 |
| Population Estimates — Racial Group and Sex - | 12 |
| Births — Sex, Race, Mother's Age, Residential Area and Residence - - - - - | 13 |
| Deaths — Age, Sex, Race, Registration Area and Residence - - - - - | 16 |
| Birth and Death Rates - - - - - | 21 |
| Infant Mortality and Infant Mortality Rates - | 22 |
| Still Births and Still Birth Rates - - - - - | 22 |
| Maternal Mortality and Maternal Mortality Rates - | 22 |
| Migration Statistics by Sea and Air - - - - - | 23 |
| SECTION II — PUBLIC HEALTH DIVISION | |
| 6 INTRODUCTION - - - - - | 27 |
| 7 ENVIRONMENTAL HEALTH SERVICES - - - - - | 37 |
| 8 QUARANTINE AND EPIDEMIOLOGY BRANCH - - - | 56 |
| 9 SCHOOL HEALTH SERVICE - - - - - | 66 |
| 10 MATERNAL AND CHILD HEALTH SERVICES - - - | 76 |
| 11 TRAINING AND HEALTH EDUCATION - - - - - | 84 |
| 12 HAWKERS AND MARKETS DEPARTMENT - - - - - | 90 |
| 13 OTHER SERVICES UNDER PUBLIC HEALTH DIVISION | |
| HEADQUARTERS - - - - - | 95 |
| 14 MALARIA OUTBREAK AT FUYONG ESTATE - - - - | 101 |

| <i>Chapter</i> | | <i>Page</i> |
|----------------|---|-------------|
| | SECTION III — HOSPITALS DIVISION | |
| 15 | INTRODUCTION - - - - - | 107 |
| | Events of the Year - - - - - | 107 |
| | Reorganisation of the Outpatient Services - - - - - | 108 |
| | Charges for Deliveries at Kandang Kerbau Hospital | 109 |
| | Conferences - - - - - | 109 |
| | Exhibitions - - - - - | 110 |
| | The Riots of July and September - - - - - | 110 |
| | Cholera Outbreak - - - - - | 111 |
| | Hospitals Facilities - - - - - | 112 |
| | Hospitals Activities - - - - - | 112 |
| | Outpatient Services - - - - - | 118 |
| | Personnel - - - - - | 119 |
| | Ancillary Services - - - - - | 122 |
| | Staff Relationships - - - - - | 124 |
| | Expenditure - - - - - | 124 |
| 16 | OUTRAM ROAD GENERAL HOSPITAL - - - - - | 127 |
| | Development - - - - - | 127 |
| | Staff - - - - - | 127 |
| | Clinical Units - - - - - | 128 |
| | Activity - - - - - | 128 |
| | Medical Unit I - - - - - | 131 |
| | Surgical Unit 'A' - - - - - | 133 |
| | Surgical Unit 'B' - - - - - | 134 |
| | Orthopædic Surgery 'O' and 'C' - - - - - | 134 |
| | Ophthalmic Unit - - - - - | 138 |
| | Ear, Nose and Throat Surgery Unit - - - - - | 139 |
| | Pædiatric Unit (West) - - - - - | 140 |
| | Pædiatric Unit (East) - - - - - | 143 |
| | Anæsthetic Unit - - - - - | 146 |
| | Physiotherapy Department - - - - - | 146 |
| | Occupational Therapy Department - - - - - | 147 |
| | Almoner's Department - - - - - | 148 |
| | Dietetic Department - - - - - | 150 |
| | Medical Records Department - - - - - | 150 |
| | Dental Clinic - - - - - | 151 |

| <i>Chapter</i> | <i>Page</i> |
|---|-------------|
| 17 THOMSON ROAD GENERAL HOSPITAL | 155 |
| Inpatients | 155 |
| Outpatients Clinic | 155 |
| 18 KANDANG KERBAU HOSPITAL (Maternity and Gynæcology) | 157 |
| Clinical Administration | 157 |
| Staff | 157 |
| Committees | 158 |
| Inpatients | 158 |
| Outpatients | 158 |
| Premature Baby Unit | 159 |
| The Domiciliary Delivery Service | 159 |
| The Domiciliary After Care Service | 159 |
| Events during the year | 159 |
| 19 MIDDLETON HOSPITAL (Infectious Diseases) | 161 |
| Cholera, El Tor | 164 |
| Cholera Carriers | 164 |
| Diphtheria | 166 |
| Diphtheria Carriers | 168 |
| Acute Anterior Poliomyelitis | 168 |
| Typhoid Fever | 169 |
| Typhoid Carrier Examinations | 170 |
| Chickenpox | 170 |
| Dysentery | 171 |
| Amœbic Dysentery Carriers | 171 |
| Bacillary Dysentery Carriers | 171 |
| Measles | 171 |
| Food Poisoning | 171 |
| 20 SOCIAL HYGIENE | 172 |
| Teaching | 172 |
| Staff | 172 |
| Attendances | 172 |
| Incidence of Venereal Diseases | 173 |
| Syphilitic Infections | 173 |
| Other Venereal Diseases | 174 |
| Skin Clinic | 175 |
| Mobile Dispensaries | 175 |

| <i>Chapter</i> | | <i>Page</i> |
|----------------|---------------------------------------|-------------|
| | Epidemiological Control Unit - - - | 176 |
| | Prophylactic Treatment - - - | 176 |
| | Almoner's Department - - - | 177 |
| | Laboratory Examinations - - - | 177 |
| 21 | TAN TOCK SENG HOSPITAL - - - | 180 |
| | Staff - - - | 180 |
| | Special Studies - - - | 180 |
| | Contract Service - - - | 181 |
| | Central Sterile Supply - - - | 181 |
| | Inpatients - - - | 181 |
| | Rotary Tuberculosis Clinic - - - | 182 |
| | Physiotherapy Division - - - | 182 |
| | Occupational Therapy Department - - - | 183 |
| | Red Cross Library - - - | 183 |
| | Dental Clinic - - - | 183 |
| | Almoner's Department - - - | 183 |
| 22 | TRAFALGAR HOME (Leprosy) - - - | 184 |
| | Staff - - - | 184 |
| | School - - - | 184 |
| | Physiotherapy Department - - - | 185 |
| | Occupational Therapy Department - - - | 185 |
| | Dental Clinic - - - | 185 |
| | Almoner's Department - - - | 185 |
| | Development - - - | 185 |
| | Record of Work - - - | 186 |
| 23 | WOODBIDGE HOSPITAL (Psychiatry) - - - | 188 |
| | Staff - - - | 188 |
| | Inpatients - - - | 188 |
| | Psychiatric Clinics - - - | 188 |
| 24 | THE OUTPATIENT SERVICES - - - | 190 |
| | History - - - | 190 |
| | Reorganisation - - - | 191 |
| | Development - - - | 192 |
| | Staff - - - | 192 |
| | Charges - - - | 195 |

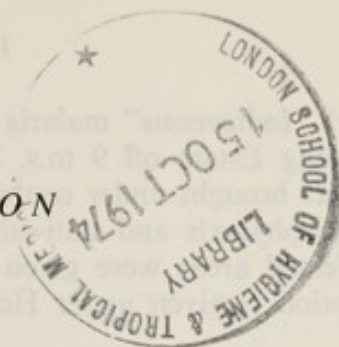
| <i>Chapter</i> | <i>Page</i> |
|--|-------------|
| Observations of Changes after Reorganisation | 195 |
| Outpatient Dispensaries | 196 |
| Travelling Dispensaries | 198 |
| Staff Dispensaries | 198 |
| Government Officials' Dispensaries | 200 |
| Staff Dispensaries for former City Council Employees | 200 |
| Police Hospital and Clinic | 200 |
| Police Families Clinic | 200 |
| Reformatory Training Centre at Ulu Bedok | 200 |
| Institutional Hospitals | 201 |
| Local Prison | 201 |
| Changi Convict Prison | 202 |
| Opium Treatment Centre | 202 |
| Opium Treatment Centre Advisory Committee | 202 |
| Opium Treatment Centre Follow-up Clinic | 203 |
| District Nursing Service | 203 |
| 25 DEPARTMENT OF RADIOLOGY | 205 |
| Diagnostic | 205 |
| Radiologists | 205 |
| Radiographers | 205 |
| School of Radiography | 205 |
| Cardiovascular Laboratory | 206 |
| WHO Multiple Seminar on Radiological Health | 206 |
| Therapeutic | 206 |
| New Radiotherapy Department | 207 |
| Staff | 207 |
| Other X-Ray Departments | 207 |
| Publications | 208 |
| Summary of work done | 208 |
| 26 BLOOD TRANSFUSION SERVICE | 209 |
| General | 209 |
| Staff | 209 |
| Donations received and transfusions given | 209 |
| Relative Donors | 210 |
| Laboratory Service | 210 |

| <i>Chapter</i> | | <i>Page</i> |
|--|--|-------------|
| | Research Projects - - - - - | 210 |
| | Blood Fractions - - - - - | 210 |
| | Production of Infusion Apparatus - - - - - | 210 |
| | Mobile Session - - - - - | 210 |
| | Publicity and Propaganda - - - - - | 210 |
| | Donations from Commercial Firms - - - - - | 211 |
| SECTION IV — OTHER SPECIAL DEPARTMENTS | | |
| 27 | DENTAL HEALTH - - - - - | 215 |
| | Schools Division - - - - - | 215 |
| | Hospitals Division - - - - - | 216 |
| | Maternal and Child Health Division - - - - - | 216 |
| | Miscellaneous Dental Services - - - - - | 217 |
| | Preventive Dentistry - - - - - | 217 |
| | Training of Staff - - - - - | 217 |
| | Dental Board - - - - - | 218 |
| | Annual Returns of Work in Government Dental Clinics - - - - - | 218 |
| 28 | TUBERCULOSIS CONTROL UNIT - - - - - | 224 |
| | Staff, Administration and World Health Day - - - - - | 224-5 |
| | Central Tuberculosis Registry - - - - - | 225 |
| | Central Tuberculosis Laboratory - - - - - | 226 |
| | Cultures - - - - - | 226 |
| | Sensitivity Tests - - - - - | 227 |
| | Research - - - - - | 227 |
| | Training - - - - - | 227 |
| | Mass X-ray Case-finding Surveys - - - - - | 228 |
| | Static X-Ray Centre - - - - - | 230 |
| | Diagnostic Clinic - - - - - | 230 |
| | Tuberculin Testing and B.C.G. Vaccination - - - - - | 230 |
| | Institutions - - - - - | 230 |
| | Contact Examination - - - - - | 230 |
| | Home Visits - - - - - | 231 |
| | School Tuberculosis Service - - - - - | 231 |
| | Tuberculin Testing and B.C.G. Vaccination in Schools - - - - - | 231 |
| | Case-finding in Schools - - - - - | 232 |

| <i>Chapter</i> | <i>Page</i> |
|--|-------------|
| School Tuberculosis Clinic - - - - | 233 |
| Contact Investigation of Index Cases found in Schools | 233 |
| Supplementary Feeding of Infected and Under-nourished School Children - - - | 234 |
| Feeding - - - - - | 234 |
| 29 GOVERNMENT PHARMACEUTICAL LABORATORY AND STORE AND DISPENSARIES - - - - - | 242 |
| 30 LABORATORY SERVICES - - - - - | 245 |
| Pathology Department - - - - - | 245 |
| Biochemistry Section - - - - - | 247 |
| Histology Section - - - - - | 253 |
| Bacteriology Section - - - - - | 261 |
| Bacteriological Laboratory, City Hall - - - | 271 |
| Serology - - - - - | 277 |
| 31 SINGAPORE HOSPITAL RESERVE - - - - - | 279 |
| 32 DEPARTMENT OF CHEMISTRY AND INSPECTORATE OF DANGEROUS AND HAZARDOUS MATERIALS - - - | 281 |
| General - - - - - | 281 |
| Forensic Section - - - - - | 284 |
| Health Section - - - - - | 297 |
| Water and Sewage Section - - - - - | 302 |
| Miscellaneous Section - - - - - | 306 |
| Revenue Section - - - - - | 308 |
| Toxicology Section - - - - - | 311 |
| Dangerous and Hazardous Materials Section - | 316 |

INTRODUCTION

The Honourable Mr. Yong Nyuk Lin,
Minister for Health,
Singapore.



Sir,

I have the honour to submit the Annual Report of the Ministry of Health for the year ended 31st December, 1964.

2. The general health of the people continue to improve, with the crude birth rate continued to fall to 32.0 while the crude death rate remained at 5.7 as for 1963.

3. During the year there were two outbreaks of riots the like of which had not occurred in Singapore for a very long time. The first riot broke out in the late evening of July the 14th and soon brought a flood of victims to the Casualty Department of the General Hospital. Notwithstanding this flood of victims and the difficulties arising from the imposition of curfew, I was proud to report that we were able to cope with it and also at the same time to keep the emergency services going thanks to the dedication to work and a sense of duty of the staff manning these services. The second riot occurred in September but the casualties were on a smaller scale.

4. During the periods of the curfew, emergency public health measures were instituted. The majority of the staff in the Public Health Division rose to the occasion and kept the essential services going. There were no outbreaks of epidemic diseases, though there was an unavoidable increase in fly and mosquito nuisances which were brought quickly under control when normal public health services resumed after the curfews. I regret to report that during the second riot a Public Cleansing worker lost his life.

MAJOR EVENTS OF THE YEAR

(a) *Public Health Division*

(i) *Spring Cleaning Campaign*—The Minister initiated a Spring Cleaning Campaign from 1st February to 31st May, 1964. This was a qualified success with the City looking brighter and cleaner after the Campaign.

(ii) *Public Health Advisory Board*—This Board was formed after the Spring Cleaning Campaign to formulate more effective and practical measures for the preservation and maintenance of the highest possible public health standards.

(iii) The nuisances arising from cattle wandering on public roads and on public and private property in the City were brought under control with the enactment of the Cattle Ordinance during the year.

(iv) There were three outbreaks of El Tor Cholera. With intensive work and investigations carried out by the staff in the Public Health Division, they were brought under control.

(v) "Indigenous" malaria made its appearance after a break of 7 years, at Fuyong Estate off 9 m.s. Bukit Timah Road in August and September. This was brought under control by emergency measures using intensive mass drug prophylaxis and anti-adult measures. Approximately 6,300 persons in the affected areas were given prophylactic drug treatment. A more detailed description is given under Health Division Section II.

(b) *Hospitals Division*

(i) The reorganisation of the Outpatient services was effected smoothly as from 1st August, 1964. This reorganisation was a decentralisation of the Outpatient services in General Hospital to bring about a more even spread of patients to each of the Outpatient Dispensaries established all over the island and to establish Emergency and Consultation Clinics at the General and the Kandang Kerbau Maternity Hospitals.

(ii) The introduction of charges for deliveries of babies at the Kandang Kerbau Maternity Hospital, at the rate of \$10 for mothers who were Singapore citizens and \$50 for mothers who were non-Singapore citizens.

(iii) The holding of an Orthopaedic Conference from 6th to 8th June, 1964 which was attended by surgeons from India, Ceylon, Pakistan, Burma, Japan, Hongkong, New Zealand and Australia. This conference was successful and it was hoped to hold a second conference in August 1966.

(iv) The holding of a symposium on Cancer of the Nasopharynx from 1st to 7th August, 1964. The symposium was organised by the Committee on Geographic Pathology of the International Union against Cancer (the Union International Centre le Cancer). This is the first U.I.C.C. Conference held in South East Asia and was attended by scientific workers locally as well as from India, Thailand, Taiwan, Japan, Australia, U.S.A. including Hawaii, Kenya and the United Kingdom.

(v) The holding of a World Health Organisation Multiple Seminar on Radiological Health from 27th to 28th October, 1964. This was the second in the series of W.H.O. Seminars on this subject, the first of which was held in the Eastern Mediterranean in 1962.

(vi) The holding of two successful exhibitions. The first was held from 6th to 12th April, 1964 in connection with World Health Day and the theme was "No Truce for Tuberculosis". The second was held from 6th to 11th June, 1964 and the theme was to show progress of Pharmacy in Singapore. Both exhibitions were held at the Victoria Memorial Hall.

I have the honour to be,

Sir,

Your obedient servant,

DR. NG SEE YOON,

Acting Permanent Secretary (Health)/Director of Medical Services.

F. LEGISLATION

The Registration of Dentists (Amendment) Ordinance (No. 15 of 1964) was passed and came into force on 4th December, 1964. It provided for a representative of dentists to Division II of the Registrar operating in the State of Singapore, nominated by the Singapore Chinese Dentists' Association, to be appointed as a Member of the Dental Board by the Minister.

The Sale of Food and Drugs (Amendment) Ordinance (No. 3 of 1964). This Ordinance makes two amendments to section 23 of the Ordinance of 1955.

SECTION I

GENERAL

The first amendment concerns the power of the Minister to make regulations under the Ordinance. The second amendment provides for the power to make regulations under the Ordinance to be exercised as soon as possible and published without the necessity of the regulations being approved by a resolution of the Legislative Assembly before they come into force.

The Carcin Ordinance (No. 15 of 1964). This Ordinance was passed to deal effectively with the problem of stray cattle causing public health problems, traffic obstructions and public nuisances which had remained unaltered for a number of years.

SUPPLEMENTARY LEGISLATION

THE Nurses Registration (Amendment) Regulations, 1964. These Regulations set out the composition of the Nursing Board and provided for the Minister to appoint ordinary members of the Board and to revoke their appointments without assigning any reason therefor.

(1) "Influenza" epidemic made its appearance after a break of 7 years, at Prince Street 7 and 8, 1000 Third Road in August and September. This was brought under control by emergency measures using various mass drug prophylaxis and anti-toxin measures. Approximately 6,000 patients in the affected areas were given prophylactic drug treatment. A more detailed description is given under Health Division Section II.

The Hospital Division

(2) The reorganisation of the Outpatient services was effected essentially as from 1st August, 1964. This reorganisation was a decentralisation of the Outpatient services in General Hospital to bring about a more even spread of patients in each of the 4 departments. The 4 departments identified are the Medical and Paediatric Clinics, the Community Clinic, the General and the Maternity Clinics.

(3) The completion of charges for delivery of babies at the Maternity Hospital, Maternity Hospital, at the rate of 240 for mothers who were Singapore citizens and 270 for mothers who were non-Singapore citizens.

(4) The holding of an Orthopaedic Conference from 4th to 26th July 1964 which was attended by surgeons from India, Ceylon, Pakistan, Burma, East, West and New Zealand and Australia. This conference was sponsored by the Hospital and held a second conference in August 1964.

(5) The holding of a symposium on Cancer of the Pancreas held on 1st to 3rd August, 1964. The symposium was organised by the Committee on Comparative Pathology of the International Union Against Cancer (UICC) entitled "Cancer of the Pancreas". This is the first U.I.C.C. Conference held in South East Asia and was attended by scientists from locally as well as from India, Pakistan, Japan, Australia, U.S.A. including Hawaii, Korea and the United Kingdom.

(6) The holding of a World Health Organisation Multiple Diseases in Epidemiological Health from 27th to 31st October, 1964. This was the second in the series of W.H.O. Seminars on this subject, the first of which was held at the Prince of Wales Hospital in 1962.

(7) The holding of two successful exhibitions. The first was held from 28th to 12th April, 1964 in connection with World Health Day and the theme was "The Fight Against Tuberculosis". The second was held from 6th to 14th June, 1964 and the theme was to show progress of Pharmacy in Singapore. Both exhibitions were held at the Victoria Memorial Hall.

I have the honour to be,

Sir,

Your obedient servant,

DR. HO SUE YOON,

Chief Pharmacist, Singapore Health Division of Medical Services.

1. LEGISLATION

THE Registration of Dentists (Amendment) Ordinance (No. 14 of 1964) was passed and came into force on 4th December, 1964. It provided for a representative of dentists in Division II of the Register practising in the State of Singapore, nominated by the Singapore Chinese Dentists' Association, to be appointed as a Member of the Dental Board by the Minister.

The Sale of Food and Drugs (Amendment) Ordinance (No. 8 of 1964). This Ordinance makes two amendments to section 28 of the Ordinance of 1955. The first amendment enables the Minister to prescribe fines not exceeding \$1,000 instead of \$500 (as provided for previously) for a breach of the Food and Drugs Regulations. The second amendment provides for the regulations made under the Ordinance to be presented as soon as possible after publication without the necessity of the regulations being approved by a resolution of the Legislative Assembly before they come into force.

The Cattle Ordinance (No. 15 of 1964). This Ordinance was enacted to deal effectively with the problem of stray cattle causing public health problems, traffic obstructions and public nuisances which had remained unchecked for a number of years.

SUBSIDIARY LEGISLATION

The Nurses Registration (Amendment) Regulations, 1964. These Regulations set out the composition of the Nursing Board and provided for the Minister to appoint certain members of the Board and to revoke their appointments without assigning any reason therefor.

2. STAFF WELFARE — DAILY RATED EMPLOYEES

DURING 1964 the Labour and Welfare Unit of the Public Health Division in the Ministry of Health continued to carry out the same function of duties as in the previous two years.

The head of this unit was designated as Senior Executive Officer (Labour and Welfare). He also acted as Chairman of the First Departmental Works Committee, working in liaison with the Ministries of Education, Culture, Social Affairs and Labour.

The strength of the staff of the Labour and Welfare Unit remained the same as the previous year although the volume of work involved had not been reduced. In fact, during the year there had been increase in disciplinary cases in respect of daily rated employees.

The former Senior Executive Officer (Labour and Welfare), Mr. R. Ramalingam, retired from the service in April 1964, and Mr. Wilfred Chew Keng Yong is now carrying out the duties in an acting capacity.

As a result of the issue of Treasury Circular No. 25/64 dated 24th October, 1964 the Labour and Welfare Unit was reorganised into two separate sections, known as the Personnel (Labour) Unit and the Welfare Unit. Henceforth, Personnel Officers will be responsible in all labour matters (except matters pertaining to welfare) connected with daily rated employees, and their duties shall normally include:

- (a) application of the labour legislation and other regulations governing daily rated employees in their departments;
- (b) assisting in the efficient recruitment, transfer, trade test and promotion of daily rated employees;
- (c) assisting in the investigation of grievances and disciplinary matters concerning daily rated employees;
- (d) advise on personnel and industrial relations matters.

The Welfare Officer of this unit will be responsible for all welfare matters pertaining to daily rated employees and his duties shall normally include:

- (a) payment of retirement benefits;
- (b) passage and other repatriation arrangements;
- (c) funeral arrangements and expenses;
- (d) unclaimed wages;
- (e) problems of absenteeism;
- (f) overstay on leave;
- (g) indebtedness;
- (h) hospitalisation;
- (i) matters relating to daily rated porters;
- (j) other general personal and welfare problems of daily rated employees.

The Interim Report of the Commission of Enquiry on Government Daily Rated Employees was published during the year, and action was taken to implement the various recommendations submitted in the report on instructions from Treasury (Establishment).

Establishment of daily-rated employees

There are eleven departments under Public Health Division employing approximately 5,000 daily-rated employees. They are as follows:

| | |
|------------------------|-----------------------------|
| Cleansing (City) | Quarantine and Epidemiology |
| Serangoon District | Public Health Engineering |
| Katong District | Cemeteries and Crematoria |
| Bukit Panjang District | Southern Islands and Unit |
| Markets and Hawkers | Transport Centre |
| Anti-Mosquito | |

During 1964 a total of 170 daily-rated employees were recruited for these departments. A total of 58 employees had left the service for the following reasons:

| | | |
|---|-----|----|
| Resignation | ... | 15 |
| Retirement | ... | 10 |
| Dismissal | ... | 20 |
| Death | ... | 6 |
| Vacation of service under Section 55 of Code of Wages | ... | 7 |

Quarters—The Federation Union has been pressing for consideration to be given by Government for more quarters to be built for daily rated employees. On the recommendation of the Commission that the Government should set up the necessary machinery to process current and future needs of quarters, a Working Party had been set up to look into the matter.

Labourers' Co-operative Society—The strength of the members has increased from 220 to 323 in 1964 and which has contributed to the increasing on the savings in investments. The Society has invested about \$58,500 in guilt-edged security bonds.

A summary of the financial position of the Society is given here below:

FINANCIAL SUMMARY OF GOVERNMENT HEALTH DEPARTMENT,
LABOURERS' CO-OPERATIVE SOCIETY LIMITED FOR
THE YEAR ENDED 31ST DECEMBER, 1964

| | | S | c. |
|-------------------------------------|----------|--------|-------|
| Post Office Savings Bank | ... | 5,575 | 53 |
| Cash at Bank | ... | 2,051 | 74 |
| Cash in transit | ... | 6,346 | 36 |
| Investments | ... | 58,530 | 75 |
| Outstanding loans | ... | 12,096 | 50 |
| | Total .. | 84,699 | 88 |
| Membership | ... | | 323 |
| Total staff eligible for membership | ... | | 1,400 |

3. STAFF AND TRAINING

MEDICAL OFFICERS

THE 1964 Estimates provided for 453 doctors (64 specialist medical posts, 69 posts of senior registrar, 320 posts of medical officers) besides 55 posts of housemen. As at 31st December, 1964, only 43 specialist medical posts and 47 posts of senior registrars were substantively filled, whilst there were 260 medical officers and 46 housemen. There were therefore 97 unfilled vacancies at the end of the year under review.

During the year 45 medical staff resigned as against 65 recruited. 20 Medical Officers proceeded overseas on Study Awards. Four Medical Officers returned after successfully completing their courses of study. 73 doctors graduated from the Faculty of Medicine, University of Singapore and 129 students were accepted for Medicine by the faculty during the year.

Under the Colombo Plan lecturers from Australia and New Zealand were made available for the conduct of a preparatory study course at the University of Singapore for candidates to sit for the primary (written part) M.R.A.C.P. Examination. One serving officer was successful in the Examination and was subsequently awarded a Colombo Plan Fellowship to prepare for the Final Examination in Australia.

DENTAL OFFICERS

THE 1964 Estimates provided for 59 Dental Officers (4 specialist posts (including Assistant Director of Medical Services (Dental)), two senior registrars, one Inspecting Officer and 52 dental officers). As at 31st December, 1964, 55 posts were filled.

During the year four resigned as against 15 (including 8 housemen) recruited. One Dental Officer proceeded on a Study Award. One Dental Officer returned after successfully completing his course of study. Nine Dental Surgeons graduated from the Faculty of Medicine and 38 students were accepted for Dentistry during the year.

NURSING PERSONNEL

Of the total number of 3,845 staff provided in the 1964 Estimates in the Nursing Service, 3,371 were filled as in December 1964 leaving 474 vacancies.

During the year 184 staff nurses and male nurses, 93 staff midwives and 168 assistant nurses were appointed to the service; and 255 student nurses, 143 pupil assistant nurses, 45 pupil assistant nurses (Psychiatric) and 98 pupil midwives were recruited for training.

During the year 73 staff nurses including male nurses and 17 assistant nurses resigned from the service and 99 student nurses, 34 pupil assistant nurses, and 45 pupil midwives resigned from their training.

There were 737 students in General Nursing Training at General Hospital at the end of the year.

The 3rd In-Service Pædiatric Training Course commenced in October 1963 with one Sister and ten Staff Nurses. The course would end in March 1965.

Six candidates successfully completed the 2nd Operation Theatre Course. The third course commenced on 15th November, 1964 with four Sisters and two Staff Nurses.

The 1st Ward Administration Course commenced in January 1964 and completed in December 1964. 11 Sisters and one Charge Nurse attended the course of whom nine were successful.

Under Psychiatric Nursing Training conducted at Woodbridge Hospital, 3 categories of training namely, Basic, Post Basic and Assistant Nurse (Psychiatric) are provided. There were 185 trainees at the end of the year.

A total of 132 Midwives qualified after training at the Kandang Kerbau Hospital. There were 232 Pupil Midwives under training at the end of the year.

Nine candidates completed their Post Basic Thoracic Nursing Training at Tan Tock Seng Hospital in May 1964.

The 6th Post Basic Public Health Nursing Course was held in the Institute of Health with 16 candidates including one from Thailand.

Table 1

THE MEDICAL REGISTER (31ST DECEMBER, 1964)

| | REGISTERED | | | | | | |
|---|----------------|-----------------|----------------------|--------------------|---------------------|-----------------|--------------------|
| | <i>Doctors</i> | <i>Dentists</i> | <i>Female Nurses</i> | <i>Male Nurses</i> | <i>Asst. Nurses</i> | <i>Midwives</i> | <i>Pharmacists</i> |
| | (a) | (b) | (c) | (c) | (c) | (d) | (e) |
| Government Medical Department | 363 | 55 | 987 | 268 | 576 | 821 | 28 |
| University (Teaching Staff) | 63 | 14 | — | — | — | — | 4 |
| Private Practice and Private Institutions | 463 | 265* | 563 | 37 | 90 | 536 | 73 |
| Housemen | 46 | — | — | — | — | — | — |
| Total | 935 | 334 | 1,550 | 305 | 666 | 1,357 | 105 |

*46 Division I Dentists.

219 Division II Dentists.

(a) The Medical Registration Ordinance (Chapter 191).

(b) The Registration of Dentists Ordinance (Chapter 197).

(c) The Nurses Registration Ordinance (Chapter 194).

(d) The Midwives Ordinance (Chapter 192).

(e) The Registration of Pharmacists Ordinance (Chapter 198).

4. FINANCE

THE receipts and expenditure of this Ministry for the year under review is set out in table 2.

Table 2
MINISTRY OF HEALTH SINGAPORE
FINANCIAL STATEMENT FOR THE YEAR 1964

| | | Receipts | | Payments | |
|------------------|--|------------|--------|------------|----|
| | | \$ | c. | \$ | c. |
| CLASS I | | | | | |
| A1 | Contribution and Fines under W. & O. Pension Ordinance | 1,699 | 91 | .. | .. |
| A2 | Penalties and Fines | 12,942 | 08 | .. | .. |
| B3 | Professional and Practising Registration Fees:—Medical, Dentist, Pharmacist, Nurses, Midwives | 14,074 | 00 | .. | .. |
| CLASS II | | | | | |
| A1 | Rent—Government Building, Quarters, Market Stalls | 820,219 | 30 | .. | .. |
| A3 | Chemistry Analysis Fees for P.U.B. | .. | 73,048 | .. | .. |
| (2) | Pathology—Laboratory Fees for Statutory Bodies | .. | 60,329 | .. | .. |
| A4 | Other Sales and Non-Regulatory Charges: | 133,377 | 00 | .. | .. |
| (6) | Health Division: Commission of Fish Sales, Trade Refuse Removal Fees and Nightsoil Removal Fees etc. | 2,267,131 | 66 | .. | .. |
| (7) | Hospitals Division: Hospital Charges: Sales of Swills Out-patient Charges | 1,656,463 | 96 | .. | .. |
| (20) | Miscellaneous Receipts | 26,545 | 77 | .. | .. |
| (21) | Search Fees | 11,129 | 00 | .. | .. |
| (22) | Sales of Stores | 27,661 | 26 | .. | .. |
| A5 | Regulatory Charges to Enterprises: | 119,958 | 00 | .. | .. |
| (2) | Chemistry Department Fees | .. | .. | .. | .. |
| (5) | Licences—Health Division | 1,148,075 | 82 | .. | .. |
| (19) | Miscellaneous | 3,908 | 40 | .. | .. |
| A6 | Regulatory Charges to Households: | .. | .. | .. | .. |
| (1) | Health: Anti Mosquito Oiling Charges Interment, Crematoria | 85,104 | 28 | .. | .. |
| B2 | Reimbursement for Services: | .. | .. | .. | .. |
| (11) | Electricity and Water Charges | 131,276 | 63 | .. | .. |
| (12) | Miscellaneous | 8,419 | 06 | .. | .. |
| CLASS III | | | | | |
| A4 | Interest | 148 | 24 | .. | .. |
| C1 | Government's Contribution Paid to C.P.F. | 4,600 | 65 | .. | .. |
| C2 | Overpayments and Refunds of Balance borne by Public Revenue | 3,565 | 56 | .. | .. |
| | | 58,479,441 | 32 | .. | .. |
| | | 64,955,741 | 90 | .. | .. |
| | | | | 35,046,351 | 52 |
| | | | | 26,694,968 | 10 |
| | | | | 1,027,888 | 38 |
| | | | | 2,186,533 | 90 |
| | | | | 64,955,741 | 90 |

5. VITAL STATISTICS

THE Vital Statistics relating to population, its main racial components, birth and deaths and migration by sea and air during 1964 are set out in the following tables from 3 to 20.

TABLE 3
POPULATION OF SINGAPORE, 1911 TO 1964

| Year | Total | Malays | Chinese | Indians and Pakis- tanis | Eura- sians | Euro- peans | Others |
|------------------|-----------|---------|-----------|--------------------------------|----------------|----------------|--------|
| 1911 (Census) .. | 303,321 | 41,806 | 219,577 | 27,755 | 4,671 | 5,711 | 3,801 |
| 1921 (Census) .. | 418,358 | 53,595 | 315,151 | 32,314 | 5,436 | 6,145 | 5,717 |
| 1931 (Census) .. | 557,745 | 65,014 | 418,640 | 50,811 | 6,903 | 8,082 | 8,295 |
| 1947 (Census) .. | 938,144 | 113,803 | 729,473 | 68,967 | 9,110 | 9,279 | 7,512 |
| 1957 (Census) .. | 1,445,929 | 197,059 | 1,090,596 | 124,084 | 11,382 | 10,826 | 11,982 |
| 1958 (Mid-Year) | 1,514,000 | 207,300 | 1,141,800 | 129,500 | 11,700 | 11,400 | 12,300 |
| 1959 (Mid-Year) | 1,579,600 | 217,400 | 1,190,000 | 134,600 | 12,000 | 12,200 | 13,400 |
| 1960 (Mid-Year) | 1,634,100 | 227,300 | 1,230,700 | 137,800 | 12,200 | 12,700 | 13,400 |
| 1961 (Mid-Year) | 1,687,300 | 236,400 | 1,269,100 | 141,500 | 12,800 | 13,400 | 14,100 |
| 1962 (Mid-Year) | 1,732,800 | 243,400 | 1,302,500 | 143,700 | 13,700 | 14,300 | 15,200 |
| 1963 (Mid-Year) | 1,775,200 | 249,200 | 1,334,500 | 146,100 | 14,400 | 15,000 | 16,000 |
| 1964 (Mid-Year) | 1,820,000 | 257,800 | 1,366,500 | 149,900 | 14,400 | 15,100 | 16,300 |

The racial group 'Malays' includes Indonesians.

TABLE 4

POPULATION ESTIMATES OF SINGAPORE BY RACIAL GROUP AND SEX, 1964

| Period | Total | Malays | Chinese | Indians and Pakis- tanis | Eura- sians | Euro- peans | Others |
|----------------------------|---------|--------|---------|-----------------------------------|----------------|----------------|--------|
| | | | | | | | |
| 30th June, 1964 | | | | | | | |
| Males .. | 944.9 | 132.6 | 690.8 | 96.2 | 7.7 | 8.5 | 9.1 |
| Females .. | 875.1 | 125.2 | 675.7 | 53.7 | 6.7 | 6.6 | 7.2 |
| Total .. | 1,820.0 | 257.8 | 1,366.5 | 149.9 | 14.4 | 15.1 | 16.3 |
| 31st December, 1964 | | | | | | | |
| Males .. | 957.4 | 135.0 | 699.0 | 97.4 | 7.9 | 8.7 | 9.4 |
| Females .. | 886.8 | 127.4 | 684.0 | 54.7 | 6.8 | 6.7 | 7.2 |
| Total .. | 1,844.2 | 262.4 | 1,383.0 | 152.1 | 14.7 | 15.4 | 16.6 |

Notes: (i) The racial group 'Malays' includes Indonesians.

(ii) The population estimates *exclude* non-locally domiciled Services personnel (including United Kingdom based civilians employed by the Services) and their families — 27,299.

(iii) Transients afloat — 3,466.

TABLE 5
LIVE-BIRTHS WHICH OCCURRED IN 1964
BY RACIAL GROUP AND AGE OF MOTHER AND BY SEX OF CHILD

| Mother's Age in Years | TOTAL | | | MALAYS | | CHINESE | | INDIANS AND PAKISTANIS | | EURASIANS | | EUROPEANS | | OTHERS | |
|-----------------------|-----------|--------|--------|--------|-------|---------|--------|------------------------|-------|-----------|-----|-----------|-----|--------|-----|
| | M. and F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| 14 .. | 15 | 8 | 7 | 1 | .. | 5 | 5 | 2 | 2 | .. | .. | .. | .. | .. | .. |
| 15 .. | 35 | 18 | 17 | 9 | 3 | 2 | 1 | 7 | 12 | .. | 1 | .. | .. | .. | .. |
| 16 .. | 268 | 129 | 139 | 49 | 58 | 54 | 47 | 23 | 34 | 2 | .. | .. | .. | 1 | .. |
| 17 .. | 653 | 346 | 307 | 139 | 122 | 148 | 120 | 58 | 62 | .. | 2 | .. | .. | 1 | 1 |
| 18 .. | 1,086 | 543 | 543 | 191 | 209 | 270 | 246 | 77 | 83 | 1 | 2 | .. | .. | 4 | 3 |
| 19 .. | 1,237 | 618 | 619 | 200 | 218 | 340 | 311 | 77 | 83 | 1 | 4 | .. | 1 | .. | 2 |
| 20 .. | 2,110 | 1,071 | 1,039 | 307 | 303 | 637 | 623 | 115 | 101 | 3 | 5 | 2 | .. | 7 | 7 |
| 21 .. | 2,284 | 1,185 | 1,099 | 318 | 295 | 740 | 694 | 122 | 99 | 2 | 4 | 1 | 3 | 2 | 4 |
| 22 .. | 2,846 | 1,486 | 1,360 | 349 | 338 | 981 | 867 | 130 | 133 | 13 | 8 | 7 | 7 | 6 | 7 |
| 23 .. | 3,709 | 1,907 | 1,802 | 411 | 370 | 1,310 | 1,261 | 162 | 152 | 9 | 5 | 4 | 3 | 11 | 11 |
| 24 .. | 4,254 | 2,163 | 2,091 | 425 | 405 | 1,526 | 1,507 | 182 | 148 | 9 | 8 | 5 | 7 | 16 | 16 |
| 25 .. | 4,100 | 2,116 | 1,984 | 436 | 364 | 1,510 | 1,443 | 138 | 143 | 13 | 13 | 10 | 3 | 9 | 18 |
| 26 .. | 3,817 | 1,938 | 1,879 | 342 | 328 | 1,442 | 1,401 | 115 | 121 | 15 | 5 | 13 | 10 | 11 | 14 |
| 27 .. | 3,203 | 1,642 | 1,561 | 329 | 318 | 1,174 | 1,074 | 108 | 139 | 13 | 10 | 6 | 8 | 12 | 12 |
| 28 .. | 3,607 | 1,877 | 1,730 | 370 | 373 | 1,342 | 1,208 | 124 | 122 | 15 | 10 | 14 | 9 | 12 | 8 |
| 29 .. | 3,325 | 1,743 | 1,582 | 314 | 308 | 1,305 | 1,158 | 96 | 100 | 11 | 6 | 9 | 7 | 8 | 3 |
| 30 .. | 3,333 | 1,663 | 1,670 | 354 | 347 | 1,191 | 1,196 | 94 | 94 | 6 | 14 | 7 | 9 | 11 | 10 |
| 31 .. | 2,295 | 1,166 | 1,129 | 193 | 191 | 890 | 850 | 67 | 66 | 4 | 7 | 4 | 11 | 8 | 4 |
| 32 .. | 2,492 | 1,283 | 1,209 | 247 | 224 | 942 | 889 | 71 | 73 | 11 | 7 | 4 | 8 | 8 | 8 |
| 33 .. | 2,076 | 1,062 | 1,014 | 163 | 183 | 802 | 749 | 77 | 62 | 8 | 7 | 8 | 4 | 4 | 9 |
| 34 .. | 2,070 | 1,074 | 996 | 176 | 184 | 830 | 742 | 50 | 58 | 7 | 3 | 5 | 3 | 6 | 6 |
| 35 .. | 1,897 | 960 | 937 | 187 | 184 | 694 | 698 | 64 | 48 | 5 | 2 | 4 | 1 | 6 | 4 |
| 36 .. | 1,560 | 784 | 776 | 154 | 125 | 583 | 605 | 36 | 31 | 3 | 4 | 2 | 2 | 6 | 9 |
| 37 .. | 1,357 | 731 | 626 | 119 | 100 | 572 | 484 | 27 | 35 | 6 | .. | 4 | 5 | 3 | 2 |
| 38 .. | 1,146 | 575 | 571 | 87 | 102 | 450 | 430 | 33 | 32 | 1 | 2 | 3 | 2 | 1 | 3 |
| 39 .. | 806 | 433 | 373 | 63 | 55 | 338 | 298 | 27 | 13 | 4 | 2 | .. | 1 | 1 | 4 |
| 40 .. | 802 | 417 | 385 | 53 | 74 | 347 | 295 | 11 | 11 | .. | 2 | 3 | 2 | 3 | 1 |
| 41 .. | 553 | 287 | 266 | 47 | 29 | 229 | 222 | 9 | 12 | 1 | 1 | 1 | 2 | .. | .. |
| 42 .. | 416 | 211 | 205 | 28 | 30 | 179 | 167 | 2 | 6 | .. | 1 | 1 | .. | 1 | 1 |
| 43 .. | 333 | 157 | 176 | 11 | 23 | 143 | 140 | 1 | 9 | .. | 1 | 1 | 2 | 1 | 1 |
| 44 .. | 228 | 114 | 114 | 11 | 13 | 98 | 96 | 5 | 3 | .. | 1 | .. | .. | .. | 1 |
| 45 .. | 140 | 64 | 76 | 5 | 16 | 57 | 58 | 2 | 2 | .. | .. | .. | .. | .. | .. |
| Over 45 .. | 153 | 81 | 72 | 14 | 10 | 67 | 58 | .. | 4 | .. | .. | .. | .. | .. | .. |
| Unknown .. | 11 | 7 | 4 | .. | .. | 2 | 3 | 1 | .. | .. | .. | .. | .. | 4 | 1 |
| Total .. | 58,217 | 29,859 | 28,358 | 6,102 | 5,902 | 21,200 | 19,946 | 2,113 | 2,093 | 163 | 137 | 118 | 110 | 163 | 170 |

The racial group 'Malays' includes Indonesians.

Figures excludes 2,179 live-births of wives of non-locally domiciled military and civilian Services personnel.

TABLE 6
LIVE-BIRTHS WHICH OCCURRED IN 1964

BY REGISTRATION AREA, RACIAL GROUP OF FATHER AND SEX OF CHILD

| Racial Group | SINGAPORE TOTAL | | | CITY AREA | | | RURAL AREA | | |
|--------------------------------|-----------------|--------|--------|-----------|--------|--------|------------|-------|-------|
| | M. and F. | M. | F. | M. and F. | M. | F. | M. and F. | M. | F. |
| | Malays | 11,709 | 5,955 | 5,754 | 8,307 | 4,273 | 4,034 | 3,402 | 1,682 | 1,720 |
| Chinese | 40,937 | 21,114 | 19,823 | 36,839 | 19,039 | 17,800 | 4,098 | 2,075 | 2,023 |
| Indians and Pakistanis | 4,572 | 2,281 | 2,291 | 4,189 | 2,091 | 2,098 | 383 | 190 | 193 |
| Eurasians | 313 | 171 | 142 | 293 | 158 | 135 | 20 | 13 | 7 |
| Europeans | 254 | 131 | 123 | 250 | 128 | 122 | 4 | 3 | 1 |
| Others | 432 | 207 | 225 | 409 | 197 | 212 | 23 | 10 | 13 |
| Total | 58,217 | 29,859 | 28,358 | 50,287 | 25,886 | 24,401 | 7,930 | 3,973 | 3,957 |

The racial group 'Malays' includes Indonesians.
Figures exclude 2,179 live-births of wives of non-locally domiciled military and civilian Services personnel.

TABLE 7

LIVE-BIRTHS WHICH OCCURRED IN 1964

BY PLACE OF USUAL RESIDENCE OF PARENTS, RACIAL GROUP OF FATHER AND SEX OF CHILD

| Place of usual Residence | TOTAL | | | MALAYS | | CHINESE | | INDIANS AND PAKISTANIS | | EURASIANS | | EUROPEANS | | OTHERS | |
|--------------------------|-----------|--------|--------|--------|-------|---------|--------|------------------------|-------|-----------|-----|-----------|-----|--------|-----|
| | M. and F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| City .. | 33,693 | 17,312 | 16,381 | 2,959 | 2,809 | 12,668 | 11,881 | 1,392 | 1,384 | 70 | 64 | 104 | 93 | 119 | 150 |
| Katong .. | 9,384 | 4,857 | 4,527 | 1,849 | 1,768 | 2,611 | 2,353 | 293 | 319 | 56 | 46 | 2 | 3 | 46 | 38 |
| Serangoon .. | 8,767 | 4,457 | 4,310 | 435 | 440 | 3,562 | 3,413 | 386 | 400 | 35 | 21 | 12 | 7 | 27 | 29 |
| Bukit Panjang .. | 2,981 | 1,549 | 1,432 | 284 | 272 | 1,085 | 1,013 | 163 | 136 | 5 | 4 | 4 | 2 | 8 | 5 |
| Jurong .. | 2,765 | 1,391 | 1,374 | 231 | 224 | 1,127 | 1,111 | 28 | 37 | 1 | 2 | .. | .. | 4 | .. |
| Southern Islands .. | 521 | 243 | 278 | 190 | 232 | 40 | 36 | 8 | 6 | 3 | 4 | 1 | .. | 1 | .. |
| States of Malaya .. | 90 | 44 | 46 | 7 | 8 | 17 | 14 | 11 | 9 | .. | 1 | 7 | 11 | 2 | 3 |
| Overseas .. | 16 | 6 | 10 | .. | 1 | 4 | 2 | .. | .. | 1 | .. | 1 | 7 | .. | .. |
| Total .. | 58,217 | 29,859 | 28,358 | 5,955 | 5,754 | 21,114 | 19,823 | 2,281 | 2,291 | 171 | 142 | 131 | 123 | 207 | 225 |

The racial group 'Malays' includes Indonesians.
 Figures exclude 2,179 live-births of wives of non-locally domiciled military and civilian Services personnel.

TABLE 8

LIVE-BIRTHS WHICH OCCURRED IN 1964

BY PLACE OF USUAL RESIDENCE OF PARENTS, REGISTRATION AREA AND SEX OF CHILD

| Place of usual Residence | TOTAL | | | REGISTRATION AREA | | | | | |
|--------------------------|-----------|--------|--------|-------------------|--------|--------|------------|-------|-------|
| | M. and F. | M. | F. | CITY AREA | | | RURAL AREA | | |
| | | | | M. and F. | M. | F. | M. and F. | M. | F. |
| City .. | 33,693 | 17,312 | 16,381 | 33,403 | 17,169 | 16,234 | 290 | 143 | 147 |
| Katong .. | 9,384 | 4,857 | 4,527 | 6,564 | 3,445 | 3,119 | 2,820 | 1,412 | 1,408 |
| Serangoon .. | 8,767 | 4,457 | 4,310 | 6,037 | 3,083 | 2,954 | 2,730 | 1,374 | 1,356 |
| Bukit Panjang .. | 2,981 | 1,549 | 1,432 | 2,042 | 1,061 | 981 | 939 | 488 | 451 |
| Jurong .. | 2,765 | 1,391 | 1,374 | 2,003 | 1,009 | 994 | 762 | 382 | 380 |
| Southern Islands .. | 521 | 243 | 278 | 143 | 73 | 70 | 378 | 170 | 208 |
| States of Malaya .. | 90 | 44 | 46 | 79 | 40 | 39 | 11 | 4 | 7 |
| Overseas .. | 16 | 6 | 10 | 16 | 6 | 10 | .. | .. | .. |
| Total .. | 58,217 | 29,859 | 28,358 | 50,287 | 25,886 | 24,401 | 7,930 | 3,973 | 3,957 |

Figures exclude 2,179 live-births of wives of non-locally domiciled military and civilian Services personnel.

TABLE 9
DEATHS REGISTERED IN 1964
BY REGISTRATION AREA, SEX AND RACIAL GROUP

| Racial Group | SINGAPORE TOTAL | | | CITY AREA | | | RURAL AREA | | |
|------------------------|-----------------|-------|--------|-----------|-------|--------|------------|-------|--------|
| | Total | Male | Female | Total | Male | Female | Total | Male | Female |
| Malays | 1,635 | 884 | 751 | 1,076 | 604 | 472 | 559 | 280 | 279 |
| Chinese | 7,813* | 4,661 | 3,151 | 6,509* | 3,942 | 2,566 | 1,304 | 719 | 585 |
| Indians and Pakistanis | 788 | 588 | 200 | 681 | 504 | 177 | 107 | 84 | 23 |
| Eurasians | 81 | 38 | 43 | 59 | 33 | 26 | 22 | 5 | 17 |
| Europeans | 57 | 32 | 25 | 52 | 30 | 22 | 5 | 2 | 3 |
| Others | 60* | 36 | 23 | 56* | 34 | 21 | 4 | 2 | 2 |
| Total | 10,434† | 6,239 | 4,193 | 8,433† | 5,147 | 3,284 | 2,001 | 1,092 | 909 |

*Includes 1 unknown sex.

†Includes 2 unknown sex.

The racial group 'Malays' includes Indonesians.

Figures exclude 76 deaths of non-locally domiciled military and civilian Services personnel and their families.

TABLE 10
DEATHS REGISTERED IN 1964
BY PLACE OF USUAL RESIDENCE RACIAL GROUP AND SEX

| Place of usual Residence | TOTAL | | MALAYS | | CHINESE | | INDIANS AND PAKISTANIS | | EURASIANS | | EUROPEANS | | OTHERS | | |
|--------------------------|-----------|-------|--------|-----|---------|-------|------------------------|-----|-----------|----|-----------|----|--------|----|----|
| | M. and F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| City | 6,613* | 4,007 | 2,604 | 421 | 348 | 3,142 | 2,086 | 380 | 120 | 18 | 19 | 21 | 16 | 25 | 15 |
| Katong | 1,569 | 902 | 667 | 302 | 261 | 490 | 363 | 87 | 23 | 12 | 9 | 3 | 5 | 8 | 6 |
| Serangoon | 1,326 | 771 | 555 | 58 | 53 | 617 | 445 | 84 | 40 | 6 | 13 | 4 | 2 | 2 | 2 |
| Bukit Panjang .. | 397 | 229 | 168 | 30 | 30 | 176 | 127 | 22 | 10 | .. | .. | 1 | 1 | .. | .. |
| Jurong | 361 | 223 | 138 | 32 | 28 | 183 | 107 | 8 | 3 | .. | .. | .. | .. | .. | .. |
| Southern Islands .. | 78 | 48 | 30 | 27 | 27 | 16 | 2 | 4 | .. | 1 | 1 | .. | .. | .. | .. |
| States of Malaya | 76 | 47 | 29 | 10 | 3 | 32 | 21 | 3 | 4 | .. | 1 | 1 | .. | 1 | .. |
| Overseas | 14 | 12 | 2 | 4 | 1 | 5 | .. | .. | .. | 1 | .. | 2 | 1 | .. | .. |
| Total | 10,434* | 6,239 | 4,193 | 884 | 751 | 4,661 | 3,151 | 588 | 200 | 38 | 43 | 32 | 25 | 36 | 23 |

*Includes 2 unknown sex (Chinese and Others).

The racial group 'Malays' includes Indonesians.

Figures exclude 76 deaths of non-locally domiciled military and civilian Services personnel and their families.

TABLE 11
DEATHS REGISTERED IN 1964
BY PLACE OF USUAL RESIDENCE, REGISTRATION AREA AND SEX

| Place of usual Residence | TOTAL | | | REGISTRATION AREA | | | | | |
|--------------------------|----------------|--------------|--------------|-------------------|--------------|--------------|--------------|--------------|------------|
| | | | | CITY AREA | | | RURAL AREA | | |
| | Total | Male | Female | Total | Male | Female | Total | Male | Female |
| City | 6,613* | 4,007 | 2,604 | 6,418* | 3,884 | 2,532 | 195 | 123 | 72 |
| Katong | 1,569 | 902 | 667 | 888 | 524 | 364 | 681 | 378 | 303 |
| Serangoon .. | 1,326 | 771 | 555 | 653 | 427 | 226 | 673 | 344 | 329 |
| Bukit Panjang .. | 397 | 229 | 168 | 166 | 114 | 52 | 231 | 115 | 116 |
| Jurong | 361 | 223 | 138 | 208 | 128 | 80 | 153 | 95 | 58 |
| Southern Islands .. | 78 | 48 | 30 | 24 | 20 | 4 | 54 | 28 | 26 |
| States of Malaya .. | 76 | 47 | 29 | 64 | 40 | 24 | 12 | 7 | 5 |
| Overseas | 14 | 12 | 2 | 12 | 10 | 2 | 2 | 2 | .. |
| Total .. | 10,434* | 6,239 | 4,193 | 8,433* | 5,147 | 3,284 | 2,001 | 1,092 | 909 |

*Includes 2 unknown sex.

Figures exclude 76 deaths of non-locally domiciled military and civilian Services personnel and their families.

TABLE 12
DEATHS REGISTERED IN 1964
BY AGE GROUP, RACIAL GROUP AND SEX

| Age Group | TOTAL | | MALAYS | | CHINESE | | INDIANS AND PAKISTANIS | | EUROPEANS | | EUROPEANS | | OTHERS | | |
|----------------------------------|-------------|-------|--------|-----|---------|-------|------------------------|-----|-----------|----|-----------|----|--------|----|----|
| | M. and F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| Under 1 day .. | 279* | 157 | 121 | 31 | 28 | 115 | 80 | 11 | 12 | .. | .. | .. | 1 | .. | .. |
| 1 day and under 2 days .. | 172 | 106 | 66 | 25 | 21 | 75 | 40 | 6 | 4 | .. | .. | .. | 1 | .. | .. |
| 2 days and under 3 days .. | 135 | 81 | 54 | 17 | 7 | 54 | 37 | 7 | 10 | 1 | .. | 1 | .. | 1 | .. |
| 3 days and under 4 days .. | 109 | 68 | 41 | 18 | 13 | 44 | 26 | 5 | 1 | 1 | .. | .. | .. | .. | 1 |
| 4 days and under 5 days .. | 63 | 38 | 25 | 8 | 5 | 30 | 17 | .. | 3 | .. | .. | .. | .. | .. | .. |
| 5 days and under 6 days .. | 40 | 24 | 16 | 3 | 3 | 21 | 13 | .. | .. | .. | .. | .. | .. | .. | .. |
| 6 days and under 7 days .. | 47 | 29 | 18 | 8 | 8 | 18 | 7 | 3 | 2 | .. | .. | .. | 1 | .. | .. |
| 7 days and under 14 days .. | 172 | 97 | 75 | 26 | 17 | 63 | 51 | 7 | 6 | .. | .. | .. | .. | 1 | 1 |
| 14 days and under 21 days .. | 70 | 33 | 37 | 6 | 6 | 24 | 26 | 3 | 5 | .. | .. | .. | .. | .. | .. |
| 21 days and under 28 days .. | 56 | 36 | 20 | 10 | 7 | 21 | 11 | 3 | 2 | .. | .. | .. | .. | 2 | .. |
| Neo-Natal Deaths | 1,143* | 669 | 473 | 152 | 115 | 465 | 308 | 45 | 45 | 2 | .. | 1 | 3 | 4 | 2 |
| 28 days and under 2 months .. | 118 | 70 | 48 | 27 | 18 | 39 | 21 | 3 | 8 | .. | .. | .. | 1 | 1 | .. |
| 2 months and under 3 months .. | 74 | 49 | 25 | 19 | 11 | 23 | 13 | 7 | 1 | .. | .. | .. | .. | .. | .. |
| 3 months and under 4 months .. | 68 | 35 | 33 | 7 | 12 | 24 | 17 | 4 | 2 | .. | 2 | .. | .. | .. | .. |
| 4 months and under 5 months .. | 45 | 24 | 21 | 9 | 8 | 11 | 12 | 4 | 1 | .. | .. | .. | .. | .. | .. |
| 5 months and under 6 months .. | 44 | 17 | 27 | 9 | 9 | 8 | 17 | .. | 1 | .. | .. | .. | .. | .. | .. |
| 6 months and under 7 months .. | 65 | 42 | 23 | 18 | 6 | 21 | 15 | 3 | 2 | .. | .. | .. | .. | .. | .. |
| 7 months and under 8 months .. | 38 | 22 | 16 | 15 | 4 | 7 | 11 | .. | 1 | .. | .. | .. | .. | .. | .. |
| 8 months and under 9 months .. | 45 | 26 | 19 | 6 | 8 | 15 | 9 | 3 | 2 | 1 | .. | .. | .. | 1 | .. |
| 9 months and under 10 months .. | 35 | 21 | 14 | 9 | 7 | 10 | 5 | 2 | 2 | .. | .. | .. | .. | .. | .. |
| 10 months and under 11 months .. | 25 | 12 | 13 | 2 | 6 | 9 | 6 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| 11 months and under 1 year .. | 38 | 17 | 21 | 6 | 9 | 10 | 11 | .. | 1 | .. | .. | 1 | .. | .. | .. |
| Infant Mortality | 1,738* | 1,004 | 733 | 279 | 213 | 642 | 445 | 72 | 67 | 3 | 2 | 2 | 4 | 6 | 2 |
| 1 year and under 2 years .. | 193 | 99 | 94 | 39 | 39 | 52 | 51 | 8 | 4 | .. | .. | .. | .. | .. | .. |
| 2 years and under 3 years .. | 120 | 64 | 56 | 20 | 18 | 38 | 35 | 6 | 2 | .. | .. | .. | .. | .. | 1 |
| 3 years and under 4 years .. | 76 | 45 | 31 | 11 | 6 | 33 | 21 | 1 | 4 | .. | .. | .. | .. | .. | .. |
| 4 years and under 5 years .. | 76 | 42 | 34 | 13 | 10 | 26 | 22 | 3 | 1 | .. | .. | .. | 1 | .. | .. |
| 5-9 years .. | 198 | 120 | 78 | 19 | 17 | 85 | 52 | 15 | 7 | 1 | .. | .. | 1 | .. | 1 |
| 10-14 years .. | 137 | 89 | 48 | 16 | 10 | 66 | 36 | 6 | 2 | .. | .. | .. | .. | 1 | .. |
| 15-19 years .. | 140 | 84 | 56 | 8 | 10 | 71 | 39 | 4 | 6 | .. | 1 | 1 | .. | .. | .. |
| 20-24 years .. | 149 | 102 | 47 | 17 | 17 | 78 | 27 | 5 | 2 | .. | .. | 1 | 1 | 1 | .. |
| 25-29 years .. | 166 | 102 | 64 | 18 | 17 | 71 | 41 | 11 | 5 | .. | 1 | 1 | .. | 1 | .. |
| 30-34 years .. | 190 | 106 | 84 | 18 | 22 | 76 | 55 | 11 | 4 | .. | 1 | 1 | 2 | .. | .. |
| 35-39 years .. | 257 | 141 | 116 | 20 | 21 | 88 | 80 | 29 | 11 | 1 | .. | 3 | 3 | .. | 1 |
| 40-44 years .. | 359 | 243 | 116 | 27 | 23 | 154 | 84 | 54 | 7 | 6 | 2 | 1 | .. | 1 | .. |
| 45-49 years .. | 495 | 331 | 164 | 37 | 26 | 226 | 120 | 62 | 15 | 4 | .. | 2 | 3 | .. | 1 |
| 50-54 years .. | 821 | 564 | 257 | 50 | 55 | 425 | 191 | 77 | 8 | 4 | .. | 6 | 2 | 2 | 1 |
| 55-59 years .. | 965 | 650 | 315 | 56 | 48 | 518 | 250 | 67 | 15 | 1 | 2 | 3 | .. | 5 | .. |
| 60-64 years .. | 1,154 | 795 | 359 | 71 | 59 | 642 | 273 | 69 | 17 | 6 | 6 | 2 | .. | 5 | 4 |
| 65-69 years .. | 946 | 595 | 351 | 59 | 38 | 492 | 290 | 35 | 8 | 3 | 7 | 4 | 3 | 2 | 5 |
| 70-74 years .. | 861 | 487 | 374 | 40 | 27 | 410 | 327 | 29 | 9 | 3 | 6 | .. | 1 | 5 | 4 |
| 75-79 years .. | 632 | 301 | 331 | 25 | 29 | 259 | 289 | 19 | 3 | 3 | 7 | 2 | 1 | 2 | 2 |
| 80-84 years .. | 441 | 166 | 275 | 23 | 20 | 127 | 248 | 9 | 2 | 3 | 2 | 2 | 2 | 2 | 1 |
| 85 years and over | 293 | 86 | 207 | 15 | 26 | 67 | 172 | 3 | 1 | .. | 6 | 1 | 1 | .. | 1 |
| Unknown .. | 27† | 23 | 3 | 3 | .. | 15 | 3 | 2 | .. | .. | .. | .. | .. | 3 | .. |
| Total .. | 10,434 ‡ | 6,239 | 4,193 | 884 | 751 | 4,661 | 3,151 | 588 | 200 | 38 | 43 | 32 | 25 | 36 | 23 |

*Includes 1 unknown sex (Chinese).

†Includes 1 unknown sex (Others).

‡Includes 2 unknown sex.

The racial group 'Malays' includes Indonesians.

Figures exclude 76 deaths of non-locally domiciled military and civilian Services personnel and their families.

TABLE 13

DEATHS REGISTERED IN 1964

BY REGISTRATION AREA, AGE GROUP AND SEX

| Age Group | TOTAL | | | CITY AREA | | | RURAL AREA | | |
|---------------------------|-----------------|-------|-----|-----------------|-----|-----|-----------------|-----|----|
| | M. and F. | M. | F. | M. and F. | M. | F. | M. and F. | M. | F. |
| Under 1 day .. | 279* | 157 | 121 | 257* | 142 | 114 | 22 | 15 | 7 |
| 1 day and under 2 days | 172 | 106 | 66 | 163 | 99 | 64 | 9 | 7 | 2 |
| 2 days and under 3 days | 135 | 81 | 54 | 126 | 75 | 51 | 9 | 6 | 3 |
| 3 days and under 4 days | 109 | 68 | 41 | 102 | 64 | 38 | 7 | 4 | 3 |
| 4 days and under 5 days | 63 | 38 | 25 | 62 | 37 | 25 | 1 | 1 | .. |
| 5 days and under 6 days | 40 | 24 | 16 | 38 | 23 | 15 | 2 | 1 | 1 |
| 6 days and under 7 days | 47 | 29 | 18 | 41 | 24 | 17 | 6 | 5 | 1 |
| 7 days and under 14 days | 172 | 97 | 75 | 154 | 90 | 64 | 18 | 7 | 11 |
| 14 days and under 21 days | 70 | 33 | 37 | 64 | 29 | 35 | 6 | 4 | 2 |
| 21 days and under 28 days | 56 | 36 | 20 | 52 | 33 | 19 | 4 | 3 | 1 |
| Neo-Natal Deaths .. | 1,143* | 669 | 473 | 1,059* | 616 | 442 | 84 | 53 | 31 |
| 28 days and under | | | | | | | | | |
| 2 months .. | 118 | 70 | 48 | 90 | 57 | 33 | 28 | 13 | 15 |
| 2 months and under | | | | | | | | | |
| 3 months .. | 74 | 49 | 25 | 56 | 35 | 21 | 18 | 14 | 4 |
| 3 months and under | | | | | | | | | |
| 4 months .. | 68 | 35 | 33 | 50 | 26 | 24 | 18 | 9 | 9 |
| 4 months and under | | | | | | | | | |
| 5 months .. | 45 | 24 | 21 | 33 | 15 | 18 | 12 | 9 | 3 |
| 5 months and under | | | | | | | | | |
| 6 months .. | 44 | 17 | 27 | 37 | 15 | 22 | 7 | 2 | 5 |
| 6 months and under | | | | | | | | | |
| 7 months .. | 65 | 42 | 23 | 48 | 27 | 21 | 17 | 15 | 2 |
| 7 months and under | | | | | | | | | |
| 8 months .. | 38 | 22 | 16 | 31 | 17 | 14 | 7 | 5 | 2 |
| 8 months and under | | | | | | | | | |
| 9 months .. | 45 | 26 | 19 | 34 | 19 | 15 | 11 | 7 | 4 |
| 9 months and under | | | | | | | | | |
| 10 months .. | 35 | 21 | 14 | 31 | 19 | 12 | 4 | 2 | 2 |
| 10 months and under | | | | | | | | | |
| 11 months .. | 25 | 12 | 13 | 21 | 10 | 11 | 4 | 2 | 2 |
| 11 months and under | | | | | | | | | |
| 1 year .. | 38 | 17 | 21 | 27 | 12 | 15 | 11 | 5 | 6 |
| Infant Mortality .. | 1,738* | 1,004 | 733 | 1,517* | 868 | 648 | 221 | 136 | 85 |

* Includes neo-natal deaths.

Figures exclude 76 deaths of non-locally domiciled military and civilian Services personnel and their families.

TABLE 13 — *continued*

DEATHS REGISTERED IN 1964

BY REGISTRATION AREA, AGE GROUP AND SEX

| Age Group | TOTAL | | | CITY AREA | | | RURAL AREA | | |
|---------------------------|-----------------|-------|-------|-----------------|-------|-------|-----------------|-------|-----|
| | M. and F. | M. | F. | M. and F. | M. | F. | M. and F. | M. | F. |
| 1 year and under 2 years | 193 | 99 | 94 | 151 | 81 | 70 | 42 | 18 | 24 |
| 2 years and under 3 years | 120 | 64 | 56 | 99 | 52 | 47 | 21 | 12 | 9 |
| 3 years and under 4 years | 76 | 45 | 31 | 66 | 38 | 28 | 10 | 7 | 3 |
| 4 years and under 5 years | 76 | 42 | 34 | 64 | 37 | 27 | 12 | 5 | 7 |
| 5—9 years .. | 198 | 120 | 78 | 164 | 101 | 63 | 34 | 19 | 15 |
| 10—14 years .. | 137 | 89 | 48 | 124 | 80 | 44 | 13 | 9 | 4 |
| 15—19 years .. | 140 | 84 | 56 | 127 | 78 | 49 | 13 | 6 | 7 |
| 20—24 years .. | 149 | 102 | 47 | 142 | 97 | 45 | 7 | 5 | 2 |
| 25—29 years .. | 166 | 102 | 64 | 151 | 93 | 58 | 15 | 9 | 6 |
| 30—34 years .. | 190 | 106 | 84 | 166 | 98 | 68 | 24 | 8 | 16 |
| 35—39 years .. | 257 | 141 | 116 | 218 | 120 | 98 | 39 | 21 | 18 |
| 40—44 years .. | 359 | 243 | 116 | 305 | 207 | 98 | 54 | 36 | 18 |
| 45—49 years .. | 495 | 331 | 164 | 423 | 291 | 132 | 72 | 40 | 32 |
| 50—54 years .. | 821 | 564 | 257 | 697 | 493 | 204 | 124 | 71 | 53 |
| 55—59 years .. | 965 | 650 | 315 | 782 | 537 | 245 | 183 | 113 | 70 |
| 60—64 years .. | 1,154 | 795 | 359 | 926 | 637 | 289 | 228 | 158 | 70 |
| 65—69 years .. | 946 | 595 | 351 | 738 | 473 | 265 | 208 | 122 | 86 |
| 70—74 years .. | 861 | 487 | 374 | 637 | 367 | 270 | 224 | 120 | 104 |
| 75—79 years .. | 632 | 301 | 331 | 447 | 219 | 228 | 185 | 82 | 103 |
| 80—84 years .. | 441 | 166 | 275 | 299 | 116 | 183 | 142 | 50 | 92 |
| 85 years and over .. | 293 | 86 | 207 | 166 | 42 | 124 | 127 | 44 | 83 |
| Unknown .. | 27* | 23 | 3 | 24* | 22 | 1 | 3 | 1 | 2 |
| Total .. | 10,434 † | 6,239 | 4,193 | 8,433† | 5,147 | 3,284 | 2,001 | 1,092 | 909 |

*Includes 1 unknown sex.

†Includes 2 unknown sex.

Figures exclude 76 deaths of non-locally domiciled military and civilian Services personnel and their families.

TABLE 14
LIVE-BIRTHS AND CRUDE BIRTH RATES: 1954 AND 1964

| Racial Group | 1954 | | 1964 | |
|--------------------------------|--------|-------|--------|-------|
| | Number | Rate* | Number | Rate* |
| Malays | 8,118 | 49.0 | 11,709 | 45.4 |
| Chinese | 42,850 | 45.3 | 40,937 | 30.0 |
| Indians and Pakistanis | 4,269 | 40.8 | 4,572 | 30.5 |
| Eurasians | 330 | 30.8 | 313 | 21.7 |
| Europeans | 895 | 23.8 | 254 | 16.8 |
| Others | 567 | 56.7 | 432 | 26.5 |
| Total | 57,029 | 45.7 | 58,217 | 32.0 |

*Number of live-births per 1,000 mid-year population.

Notes: (i) Figures for 1954 include live-births of wives of non-locally domiciled Services personnel (including United Kingdom-based civilians employed by the Services).

(ii) Figures for 1954 exclude 2,179 live-births of wives of non-locally domiciled Services personnel (including United Kingdom-based civilians employed by the Services).

(iii) The racial group 'Malays' includes Indonesians.

TABLE 15
DEATHS AND CRUDE DEATHS RATES: 1954 AND 1964

| Racial Group | 1954 | | 1964 | |
|--------------------------------|--------|-------|--------|-------|
| | Number | Rate* | Number | Rate* |
| Malays | 1,933 | 11.7 | 1,635 | 6.3 |
| Chinese | 7,752 | 8.2 | 7,813 | 5.7 |
| Indians and Pakistanis | 805 | 7.7 | 788 | 5.3 |
| Eurasians | 94 | 8.8 | 81 | 5.6 |
| Europeans | 107 | 2.8 | 57 | 3.8 |
| Others | 99 | 9.9 | 60 | 3.7 |
| Total | 10,790 | 8.6 | 10,434 | 5.7 |

*Number of deaths per 1,000 mid-year population.

Notes: (i) Figures for 1954 include deaths of non-locally domiciled Services personnel (including United Kingdom-based civilians employed by the Services) and members of their families.

(ii) Figures for 1964 exclude 76 deaths of non-locally domiciled Services personnel (including United Kingdom-based civilians employed by the Services) and members of their families.

(iii) The racial group 'Malays' includes Indonesians.

TABLE 16
 INFANT MORTALITY AND INFANT MORTALITY RATES: 1962—1964

| Racial Group | 1962 | | 1963 | | 1964 | |
|---------------------------|--------|-------|--------|-------|--------|-------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| Malays | 540 | 48.0 | 455 | 39.3 | 492 | 42.0 |
| Chinese | 1,142 | 27.2 | 1,061 | 25.1 | 1,088 | 26.6 |
| Indians and Pakistanis .. | 138 | 29.7 | 137 | 29.7 | 139 | 30.4 |
| Eurasians | 13 | 36.0 | 4 | 12.6 | 5 | 16.0 |
| Europeans | 1 | 3.4 | 12 | 39.3 | 6 | 23.6 |
| Others | 9 | 18.6 | 5 | 9.8 | 8 | 18.5 |
| Total | 1,843 | 31.2 | 1,674 | 28.1 | 1,738 | 29.9 |

*Number of deaths under 1 year of age per 1,000 live-births.

Note: Figures exclude 43, 42 and 32 deaths of children under 1 year of age of non-locally domiciled military and civilian Services personnel for the years 1962, 1963 and 1964 respectively.

TABLE 17
 STILL-BIRTHS AND STILL-BIRTH RATES: 1962—1964

| Year | Number | Rate* |
|------|--------|-------|
| 1962 | 740 | 12.4 |
| 1963 | 739 | 12.3 |
| 1964 | 694 | 11.8 |

*Number of still-births per 1,000 total live-births and still-births.

Note: Figures exclude 14, 26 and 30 still-births of wives of non-locally domiciled military and civilian Services personnel for the years 1962, 1963 and 1964 respectively.

TABLE 18
 MATERNAL MORTALITY AND MATERNAL MORTALITY RATES: 1962—1964

| Year | Number | Rate* |
|------|--------|-------|
| 1962 | 23 | 0.4 |
| 1963 | 21 | 0.3 |
| 1964 | 23† | 0.4† |

*Number of maternal deaths per 1,000 total live-births and still-births.

†Provisional.

Note: There were no maternal deaths of non-locally domiciled military and civilian Services personnel and their families for the years 1962, 1963 and 1964.

TABLE 19
DEATHS FROM TUBERCULOSIS (ALL FORMS) AND
TUBERCULOSIS DEATH RATES: 1961—1964

| Year | Number | Rate* |
|------|--------|--------|
| 1961 | 647 | 38.35 |
| 1962 | 654 | 37.74 |
| 1963 | 669 | 37.69 |
| 1964 | 703† | 38.63† |

*Number of tuberculosis (all forms) deaths per 100,000 mid-year population.

†Provisional.

Note: Tuberculosis deaths of non-locally domiciled military and civilian Services personnel and their families, if any, are included in the above figures.

PUBLIC HEALTH DIVISION
TABLE 20
MIGRATION STATISTICS BY SEA AND AIR DURING 1964

(a) Arrivals

| Race | ADULTS | | CHILDREN* | | Total |
|------------------------------|---------|--------|-----------|--------|---------|
| | Male | Female | Male | Female | |
| Malays | 5,859 | 1,966 | 358 | 349 | 8,532 |
| Chinese | 24,866 | 9,686 | 966 | 662 | 36,180 |
| Indians and Pakistanis | 11,824 | 2,773 | 1,184 | 838 | 16,619 |
| Eurasians | 263 | 111 | 31 | 31 | 436 |
| Europeans | 53,140 | 27,565 | 3,196 | 2,324 | 86,225 |
| Other Races | 13,565 | 1,361 | 235 | 122 | 15,283 |
| Total—ALL RACES .. | 109,517 | 43,462 | 5,970 | 4,326 | 163,275 |

(b) Departures

| Race | ADULTS | | CHILDREN* | | Total |
|------------------------------|---------|--------|-----------|--------|---------|
| | Male | Female | Male | Female | |
| Malays | 7,017 | 2,181 | 441 | 370 | 10,009 |
| Chinese | 27,624 | 11,125 | 1,093 | 634 | 40,476 |
| Indians and Pakistanis | 20,247 | 3,381 | 1,733 | 1,402 | 26,763 |
| Eurasians | 311 | 141 | 36 | 23 | 511 |
| Europeans | 53,285 | 27,539 | 3,721 | 2,825 | 87,370 |
| Other Races | 11,719 | 1,479 | 215 | 182 | 13,595 |
| Total—ALL RACES .. | 120,203 | 45,846 | 7,239 | 5,436 | 178,724 |

*Under 12 years of age.

The racial group 'Malays' includes Indonesians.

Table 19

DEATHS FROM TUBERCULOSIS FALL FORMERLY AND TUBERCULOSIS DEATH RATES 1961-1964

| Year | Number of deaths | Rate per 100,000 population |
|------|------------------|-----------------------------|
| 1961 | 697 | 38.3 |
| 1962 | 658 | 37.7 |
| 1963 | 659 | 37.9 |
| 1964 | 707 | 38.9 |

Migration statistics by sea and air during 1964

| Year | Immigrants | Emigrants | Net Migration |
|-------------------|------------|-----------|---------------|
| 1961 | 1,908 | 1,104 | 804 |
| 1962 | 2,086 | 1,104 | 982 |
| 1963 | 1,773 | 1,104 | 669 |
| 1964 | 1,111 | 1,104 | 7 |
| Total - All Races | 6,878 | 4,416 | 2,462 |

(a) Districts

Deaths from tuberculosis in 1964 were 707, compared with 697 in 1961.

| Race | 1961 | | 1964 | |
|---------------------|-------|--------|-------|--------|
| | Male | Female | Male | Female |
| Chinese | 1,111 | 1,104 | 1,111 | 1,104 |
| European | 1,111 | 1,104 | 1,111 | 1,104 |
| Indian and Pakistan | 1,111 | 1,104 | 1,111 | 1,104 |
| Other Races | 1,111 | 1,104 | 1,111 | 1,104 |
| Total - All Races | 4,416 | 4,416 | 4,416 | 4,416 |

*Under 15 years of age

C. PUBLIC HEALTH DIVISION

INTRODUCTION

The State of Singapore is comprised of the main island of Singapore with several small surrounding islands within its territorial waters. The main island is 27 miles long and 14 miles wide with a total area of 216 square miles. The combined area of the smaller islands is about 20 square miles.

SECTION II PUBLIC HEALTH DIVISION

With the completion of the former City Council Health Services and the Rural Health Department Services, respectively and the formation of the Public Health Division under the charge of the Deputy Director of Medical Services (Health). The Public Health Services continued to be maintained at a satisfactory level despite continued difficulties during the year. Dr. K. Ranganathan was the Deputy Director of Medical Services (Health).

The Public Health Division is responsible for Preventive Health Services under the following branches:—

- (1) Environmental Health.
- (2) Quarantine and Epidemiology.
- (3) School Health Services.
- (4) Maternal and Child Health Services.
- (5) Training and Health Education.
- (6) Markets and Hawkers.
- (7) Other Services under Public Health Headquarters Advisory Board.

It will be noted to record the major events of public health significance in 1964:

Spring Cleaning Campaign.—As public cleanliness has always been one of the major problems in the Public Health Service, the Minister for Health took a personal interest in the re-organisation of the Public Cleaning Department. In early 1964 a "Spring Cleaning Campaign" was initiated by the Minister which lasted from 1st February, 1964 to 21st May, 1964. During the campaign various problems in refuse disposal and collection were brought to the surface. These served as basis for investigations and study in order that long-term solutions may be found.

At the end of 4 months, the Minister was able to announce that the campaign was a qualified success, and that the City looked brighter and cleaner.

Formation of the Public Health Advisory Board.—After the Spring Cleaning Campaign (February to May 1964) on the direction of the Minister, the Public Health Advisory Board was formed in order that more effective

PUBLIC HEALTH DIVISION
SECTION II

6. PUBLIC HEALTH DIVISION

INTRODUCTION

THE State of Singapore is comprised of the main island of Singapore with several small surrounding islands within its territorial waters. The main island is 27 miles long and 14 miles wide with a land area of 216 square miles. The combined area of the smaller islands is about 10 square miles.

With the completion of integration of the former City Council Health Services and the Rural Board Health Department Services, physically and financially, at the end of 1961 the Ministry of Health has been re-organised with the formation of the Public Health Division under the charge of the Deputy Director of Medical Services (Health). The Public Health Services continued to be maintained at a satisfactory level despite operational difficulties during the year. Dr. K. Kanagaratnam was the Deputy Director of Medical Services (Health).

The Public Health Division is responsible for Preventive Health Services under the following branches:—

- (1) Environmental Health.
- (2) Quarantine and Epidemiology.
- (3) School Health Services.
- (4) Maternal and Child Health Services.
- (5) Training and Health Education.
- (6) Markets and Hawkers.
- (7) Other Services under Public Health Headquarters Administration.

It will be useful to recount the major events of public health significance in 1964:

Spring Cleaning Campaign.—As public cleansing has always been one of the major problems in the Public Health Service, the Minister for Health took a personal interest in the re-organisation of the Public Cleansing Department. In early 1964 a "Spring Cleaning Campaign" was initiated by the Minister which lasted from 1st February, 1964 to 31st May, 1964. During the campaign various problems in refuse disposal and collection were brought to the surface. These served as basis for investigations and study in order that long-term solutions may be found.

At the end of 4 months, the Minister was able to announce that the campaign was a qualified success, and that the City looked brighter and cleaner.

Formation of the Public Health Advisory Board.—After the Spring Cleaning Campaign (February to May 1964) on the direction of the Minister, the Public Health Advisory Board was formed in order that more effective

and practical measures for the preservation and maintenance of the highest possible public health standards may be formulated. The Board had representatives from other Government Ministries and Government agencies whose activities had direct public health importance or with whom liaison was essential for operational efficiency.

The Board gave immediate attention to three pressing public health problems — viz.: (i) collection and disposal of refuse; (ii) hawkers and markets; and (iii) cattle straying on public streets.

Fifteen meetings were held during the year resulting *inter alia* in: (i) the formulation of the Hawkers Code; (ii) the planning of the resiting of hawkers by stages in five constituencies; and (iii) better co-ordination with other government departments.

Cattle Ordinance.—Toward the end of the year legislation was also introduced to control the “cattle nuisance”, which has been a problem for some time. The problem had become more acute as much of the land formerly available for “cattle grazing” had been built upon. Cattle were found on public roads and on public and private property. The Cattle Ordinance giving new powers to the health authority was passed. Under its provisions it is anticipated that nuisances connected with cattle will once and for all be effectively eliminated.

Civil Disturbances.—1964 also saw two episodes of civil disturbances occurring in July and September. All branches and sub-sections of the Public Health Division, especially the Environmental Health Services, were temporarily disrupted. With the imposition of curfew, emergency public health measures were instituted, and with the restoration of law and order, normal public health services were resumed. During the disturbances, the majority of the staff rose to the occasion in order that essential services may be carried on. The Public Health Division staff in general lived up to expectations, and in many cases did their duty regardless of personal safety. One Public Cleansing worker lost his life during the second riots. There were no outbreaks of epidemic diseases as a result of the disturbances although there was unavoidable increase in fly and mosquito nuisances following the outbreaks caused by the temporary breakdown of service.

Cholera Outbreaks.—During the year there were three episodes of El Tor Cholera — viz., 13th January, 1964 to 3rd February, 1964 (3 cases), 13th April, 1964 to 27th June, 1964 (20 cases with 3 deaths) and 27th August, 1964 (1 case). There was thus total of 24 cases in all with three deaths during these three episodes. Seven cholera carriers were discovered and treated during the second episode. From an epidemiological point of view, the outbreaks were possible hazards, as El Tor Cholera had since 1963 become endemic in Malaysia. Two of the episodes with one case and three cases were minor but the other episode with 20 cases was brought under control with intensive work and investigations done by the staff of the Environmental Health and the Quarantine and Epidemiology Branches.

Malaria at Fuyong Estate, off 9 m.s. Bugit Timah Road.—After an absence of seven years “indigenous” malaria made its appearance in the State in the shape of an outbreak of benign tertian malaria at Fuyong Estate off 9 m.s., Bukit Timah Road in August and September. Altogether 30 cases were reported. The outbreak was the result mainly of control measures having broken down temporarily due to labour difficulties. This outbreak was brought under control by emergency measures using intensive mass drug prophylaxis and anti-adult measures, both of which served to break transmission while anti-larval operations were restored. Approximately 6,300 persons in the affected areas were given prophylactic drug treatment in connection with the emergency measures.

THE ENVIRONMENTAL HEALTH SECTION

This section is responsible for— (1) general hygiene and sanitation (including public cleansing); (2) food hygiene and control of the sale of food and drugs; (3) Anti-malaria/Anti-mosquito control.

This section is headed by a Senior Health Officer. For administrative purposes, Singapore is divided into six districts—viz., Katong, Serangoon, Bukit Panjang/Jurong, Southern Islands, City (South) and City (North); each under the charge of a District Health Officer.

Maintenance of good general sanitation and hygiene is the main function of the Public Health Inspectorate of the Environmental Health Section. Mosquito, fly and other miscellaneous complaints from the general public were dealt with.

Cleansing services in the City area are under the direction of the Superintendent, Public Cleansing while cleansing services in the Rural area are carried out by the Rural Cleansing Sections under the charge of the respective District Health Officers. During the year cleansing services in the State were maintained and initial steps to improve the service undertaken.

The Environment Health Section also carried out inspections on licensed premises in order to maintain a reasonable standard of food hygiene in food establishments. Samples of food and drugs were taken and submitted to the Chief Chemist for analysis. 92,209 pounds of unsound assorted food and 91 bottles of hair darkener containing lead were destroyed, while 12,326 bottles and 68 tins of substandard food and deleterious drugs were forfeited on Court order.

The Food and Drugs Unit of the Environmental Health Section also assisted in investigations of food poisoning with sodium arsenite, as a result of which the Poisons Inspectorate instituted strong preventive measures regarding storage and handling of sodium arsenite in a certain glass factory.

With the outbreak of malaria at Fuyong Estate, the Anti-Mosquito Section of the Environmental Health Section stepped up in anti-malaria maintenance work in dangerous areas. More frequent inspections of tidal areas such as the Kallang Basin where land reclamation for development were instituted to ensure the free flow of the tides so as to prevent the breeding of malaria vectors.

THE QUARANTINE AND EPIDEMIOLOGY SECTION

This section is under the charge of a Senior Health Officer.

The function of the Quarantine Section is to maintain control of dangerous infectious diseases by surveillance of international traffic. During the year 132,171 passengers and crew were inspected by the Marine Port Health Service and 156,645 passengers and crew inspected by the Airport Health Service.

The Vaccination Centre under this section also provides vaccination service to the public and to travellers, and issues international vaccination certificates. A total of 56,736 vaccinations were done during the year for travellers.

The Epidemiology Section, which is responsible for investigations and administers the control of infectious disease conditions locally, maintains measures against yellow fever around the Airport, and maintains a regular check on rodent life in the Port area. During the year, the Section was engaged in the Cholera Control programme besides carrying out investigations on notifiable infectious diseases.

THE SCHOOL HEALTH SERVICE

The School Health Service in Singapore is centrally administered at the Institute of Health at Outram Road.

This service continues to prevent diseases and to promote and maintain good health among an important section of the population—i.e., the school-going population. However, with the school population increasing annually further growth of the service will become necessary. Development of other specified child health services will also become necessary.

The School Health Service provides the following:

- (1) Routine and special medical examination of all school children on a selective basis.
- (2) Treatment of minor ailments and nutritional defects in school clinics.
- (3) Reference of cases to specialists in the various institutions for investigations, treatment or advice.
- (4) Control of tuberculosis in the school population, including teachers, hawkers and other staff.
- (5) Control of infectious diseases.
- (6) Ensuring the compliance of the provisions of the Education Ordinance, 1957 and the regulations made thereunder.

At the end of 1964 there were 584 schools in the State of Singapore with 59,084 new entrants, as against 58,020 in 1963. The total school population rose from 429,150 in 1963 to 457,136 in 1964—an increase of 27,986 pupils.

THE MATERNAL AND CHILD HEALTH SERVICES

These services are carried out on an island-wide basis. Its centrally administered office is based at the Institute of Health, Outram Road. This branch is responsible for preventive services and a limited amount of curative health services concerning the health needs of the mother and child population of Singapore.

With its 34 main clinics, 25 visiting centres and five kampongs midwife centres, the Maternal and Child Health Services provide the following:

- (1) Antenatal care.
- (2) Natal care through the Domiciliary Midwifery Service and Domiciliary After-Care Service operating at main clinics and kampong midwife centres with resident midwives.
- (3) Post-natal care.
- (4) Immunisation against small-pox, diphtheria, whooping cough, tetanus and poliomyelitis for pre-school children.
- (5) Supervision of Midwives.

In spite of two civil disturbances, normal routine antenatal attendances rose from 120,627 in 1963 to 141,473 in 1964 — an increase of 20,846.

During the year attendances in infant clinics fell from 447,539 in 1963 to 443,273 in 1964. Attendances in pre-school sessions also fell from 382,931 in 1963 to 366,345 in 1964. This was due to the disruption of services during the two periods of civil disturbances in July and September.

THE TRAINING AND HEALTH EDUCATION BRANCH

This branch is under the charge of a Senior Health Officer and carries out the following functions:

- (1) Training of ancillary health personnel, including: (a) Public Health Inspectors; (b) Public Health Nurses. Both these training courses were modelled on the requirements of the Royal Society of Health in London whose certificates are issued to the successful candidates.
- (2) *Health Education*.—This sub-section assists in the training courses and refresher courses in health education for specific categories of health personnel such as Public Health Inspectors-in-Training, Public Health Inspectors and candidates for Public Health Inspectors' Diploma and Public Health Nursing and Health Visitors of the Royal Society of Health. It is also a resource department for other departments/organisations who may request for health education material from time to time.
- (3) *Special Assignments*.—This sub-section often carries out special assignments for the Division in various fields.

HAWKERS AND MARKETS

This branch is under the control of the Superintendent, Hawkers and Markets, and deals with licensing and control of hawkers and the supervision and licensing of markets. The Hawkers and Markets Branch discharges its functions in two separate sections—viz., the Hawkers Section and the Markets Section.

Mr. Lim Chooi Sian, Director of the Central Complaints Bureau was seconded for duty as Officer in charge of Re-organisation in November 1964.

On Sunday morning, 11th October, 1964, at 10 o'clock a fire broke out which made the Markets and Hawkers Department building untenable and there was loss of equipment and records. The Hawkers and Markets Department was consequently shifted temporarily to the first floor of the Registry of Vehicles building in Middle Road. Towards the end of 1964 the Ministry of Education kindly made available accommodation at the former Malay Craft School at Scotts Road where the Department is now housed. It is expected that this building will be occupied by the Hawkers and Markets Department for two years.

Three new markets were completed during the year.

OTHER SERVICES UNDER PUBLIC HEALTH HEADQUARTERS
ADMINISTRATION

These services include: (1) The Public Health Engineering Unit; (2) Cemeteries and Crematoria; (3) Personnel (Labour) Unit; (4) The Transport Centre which continued to provide specialised services for the Division.

VITAL STATISTICS

TABLE 21
POPULATION ESTIMATES BY RACIAL GROUP AND SEX AS ON
30TH JUNE, 1964
Thousands

| | Total | Malays* | Chinese | Indians and Pakis- tanis | Eura- sians | Euro- peans | Others |
|---------------------|---------|---------|---------|-----------------------------------|----------------|----------------|--------|
| Total Population .. | 1,820.0 | 257.8 | 1,366.5 | 149.9 | 14.4 | 15.1 | 16.3 |
| Males | 944.9 | 132.6 | 690.8 | 96.2 | 7.7 | 8.5 | 9.1 |
| Females | 875.1 | 125.2 | 675.7 | 53.7 | 6.7 | 6.6 | 7.2 |

1. *Include Indonesians.
2. The Population Estimates exclude the following categories enumerated in the June 1957 census:—
 - (a) Non-Locally domiciled services personnel (including United Kingdom—based civilians employed by the Services) and their families 27,299
 - (b) Transients afloat 3,466
3. Births and deaths of persons within category 2 (a) are excluded from these estimates.
4. Births and deaths of persons within category 2 (b) are included in these estimates, but the number of such is negligible.

TABLE 22
 TABLE 22 GIVES VITAL STATISTICS IN THE STATE OF SINGAPORE FOR PAST 5 YEARS

| | 1960 | | 1961 | | 1962 | | 1963 | | 1964 | |
|---------------------------------|--------|-------|--------|------|--------|------|--------|------|--------|------|
| | Number | Rate | Number | Rate | Number | Rate | Number | Rate | Number | Rate |
| Live Births | 61,775 | 37.8* | 59,930 | 35.5 | 58,977 | 34.0 | 59,577 | 33.6 | 58,127 | 32.0 |
| Still Births | 886 | 14.1† | 766 | 12.6 | 740 | 12.4 | 739 | 12.3 | 694 | 11.8 |
| Perinatal Deaths | 1,747 | 27.9‡ | 1,593 | 26.2 | 1,593 | 26.7 | 1,578 | 26.2 | 1,539 | 26.1 |
| Neonatal Deaths | 1,093 | 17.7§ | 1,059 | 17.7 | 1,127 | 19.1 | 1,097 | 18.4 | 1,143 | 19.6 |
| Infant Deaths (Birth to 1 year) | 2,158 | 34.9\|\| | 1,937 | 32.3 | 1,843 | 31.2 | 1,674 | 28.1 | 1,738 | 29.9 |
| Maternal Deaths | 28 | 0.4¶ | 24 | 0.39 | 23 | 0.4 | 21 | 0.3 | 23 | 0.4 |
| Deaths | 10,210 | 6.2** | 10,027 | 5.9 | 10,178 | 5.9 | 10,138 | 5.7 | 10,434 | 5.7 |

* The Crude Birth Rate —Number of live births/1,000 mid-year population.

† The Still Birth Rate —Number of still births/1,000 still and live births.

‡ The Perinatal Mortality Rate —Number of deaths under 7 days of age plus still births/1,000 still and live births.

§ The Neonatal Mortality Rate —Number of deaths under 28 days of age/1,000 live births.

|| The Infant Mortality Rate —Number of deaths under 1 year of age/1,000 live births.

¶ The Maternal Mortality Rate —Number of maternal deaths per 1,000 total live and still births.

** The Crude Death Rate —Number of deaths/1,000 mid-year population.

These figures have been obtained from the 1960 Report on the Registration of births and deaths, marriages and persons, and from the monthly demographic bulletins for the State of Singapore for 1961, 1962, 1963 and 1964.

TABLE 23

TABLE 23 GIVES THE INFANT MORTALITY RATE BY ETHNIC GROUPS IN SINGAPORE FOR 1961, 1962, 1963 AND 1964

| | 1961 | 1962 | 1963 | 1964 |
|-------------------|------|------|------|------|
| | | | | |
| All Races | 32.3 | 31.2 | 28.1 | 29.9 |
| Malays | 56.8 | 48.0 | 39.3 | 42.0 |
| Chinese | 26.3 | 27.2 | 25.1 | 26.6 |
| Indians | 33.4 | 29.7 | 29.5 | 30.4 |
| Eurasians | 16.6 | 36.0 | 12.7 | 16.0 |
| Europeans | 24.6 | 3.4 | 39.2 | 23.6 |
| Others | 21.1 | 18.6 | 9.8 | 18.5 |

These figures have been obtained from the Monthly Demographic Bulletin issued by the Department of Statistics, Singapore.

TABLE 24

TABLE 24 GIVES THE PERINATAL MORTALITY RATE BY ETHNIC GROUPS IN SINGAPORE, 1961, 1962, 1963 AND 1964

| | 1961 | 1962 | 1963 | 1964 |
|-------------------|------|------|------|------|
| | | | | |
| All Races | 26.2 | 26.7 | 26.2 | 26.1 |
| Malays | 36.3 | 31.9 | 28.4 | 32.2 |
| Chinese | 22.6 | 24.7 | 24.7 | 23.7 |
| Indians | 36.0 | 32.5 | 33.4 | 33.7 |
| Eurasians | 24.5 | 27.5 | 12.5 | 15.8 |
| Europeans | 27.7 | 6.8 | 57.5 | 31.0 |
| Others | 22.8 | 26.5 | 19.3 | 16.0 |

These figures have been obtained from Monthly Demographic Bulletin issued by the Department of Statistics, Singapore.

SINGAPORE VITAL STATISTICS, 1962 — 1964

(a) BY PLACE OF USUAL RESIDENCE

| Vital Events | 1962 | | | | 1963 | | | | 1964 | | | |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | Total | City | Rural | Other* | Total | City | Rural | Other* | Total | City | Rural | Other* |
| Live-births | 58,977 | 33,837 | 25,041 | 99 | 59,530 | 34,479 | 24,938 | 113 | 58,217 | 33,693 | 24,418 | 106 |
| Still-births | 740 | 438 | 307 | 2 | 739 | 415 | 323 | 1 | 694 | 437 | 225 | 2 |
| Total births | 59,717 | 34,268 | 25,348 | 101 | 60,269 | 34,894 | 25,261 | 114 | 58,911 | 34,130 | 24,673 | 108 |
| Maternal deaths | 23 | 11 | 12 | .. | 21 | 10 | 11 | .. | 24 | 11 | 13 | .. |
| Perinatal deaths | 1,593 | 963 | 628 | 2 | 1,592 | 950 | 640 | 2 | 1,539 | 962 | 574 | 3 |
| Neonatal deaths | 1,127 | 693 | 432 | 2 | 1,097 | 673 | 423 | 1 | 1,143 | 707 | 435 | 1 |
| Infant deaths | 1,843 | 1,070 | 768 | 5 | 1,674 | 988 | 684 | 2 | 1,738 | 1,046 | 689 | 3 |
| Still-birth Rate† | 12.4 | 12.6 | 12.1 | 19.8 | 12.3 | 11.9 | 12.8 | 8.8 | 11.8 | 12.8 | 10.3 | 18.5 |
| Maternal Mortality Rate‡ | 0.4 | 0.3 | 0.5 | .. | 0.3 | 0.3 | 0.4 | .. | 0.4 | 0.3 | 0.5 | .. |
| Perinatal Mortality Rate‡ | 26.7 | 28.1 | 24.8 | 19.8 | 26.4 | 27.2 | 25.3 | 17.5 | 26.1 | 28.2 | 23.3 | 27.8 |
| Neonatal Mortality Rate‡ | 19.1 | 20.5 | 17.3 | 20.2 | 18.4 | 19.5 | 17.0 | 8.8 | 19.6 | 21.0 | 17.8 | 9.4 |
| Infant Mortality Rate‡ | 31.2 | 31.6 | 30.7 | 50.5 | 28.1 | 28.7 | 27.4 | 17.7 | 29.9 | 31.0 | 28.2 | 28.3 |

Note:— *Others refers to States of Malaya and 'overseas'.

†Rate per thousand total live-births and still-births.

‡Rate per thousand live-births.

The above figures exclude events occurring among non-locally domiciled Services personnel (including United Kingdom based civilians employed by the Services) and their families.

(b) BY REGISTRATION AREA

| Vital Events | 1962 | | | 1963 | | | 1964 | | |
|-----------------------------------|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| | Total | City | Rural | Total | City | Rural | Total | City | Rural |
| | Live-births | 58,977 | 49,700 | 9,277 | 59,530 | 51,043 | 8,487 | 58,217 | 50,287 | 7,930 |
| Still-births | 740 | 659 | 81 | 739 | 672 | 67 | 694 | 640 | 54 |
| Total births | 59,717 | 50,359 | 9,358 | 60,269 | 51,715 | 8,554 | 58,911 | 50,927 | 7,984 |
| Maternal deaths | 23 | 20 | 3 | 21 | 20 | 1 | 24 | 20 | 4 |
| Perinatal deaths | 1,593 | 1,469 | 124 | 1,592 | 1,476 | 116 | 1,539 | 1,429 | 110 |
| Neonatal deaths | 1,127 | 1,059 | 68 | 1,097 | 1,102 | 85 | 1,143 | 1,059 | 84 |
| Infant deaths | 1,843 | 1,584 | 259 | 1,674 | 1,448 | 226 | 1,738 | 1,517 | 221 |
| Still-birth Rate† | 12.4 | 13.1 | 8.7 | 12.3 | 13.0 | 7.8 | 11.8 | 12.6 | 6.8 |
| Maternal Mortality Rate† | 0.4 | 0.4 | 0.3 | 0.3 | 0.4 | 0.1 | 0.4 | 0.4 | 0.5 |
| Perinatal Mortality Rate† | 26.7 | 29.2 | 13.3 | 26.4 | 28.5 | 13.6 | 26.1 | 28.1 | 13.8 |
| Neonatal Mortality‡ | 19.1 | 21.3 | 7.3 | 18.4 | 21.6 | 10.0 | 19.6 | 21.1 | 10.6 |
| Infant Mortality Rate‡ | 31.2 | 31.9 | 27.9 | 28.1 | 28.4 | 26.6 | 29.9 | 30.2 | 27.9 |

Note:— *Others refers to States of Malaya and 'overseas'.

†Rate per thousand total live-births and still-births.

‡Rate per thousand live-births.

The above figures exclude events occurring among non-locally domiciled Services personnel (including United Kingdom based civilians employed by the Services) and their families.

7. ENVIRONMENTAL HEALTH SERVICES

INTRODUCTION

The Environmental Health Branch provides a large part of the Public Health Services for the whole State by maintaining effective control over:—

- (1) General Hygiene and Sanitation
- (2) Food Hygiene and the Control of the Sale of Food and Drugs
- (3) Malarial and Mosquito Control

Organisation and Staff.—The Senior Health Officer, Environmental Health maintains an overall control of the services provided by the Environmental Health Branch. For administrative purposes, the State is divided into six districts viz. Katong, Serangoon, Bukit Panjang/Jurong, Southern Islands, City South and City North, each under the charge of a District Health Officer.

The Public Health Inspectorate is headed by the Chief Public Health Inspector. The Health Inspectorate is again organised on a district basis under the charge of a Senior Public Health Inspector who works under the direction of the District Health Officers.

In the City area, the Superintendent of City Cleansing Department is in charge of the Cleansing Services while in the Rural Districts the Cleansing Service is run by the District Health Officer.

The Superintendent of City A.M.D. and the Chief Food and Drugs Inspector work under the direction of the respective Health Officers responsible for these functions.

Staff

(a) Health Officers

| | | |
|--------------------------|-----|---|
| Senior Health Officer | ... | 1 |
| District Health Officers | ... | 7 |

(b) Public Health Inspectorate

| | | |
|--------------------------------------|-----|----|
| Chief Public Health Inspector | ... | 1 |
| Chief Food and Drugs Inspector | ... | 1 |
| Senior Public Health Inspectors | ... | 5* |
| Ag. Food & Drugs Inspectors | ... | 2 |
| Public Health Inspectors | ... | 56 |
| Public Health Inspectors-in-training | ... | 12 |
| Piggery Overseers | ... | 2 |

* Senior Public Health Inspector (Quarantine and Epidemiology) covers Southern Islands.

(c) Cleansing

City

| | | |
|---------------------------------|-----|------------|
| Superintendent | ... | 1 (Acting) |
| Assistant Superintendents | ... | 1 (Acting) |
| Divisional Cleansing Inspectors | ... | 3 |
| Senior Cleansing Inspectors | ... | 3 |
| Cleansing Inspectors | ... | 26 |
| Conservancy Overseers | ... | 2 |
| Conservancy Sub-Overseers | ... | 42 |

Rural

| | | |
|-----------------------------|-----|----|
| Senior Cleansing Inspectors | ... | 3 |
| Cleansing Inspectors | ... | 11 |
| Technical Subordinates | ... | 6 |
| Cleansing Overseers | ... | 20 |

*(d) Anti-Mosquito Department**City*

| | | |
|---------------------------------------|-----|----|
| Health Officer | ... | 1 |
| Superintendent | ... | 1 |
| Technical Subordinate (Super Scale) | ... | 1 |
| Technical Subordinate (Special Grade) | ... | 3 |
| Technical Subordinates | ... | 17 |
| Laboratory Assistant | ... | 1 |

Rural

| | | |
|-------------------------------|-----|----|
| Senior Technical Subordinates | ... | 3 |
| Technical Subordinates | ... | 19 |

The previous posts of A.M. Inspector, Senior Overseer, Overseer, Junior Overseer and Surveyor/Draftsman were redesignated as Technical Subordinate (Super Scale), Technical Subordinate (Special Grade), Technical Subordinate and Technician with effect from 1st September, 1963 according to the Integration Ordinance.

Secondment: Two Public Health Inspectors were seconded to the Port Health Office to perform clearance of ships. Four Public Health Inspectors were seconded to the Quarantine and Epidemiology Section to do investigation of infectious diseases. Eight Public Health Inspectors were seconded to the City Abattoirs to assist in the inspection of meat.

Training: During the year under review, four Public Health Inspectors in training attended the course leading to the Diploma of the Royal Society for the Promotion of Health.

GENERAL HYGIENE AND SANITATION

This includes (a) general sanitation and Kampong Sanitation, (b) water supplies (c) licensed premises (d) offensive and dangerous trades, (e) the cleansing services.

(a) General Sanitation.—General sanitation is the main function of the Public Health Inspectorate. The Public Health Inspectorate inspects all premises licensed by the Environmental Health Branch to ensure that proper health standards are maintained. In addition all unlicensed premises are checked by the Inspectorate and, if necessary, Court action is taken. Besides, the Inspectorate also inspects and reports on health requirements for Public and Beer Houses, Printing Presses, Hotels and Lodging Houses, places of entertainment and Massage Parlours.

A major part of the work of the Inspectorate is the investigation of numerous complaints from the public regarding various health nuisances. Once the genuineness of the complaint is established, necessary action is taken to abate or minimise the nuisances. In this connection the total number of primary visits and revisits for the year 1964 was 44,367. Table 25 (1) gives a summary of complaints received.

TABLE 25 (1) SUMMARY OF NATURE AND NUMBER OF COMPLAINTS RECEIVED FOR THE YEAR 1964

| Nature of Complaints | City | Katong | Serangoon | Bt. Panjang/ Jurong | Total |
|----------------------|-------|--------|-----------|------------------------|-------|
| Mosquito ... | 662 | 148 | 78 | 54 | 942 |
| Fly ... | 75 | 38 | 18 | 20 | 151 |
| Smoke ... | — | — | 4 | 6 | 10 |
| Smell ... | — | — | 51 | 18 | 69 |
| Drainage ... | — | — | 71 | 29 | 100 |
| Others ... | *639 | 224 | 89 | 29 | 981 |
| Total ... | 1,376 | 410 | 311 | 156 | 2,253 |

* In the City this includes Smoke, Smell and Drainage complaints.

Housing: Building industry has been in full swing both in the City and Rural areas of Singapore. The Housing and Development Board also completed over 10,000 units during the course of the year.

In connection with building and planning, this Branch inspected and checked over 634 layouts and permits, stating requirements and giving comments from the health point of view. A total number of 205 planning consultations were handled by the Branch. A summary is shown in Table 25 (2).

TABLE 25 (2) NUMBER OF BUILDING PLANS AND PLANNINGS CONSULTATIONS HANDLED BY THE BRANCH FOR 1964

| | City | Katong | Serangoon | Bt. Panjang/ Jurong | Total |
|--|-------|--------|-----------|------------------------|--------|
| No. of building plans dealt with ... | 297 | 84 | 83 | 121 | 585 |
| No. of planning consultations dealt with ... | 115 | 27 | 39 | 24 | 205 |
| No. of housing permits dealt with ... | — | 23 | 26 | — | 49 |
| No. of homes inspected in connection with environmental sanitation ... | 2,139 | 932 | 9,252 | 6,620 | 18,943 |

(b) *Water Supplies.*—The main source of water supply for use of population throughout the Island is piped water.

Water rationing in the State of Singapore was lifted on 29th February, 1964 following heavy rainfall at the beginning of 1964.

Standpipes continued to be erected and are conveniently situated in kampongs, so that a wholesome and pure water supply for drinking and cooking is available. By the end of 1964 a total of 2,510 standpipes were in use throughout the island. Water supply to the public through the standpipes is free to the consumers and was made a public charge costing the Department \$1,587,350 for the year 1964.

Well water is the main source of water supply in the kampongs and in the more remote areas of the islands. Wells have been constructed in many areas by the Government. In areas where drainage has been constructed as anti malarial measures "anti malarial" wells provide a relatively safe water supply. However, the provision of adequate wholesome water supply for the islands continues to be a problem.

(c) *Licensed Premises.*—The issuing of all new licences is considered and approved by the Licensing Policy Committee. In addition, all problems pertaining to licensing are directed to this Committee for consideration and recommendation. The Public Health Inspectorate make regular visits to all licensed premises to ensure that satisfactory health standards are maintained.

INSPECTION OF LICENSED PREMISES BY THE PUBLIC HEALTH
INSPECTORATE, 1964

| | City | Katong | Serangoon | Bt. Panjang/ Jurong | Total |
|--|--------|--------|-----------|------------------------|--------|
| Sauce Factories ... | 139 | 113 | 49 | 38 | 339 |
| Oil Mills ... | 120 | 32 | 16 | 47 | 215 |
| Sawmills ... | 84 | 31 | 7 | 107 | 229 |
| Smoke Observations | 13 | 12 | — | 3 | 28 |
| Places of Entertainment ... | 546 | 114 | 94 | 90 | 844 |
| City Markets/ Private Markets ... | 117 | — | — | — | 117 |
| Grinding Mills ... | 66 | 73 | 23 | 64 | 226 |
| Gold Smiths ... | 17 | — | — | — | 17 |
| Printing Presses ... | 667 | 64 | 2 | 8 | 741 |
| Licensed Premises | 21,848 | 657 | 5,491 | 2,871 | 30,867 |
| Unlicensed Premises | — | 528 | 154 | 126 | 808 |
| Public Houses ... | 454 | 473 | 223 | 149 | 1,299 |
| Hotels and Native Passenger Lodging Houses ... | 361 | 122 | 7 | — | 490 |
| Inspecting Notices | 124 | — | — | — | 124 |
| No. of visits paid in cautionary cases ... | 39 | — | — | — | 39 |
| Serving Notices ... | 66 | — | — | — | 66 |
| Piggeries ... | — | — | 956 | — | 956 |
| Other Premises ... | 8,538 | 669 | 628 | 271 | 10,106 |
| Total ... | 33,199 | 2,888 | 7,650 | 3,774 | 47,511 |

Table 25 (3)

NUMBER OF LICENSED PREMISES

| | City | Katong | Serangoon | Bt. Panjang/ Jurong | Total | |
|--|-------|--------|-----------|------------------------|-------|-----|
| Eating House ... | 774 | 210 | } 200 | 101 | 1,285 | |
| Restaurant ... | 349 | | | 19 | 20 | 388 |
| Coffee Shop ... | 129 | 11 | | 12 | 7 | 159 |
| Iced Water and Cold Drinks ... | 25 | 7 | — | — | 32 | |
| Soda Fountain ... | 2 | — | — | — | 2 | |
| Meat Shop ... | 106 | 24 | 33 | 8 | 171 | |
| Possession of Wild Boar Meat ... | 4 | — | — | — | 4 | |
| Milk Bar ... | 2 | 2 | 2 | — | 6 | |
| Aerated Water Factory ... | 12 | 1 | 1 | — | 14 | |
| Bakery ... | 40 | 22 | 19 | 4 | 85 | |
| Biscuit Factory ... | 5 | 1 | 1 | — | 7 | |
| Cake Shop ... | 38 | — | 9 | 2 | 49 | |
| Ice Cream Factory ... | 9 | — | — | — | 9 | |
| Ice Popsicle Manufactory ... | — | — | — | — | — | |
| Syrup Making Shop ... | 5 | 3 | 1 | 2 | 11 | |
| Sweets Making Shop ... | 12 | 1 | 2 | — | 15 | |
| Margarine Factory ... | 2 | — | — | — | 2 | |
| Confectionery ... | 6 | 4 | — | 4 | 14 | |
| Food Shop ... | 48 | 2 | 40 | — | 90 | |
| Food Caterer ... | 1 | — | — | — | 1 | |
| Dairy Shop ... | — | — | — | — | — | |
| Ice Cream Distribution ... | 4 | 6 | 19 | 5 | 34 | |
| Soya Bean Milk Factory ... | 2 | — | 3 | 1 | 6 | |
| Manufacturing and Bottling of Orange Squash ... | 1 | — | — | — | 1 | |
| Manufacturing and Bottling of non- carbonated drinks ... | — | — | — | 2 | 2 | |
| Mono-sodium Glutamate ... | — | — | — | 1 | 1 | |
| Milk Vendor ... | — | — | — | 1 | 1 | |
| Pasteurising and Packing Milk Plant ... | — | — | — | 3 | 3 | |
| Vegetable Shop ... | — | — | — | 3 | 3 | |
| Vermicelli Factory ... | — | — | — | 2 | 2 | |
| Total ... | 1,576 | 294 | 361 | 166 | 2,397 | |

Table 25 (4)

NUMBER OF LICENSED PREMISES IN SOUTHERN ISLANDS

| | |
|------------------------------|----|
| Eating House ... | 26 |
| Restaurant ... | 1 |
| Meat and Ice Cream Shops ... | 2 |
| Fruit Shops ... | 3 |
| Vegetable Shops ... | 2 |

(d) *Offensive and Dangerous Trades.*—Offensive and Dangerous Trades are now governed by sections 80, 81 and 132, 133 of the Local Government Integration Ordinance of 1963. These laws provides for sanitary requirements, adequate lighting, ventilation, drainage, adequate and wholesome water supply and satisfactory safeguards to meet occupational hazards.

In the City area the Dangerous Trades were licensed by the Chief Fire Officer whilst in the Rural area this was done by the District Health Officers. However, with the passing of the Local Government Integration Ordinance the Dangerous Trades mentioned in the Second Schedule came fully under the control of the Chief Fire Officer as from 1st September, 1963. The licensing of Offensive Trades mentioned in the First Schedule continues to be the responsibility of the Ministry of Health.

Table 25 (5)

LIST OF LICENSED PREMISES FOR OFFENSIVE TRADES 1964

| Nature of Licence | Total No. of Licensed Premises | | | | |
|--|--------------------------------|------------|------------|------------------------|--------------|
| | City | Katong | Serangoon | Bt. Panjang/ Jurong | Total |
| Blachan Store ... | 3 | — | — | — | 3 |
| Brick Kiln ... | 2 | 1 | — | 10 | 13 |
| Coffee Roasting Factory ... | 8 | 6 | 2 | 2 | 18 |
| Dye House ... | 1 | — | — | — | 1 |
| Drying and Sorting Fish ... | 1 | — | — | — | 1 |
| Fruit Preserving ... | — | 1 | 2 | 2 | 5 |
| Laundry ... | 309 | 98 | 66 | 26 | 499 |
| Oil Mill ... | 13 | 2 | 6 | 6 | 27 |
| Refining Precious Metals by Acid Process ... | 7 | — | — | — | 7 |
| Sago Factory ... | 7 | — | 1 | 5 | 13 |
| Sauce Factory ... | 16 | — | 8 | 2 | 26 |
| Sauce Mixture Factory ... | 2 | 6 | — | — | 8 |
| Sheep and Goat Pen ... | 1 | 2 | 1 | 1 | 5 |
| Soap Boiling ... | 8 | 5 | 4 | 4 | 21 |
| Sugar Boiling ... | 3 | — | 1 | — | 4 |
| Tannery ... | 2 | — | 5 | — | 7 |
| Slaughter House ... | — | 2 | — | — | 2 |
| Private Markets ... | — | — | 6 | — | 6 |
| Importation of Meat ... | 13 | — | — | — | 13 |
| Cattle Shed ... | — | 5 | 29 | 15 | 49 |
| Lime Making ... | — | 6 | — | — | 6 |
| Rattan Store ... | — | — | — | 2 | 2 |
| Grinding Mill ... | — | 8 | 8 | 7 | 23 |
| Pottery Works ... | — | — | — | 3 | 3 |
| Fertiliser Factory ... | — | — | 1 | — | 1 |
| Canneries ... | — | — | — | 2 | 2 |
| Piggery ... | — | 465 | 418 | 729 | 1,612 |
| Sick Receiving House ... | 3 | — | — | — | 3 |
| Miniature Zoo ... | — | — | 1 | 2 | 3 |
| Total ... | 399 | 607 | 559 | 818 | 2,383 |

Table 25 (6)

LIST OF DANGEROUS TRADES LICENSED IN RURAL AREAS 1964

| Nature of Licence | Total No. of Licensed Premises | | | |
|---|--------------------------------|-----------|------------------------|-------|
| | Katong | Serangoon | Bt. Panjang/ Jurong | Total |
| Attap Store ... | 24 | 25 | 17 | 66 |
| Timber Yard, Sawmill, Furniture Shop ... | 38 | 44 | 39 | 121 |
| Firewood Store ... | 16 | 49 | 10 | 75 |
| Charcoal Store ... | 13 | 31 | 6 | 50 |
| Calcium Carbide Store | 7 | 2 | 3 | 12 |
| Petroleum Store ... | 27 | 37 | 37 | 101 |
| Kerosene Store ... | 1 | — | 3 | 4 |
| Fire Cracker Store ... | 27 | 3 | 4 | 34 |
| Smithy/Foundry ... | 2 | 4 | 4 | 10 |
| Rubber Smoke House | 2 | 18 | 3 | 23 |
| Rubber Factory ... | — | 3 | — | 3 |
| Garage ... | 23 | 36 | 20 | 79 |
| Others ... | — | 22 | 12 | 34 |
| Total ... | 180 | 274 | 158 | 612 |

Footnote:—Southern Islands have 1 smelting work, 4 Petroleum Installation and 3 Open air cinemas (not included in above table).

(e) *The Cleansing Service*.—This important service functions on a district basis and is provided by the City Cleansing Department for the City Area and Rural District Health Departments for the rest of the State.

These services include (1) cleansing of public streets and drains daily; (2) the removal of domestic and trade refuse from premises; (3) the flushing of main streets and drains; (4) the disposal of refuse by controlled tipping and incineration; (5) the supervision of cleansing outlet drains carried out by Contract Labourers; and (6) the removal of nightsoil from premises not yet sewered.

In the City area daily removal of refuse is carried out from houses and business premises along main roads, public streets and housing estates. Refuse collected is either domestic or trade refuse. The collection and disposal of domestic refuse is carried out free of charge but owners of trade premises are levied a charge for the service.

In the Rural area the removal of refuse is done daily from domestic houses and business premises along the main roads, gazetted streets and housing estates. Domestic refuse is removed and disposed of free of charge but trade refuse removal is carried out for a levy. A considerable number of kampongs are provided with Labourers to maintain skeleton cleansing services.

Street Watering.—Three street watering vans of 1,000 gallons capacity each were used for watering and washing principal streets whenever necessary.

47 steel handcarts fitted with meters, hoses, etc., were also used for flushing roadside and backlane drains.

The amount of water consumed during the year was 2,431,700 gallons by water vans for street watering and 65,198,100 gallons by flushing handcarts for flushing streets, backlanes and culverts.

Incinerator.—Combustible refuse amounting to 320 tons were delivered to Kolam Ayer Incinerator by departmental and other vehicles during the year for destruction by incineration.

Controlled Refuse Tip.—During the year incombustible refuse amounting to 174,396 tons was delivered to the controlled tip at Kolam Ayer Lane by departmental and other vehicles for disposal.

Table 25 (7)

REFUSE DISPOSED OF AT INCINERATOR AND CONTROLLED DISPOSAL
FOR THE CITY AREA — 1964

Combustible Refuse Disposed of at Incinerator

| | Tons | Tons |
|---|------|------|
| Departmental (Domestic and Trade Refuse and Sweeping) | | |
| Other Sources | 320 | 320 |

Incombustible Refuse Disposed of at Controlled Tips

| | | |
|---|--------|---------|
| <i>Departmental:</i> | | |
| Domestic and Trade Refuse and Sweepings | 77,377 | |
| Drain Refuse and Sweepings | 67,946 | |
| District Councils — Domestic Refuse etc. | 10,580 | |
| Other Sources | 18,493 | |
| | | 174,396 |
| Refuse collected by the department from Storm Drains used for filling low lying land, etc. | — | — |
| Total | | 174,716 |

Table 25 (8)

AVERAGE NUMBER OF BINS OF REFUSE EMPTIED DAILY
FOR THE CITY AREA 1964

| | From Dwelling Houses | From Business and Trade Premises | Total |
|--------------|----------------------|----------------------------------|--------|
| By Wagons | 31,130 | 18,671 | 49,801 |
| By Handcarts | 12,406 | 2,062 | 14,468 |
| Total | 43,536 | 20,733 | 64,269 |

Table 25 (9)

COLLECTION OF REFUSE IN RURAL AREAS 1964

| | Katong | Serangoon | Bt. Panjang/ Jurong | Total |
|------------------------------------|--------|-----------|------------------------|--------|
| Number of houses | 14,771 | 19,970 | 3,703 | 38,444 |
| Amount of Refuse collected in tons | 22,536 | 22,400 | 9,150 | 54,086 |
| No. of bin centres | 64 | 92 | 45 | 201 |
| No. of street bins | 751 | 800 | 387 | 1,938 |

Table 25 (10)

EXPENDITURE ON COLLECTION OF DOMESTIC AND TRADE REFUSE, STREET AND DRAINS CLEANSING AND DISPOSAL—CITY AREA—1964

| Year | Labour Wages | Population (City Area) | No. of Assessed Buildings | MILEAGE OF | | Tonnage | Cost Per ton |
|------------|--------------|------------------------|---------------------------|-------------------|------------|---------|--------------|
| | | | | Streets and Roads | Back-Lanes | | |
| | \$ | | | | | | \$ |
| 1964 | 3,705,152 | 1,128,700 | 96,242 | 259.4 | 40.5 | 145,323 | 25.49 |

Conservancy Service.—During the year under review, 5,366,496 pails of Nightsoil collected by the City Cleansing Department from 15,102 latrines in 12,034 houses were disposed of at the three Nightsoil Disposal Stations, i.e. Albert Street, Peoples Park and Paya Lebar.

Table 25 (11)

COLLECTION AND DISPOSAL OF NIGHTSOIL IN THE CITY AREA — 1964

| Year | Expenditure | No. of Vans | No. of Pails collected | Average Gross Cost per month per pail on collection and disposal |
|------|-------------|-------------|------------------------|--|
| 1964 | \$1,332,670 | 40 | 5,366,496 | 25 cents |

The figures for removal of nightsoil in Rural Areas are shown in Table 25 (12).

Table 25 (12)

NIGHTSOIL COLLECTION IN RURAL AREAS — 1964

| | No. of Pails removed during the year 1964 | | | |
|---|---|-----------|------------------------|-----------|
| | Katong | Serangoon | Bt. Panjang/ Jurong | Total |
| No. of pails removed by Contractors ... | 1,388,067 | 470,200 | 201,300 | 2,059,567 |
| No. of pails removed departmentally ... | 1,072,090 | 1,230,500 | 479,826 | 2,782,416 |
| Total ... | 2,460,157 | 1,700,700 | 681,126 | 4,841,983 |

The nightsoil collected in Rural districts is disposed of by the following methods: (a) trenching, (b) Ulu Pandan Sewage Works (Bt. Panjang/Jurong District), (c) Paya Lebar Nightsoil Pumping Station (Serangoon and Katong Districts).

Public Conveniences.—The City Cleansing Department cleansed and maintained 92 public conveniences situated at various parts of the City.

Similar service was also rendered in the rural districts.

Aluminium Portable Latrines.—Portable aluminium latrine structures were hired out to organisers of wayang performances, etc. and the hiring and services fees collected amounted to \$10,408.

Approved type refuse carrier bins were also hired out at the same time and the hiring and services fees collected amounted to \$12,190.

At present 29 aluminium portable latrine structures are available for hire from the various nightsoil stations.

(f) *Kampong Sanitation.*—This work is carried out by the Public Health Engineering Unit under the charge of the Public Health Engineer. The nature of the work carried out includes improvement to existing drainage of kampongs and standpipes, construction of public latrines, wells and repairs to stand-pipe aprons.

Table 25 (13)

KAMPONGS SANITATED DURING 1964

| | City | Katong | Serangoon | Bt. Panjang/ Jurong | Total |
|--|------|--------|-----------|------------------------|-------|
| No. of kampongs where sanitation is maintained ... | 18 | 15 | 16 | 9 | 58 |
| No. of new kampongs sanitated ... | 1 | — | 12 | 3 | 16 |
| | — | — | — | — | — |
| Total ... | 19 | 15 | 28 | 12 | 74 |
| | — | — | — | — | — |

FOOD HYGIENE AND THE CONTROL OF THE SALE OF FOOD AND DRUGS

The Food and Drugs Section operates on an island wide basis and is responsible for maintenance of food hygiene standards and for the control of the manufacture, storage, preparation and sale of food and drugs, under the Food and Drugs Ordinance (Cap. 148) and the regulations made thereunder. Samples of food and drugs taken are analysed for quality to ensure compliance with standards laid down in the Ordinance. Prosecution is instituted when necessary.

In 1964, 1,436 samples of food and drugs and cosmetics were submitted by the Food and Drugs Inspectorate for analysis and/or examination. Another 667 samples of food and other specimens were taken by the rest of the Public Health Inspectorate, making a total of 2,103 samples for the year. A breakdown of the above figures is given in Table 26 (1a).

Table 26 (1a)

| <i>Type of Samples</i> | <i>No. Taken</i> | <i>Type of Samples</i> | <i>No. Taken</i> |
|--------------------------|------------------|--------------------------------------|------------------|
| Formal Food | | Informal Drugs (Analyst) | |
| Coffee Mixture | 151 | Cough Mixture | 9 |
| Honey | 10 | Medicated Oil | 10 |
| Groundnut Oil | 21 | Hair Darkener | 1 |
| Jam | 5 | Hair Restorer | 1 |
| Syrup with Vitamin C | 39 | Multivitamins | 3 |
| Chilly Sauce | 14 | Fever Powder | 2 |
| Coffee and Chicory | 2 | Hair Oil | 1 |
| Kaya | 4 | Multivitamin Syrup | 1 |
| Popsicles | 1 | A.P.C. Tablets | 2 |
| Sauce Colouring Agent | 1 | Eye Lotion | 1 |
| Ghee substitute | 1 | Anti-Cholera Vaccine | 1 |
| Aerated Water | 53 | | — 32 |
| Cream | 9 | Informal (Bacteriologist) | |
| Margarine | 29 | Ice-Cream | 335 |
| Syrup and Cordials | 30 | Popsicles | 275 |
| Coriander Powder | 9 | Condensed Milk | 2 |
| Rice Vinegar | 3 | Well Water and others | 3 |
| Coffee and Coffee Powder | 5 | | — 615 |
| Whisky | 9 | (Analyst) | |
| Bacon | 9 | Trade Effluent and Tap Water | 3 |
| Vinegar | 6 | | — 3 |
| Essence of Chicken | 1 | Drug Informant (Toxicologist) | |
| Ghee | 11 | Eye Lotion | 2 |
| Sauce Imported | 12 | Fever Powder | 1 |
| Butter | 40 | | — 3 |
| Chilly Powder | 27 | Formal Drugs | |
| Milk (Fresh) | 31 | Medicated Oil | 20 |
| Tomato Sauce | 6 | Hair Restorer | 2 |
| Tea | 22 | Tincture of Iodine | 13 |
| Soya Bean Sauce | 32 | Ointment | 9 |
| Iced Water | 46 | Hydrogen Peroxide | 5 |
| Soya Bean Cake | 47 | Vitamin A Capsules | 19 |
| Still Drinks | 6 | Vitamin B1 Tablets | 17 |
| Noodles and Vermicelli | 20 | Fever Powder | 18 |
| Sweet Meat (Char Siew) | 49 | A.P.C. Tablets | 19 |
| Tea Dust | 3 | Aspirin | 2 |
| Coloured Sugar | 1 | Vitamin B | 1 |
| Curry Powder | 4 | Eye Lotion | 1 |
| Coloured Cakes | 4 | Vitamin Tablets | 2 |
| Apples | 10 | Hair Darkener | 10 |
| | — 783 | Tr. of Benzoin | 2 |
| | | Proprietary Drugs | 1 |
| | | Hair Spray | 2 |
| | | | — 143 |

Table 26 (1a)—continued

| Type of Samples | No. Taken | Type of Samples | No. Taken |
|--|-----------|--|-----------|
| Informal Food (Analyst) | | For identification only | |
| Coloured Skimmed and Buttermilk Powder | 59 | Food Contamination Informal (Bacteriologist) | |
| Star Aniseed | 20 | Sweet Cigarettes | 1 |
| Cooking Oil | 8 | Condensed Milk | 3 |
| Vegetable Shortening | 1 | Fresh Milk | 10 |
| Cheese | 24 | Reconstituted Milk | 6 |
| Cream | 2 | Chocolate Milk | 5 |
| Coffee and Coffee Powder | 15 | Flavoured Milk | 3 |
| Dried Snow Frog | 9 | Milk | 12 |
| Essence of Chicken | 2 | Cockles | 6 |
| Honey | 2 | Cooked Duck | 2 |
| Fruits | 81 | Cooked Canned Ham | 8 |
| Sesame Oil | 1 | Tinned Cooked Ham | 16 |
| Coffee Mixture | 1 | Tinned Vegetables | 4 |
| Pure Groundnut Oil | 2 | Still Drinks | 6 |
| Chilly Sauce | 4 | Mushroom | 2 |
| Sausages | 7 | Abalone | 3 |
| Saukraut | 10 | Rice contaminated with stain | 1 |
| Rice | 1 | Sacking for rice | 1 |
| Sugar | 1 | Iced Water | 4 |
| Grape Drink | 1 | | — 93 |
| Carbonated/Non carbonated drinks | 19 | Food Poisoning | |
| Baking Powder | 1 | Informal (Bacteriologist) | |
| Colouring Matter | 7 | Remnant of Chicken | 1 |
| Sweetened Ice Water | 10 | Fish (Ikan Merah) | 1 |
| Powder Milk | 1 | Dried Cooked Fish | 1 |
| Whey Milk Powder | 3 | Shredded Dried Pork | 1 |
| Canned Milk | 1 | Chicken Soup with Mushroom | 1 |
| Still Drinks | 18 | Cooked Ham | 1 |
| Soya Bean Cake (Tow Kuah) | 35 | Bread | 1 |
| Sweet Meat (Char Siew) | 15 | Kaya | 1 |
| Sauce | 1 | Cooked Food remnants | 1 |
| Potatoes | 4 | Pepper | 1 |
| Tinned Vegetables | 4 | Black Vinegar | 1 |
| Black Currant Extract | 1 | Cold Cooked Duck | 3 |
| Coloured sugar | 3 | Sea Anemone | 1 |
| Jelly | 1 | Cooked Chicken and Duck Giblets | 1 |
| Coloured cakes | 3 | Canned Abalone | 1 |
| Margarine | 1 | Cold Jellied Mutton | 1 |
| Black Currant Pastilles | 1 | Soya Bean Curd | 2 |
| Drinks in Powdered Form | 6 | Cold Cooked Chicken | 2 |
| Canned Arbutus in Syrup | 1 | Cold chicken in Sauce | 6 |
| | — 387 | Almond Jelly | 1 |
| | | Salt | 2 |
| | | Grated Coconut | 1 |
| | | Malay Cakes (Kueh Lapis) | 1 |
| | | Bread | 1 |
| | | Kaya | 1 |
| | | Vomitus | 1 |
| | | Nasi Lemak | 2 |
| | | Cocoanut Milk | 1 |
| | | Tow Sar Pow | 1 |
| | | Fried Fish | 1 |
| | | Pork and Vegetable in Gray | 1 |
| | | | — 42 |
| Food Contamination (Analyst) | | | |
| White granulated substance | 1 | | |
| | — 1 | | |
| For identification only | | | |
| Botanic Gardens Seeds | 1 | | |
| | — 1 | | |

Table 26 (1b)

SUMMARY OF SAMPLES TAKEN DURING 1964

| | To Analyst | To Bacterio- logist | To Toxi- cologist | To Univer- sity of Singa- pore | To Botanic Gardens | Total |
|---|---------------|---------------------------|-------------------------|--|--------------------------|-------|
| Food ... | 1,172 | 610 | — | — | 1 | 1,783 |
| Well water, tap water and others ... | 3 | 3 | — | — | — | 6 |
| Drugs ... | 175 | — | 3 | — | — | 178 |
| Food Poisoning ... | — | 42 | — | — | — | 42 |
| Food Contamination ... | 1 | 93 | — | — | — | 94 |
| Total ... | 1,351 | 748 | 3 | — | 1 | 2,103 |

During the year, 92,232 lbs. of unsound food were condemned and destroyed as unfit for human consumption. In all 229 prosecutions were carried out resulting in 227 convictions and a total of \$15,370 in fines.

Food Establishments.—A total of 2,397 food establishments in the City and Rural Areas were inspected by the Public Health Inspectorate in connection with the preparation, storage, manufacture and sale of food. The distribution of these premises is given in Table 26 (2).

Table 26 (2)

LICENSED FOOD ESTABLISHMENTS IN SINGAPORE 1964

| | District Councils | | | | Total |
|------------------------|-------------------|--------|-----------|------------------------|-------|
| | City | Katong | Serangoon | Bt. Panjang/ Jurong | |
| Coffee Shop ... | 129 | 11 | 12 | 7 | 159 |
| Eating House ... | 774 | 210 | 200 | 101 | 1,285 |
| Restaurant ... | 349 | 73 | 19 | 20 | 388 |
| Others (Food Bye-laws) | 324 | | 130 | 38 | 565 |

Ice-Cream

Table 26 (3)

LICENSED ICE-CREAM FACTORIES, DISTRIBUTION CENTRES AND CONFECTIONERIES 1964

| | |
|------------------------------------|----|
| Number of Ice-Cream Factories ... | 9 |
| Number of Distribution Centres ... | 34 |
| Number of Confectioneries ... | 14 |
| Total ... | 57 |

Ice-Cream Samples for Bacteriological Examinations.—During the year a total of 610 samples of ice-cream and popsicles were taken for bacteriological examinations. Of these 41 were unsatisfactory.

190 employees of all ice-cream factories and distribution centres were examined for typhoid carrier state in Middleton Hospital.

Labellings.—Investigations into the contravention of labelling regulations were continued during the year. When these contraventions were detected warning letters were sent to those concerned, drawing attention to the nature of infringement and a time limit for rectification of the infringement was imposed.

Food Poisonings.—There was a serious outbreak of food poisoning during July 1964, involving 207 persons. The incriminating food was found to be coconut milk for *nasi lemak*, which was contaminated with arsenic.

During the year there were 31 confirmed reported outbreaks of food poisoning involving a total of 311 persons. In the majority of cases, the causative agent appeared to be of bacterial origin due to improper storage, preparation and handling of food. In a number of cases the specific organism could not be ascertained as no food remnants were available for examination.

MALARIA CONTROL AND MOSQUITO CONTROL

General.—Anti-malarial and anti-mosquito measures are still carried out on "City" and "Rural" basis, i.e. by the Health Officer, A.M.D. in the City area and by the District Health Officers in the Rural Districts respectively.

The main method of malarial control is the use of anti-larvæ measures against the two main vectors *A. sudaicus* and *A. maculatus*. This entails subsoil drainage, construction of permanent surface drains, ditching and weekly anti-malarial oiling including the use of insecticides.

The construction of permanent anti-malarial works is carried out by the Public Health Engineering Unit.

Close liaison was also maintained between the department and the Armed Forces, Railway Administration, Port of Singapore Authority and the Malaria Advisory Board of Malaya.

Malaria.—All cases of malaria occurring in Singapore which were reported to S.H.O. (Quarantine and Epidemiology) by hospitals, Government's outdoor dispensaries and other private sources, were carefully investigated by the Quarantine and Epidemiology Branch.

Eight cases of malaria were reported in Pulau Tekong Island under the jurisdiction of Katong District. These cases occurred in kampongs which were in "uncontrolled" areas. Breeding of malaria vectors was revealed as a result of field surveys. The outbreak was controlled with chemoprophylaxis and the areas concerned were brought under weekly anti malarial oiling.

Thirty-three cases of malaria were reported in the Fuyong area of Bukit Panjang District. This outbreak was the largest reported for many years and of this number of people only four persons had definite histories of having been to Johore area in the two weeks prior to the outbreak. Larvæ surveys revealed breeding of *A. maculatus* breeding in the ravines in the nature reserve by the side of the Housing and Development Board Quarry and in the "face" of the Singapore Granite Quarry Ltd. and also at the jungle ravine near the Kramat Habib Ismail, 8½ m.s. Bukit Timah Road. The vector concerned is the *A. maculatus* in this outbreak.

With the integration of Government and City Council, the Anti-malaria Oilers of the district had refused to clear the drains, a preliminary step towards the effective oiling of these drains. This resulted in intense breeding of *A. maculatus* and so set the stage for the transmission of the disease.

Investigation of all fever cases reported in the area together with blood films for malaria parasite of all persons immediately around the reported cases of malaria were taken.

The malaria parasite transmission were interrupted by use of mass drug administration involving about 4,000 of the population in the area. Residual spraying of about 690 houses and swing fogging of the out houses and the ravine were also done. Drainage labourers were deployed from other areas to clear all overgrown drains and this was followed by heavy anti-malarial oiling. The outbreak was brought under control effectively.

Table 27 (1)

1,000 Consecutive Collections from Common Breeding Places in the City

| | | |
|---|-----|--------------|
| Public Roadside concrete drains | ... | 450 |
| Concrete sullage drains | ... | 31 |
| Backlane concrete drains | ... | 11 |
| S.I.T. concrete drain | ... | 8 |
| Septic tanks | ... | 7 |
| Edges of Reservoir border | ... | 9 |
| Leaf Axils | ... | 12 |
| Edge of river | ... | 2 |
| Concrete pond | ... | 9 |
| Fish pond | ... | 8 |
| Earth pond | ... | 3 |
| Concrete pit | ... | 4 |
| Concrete tank | ... | 1 |
| Concrete well | ... | 5 |
| Water cork pit | ... | 12 |
| Boat | ... | 8 |
| Sewerage Excavation | ... | 4 |
| Silt trap | ... | 3 |
| Earth pool | ... | 8 |
| Building excavation | ... | 11 |
| Seepages | ... | 4 |
| Earth drains | ... | 22 |
| Lorry track | ... | 8 |
| Hyacinth pond | ... | 9 |
| Grassy pool | ... | 7 |
| Vegetable | ... | 4 |
| Earth well | ... | 11 |
| Stagnant Water | ... | 210 |
| Water bearing receptacles (tyres, tins, bottles, kwali, etc.) | ... | 119 |
| Total | ... | <u>1,000</u> |

Notices.—A total of 172 notices under the Destruction of Mosquitoes Ordinance were served. The majority of these were served on owners of lands or contractors who were responsible for building excavations in which mosquitoes were found breeding.

Table 27 (2)

| | | |
|--------------------|-----|------------|
| City | ... | 27 |
| Katong | ... | 47 |
| Serangoon | ... | 64 |
| Bt. Panjang/Jurong | ... | 34 |
| Southern Islands | ... | — |
| Total | ... | <u>172</u> |

Anti-Mosquito Control.—Throughout the year, anti-mosquito control was maintained through (a) Permanent measures, (b) non-permanent measures.

(a) *Permanent Measures.*—These include:

- (i) Construction of permanent concrete drains, subsoil drains and earth drains. With the construction of subsoil drains, a number of "anti-malarial" wells were constructed providing the population in those areas a safe water supply.
- (ii) Maintenance and repair of existing anti-malarial drains. This was done in both Rural and City Areas.
- (iii) Control of tidal areas. This consists of filling of extensive tidal swamp areas by controlled tipping. Large areas in Kolam Ayer and in the Kallang Basin are continuing to be filled. Where malarial vectors have been discovered in fish and prawn ponds, owners have been advised to empty their ponds daily with the tides.

(b) *Non-Permanent Measures.*—These are mainly larvicidal measures. During the year under review a total of 337,701 gallons of anti-malarial oil was used.

Table 27 (3)

AMOUNT OF ANTI-MALARIAL OIL USED IN GALLONS

| | | |
|--------------------------|-----|----------------|
| City | ... | 102,868 |
| Katong | ... | 93,851 |
| Serangoon | ... | 55,100 |
| Bt. Panjang/Jurong | ... | 44,935 |
| Southern Islands | ... | 9,579 |
| Jurong Industrial Estate | ... | 31,368 |
| Total | ... | <u>337,701</u> |

Anti-Malarial Measures at Jurong Industrial Site.—Oiling was introduced in January 1962 following 9 mosquito surveys carried out in October and November 1961. There were 13 collections of *A. sudaicus* and 2 collections of *A. Letifer*, from these mosquito surveys. Control measures were planned to cover:

- (a) the catchment of S. Jurong, from the causeway northwards to Jurong Road and
- (b) the other areas where civil engineering and development works are proceeding, especially from 16 m.s. Boon Lay Road to Tanjong Kling.

Throughout 1964, 34 mosquito surveys were made, and there were no collections of dangerous anophelene species.

The Anti-Malarial team has kept track with the progress of all civil engineering works, which produce seepages, stagnant pools and blocked outlets. These have been covered with a heavy oiling programme, and 26,880 gallons of A.M. oil were used.

The overall supervision of these measures is done by the Public Health Engineer, assisted by a Super Scale Technical Subordinate.

GENERAL

(1) *Cholera.*—During the year there were 3 outbreaks of cholera, as follows:

- 1st Outbreak — Period 30th January, 1964 to 3rd February 1964 — 3 cases with no deaths
- 2nd Outbreak — Period 13th April, 1964 to 27th June, 1964 — 20 cases with 3 deaths
- 3rd Outbreak — Period 27th August, 1964 — 1 case with no death.

Throughout these outbreaks, the Public Health Inspectors, immediately on notification of each individual case, carried out house to house investigations in the area affected to look for suspected cases. Those people who had not been inoculated, were also advised to have inoculations.

Environmental sanitation was also carried out. This involves the spraying of the area with gammexane and disinfecting of all bucket latrines with Jeyes' fluid. All accumulations of refuse were removed by the City Cleansing Department and hawkers were cleared from the affected areas by the Markets and Hawkers Department.

In the Rural areas spraying of pigsties and poultry runs was also done and wells were treated with chlorine.

The placing of premises, where the cases have occurred, under quarantine and the removal of contacts to St. John's Island were carried out by the Public Health Inspectorate.

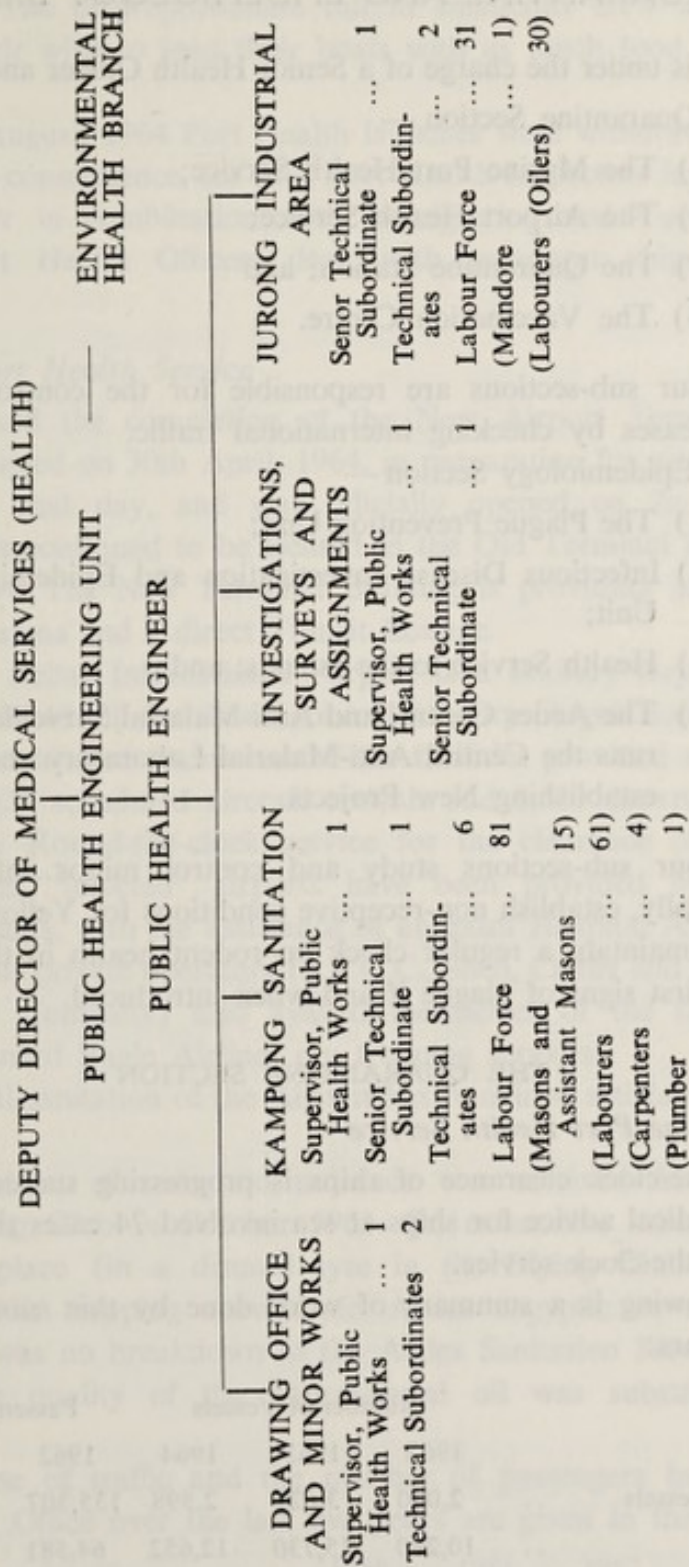
(2) *Offences and Prosecutions.*—City—During the year, 323 summonses were applied for all types of infringements of the Ordinances, Regulations and Bye-laws. There were 229 prosecutions with 227 convictions. 11 summonses were not served and 88 summonses were withdrawn in Court. Total fines amounted to \$15,370.

The following table 28 (1) shows the number of offences and prosecutions in the Rural Districts.

Table 28 (1)

| | | Offences | Prosecutions |
|--------------------|-----|----------|--------------|
| Katong | ... | 8 | 8 |
| Bt. Panjang/Jurong | ... | — | — |
| Serangoon | ... | 1 | 1 |
| Southern Islands | ... | — | — |
| Total | ... | 9 | 9 |

ORGANISATION CHART OF THE PUBLIC HEALTH ENGINEERING UNIT (JUNE 1964)



8. QUARANTINE AND EPIDEMIOLOGY BRANCH

THIS Branch is under the charge of a Senior Health Officer and comprises of:

I. The Quarantine Section —

- (1) The Marine Port Health Service;
- (2) The Airport Health Service;
- (3) The Quarantine Station; and
- (4) The Vaccination Centre.

These four sub-sections are responsible for the control of dangerous infectious diseases by checking international traffic.

II. The Epidemiology Section —

- (1) The Plague Prevention Unit;
- (2) Infectious Disease Investigation and Epidemiological Studies Unit;
- (3) Health Service to the Islands; and
- (4) The Aedes Control and Anti-Malarial Surveillance Unit which runs the Central Anti-Malarial Laboratory and also assists in establishing New Projects.

These four sub-sections study and control minor infectious disease conditions locally, establish non-receptive conditions for Yellow Fever around Airport, and maintain a regular check on rodent health in the Port area to discover the first signs of plague if and when introduced.

THE QUARANTINE SECTION

(1) *The Marine Port Health Service*

Round-the-clock clearance of ships is progressing successfully.

Radiomedical advice for ships at sea involved 74 cases this year. This is also a round-the-clock service.

The following is a summary of work done by this sub-section for the past three years:

| | Number of Vessels | | | Passengers and Crews | | |
|--------------------------|-------------------|--------|--------|----------------------|---------|---------|
| | 1962 | 1963 | 1964 | 1962 | 1963 | 1964 |
| Foreign going vessels .. | 2,080 | 3,024 | 2,598 | 135,307 | 177,553 | 132,171 |
| Small craft .. | 10,260 | 15,730 | 12,652 | 64,581 | 63,740 | 35,474 |

Sanitary inspection of six water-boats and 66 bum-boats was carried out. Of 346 ships examined, 69 were required for fumigation and certificates were issued accordingly.

The reduction in foreign going vessels was due to Indonesia's policy of confrontation, and in smallcraft was due to Malaysia's ban on them since August 1964. The disproportionate fall in smallcraft crew and passengers was due to their wish to load their boats with as much food as they could in Singapore.

On 10th August, 1964 Port Health launches were withdrawn for defence purposes. As a consequence, the four Port Health Inspectors formed a round-the-clock roster in combination with Immigration and Customs officials, while the Port Health Officers dealt with passenger ships and special problems.

(2) *The Airport Health Service*

1964 marked the completion of the New Airport Terminal Building which was occupied on 30th April, 1964, in preparation for aircraft clearance after midnight that day, and was officially opened on 2nd May, 1964. Domestic flights continued to be cleared in the Old Terminal Building up to 30th June, 1964. The New Terminal Building is providing separate arrival and departure areas and a direct Transit Lounge.

The Paya Lebar International Airport is a sanitary airport under the terms of Article 19 of the International Sanitary Regulations. During the year, 15 Airlines availed themselves of the facilities provided at the Airport. There were 8,530 scheduled aircraft arrivals and 8,530 departures on international flights. Round-the-clock service for the clearance of aircraft and passengers from "infected" airports have been provided by four senior Hospital Assistants, with the assistance of an extra Hospital Assistant during peak hours. Four private operators (S.V.O.C., Shell, Caltex and Pan American Indonesian Oil Company) also availed themselves of the facilities, while B.U.A. and Cunard Eagle Airlines ran trooping services.

The general sanitation of the Airport has remained satisfactorily throughout the year.

One complaint of mosquito nuisance was received from the Royal Singapore Flying Club in October 1964. On exhaustive investigation, only one breeding place (in a disused tyre in the Flying Club hangar) was discovered. Adult trapping showed no *Aedes aegyptic* or *A. albopictus*, showing there was no breakdown in the Aedes Sanitation Service. It will be noted that the quality of the anti-malarial oil was substandard during this time.

The volume of traffic and the number of passengers handled by the Airport Health Office over the last five years are given in the table below:

| | 1960 | 1961 | 1962 | 1963 | 1964 |
|----------------------------------|--------|--------|---------|---------|---------|
| Aircraft from infected ports .. | 1,325 | 1,641 | 1,917 | 3,223 | 3,057 |
| Passengers and crew cleared .. | 74,916 | 91,343 | 110,852 | 192,864 | 156,645 |
| Passengers isolated .. | — | — | — | — | — |
| Passengers under surveillance .. | 174 | 354 | 670 | 743 | 680 |

The fall in "passengers and crew cleared" is due to fact that 47,093 transit passengers from infected ports did not require to be cleared as they were sent direct to the Transit Lounge. There has been no significant decrease in number of passengers without valid vaccination certificates. This is a matter for concern as the world incidence of small-pox and cholera has been increasing since 1960.

Examination of Toilet Wastes from Aircraft.—The disinfection status is improving but not as much as would be desired.

(3) *The Quarantine Station*

The table below shows the number of passengers quarantined at St. John's Island for the past five years:

| Year | Total | Chinese | Indians | Malays | Others |
|------|--------|---------|---------|--------|--------|
| 1960 | 10,252 | 6,201 | 4,016 | 15 | 20 |
| 1961 | 10,615 | 5,496 | 4,754 | 302 | 63 |
| 1962 | 6,625 | 3,427 | 3,126 | — | 36 |
| 1963 | 4,228 | 832 | 3,224 | 155 | 17 |
| 1964 | 4,302 | 948 | 3,337 | — | 17 |

For the first time in many years, there has been no drop in the number of passengers quarantined in St. John's Island. Quarantine measures are limited to re-vaccination of all arrivals and observation for 48 hours.

During the outbreak of cholera in May and June and again in August and September, 127 and 24 contacts respectively were isolated in St. John's Island.

(4) *The Government Vaccination Centre*

This Centre affords free vaccination service to the public and travellers. International vaccination certificates are also available here.

The following is the summary of the work done at this centre for 1962-1964.

Summary of work done at the Government Vaccination Centre 1962-1964

| | 1962 | 1963 | 1964 |
|---|--------|---------|--------|
| Small-pox Vaccinations .. | 19,260 | 20,323 | 22,583 |
| Cholera Vaccinations .. | 20,973 | 173,146 | 33,679 |
| TAB Vaccinations (Typhoid Paratyphoid A & B) .. | 91 | 75 | 474 |
| Total .. | 40,324 | 193,544 | 56,736 |

THE EPIDEMIOLOGICAL SECTION

(1) *Plague Prevention Unit*

Rats, trapped along the Singapore River and in the Harbour Board area subjected to post-mortem examination and, if suspicious, bacteriological investigation. Rats obtained from fumigated ships are also subjected to post-mortem examination. A total of 2,940 rats were examined during the year and none of them was infected with plague.

(2) *Infectious Disease Investigation and Epidemiological Studies Unit*

Notifiable infectious diseases are divided into two broad categories under the Quarantine and Prevention of Disease Ordinance.

- (1) The dangerous infectious diseases, which are quarantinable, and include small-pox, plague, cholera, epidemic or louse-borne typhus and yellow fever.
- (2) The minor infectious diseases which include anthrax, endemic typhus, cerebro spinal fever, acute poliomyelitis, chicken-pox, diphtheria, enteric fever, erysipelas, leprosy, puerperal fever, scarlet fever and tuberculosis.

Table 29 shows the incidence of the main notifiable diseases from 1962 to 1964.

Table 29

| | 1962 | | | 1963 | | | 1964 | | |
|----------------------------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| | City | Rural | Total | City | Rural | Total | City | Rural | Total |
| Cholera El Tor | .. | .. | .. | 15 | 12 | 27 | 16 | 8 | 24 |
| Typhoid | 65 | 45 | 110 | 123 | 66 | 189 | 76 | 53 | 129 |
| Diphtheria | 261 | 92 | 353 | 312 | 88 | 400 | 166 | 40 | 206 |
| Chickenpox | 1,372 | 652 | 2,024 | 1,746 | 765 | 2,511 | 853 | 417 | 1,270 |
| Poliomyelitis | 6 | 8 | 14 | 50 | 18 | 68 | 11† | 6 | 17† |
| Cerebro Spinal Fever | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Leprosy | 69 | 43 | 112 | 75 | 33 | 108 | 89 | 47 | 136 |
| Typhus* | .. | 2 | 2 | 1 | 3 | 4 | .. | 1 | 1 |
| Puereral Fever | 40 | 7 | 47 | 15 | 3 | 18 | 85 | 29 | 114 |

* Under the heading, typhus are included Tsutsugumushi or Scrub Typhus of Malaya (mite borne) and flea borne Urban Type Tropical Typhus. Louse-borne typhus has not been seen in Singapore.

† One imported case.

The figures for tuberculosis are not included in this report as tuberculosis (since 1959) is notified directly to the Assistant Director of Medical Services (Tuberculosis) at Tan Tock Seng Hospital.

Cholera El Tor (Ogawa Strain).—Following the two outbreaks in 1963, there were three outbreaks in 1964.

Between 30th January, 1964 and 3rd February, 1964 there were three cases. All recovered, and no carrier was discovered.

The next outbreak was from 13th April, 1964 to 27th June, 1964. Twenty cases occurred, with three deaths. Seven carriers were discovered.

The last outbreak occurred on 27th August, 1964 with just one case.

Diphtheria.—The morbidity figure is the lowest in recent years, while the mortality figure of 17 is just one more than the lowest reached in 1962. The local disturbances may have played a part in the mortality picture as some of the cases admitted thereafter were quite advanced and in a serious condition.

This is the third year since the operation of compulsory vaccination. Public response is still not as good as expected.

The Urban/Rural distribution in 1964 was 166:40, as compared with 312:88 in 1963. The table below gives the monthly notifications of diphtheria in 1964.

Table 30 showing the distribution of diphtheria by month and locality, 1964.

Table 30

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|----------|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| Urban .. | 21 | 16 | 14 | 16 | 8 | 11 | 13 | 14 | 7 | 13 | 19 | 14 | 166 |
| Rural .. | 6 | 2 | 2 | 4 | 1 | .. | 2 | 7 | 2 | 5 | 3 | 6 | 40 |
| Total .. | 27 | 18 | 16 | 20 | 9 | 11 | 15 | 21 | 9 | 18 | 22 | 20 | 206 |

Table 31 showing comparative monthly incidence of diphtheria for 1962, 1963 and 1964.

Table 31

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---------|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| 1962 .. | 41 | 26 | 36 | 36 | 35 | 21 | 34 | 34 | 26 | 15 | 18 | 31 | 353 |
| 1963 .. | 36 | 35 | 32 | 23 | 19 | 31 | 53 | 30 | 27 | 47 | 38 | 29 | 400 |
| 1964 .. | 27 | 18 | 16 | 20 | 9 | 11 | 15 | 21 | 9 | 18 | 22 | 20 | 206 |

Table 32 showing diphtheria notifications and deaths for the last ten years.

Table 32

| Year | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 |
|------------------|------|------|------|------|------|------|------|------|------|------|
| Notifications .. | 460 | 552 | 712 | 548 | 519 | 642 | 587 | 353 | 400 | 206 |
| Deaths .. | 41 | 47 | 58 | 34 | 23 | 32 | 27 | 13 | 24 | 17 |
| Mortality Rate | 8.91 | 8.51 | 8.14 | 6.20 | 4.43 | 4.98 | 4.60 | 3.68 | 6.00 | 8.25 |

Poliomyelitis.—The remarkable record of 1962 (14 cases) has been exceeded by only three (including one imported) cases this year, following the policy of repeating Sabin dosage three or more times if possible.

Table 33 shows the monthly incidence of poliomyelitis for 1964.

Table 33

| Poliomyelitis 1964 | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|-----------------------|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| City .. | 4 | .. | 3 | 1* | .. | .. | .. | .. | .. | 1 | .. | 2 | 11* |
| Rural .. | 3 | .. | .. | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | 6 |
| Total .. | 7 | .. | 3 | 2* | .. | 2 | .. | .. | .. | 1 | .. | 2 | 17* |

* One imported case.

Table 34 shows the incidence of notified and confirmed cases of poliomyelitis by age, sex and ethnic group in Singapore, 1964.

Table 35 shows the incidence of poliomyelitis over the past five years.

Table 35

| Year | 1960 | 1961 | 1962 | 1963 | 1964 |
|----------|------|------|------|------|------|
| Cases .. | 197 | 57 | 14 | 68 | 17 |

Typhoid Fever.—The incidence has decreased considerably this year (123) from that of last year (189). There was tendency towards localisation in the Jalan Eunus area where the source of infection could not be identified but the situation improved with greater application of environmental health measures to the locality.

Table 36 gives the monthly incidence of typhoid in Singapore 1964.

Table 36

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|----------|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| City .. | 7 | 9 | 9 | 8 | 7 | 4 | 4 | 2 | 4 | 9 | 4 | 6 | 73 |
| Rural .. | 4 | 4 | 7 | 8 | 1 | 7 | 3 | 2 | 2 | 4 | 4 | 4 | 50 |
| Total .. | 11 | 13 | 16 | 16 | 8 | 11 | 7 | 4 | 6 | 13 | 8 | 10 | 123 |

Leprosy.—Table 37 shows the incidence of leprosy in Singapore for 1960, 1961, 1962, 1963 and 1964.

Table 37

| Year | City | Rural | Total |
|---------|------|-------|-------|
| 1960 .. | 119 | 27 | 146 |
| 1961 .. | 62 | 39 | 101 |
| 1962 .. | 69 | 43 | 112 |
| 1963 .. | 75 | 33 | 108 |
| 1964 .. | 89 | 47 | 136 |

(3) Health Service to the Islands

The floating dispensaries follow a programme whereby most of the islands are visited regularly. Each launch has a Senior Hospital Assistant in charge who treats minor ailments and refers more serious cases to hospitals in the "mainland" (Singapore Island). Incidentally, he serves to discover cases of infectious diseases in islands and initiates appropriate action. A total of 6,712 cases were attended to. Of these, 3,389 were in St. John's Island where there is a resident Hospital Assistant and 3,323 were from the other islands.

(4) The Aedes Control and the Anti-Malarial Surveillance Unit

The Unit is responsible for:

- (a) the control of Aedes mosquitoes in the airport within a perimeter of 800 metres;
- (b) malaria surveillance on an island-wide basis; and
- (c) check on mosquito breeding areas in the Rural area.

(a) *Aedes Stegomyia Control*.—A perimeter of 800 metres round the airport is under constant vigilance and control for *Aedes aegypti* breeding. This ensures that the Airport Protection Area of a perimeter of 400 metres is completely free from larval and adult forms of all mosquitoes, with special attention paid to possible vectors of Yellow Fever.

The *Aedes* Indices achieved in 1964 are as shown in Table 38, a result of 11 surveys covering an average of 1,229 houses each quarter of the year. 48 weekly surveys were carried out to cover 130 check points in the area.

Table 38 showing the results of mosquito surveys carried out in 1964.

Table 38

| Period of Survey (1964) | Number of Survey | Number of houses checked | NUMBER OF COLLECTIONS MADE | | | | Aedes (S) Aegypti Index | Aedes (S) Alopictus Index |
|-------------------------|------------------|--------------------------|----------------------------|-------------------|----------------|-------|-------------------------|---------------------------|
| | | | A (S) Aegypti | A (S) Albo-pictus | A (A) Obturans | Culex | | |
| 1st Quarter . . | 4 | 1,524 | Nil | 29 | 2 | 9 | Nil | 1.9 |
| 2nd Quarter | 4 | 1,175 | Nil | 16 | Nil | 7 | Nil | 1.4 |
| 3rd Quarter | 3 | 1,077 | Nil | 17 | 2 | 3 | Nil | 1.6 |
| 4th Quarter | 4 | 1,140 | Nil | 16 | 2 | 9 | Nil | 1.4 |

(b) *Malaria Surveillance*.—177 cases were reported during the year. Of these, 62 required home investigation. 129 were definitely imported cases, and 41 were local cases (30 from the Fuyong Estate area, and 11 from Pulau Tekong). Of the remaining seven cases, two were notified with wrong addresses and could not be traced for investigation; one returned from Nepal recently and could have been infected there and another had a recent blood transfusion which could have been the source of infection; while three maintained they had never left Singapore for malarious places. Every such case was thoroughly investigated, a larval survey forming part of the investigation. Malarial vectors could not be found except on two occasions when minimal breeding of *A. maculatus* was discovered in their relative areas. History has proved unreliable in many cases, and local transmission is highly improbable when vectors cannot be detected and when the presence of parasites in the community is questionable.

(c) *Check on Mosquito Breeding Areas in Rural Areas*.—*Malaria Surveys*.—As a check on the efficiency of the Rural Anti-Malarial Work, 318 rural malarial surveys were carried out and the summary total of the various mosquito species collected on these surveys are given below:

| | | | | | |
|--------------|----|-----|-----------------|----|---|
| A. maculatus | .. | 62 | A. baezai | .. | 7 |
| A. sondaicus | .. | 4 | A. lencosphyrus | .. | 3 |
| A. kochi | .. | 325 | A. aitkeni | .. | 2 |
| A. hyrcanus | .. | 860 | A. separatus | .. | 1 |
| A. vagus | .. | 9 | | | |

Special Surveys.—18 such surveys (larval) were carried out in areas where malarial cases were reported and three surveys (adult trapping) were carried out for three nights in Fuyong Estate and for six nights at the Royal Singapore Flying Club in response to a mosquito complaint there. At Fuyong Estate, 11 culicines and two female non-infective *A. maculatus* mosquitoes were trapped, while at the Flying Club 35 culicines, 15 *mansonia* and one *Aedes* (*B*) *lineatopennis* were trapped.

The following were the collections made during the 18 larval surveys.

| | | | | | |
|------------------------|----|----|---------------------|----|---|
| <i>A. maculatus</i> | .. | 19 | <i>A. hyrcannus</i> | .. | 2 |
| <i>A. sundaicus</i> | .. | 1 | <i>A. aitkeni</i> | .. | 1 |
| <i>A. kochi</i> | .. | 7 | <i>A. baezai</i> | .. | 1 |
| <i>A. lencosphyrus</i> | .. | 2 | <i>A. vagus</i> | .. | 1 |

Table 39

Work done under Airport Drainage Scheme

| | | |
|--|----|-------------|
| Widening of drains | .. | 1,264 ft. |
| Brick-wall silt traps | .. | 6 ft. |
| Brick-wall drain steppings | .. | 11 ft. |
| Brick-wall (extension to wash well) | .. | 1 ft. |
| Brick platform (Latrine base) | .. | 1 ft. |
| Standpipe base | .. | 1 ft. |
| 15" Invert covered outlet drain | .. | 20 ft. |
| 18" Invert covered outlet drain | .. | 18 ft. |
| 15" hume pipe culvert | .. | 10 ft. |
| Maintenance (grass clearing and desilting) | | 49,000 yds. |

9. SCHOOL HEALTH SERVICE

GENERAL

THE School Health Service is centrally administered in Singapore. During the year 12 new schools were opened while 9 schools ceased to function and 6 schools were integrated into 3 schools. At the end of 1964 there were 584 schools in the State of Singapore; this excludes the miscellaneous schools (e.g. religious, commercial, sewing, dancing schools, etc.). There were 59,084 new entrants, as against 58,020 in 1963. The total school population rose from 429,150 in 1963 to 457,136 in 1964, an increase of 27,986.

A classification of Government, Government Aided and private schools, together with the enrolment for 1963 and 1964 is shown in Table 40. The geographical distribution of schools, and the enrolment of Government and Aided schools as compared with private schools are given in Tables 41 and 42.

Table 40

SUMMARY OF SCHOOLS AND SCHOOL POPULATION

| | Number of Schools | | Enrolment | |
|---------------------------|-------------------|------|-----------|---------|
| | 1963 | 1964 | 1963 | 1964 |
| <i>Government Schools</i> | | | | |
| (a) English .. | 136 | 128 | 157,968 | 154,870 |
| (b) Malay .. | 47 | 43 | 28,225 | 25,352 |
| (c) Chinese .. | 13 | 13 | 16,195 | 17,003 |
| (d) Indian .. | 2 | 2 | 172 | 195 |
| (e) Integrated .. | 27 | 43 | 28,624 | 63,653 |
| <i>Aided Schools</i> | | | | |
| (a) English .. | 47 | 49 | 44,927 | 46,474 |
| (b) Chinese .. | 224 | 221 | 138,326 | 135,807 |
| (c) Indian .. | 13 | 13 | 1,494 | 1,587 |
| <i>Private Schools</i> | | | | |
| (a) English .. | 40 | 42 | 8,896 | 8,327 |
| (b) Chinese .. | 33 | 30 | 4,323 | 3,868 |
| Total .. | 582 | 584 | 429,150 | 457,136 |

57.11% of all the pupils attended Government Schools.

40.22% of all the pupils attended Aided Schools.

2.67% of all the pupils attended Unaided Schools.

Table 41

GEOGRAPHICAL DISTRIBUTION OF SCHOOLS

| | City | Rural | Island | Total |
|--|------|-------|--------|-------|
| Government and Government Aided Schools .. | 269 | 223 | 20 | 512 |
| Private Schools .. | 57 | 14 | 1 | 72 |

Table 42

DISTRIBUTION OF SCHOOL POPULATION

| | |
|--|----------------|
| Government and Government Aided Schools .. | 444,941 |
| Private Schools .. | 12,195 |
| Total .. | <u>457,136</u> |

STAFF

At the end of 1964 the staff of the School Health Section consisted of one Senior Health Officer in charge of Schools, six Health Officers, six Lady Health Officers, three Health Sisters, 15 Staff Nurses, 2 Male Nurses, 16 Assistant and Assistant Health Nurses, 1 Almoner, 1 Chief Dispensing Assistant, 3 Dispensing Assistants, 1 Laboratory Technician, 2 Public Health Inspectors, 1 Radiographer, 24 clerks and other miscellaneous subordinate staff.

Table 43

SUMMARY OF SCHOOLS, SCHOOL POPULATION, CHILDREN EXAMINED, AND HEALTH OFFICERS 1960-1964

| | 1960 | 1961 | 1962 | 1963 | 1964 |
|-----------------------|---------|---------|---------|---------|---------|
| Registered Schools .. | 762 | 776 | 568* | 582* | 584* |
| Students .. | 353,408 | 379,604 | 401,587 | 429,150 | 457,136 |
| Students Examined .. | 109,214 | 93,402 | 132,392 | 115,843 | 125,289 |
| Health Officers .. | 12 | 11 | 11 | 12 | 12 |

* A School with morning and afternoon sessions is counted as one school.

ROUTINE MEDICAL EXAMINATIONS

Medical examinations of children were carried out by the School Health Officers in Government and Government Aided schools only. Whilst no examinations are conducted at non-aided (private) schools, children from such schools may, and do, attend the school clinics which are open to all school children.

Because of the enormous size of the school population it has been found necessary to establish a system of selective examinations. The School Health Officers during their visits to schools for the routine medical examinations confine their attention to particular groups. The groups include (a) new entrants, (b) primary and secondary school leavers, (c) defectives found at previous examinations. During the visit to the school, the staff are encouraged to refer children who were not due for routine periodic examination but whose physical or mental progress was considered to be below par. These children are listed as "Others". These four groups are referred to in the report as "New Entrants", "School Leavers", "Re-examinations" and "Others".

As it is quite impossible to obtain an accurate history of past illnesses, previous inoculations, etc. from children aged 6-7 years in the Primary I classes, the parents of these children are invited to be present during the routine examinations. Their presence also affords an excellent opportunity for the Health Officers to advise them on hygiene and diet.

Out of a total of 512 Government and Government Aided schools, 495 were visited by either a Health Officer or a Lady Health Officer, and in the case of a mixed school by both a Health Officer or a Lady Health Officer. The total number of children examined was 125,289 so that more than one fourth of the school population was examined by the School Health Officers.

Table 44 shows the number of boys and girls examined at the various types of schools.

Table 44

CLASSIFICATION OF CHILDREN EXAMINED

| | Girls | Boys | Total |
|--------------------------|---------------|---------------|----------------|
| Government English .. | 26,082 | 25,246 | 51,328 |
| Aided English .. | 7,656 | 6,531 | 14,187 |
| Government Chinese .. | 1,776 | 1,449 | 3,225 |
| Aided Chinese .. | 14,930 | 17,709 | 32,639 |
| Government Malay .. | 3,446 | 3,022 | 6,468 |
| Government Tamil .. | 65 | 35 | 100 |
| Aided Tamil .. | 229 | 151 | 380 |
| Government Integrated .. | 7,870 | 9,092 | 16,962 |
| Total .. | <u>62,054</u> | <u>63,235</u> | <u>125,289</u> |

It was considered particularly important to examine the new entrants, in order to diagnose and treat defectives as early as possible, and where time was limited, the Health Officers concentrated on this group. According to the Ministry of Education statistics 59,084 children entered school for the first time in 1964, of these 50,936 were examined during the year by the School Health Officers. Table 45 shows the total number of school children in the various groups that were examined by the Health Officers.

Table 45

CLASSIFICATION OF EXAMINATIONS DONE

| | Girls | Boys | Total |
|----------------------|---------------|---------------|----------------|
| New Entrants .. | 22,923 | 28,013 | 50,936 |
| Primary Leavers .. | 16,997 | 23,923 | 40,920 |
| Secondary Leavers .. | 4,508 | 5,448 | 9,956 |
| Re-Examinations .. | 12,107 | 4,168 | 16,275 |
| Others .. | 5,519 | 1,683 | 7,202 |
| Total .. | <u>62,054</u> | <u>63,235</u> | <u>125,289</u> |

Table 46 shows the classification of the various types of schools visited by the Health Officers for the purpose of conducting medical examination of school children.

Table 46

CLASSIFICATION OF SINGAPORE SCHOOLS INSPECTED BY
SCHOOL HEALTH OFFICERS

| | City | Rural | Island | Total |
|--------------------------|------|-------|--------|-------|
| Government English .. | 83 | 40 | 2 | 125 |
| Aided English .. | 26 | 22 | — | 48 |
| Government Chinese .. | 10 | 3 | — | 13 |
| Aided Chinese .. | 85 | 126 | 4 | 215 |
| Government Malay .. | 14 | 14 | 12 | 40 |
| Government Tamil .. | 2 | — | — | 2 |
| Aided Tamil .. | 8 | 4 | — | 12 |
| Government Integrated .. | 25 | 14 | 1 | 40 |
| Total .. | 253 | 223 | 19 | 495 |

GENERAL HEALTH

On the whole, the general standard of health of the new entrants is fair, and that of the school leavers good. Of the total number of school children examined by the School Health Officers, 38,839 or 61.42 per cent of the boys examined were rated as being of good general condition, 23,740 or 37.54 per cent fair, and 656 or 1.04 per cent poor. The corresponding figures for girls are, 26,951 or 43.43 per cent good, 31,076 or 50.08 per cent fair, and 4,027 or 6.49 per cent poor.

Apart from dental caries and defective vision, a much higher percentage of defectives was found among the new entrants. The main defects amongst the school children are skin and respiratory infections, poor dental and personal hygiene and ignorance of parents of their children's dietetic requirements.

Dental Caries.—This is by far the most common defects amongst the school children. The majority cannot afford dental treatment, especially those from the rural areas. The present facilities for dental treatment are still inadequate. There are two main Government Dental Clinics for the treatment of school children, one at the Institute of Health and the other at Pegu Road, near Tan Tock Seng Hospital. In addition there are 3 school mobile dental clinics and 24 school dental huts. The Dental Nursing School is producing about 20 Dental Nurses a year and these will help staff new school dental clinics.

It is distressing to note that some parents of school children in schools where there are dental huts, are refusing to have their children treated. They fail to realise that any minor discomfort experienced by their children is well compensated for by the great improvement in dental health obtained. The fluoridation of the Singapore water supply is now reflected in the gradually lessening incidence of dental caries, although this still remains the most common defect found among school children.

Skin Infections.—Skin conditions such as sores, ulcers, ringworm, eczema and scabies are found to be slightly more common among school children in the rural schools due to the lower standard of environmental hygiene. Malnutrition also accounts for dry scaly skin, phrynodema, angular stomatitis, etc.

Many of these skin complaints affect usually all the members of a family simultaneously and consequently the eradication of such conditions from the school population is more difficult since the school children alone will receive treatment. It is therefore obvious that not only the children involved, but the whole family should be treated and given all the advice and guidance.

Five cases of suspected Hensen's disease were referred to the Irrawady Road Skin Clinic and of these three were proved cases of Leprosy.

Ear, Nose and Throat.—Twelve cases of deafness were reported. Infections of the middle ear, which were usually chronic, were referred to the E.N.T. Specialist for treatment. A number of children were found to have enlarged tonsils and parents were instructed with regard to conservative treatment. Tonsillectomy was not recommended except in cases with a history of repeated sorethroats or where the general condition of the child was below normal.

Organic and Valvular Heart Disease.—Mitral stenosis, auricular and ventricular septal defects, and patent ductus arteriosus are the common heart defects found. In the case of the acquired cardiac disabilities, they are probably of rheumatic origin although a previous history of rheumatic fever is very difficult to obtain.

Respiratory Infections.—Children from the urban areas, where overcrowded living conditions and poor ventilation are more common, were more susceptible to infection of the upper respiratory tract.

Bronchial asthma is quite a common condition found among the school children. Children with poor physical development associated with a history of chronic cough are mantoux-tested and sent for radiological examination of the chest. Suspected cases of Primary Complex are referred to the School Tuberculosis Officer for diagnosis and treatment.

Genito-Urinary.—Phimosis, inguinal hernia and hydrocele were the common defects found among the boys. With the consent of the parents, these children were referred to the consultants and surgeons of the General Hospital for further treatment.

Blood Conditions.—Cases of anæmia, particularly gross anæmia, were found more in the rural areas, where worm infestation is prevalent. A certain number of these cases were due to nutritional causes in both urban and rural areas.

Worm Infestation.—The incidence is higher amongst the children in the rural areas as compared with the urban school children. This is due to inadequate sanitation, the illegal use of nightsoil as a vegetable manure and the failure of the rural children to use protective footwear.

Table 47

INCIDENCE OF DEFECTS DETECTED IN ROUTINE SCHOOL EXAMINATIONS
(Figures for incidence of defects expressed as percentages)

| | | | 1960 | 1961 | 1962 | 1963 | 1964 |
|---|-------|--|--------|--------|--------|--------|--------|
| Dental Caries | Boys | | 55.64 | 47.38 | 47.24 | 40.59 | 35.85 |
| | Girls | | 39.85 | 44.41 | 41.11 | 38.68 | 40.01 |
| Skin Infection | Boys | | 6.01 | 3.33 | 4.36 | 3.70 | 4.11 |
| | Girls | | 8.56 | 9.97 | 9.15 | 6.94 | 5.35 |
| Eyes: Infection | Boys | | .87 | .49 | .73 | .91 | 1.51 |
| | Girls | | .77 | .51 | .39 | .35 | .34 |
| Defective vision | Boys | | 4.87 | 5.52 | 6.52 | 5.72 | 6.33 |
| | Girls | | 6.34 | 7.33 | 7.68 | 10.17 | 9.02 |
| E.N.T. Enlarged tonsils | Boys | | 1.17 | .43 | .15 | .52 | .16 |
| | Girls | | .29 | .07 | .11 | .22 | .19 |
| Ear infections | Boys | | .47 | .28 | .34 | .39 | .47 |
| | Girls | | .16 | .14 | .06 | .07 | .06 |
| Cardiac Disease | Boys | | .53 | .24 | .27 | .65 | .77 |
| | Girls | | .64 | .44 | .39 | .52 | .44 |
| Respiratory Infection | Boys | | 1.08 | .75 | .96 | 1.53 | 1.31 |
| | Girls | | 3.12 | 2.20 | 1.00 | 1.14 | 2.04 |
| Genito-Urinary | Boys | | 2.86 | 2.05 | 2.86 | 6.10 | 6.17 |
| | Girls | | .34 | .38 | .27 | .24 | .29 |
| Anaemia (under 60% Hb.) | Boys | | .55 | .55 | .33 | .46 | .12 |
| | Girls | | .90 | .51 | .58 | 1.28 | .96 |
| Worm Infestation | Boys | | 2.52 | 3.46 | 1.34 | .76 | 4.16 |
| | Girls | | 8.83 | 8.70 | 5.06 | 4.58 | 5.47 |
| Other abnormalities including post- ural defects, Cleft Palate, Chest deformities | Boys | | .82 | .42 | 1.36 | 2.27 | 2.49 |
| | Girls | | 3.18 | 2.79 | 1.02 | 1.54 | 2.00 |
| Children Examined | Boys | | 50,624 | 44,695 | 61,489 | 63,402 | 63,235 |
| | Girls | | 58,590 | 48,707 | 70,903 | 52,441 | 62,054 |

Personal Hygiene.—There has been some improvement in general cleanliness among school children. School Health Officers have been able to get the co-operation of teachers in most cases to improve the hygiene habits of the children. More attention, however, should still be paid to the care of teeth and finger nails, and the wearing of shoes in rural schools. Pediculosis is prevalent among Malay Schools and to some extent in Tamil Schools. The school teachers can play an important part in its eradication.

School Clinics.—There is one main clinic at the Institute of Health, Outram Road, which functions daily both in the mornings and afternoons. The Health Officers have regular morning and afternoon sessions in order

to follow up their own cases and to see outpatients of school children. There are three subsidiary clinics in the suburban and rural areas. The Paya Lebar Clinic functions on Monday and Friday afternoons, the Kallang Clinic on Wednesday afternoons and the Bukit Timah Clinic on Saturday mornings. The Health Officers responsible for the schools served by the particular clinic are in attendance at each clinic session.

Table 48

ATTENDANCES AT SCHOOL CLINICS

| | 1960 | 1961 | 1962 | 1963 | 1964 |
|------------------------------|----------------|----------------|----------------|----------------|----------------|
| Total number of new cases .. | 55,056 | 52,196 | 55,678 | 53,160 | 54,973 |
| Total number of re-visits .. | 81,057 | 74,612 | 92,664 | 91,948 | 93,820 |
| Total .. | <u>136,113</u> | <u>126,808</u> | <u>148,342</u> | <u>145,108</u> | <u>148,793</u> |

Table 49

BREAKDOWN OF SCHOOL CLINIC ATTENDANCES, 1964

| | New Cases | Repeat Cases | Total |
|-------------------------------|---------------|---------------|----------------|
| Institute of Health Clinic .. | 46,010 | 84,085 | 130,095 |
| Paya Lebar Clinic .. | 5,111 | 3,747 | 8,858 |
| Kallang Clinic .. | 2,306 | 3,728 | 6,034 |
| Bukit Timah Clinic .. | 1,546 | 2,260 | 3,806 |
| Total .. | <u>54,973</u> | <u>93,820</u> | <u>148,793</u> |

Laboratory Investigations.—Routine Laboratory examinations are conducted in the main clinic at the Institute of Health where there is a small Laboratory staffed by a qualified Laboratory technician. 6,593 investigations were carried out by him as against 6,693 in 1963.

School Travelling Dispensaries.—Two travelling dispensaries in charge of one Health Sister, assisted by 4 nurses visited the rural schools during the year for the treatment of minor ailments and to follow up cases referred by the School Health Officers.

Table 50

TOTAL NUMBER OF VISITS TO SCHOOLS BY THE SCHOOL TRAVELLING DISPENSARIES AND THE TREATMENT GIVEN

| | 1962 | 1963 | 1964 |
|--------------------------------------|--------|--------|--------|
| Total Number of visits to schools .. | 935 | 828 | 932 |
| Total Number of treatment given .. | 47,345 | 41,535 | 47,292 |

Table 51

CASES REFERRED TO SPECIALISTS, HOSPITALS AND OTHER INSTITUTIONS, 1964

| (a) Cases referred to Specialists: | | (b) Cases referred to Hospitals and other Institutions: | |
|------------------------------------|----------|---|----------|
| Cardiac Specialist | .. 147 | Casualty Department General Hospital | 689 |
| E.N.T. Specialist | .. 300 | Emergency Unit, General Hospital | .. 450 |
| Psychologist | .. 18 | Outpatient Department, General Hospital | 18 |
| Psychiatrist | .. 23 | General Hospital for admission | .. 208 |
| Paediatrician | .. 193 | Physiotherapy Dept., General Hospital | 7 |
| Ophthalmic Surgeon | .. 543 | Middleton Hospital | .. 66 |
| Surgeons | .. 1,019 | Social Hygiene Clinic, Middle Road | .. 3 |
| Physicians | .. 116 | Trafalgar Home | .. 2 |
| Orthopaedic Surgeon | .. 147 | Cases sent to School Tuberculosis Officer | 35 |
| Skin Specialist | .. 60 | Dental Clinic at Institute of Health | .. 537 |
| Gynaecologist | .. 16 | Dental Clinic at Pegu Road | .. 16 |
| | | Dental Clinic at Jalan Teck Whye | .. 35 |
| | | X-ray Dept. at General Hospital | .. 73 |
| | | X-ray Dept. at Institute of Health | .. 689 |
| Total | .. 2,581 | Total | .. 2,828 |

Cases referred from School Clinics.—2,581 cases were referred to specialists and 2,828 cases were referred to various institutions.

Table 52

INFECTIOUS DISEASES IN SCHOOLS

| | 1960 | 1961 | 1962 | 1963 | 1964 |
|----------------|------|------|------|------|------|
| Chickenpox | 244 | 170 | 158 | 285 | 104 |
| Diphtheria | 425 | 335 | 162 | 111 | 52 |
| Mumps | 984 | 447 | 300 | 514 | 776 |
| Dysentery | 26 | 26 | 24 | 11 | 14 |
| Leprosy | 6 | 3 | 1 | 2 | 3 |
| Malaria | 1 | 2 | 6 | 3 | 2 |
| Measles | 20 | 17 | 28 | 118 | 88 |
| Poliomyelitis | 2 | 3 | 1 | 1 | 2 |
| Typhoid fever | 6 | 7 | — | 2 | — |
| Whooping cough | 83 | 35 | 25 | 10 | 28 |
| Cholera | — | — | — | — | 3 |

Cholera Cases.—There were 3 cases among school children reported in 1964.

HOME AND SCHOOL VISITING

Homes and Schools were visited by the Health Nurses of the Travelling Dispensaries and the Institute of Health Clinic:—

- (i) to investigate and follow up cases of tuberculosis before transfer to the School Tuberculosis Officer;
- (ii) to investigate cases of infectious diseases reported by School Principals or the Senior Health Officer i/c Epidemiology;

- (iii) to take throat swabs of all indirect class contacts of diphtheria. 521 throat swabs were taken in 1964 as against 1,164 in 1963;
- (iv) to call up patients who have failed to see the doctor as arranged e.g. cases of suspected leprosy;
- (v) to vaccinate new entrants (56,257 new entrants were vaccinated in 1964 as against 59,114 in 1963).

Diphtheria, Tetanus and Poliomyelitis Immunisations.—From May this year diphtheria and tetanus immunizations were started among Primary one school children. At the same time oral poliomyelitis immunisation was given to these children. Two immunisation teams started in May, while a third team was added in June. The following Table 53 summaries the work done by the School Immunisation teams:—

Table 53

| | | |
|---|-----|--------|
| Number of schools visited (1st visit) | ... | 257 |
| Number of schools visited (2nd visit) | ... | 253 |
| Number of children immunised (1st and 2nd visits) | ... | 63,698 |
| Diphtheria — Tetanus 1st dose | ... | 25,184 |
| 2nd dose | ... | 21,975 |
| Booster | ... | 4,298 |
| Tetanus toxoid | ... | 2,309 |
| Sabin 1st dose | ... | 33,640 |
| 2nd dose | ... | 29,471 |

School Milk Scheme.—Skimmed milk for undernourished school children was supplied as in the past, by the Social Welfare Department on the recommendation of School Health Officers. 28,786 children were recommended for skimmed milk in 1964 as against 32,633 in 1963. More and more principals are showing an interest in this scheme. In order to prevent any wastage, the Social Welfare Department distributed this milk only to the principals who were sufficiently interested to see that the children were given the milk daily.

Almoner Service.—The Almoner in the School Health Section deals with the medico-social problems of the school children. 456 new cases were seen in 1964 of which 323 were undernourished children. Children were supplied with free supplementary rations if their parents cannot afford them, while others are given dietary advice. 50 children were recommended for admission to the Singapore Children's Society Convalescent Home.

Educationally backward children are referred to the Almoner. 25 children were referred for I.Q. tests. A total of 1,265 pairs of spectacles were supplied in 1964.

ENVIRONMENTAL HYGIENE IN SCHOOLS

Further improvement in the field of environmental hygiene and sanitation of schools was made during 1964.

New schools were erected with due consideration to health and hygiene and old buildings were renovated or reconstructed and in some cases extensions made to improve the existing sanitary condition of the schools.

Two fully qualified Public Health Inspectors are engaged on a whole time basis for duties connected with the School Health Service. Visits are made regularly to schools for the purpose of routine inspections or in connection with special investigations. Routine inspections are confined to yearly inspection of the existing schools for the purpose of ascertaining whether the provisions of the Education Ordinance and the Regulations made thereunder are being complied with. The special visits are made because of complaints received, nuisances reported, applications by new schools for registration, new school projects and any additions or alterations to existing schools. In 1964 896 inspections were made.

A total of 104 building plans were submitted for advice and recommendations. All of them were recommended for approval subject to compliance of the health requirements.

The Senior Health Officer i/c Schools was asked by the Ministry of Education to inspect 8 schools prior to their registration. All these applications were recommended for registration from the health point of view subject to compliance of health requirements.

As reported in previous years, overcrowding still existed in a few vernacular schools. The Ministry of Education after consultation with the Ministry of Health, granted as a temporary measure, a 10 per cent overcrowding allowance to all standard size classrooms, and thereby permitting a maximum of 44 pupils per classroom as against the 40 allowed for in the school Regulations.

Regular inspections were made of school canteens to ensure a high standard of food hygiene. Health education and advice were freely given to stall-holders as well as the staff of schools during such visits. In 1964 ten schools were provided with proper tuckshops while 6 more schools were recommended to have them installed. Five schools were installed with modern sanitation while 9 schools were recommended to install the water-carriage system.

10. MATERNAL AND CHILD HEALTH SERVICES

GENERAL

WITH integration, the Maternal and Child Health Services in the City as well as the Rural areas have been unified since 1960 and are now centrally administered.

The year 1964 has been of consolidation for the Maternal and Child Health Services. As there is only one new clinic opened during the year, there has been time to take stock of the organisation and staffing and try wherever possible to streamline the work and standardise procedures for both City and Rural clinics following full integration.

Normal duties were interrupted on several occasions throughout the year due to two riots and civil disturbances and civil disasters such as fires and floods, while three cholera campaigns affected the usual services offered.

The service operates a net work of 3 types of clinics which are distributed as follows:

| | Rural | City | Total |
|-------------------------------|-------|------|-------|
| (a) Main Centres ... | 24 | 10 | 34 |
| (b) Kampong Midwives Centres* | 5 | — | 5 |
| (c) Visiting Centres ... | 24 | 1 | 25 |

* Excluding 3 others from last year which have now been combined as visiting centres.

The main function of the service is preventive although limited curative work has to be included so as to meet the exigencies of the health needs of the population. The Maternal and Child Health Doctors also assist in training programmes, including lectures to Midwives, Health Visitors and Public Health Inspectors-in-Training.

LIST OF CLINICS AND CENTRES AS ON 31ST DECEMBER, 1964

| Main Clinics (34) | Midwife Centres | Visiting Centres (23) |
|-------------------|---------------------|-----------------------|
| Rural | (Residential) | Rural |
| Airport | *Bulim, 13½ m.s. | Tg. Murai |
| Ama Keng | Jurong, 10 m.s. | Kg. Blukang |
| Bedok, 9 m.s. | *Kg. Loyang | Kg. Bajau |
| Bukit Panjang | *Ponggol, 9½ m.s. | Damar Laut |
| Bukit Timah | Somapah | Pulau Sudong |
| Buona Vista | St. John's Island | Pulau Semakau |
| Chai Chee | P. Ubin | Pulau Seking |
| Changi | *Midwife Centre cum | Pulau Seraya |
| Holland Road | visiting centre | Pulau Bukom Kechil |
| Jalan Bahru | | Lazarus Island |
| Jurong, 12 m.s. | | Pulau Ayer Melinan |
| Jurong, 18 m.s. | | Pulau Ayer Mertau |
| Kampong Batok | | P. Semulor |
| Kim Chuan Road | | P. Sebarok |
| Kranji | | Ayer Gemuroh |
| Lim Ah Pin | | Chia Keng Village |
| Mandai | | Pulau Ubin |
| Pulau Brani | | Ponggol |
| Pulau Tekong | | Kg. Loyang |

LIST OF CLINICS AND CENTRES AS ON 31ST DECEMBER, 1964 — *contd.*

| Main Clinics (34) | Midwife Centres (Residential) | Visiting Centres (23) |
|---------------------|----------------------------------|-----------------------|
| Rural | | Rural |
| Sembawang | | Bulim |
| Still Road | | Loyang |
| Thomson Road | | St. John's Island |
| Thong Ho | | |
| Yio Chu Kang | | City |
| | | Radin Mas |
| City | | |
| Alexandra | | |
| Aljunied Road | | |
| Bukit Ho Swee | | |
| Institute of Health | | |
| Joo Chiat | | |
| Kallang Estate | | |
| Kim Keat Road | | |
| Kreta Ayer | | |
| Prinsep Street | | |
| Queenstown | | |

* (1) Princess Elizabeth Estate sessions stopped with effect from 15th February, 1960.

(2) Woodlands, 15½ m.s. sessions stopped with effect from October 1962.

The Maternal and Child Health Clinics also serve the needs of the child and mother population of the islands off Singapore. This service is performed by a health team usually comprising a Health Officer, Health Nurse, an Assistant Nurse, a Midwife and a Hospital Assistant. The team travels by motor launch and the islands are visited at least weekly or bi-weekly. However, owing to staff shortage in 1964, a Staff Nurse was put in charge and has managed to carry on by bringing the problems to the Senior Health Officer and Public Health Matron whenever these arise for advice.

To help matters, especially in the case of emergencies, the Floating Dispensary *Seraya* has been equipped with radio-telephone from May 1964. The staff carried on despite rough seas and bad weather which often forced the team to deviate from their scheduled visits to certain islands.

MATERNITY SERVICES

These include (a) antenatal care, (b) natal care, (c) post-natal care. In addition, the Family Planning Association holds regular sessions at the main Maternal and Child Health Clinics.

(a) *Antenatal care.*—In spite of the disturbances to normal routine caused by two periods of civil disturbances in 1964 and the heavy rains in the latter two months of the year, antenatal attendances rose by 20,846 visits over the previous year. A comparative table of antenatal visits to Rural and City Maternal and Child Health Clinics for the last five years is shown below:

Table 54

ANTENATAL VISITS TO M. & C.H. CLINICS

| Year | Rural | City | Total |
|------|---------|--------|---------|
| 1960 | 105,907 | 27,760 | 133,567 |
| 1961 | 108,067 | 31,946 | 140,013 |
| 1962 | 111,995 | 39,313 | 151,308 |
| 1963 | 80,458 | 40,169 | 120,627 |
| 1964 | 89,378 | 52,095 | 141,473 |

In the last quarter of the year attendances at antenatal clinic sessions were increased, especially in City clinics. This was due to re-organisation of the Maternity Services at Kandang Kerbau Hospital whereby all normal antenatal cases have been referred to Maternal and Child Health sessions in the first instance. An appointment system for referral of cases needing specialised curative care was instituted since Kandang Kerbau Hospital have limited their intake to more manageable proportions. A good deal of adjustment of duties had to be made to cope with the increases, and plans were in hand in case there were further increases.

(b) *Natal care*.—This is provided for in the Domiciliary Midwifery Service. Midwives employed by the Government are responsible at the main clinics and at the Midwife Centres. There is a 24-hour service available for patients who have been attending the clinic and who are found to be suitable for domiciliary delivery.

The universal trend, however, is growing towards institutional confinement, which is desirable and in the best interest of mother and child. More and more mothers are going to Kandang Kerbau Hospital for their confinements—more than 60 per cent of births occur in Kandang Kerbau Hospital alone. The following table shows deliveries in the Kandang Kerbau Hospital and those cases attended by Government Midwives and Private Midwives for the last three years.

| | Number of Confinements in the Home Attended by Health Midwives | | | Confinements in Kandang Kerbau Hospital | | | Total Births* |
|------|---|--------------|-------|---|---------------|--------|---------------|
| | Rural Area | City Area | Total | Private Midwives | Total Births* | | |
| 1962 | 5,045 | 880 | 5,925 | 10,572 | 37,861 | 59,717 | |
| 1963 | 4,526 | 887 | 5,413 | 8,176 | 39,436 | 60,269 | |
| 1964 | 5,320 | 1,016 | 6,336 | 8,006 | 39,598 | 58,911 | |

* Total Live and Still Births as given in Annual Report of Registrar General of Births and Deaths.

With the imposition of a \$10 charge for confinements in Kandang Kerbau Hospital, it was expected that there would be an increased demand for confinements in the home, but except for a very short time initially, Midwives' case load of 3-5 cases per Midwife per month still continues.

There were 16 maternal deaths in cases undertaken by the service, as compared to 10 last year. Of these 16 deaths, 12 were Malays, 1 Chinese and 3 were Indians. 13 deaths occurred in the home and 3 in hospital. In the majority of these 16 maternal deaths, the histories showed that 75 per cent could have been avoidable had patients listened to advice regarding hospital confinement and proper attendance in the confinement.

(c) *Post-natal care*.—This is achieved by:

(i) The Domiciliary After-care Service,

(ii) Follow-up of new delivery by District Sister.

(iii) Post-natal visits to the clinics.

(i) *The Domiciliary After-care Service.*—This service caters for mothers who are delivered at Kandang Kerbau Hospital and the return home within 24 hours. This includes both City and Rural areas and the following table shows the number of patients attended by the D.A.C. for the last 3 years:

NUMBER OF D.A.C. PATIENTS

| Year | | Rural | City | Total |
|------|-----|--------|--------|--------|
| 1962 | ... | 10,180 | 11,920 | 22,100 |
| 1963 | ... | 11,245 | 12,279 | 23,524 |
| 1964 | ... | 11,949 | 12,165 | 24,114 |

(ii) *Follow-up of new delivery by District Sister.*—Every registered new birth is visited by the District Health Sister. This includes mothers and infants who are delivered by private midwives. All ill cases in the puerperium are referred to the Health Officer in charge of the district who will then attend to them, if the private practitioner is not in attendance.

Midwives practising in Singapore are under the supervision of two Supervisors of Midwives—a Rural Supervisor and a City Supervisor. The Rural Supervisor is responsible for all Government Midwives in the Rural area and Pupil Midwives undergoing their domiciliary training, while the City Supervisor supervises the City Midwives and the Midwives in private practice. This supervision excludes trained Nurse Midwives.

Below are tables which are summaries of the work done in relation to Maternal Services for 1962, 1963 and 1964:

SUMMARIES OF WORK DONE IN RELATION TO MATERNAL SERVICES IN 1962—1964

| | 1962 | | | 1963* | | | 1964 | | |
|--|---------|--------|---------|--------|--------|---------|--------|--------|---------|
| | Rural | City | Total | Rural | City | Total | Rural | City | Total |
| Antenatal Visits to Clinics | 111,995 | 39,313 | 151,308 | 80,458 | 40,169 | 120,627 | 89,378 | 52,095 | 141,473 |
| Postnatal Visits to Clinics | 3,922 | 339 | 4,261 | 3,414 | 983 | 4,397 | 3,979 | 3,979 | 7,958 |
| Confinements attended by Government Midwives | 5,045 | 880 | 5,925 | 4,526* | 887 | 5,413 | 5,320 | 1,016 | 6,336 |
| Mother in Labour sent to K.K.M.H.* | 847 | 26 | 873 | 465 | 25 | 490 | 570 | 22 | 529 |
| Visits by Midwives in Puerperium† | 90,251 | 57,621 | 147,872 | 92,249 | 62,934 | 155,183 | 97,349 | 60,660 | 158,009 |

*Kandang Kerbau Hospital.

†These include visits for cases in both the Domiciliary Service and the Domiciliary After-Care Services.

| | 1962 | 1963 | 1964 |
|--|--------|---------|--------|
| | Total | Total | Total |
| Total No. of Live Births ... | 58,977 | 59,530 | 58,217 |
| Total No. of Still Births ... | 740 | 739 | 694 |
| Confinements attended by Government Midwives ... | 5,925 | 5,413 | 6,336 |
| Confinements attended by Private Midwives Class B+ ... | 10,572 | 8,176 | 8,006 |
| Confinements attended by Private Doctors ... | 2,924 | 3,395 | 3,632 |
| Confinements in K.K.M.H. ... | 37,861 | 39,436* | 39,598 |
| Self-attended cases ... | 22 | 38 | 82 |

* 1963 — figure confirmed with M.S., K.K. Hospital.

THE CHILD HEALTH SERVICES

The services provided for the pre-school child are:

- (a) A comprehensive immunization programme.
- (b) Advice and Health Education to mothers on child care, in particular the infant.
- (c) Treatment of minor ailments.

(a) *The Immunization Programme.*—This includes (i) B.C.G. vaccination, (ii) vaccination against smallpox, (iii) immunization against diphtheria, whooping cough and tetanus, (iv) immunization against poliomyelitis, (v) cholera immunization (emergency campaigns).

(i) *B.C.G. Vaccination.*—B.C.G. vaccination continued to be well accepted by the public as shown by the following figures:

B.C.G. VACCINATION IN MATERNAL AND CHILD HEALTH CLINICS

| | |
|----------|--------|
| 1962 ... | 12,186 |
| 1963 ... | 14,025 |
| 1964 ... | 14,663 |

Nearly 100 per cent of Government midwife cases are referred for B.C.G. but cases delivered by private midwives are not all being referred for B.C.G. although Supervisors of Midwives have advised them to do so.

(ii) *Smallpox Vaccination.*—Smallpox vaccination is compulsory by law and all children must be vaccinated by the age of six months. A total of 45,774 children were given primary vaccinations through the Maternal and Child Health Services and a further 9,985 were given vaccinations by private doctors, making a total of 55,759, representing 95 per cent of the total births for 1964.

(iii) *Diphtheria Immunization.*—This is given either alone or in combination with other immunizing agents, thereby giving protection against diphtheria, whooping cough and tetanus. Although diphtheria immunization has been made compulsory since April 1962, the response to immunization

by one year of age is not complete. However, there are a large number who do come up between one to two years, when they feel the child is older and more able to withstand any reactions which may arise. Immunization is carried out in all Maternal and Child Health Clinics. A total of 40,103 children completed their primary immunization with Triple Antigen. This figure constitutes 96.8 per cent of 41,394 children, who originally had their first dose.

(iv) *Poliomyelitis Immunization.*—Poliomyelitis has been a regular feature in the immunization programme since March 1963 when oral Sabin vaccine was used. This policy was continued from 1962 when Sabin vaccine was first widely used in a campaign which averted an expected epidemic.

In 1963 there were 68 cases of notified poliomyelitis. During 1964 there were only 18 cases — one being an imported case from Johore.

After due consultation with the Professor of Bacteriology, all infants and pre-school children besides receiving their primary course of oral Sabin are receiving a fourth dose when they return for their booster doses for anti-diphtheria with effect from 1st October, 1964.

(v) *Cholera Immunization.*—For the second year running the Maternal and Child Health Services were mobilised to administer cholera immunization to the public. Two emergency immunization centres for cholera were opened at the end of January 1964 at Buona Vista and Bukit Panjang Maternal and Child Health Centres. These centres were subsequently closed down on 5th March, 1964. Because of the recent mass campaign against cholera, the response was poor with only 546 persons coming in for immunization. From 5th April to 28th July a total of 25,796 persons were immunized at 10 Maternal and Child Health Centres.

As a result of a sporadic case of cholera which occurred in August 1964, 194 persons were immunized against cholera.

(b) *Advice and Health Education on Child Care.*—There was a fall in attendances at infant and pre-school sessions due probably to the disruption of service from cholera campaigns and the two periods of civil disturbances in July and September when curfew was imposed for the whole State for several days. In December, due to bad weather and heavy rains, mothers and children kept away.

In 1964, 443,273 infants and 366,345 pre-school children attended the clinics.

Advice given revolves mainly around the infant. If necessary, milk powder, multivitamins, protein foods and other additional nutrients are given to families.

(c) *Treatment of minor ailments.*—Treatment of a certain amount of minor ailments is part of the functions of the Maternal and Child Health Clinics, although this is often done at the expense of preventive work.

ATTENDANCES—THE NUMBER OF CHILDREN IMMUNISED AND OTHER FUNCTIONS CARRIED OUT AT THE MATERNAL AND CHILD HEALTH CLINICS—1962, 1963 AND 1964

| | 1962 | | | 1963 | | | 1964 | | |
|--------------------------------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|
| | Rural | City | Total | Rural | City | Total | Rural | City | Total |
| | Attendances | | | | | | | | |
| Infant | 176,488 | 250,749 | 427,237 | 177,685 | 269,854 | 447,539 | 182,572 | 260,701 | 443,273 |
| Pre-school | 333,077 | 400,139 | 733,216 | 199,105 | 183,826 | 382,931 | 187,518 | 178,827 | 366,345 |
| B.C.G. | 5,602 | 6,584 | 12,186 | 6,520 | 7,505 | 14,025 | 6,956 | 7,707 | 14,663 |
| Primary Vaccination | 20,554 | 26,621 | 47,175 | 19,243 | 26,237 | 45,480 | 19,528 | 26,246 | 45,774 |
| <i>Diphtheria Immunisation</i> | | | | | | | | | |
| Clinic: T.A. | | | | | | | | | |
| 1st Dose | 23,650 | 40,045 | 63,695 | 20,684 | 28,850 | 49,534 | 18,913 | 21,561 | 40,474 |
| 2nd Dose | 20,003 | 31,549 | 51,552 | 17,129 | 27,070 | 44,199 | 17,489 | 22,760 | 40,249 |
| 3rd Dose | 17,387 | 27,622 | 45,009 | 17,345 | 26,027 | 43,372 | 16,523 | 22,983 | 39,506 |
| Boosters | 12,875 | 7,695 | 20,570 | 11,281 | 4,947 | 16,228 | 8,311 | 2,833 | 11,144 |
| Kampong: | | | | | | | | | |
| 1st Dose | 717 | .. | 717 | 722 | 1,914 | 2,636 | 685 | 235 | 920 |
| 2nd Dose | 302 | .. | 302 | 434 | 851 | 1,285 | 486 | 213 | 699 |
| 3rd Dose | 202 | .. | 202 | 353 | 53 | 406 | 445 | 152 | 597 |
| Boosters | 715 | .. | 715 | 605 | 522 | 1,127 | 565 | 58 | 623 |
| <i>Diphtheria Immunisation</i> | | | | | | | | | |
| Clinic: | | | | | | | | | |
| 1st Dose | 3,497 | 13,123 | 16,620 | 2,212 | 4,444 | 6,656 | 2,863 | 6,699 | 9,562 |
| 2nd Dose | 2,664 | 10,579 | 13,243 | 1,939 | 4,530 | 6,469 | 2,276 | 5,631 | 7,907 |
| Boosters | 2,909 | 4,800 | 7,709 | 4,242 | 2,121 | 6,363 | 8,861 | 4,418 | 13,279 |

11. TRAINING AND HEALTH EDUCATION

INTRODUCTION

THIS Branch created in November 1963 is now under the charge of a Senior Health Officer. It consists of three Units: (1) Training Unit; (2) Health Education Unit; (3) Special Assignments Unit. During the year under review, programmes were planned to involve all the three Units. This has been desirable from the functional point of view, as many of the programmes planned are inter-related. The main activities for the year under review are as follows:

THE TRAINING UNIT

The Training Unit is responsible for (a) the training of Public Health Inspectors; (b) the training of Public Health Nurses; (c) in-service training courses for: (i) Technical Subordinates, (ii) Public Health Inspectors-in-Training, (iii) other health auxiliaries.

It also liaises with other training institutions and the staff are involved in assisting with the teaching in relation to Public Health carried on in these institutions. This Unit also organizes seminars and symposiums.

(a) *The Training of Public Health Inspectors.*—Training of Public Health Inspectors is carried out at the Institute of Health and is one of the oldest courses of training in Singapore. The Overseers Examination Board which was originally established in 1921 is responsible for preparing the scheme of training and holding of examinations for Public Health Inspectors in this region—Singapore, Federation of Malaya, Sarawak, North Borneo and Brunei. The Board has functioned continuously since its inception except for the interruption due to the World War II of 1942–1946, and for a brief period between 1951–1952, when staff shortages made it impossible to run the course.

In January 1959, a Public Health Inspectors' Training School was started in Kuala Lumpur on the same lines as the training centre in Singapore, and since then courses and examinations for Public Health Inspectors are held simultaneously in Singapore and Kuala Lumpur.

The 10-month course leads to the Diploma of the Royal Society of Health.

The Public Health Inspectors' Training Course, 1964.—This was the 34th session of the Royal Society of Health in the training of Public Health Inspectors in Singapore. It commenced on 13th January, 1964 and ended on 21st November, 1964. There were 11 candidates, 7 from Sabah, including for the first time in its history a woman. The examination was conducted from 9th November, 1964 to 18th November, 1964. The results are awaited, pending ratification by the Council of the Royal Society of Health in London.

(b) *The Training of Public Health Nurses.*—In 1955, the first Health Visitors' Course held in Malaya was conducted in Penang. The Public Health Nursing Course in Singapore was established in 1957 with assistance from W.H.O. The Royal Society of Health Examination Board is also responsible for preparation of the training schemes and the conduct of these examinations. In 1958 the first Health Visitors' Course was started in Singapore under the direction of a W.H.O. Public Health Nurse Educator in the University Wing of the Institute of Health. Since then 5 courses have been held and 60 students have qualified and returned to the different branches of the Public Health Nursing services from which they were drawn. There are therefore two courses for Health Visitors — one in Singapore and one in Kuala Lumpur (the original centre in Penang being transferred to Kuala Lumpur) concurrently in operation.

The above course which is of one year's duration leads to the Health Visitors' Certificate of the Royal Society of Health. Training is carried out for one year and consists of 9 months in the classroom and 3 months of district nursing.

The Health Visitors' Course, 1964.—The fifth course commenced in April 1963 and ended on 22nd February, 1964. The examination was held from 18th to 22nd February. 16 candidates entered and 12 passed the examination. Examiners were Dr. B. V. Hassan, Health Officer, Johore; Dr. Nalla Tan, Senior Health Officer (Training and Health Education), Singapore; and Sister Le Mercier, Maternal and Child Health Service.

For the first time, a supplementary examination was arranged and held in August 1964 for the unsuccessful candidates. Three candidates entered, and all passed.

The Sixth Public Health Nursing Course commenced on 20th April, 1964. 35 applications were received (34 from Singapore and 1 Colombo Plan candidate from Thailand). 16 candidates were selected. Since selection, two have withdrawn from the Course. The examination for this Course will be held in early 1965.

(c) (i) *Training Course for Public Health Inspectors-in-Training.*—A departmental course of lectures for Public Health Inspectors-in-Training was held from 12th October to 11th December, 1964, after which a departmental examination was held on the 21st and 22nd December, 1964. Five candidates sat, and 4 were successful.

(ii) *Other Health Auxiliaries.*—Plans to hold a departmental training course for Technical Subordinates in 1965 were finalised, and five Technical Subordinates will attend this course when it commences in January 1965.

(iii) *Refresher Courses.*—For the first time a refresher course was conducted for Public Health Nurses in the Service who do not possess the Health Visitors' Certificate. This refresher course was held from the 31st March, 1964 to the 11th April, 1964 and 10 Public Health Nurses from the

Maternal and Child Health Services attended. The course was a success and plans are in hand to hold this annually and to include in future years Health Nurses from all branches of the Public Health Nursing Service.

The staff of this Unit gave assistance to basic nursing course in the School of Nursing, General Hospital and to the Midwifery Training Course at Kandang Kerbau Hospital.

THE HEALTH EDUCATION UNIT

This Unit is responsible for the dissemination of health education to the population in general. Besides this, it conducts training courses and refreshes course in health education for specific categories of health personnel and other categories who can effectively be involved in disseminating knowledge in health. In respect of health education, it is felt that emphasis should be placed on programmes directed to primary school children initially and that later these programmes can be extended to include secondary school children.

The activities of this Unit were widened considerably during the year, and it has now embarked on several projects on an organized basis and has continued with certain projects which were initiated in the previous year. The following are descriptions of projects in the programmes implemented during 1964:

Health Education of the General Public.—This was effected: (a) through the Spring Cleaning Campaign which occupied the first five months of 1964, (b) intensive health education was carried out through the press, radio and television.

The campaign was extended into primary and secondary schools. Health squads of older school children were formed in schools. Essay and poster competitions were held in all schools of the 4-language streams and a total of 300,000 children participated. Prizes amounting to \$2,000 were awarded to winning efforts. The Health Education Campaign culminated in a prize-giving ceremony which was held at the Gan Eng Seng School when the Minister for Health, Mr. Yong Nyuk Lin presented gift vouchers to winning pupils.

A series of 31 radio talks were given over radio covering health of mothers, infants, the pre-school child and the school child. There was a series of television interviews also conducted on the same subject during the year.

Refresher Courses in Health Education for In-service Midwives.—Three such courses were held in January/February, April/May and October/November. These refresher courses in health education were given in conjunction with the midwives' refresher courses organized by the Midwifery School at Kandang Kerbau Hospital.

Credit Course in Health Education.—A credit course in health education for primary school teachers was planned in conjunction with the Ministry of Education. It was conducted from June to October 1964. This course has been commenced with the intention of stimulating teachers to realise the

important part that they can play in dissemination knowledge in health to school children. The course was interrupted by two curfews during the civil disturbances in July and September 1964. 60 teachers enrolled for this course and on completion of the syllabus an examination was held in November 1964. 60 per cent of the candidates, who sat were successful. It is intended that this course be continued in subsequent years.

Special Lectures for Primary School Children and Young Adolescents.—

A total of 3,600 children from various schools attended lectures on upper respiratory infections and developmental changes at puberty. The lectures were followed by a film show, after which was a question-answer session. This programme was arranged in conjunction with the Ministry of Education, and four main centres were selected. Students from schools in the area attended. The following centres were used:

- (a) Queensway Secondary School — Margaret Drive — 20th June, 1964.
- (b) Raffles Secondary School — Anderson Road — 27th June, 1964.
- (c) Dunman Secondary Integrated School — Off Haig Road — 11th July, 1964
- (d) Cedar Girls Secondary School — Cedar Avenue — 4th July, 1964.

During these talks pamphlets and other handouts were given to every child present.

Health Education Programmes at Kampong Tulloch.—At the request of the Army Medical Services at Kampong Tulloch, a series of six health education sessions were held by Malay mothers in the Medical Centre in this Army Camp. This was held in the months of June and July 1964 and was carried out by staff of both the P.H.N. Training Unit and the Health Education Unit.

Film Shows.—During the year a programme of film shows was held at Maternal and Child Health Clinics. These film shows were held using a daylight screen in the afternoons during the midwives' sessions when the pace of the clinics was a little slower than usual. 41 such film shows were held. Some clinics were visited twice during the year, and 3 films were shown on each visit. A programme of film shows at community centres was commenced in October. The films shown dealt with general health and a total of 13 film shows were held.

Preparation and Distribution of Health Education Material.—During the year a considerable amount of health education material was prepared and printed. Three posters prepared specially in conjunction with the Spring Cleaning Campaign and a pamphlet advising householders in relation to general cleanliness and its effect on health were printed. These were available in the four languages and were widely distributed to community centres, Health Services and all schools in the State through the Ministry of Education in conjunction with the School Health Education Programme, pamphlets for the teachers' use and for school children were produced in large quantities and

again distributed to all schools within the State through the Ministry of Education. In conjunction with the cholera outbreak, two posters were produced: (i) "Wash Your Hands", (ii) "Kill that fly, it could cause cholera". A pamphlet on malaria was produced in conjunction with the malaria outbreak in Fuyong Estate during the year. At the request of the Municipal Health Officer, Kuala Lumpur 40,000 pamphlets and posters in the four languages in Cholera were sent to him.

General.—During the year Nurses-in-Training from the School of Nursing and trainees in Family Planning from the I.P.P.F., teachers attending the Credit Course in Health Education, Midwives and Public Health Inspectors visited the Health Education Unit and familiarised themselves with the work that is carried on there.

The activities of the year have shown that it is possible to effectively to educate the public. So far programmes in schools and other special categories have been carried out on a limited basis because of a lack of staff. That staff with an aptitude for Health Education be recruited cannot be too strongly stressed, lectures are also badly needed for the Health Education programmes particularly in schools.

A W.H.O. adviser on Health Education was promised in 1964. This advisor will evaluate existing Health Education programmes and plan extended programmes in furtherance of these services with special attention to Maternal and Child Health, School Health Programmes, the inclusions of Health Education in School curricula and Health Education of the Public in general.

SPECIAL ASSIGNMENTS

(a) *Public Health Library.*—During the year, books were ordered and a considerable number of journals were systematically bound and put into the Public Health Library now situated within the Training Unit at the Institute of Health. It is intended that this Library be built up into a comprehensive reference library to be made use of by all categories of personnel in training and to provide information on all matters relating to Public Health.

(b) *The World Health Day Celebrations.*—The Branch participated in the World Health Day celebrations. The theme was "No Truce for Tuberculosis".

(c) *P.A.P. Tenth Anniversary Exhibition.*—The Branch was responsible for putting up exhibits to fill one booth reserved for the Ministry of Health in an exhibition held at the Victoria Memorial Hall from the 20th to 22nd November, 1964. The exhibition booth showed generally, the functions of the various Departments of the Ministry of Health.

(d) *Special Nutrition Survey in Jalan Eunos Settlement.*—This nutrition survey commenced in 1963 and went into its third phase during the year with the systematic lecture/demonstrations on nutrition which were given to Malay mothers originally included in the survey area. Nurses undergoing training in the Public Health Nurses' Course were instructed on what lectures

to give and were responsible for this part of the programme. A series of 16 talks were given. A preliminary report on the first two phases of this nutrition project has been prepared and is available.

During the year the following persons visited the Branch:

1. Mr. Yong Nyuk Lin, Minister for Health in January 1964.
2. Miss L. Turnbull, Regional Nursing Adviser in January 1964.
3. Miss Mum, W.H.O. Health Educator, *en route* to Korea in January 1964.
4. Dr. Chen Yu Chi from Taiwan in January 1964.
5. Dr. Artiero Reyes in March 1964.
6. Mr. Holliday, Chief of Health Education Services in Queensland in July 1964.
7. Miss L. N. Knapp and Miss W. A. B. Holland, Principal Matrons of Sabah and Sarawak respectively in July 1964.
8. Dr. Ian C. Lewis from the Department of Child Health, University of Western Australia in August 1964.
9. Mr. Bovay from W.H.O. Regional Office, Manila, in November 1964.
10. Dr. J. Y. Lu of Taiwan, W.H.O. Fellow in December 1964.

12. HAWKERS AND MARKETS DEPARTMENT

GENERAL

THE Hawkers and Markets Department deals with licensing of hawkers, supervision of public markets, licensing and control of private markets, including private lands used for the accommodation of static hawkers. The Department is under the charge of a Superintendent.

Administrative and Licensing Section Staff.—The staff consists of:

- | | |
|--|--|
| (i) Superintendent | (viii) Four Cashiers (equated to General Clerical Officers) |
| (ii) Two Assistant Superintendents | (ix) Six Licensing Assistants (equated to General Clerical Assistants) |
| (iii) Two Higher Clerical Officers (one post vacant) | (x) Three Office Boys |
| (iv) Executive Officer (Licensing) | (xi) One Messenger |
| (v) Eight General Clerical Officers | (xii) One Office Watchman |
| (vi) Three General Clerical Assistants | |
| (vii) Four Typists | |

Number of Licences and Hawkers.—There is an estimated total of over 40,000 licensed and unlicensed hawkers in Singapore. Of this number, 5,372 are licensed, giving an approximate ratio of one to eight licensed to unlicensed hawkers. The table below gives the number of licensed hawkers for the years 1960 to 1964 in the City and Rural areas:

| | | NUMBER OF LICENSED HAWKERS | | | | |
|----------------------|------------------|----------------------------|--------------|--------------|--------------|--------------|
| | | 1960 | 1961 | 1962 | 1963 | 1964 |
| Itinerant | | | | | | |
| | City Area ... | 617 | 345 | 441 | 530 | 516 |
| | Rural Areas ... | — | — | — | 78 | 75 |
| Day Street Pitches | | | | | | |
| | City Area ... | 3,065 | 2,586 | 2,515 | 3,095 | 3,383* |
| | Rural Areas ... | — | 271 | 331 | 306 | 369 |
| Night Street Pitches | | | | | | |
| | City Area ... | 1,198 | 969 | 925 | 971 | 1,029† |
| | Total ... | 4,880 | 4,171 | 4,212 | 4,980 | 5,372 |

* Excludes 114 licences cancelled during the year.

† Excludes 96 licences cancelled during the year.

For the purpose of this report, the Hawkers and Markets Department may be divided into (a) the Hawkers Section; (b) the Markets Section.

THE HAWKERS SECTION

The staff of the Hawkers Section consists of —

- (i) two Divisional Hawkers and Markets Inspectors
- (ii) four Senior Hawkers and Markets Inspectors
- (iii) 48 Hawkers and Markets Inspectors (34 posts vacant).
- (iv) 24 Assistant Hawkers and Markets Inspectors
- (v) four Temporary Assistant Hawkers and Markets Inspectors (3-monthly contract)
- (vi) four Assistant Hawkers Inspectors (Rural) (1 post filled by Daily Rated personnel and 3 posts vacant)

Enforcement.—During the year, action was taken to clear hawkers from the following streets and hawking sites, either due to their causing serious obstruction or because the sites were required for carrying out road widening schemes. Wherever possible, alternative sites were provided for these hawkers: (i) Jalan Merpati Car Park at MacPherson (South) Housing Estate, (ii) Jalan Cheng Wah, (iii) New Pasar Malam site along Farrer Road, (iv) New Pasar Malam site at East Coast Road near Karikal Lane, (v) New Pasar Malam site at Meyer Road.

New Specified Sites for Hawkers.—Hawkers selling at the following new sites and markets were issued licences during the year: (i) Cashin Street, (ii) Pahang Street, (iii) Geylang Road Backlane, (iv) MacPherson (South) Market Open Pitches, (v) Geylang Serai Market, (vi) Bukit Panjang Market Extension, (vii) Tanjong Katong Road Sidelane and (viii) Tanglin Halt (Queenstown IV) Market.

New Pasar Malam Areas.—No new pasar malam areas were reported or permitted to operate during the year.

Complaints.—During the year, a total of 534 complaints were received about nuisances, obstruction, construction of unauthorised structures, indiscriminate depositing of refuse, etc. by the hawkers and were promptly dealt with by the Department.

Prosecution.—During the year, court action was taken in 6,537 cases, and a total of \$33,363 was collected on fines.

NUMBER OF LICENCES ISSUED FOR STREET PITCHES
AND ITINERANT HAWKERS IN RURAL AREAS

| | Street Pitches | Itinerant Hawkers |
|----------------------------|-------------------|----------------------|
| (i) Bukit Panjang District | 78 | 18 |
| (ii) Katong District | 136 | 6 |
| (iii) Serangoon District | 155 | 51 |
| Total | 369 | 75 |

MARKETS SECTION

The Staff consists of:

- (i) one Divisional Hawkers and Markets Inspector (vacant);
- (ii) one Market Inspector (Rural);
- (iii) 37 Market Overseers;
- (iv) six Market Overseers (Rural) (five posts filled by Daily Rated personnel, one post vacant);
- (v) 65 monthly rated watchmen;
- (vi) 224 Labourers (four posts vacant);
- (vii) eight daily rated watchmen (Rural);
- (viii) one Mandore (Rural);
- (ix) 23 labourers (Rural).

Control of Markets.—There are 33 markets in the City Area and eight markets in the Rural Areas. They include the new market at MacPherson (South), officially opened by Assemblyman Mr. S. V. Lingam on 9th February, 1964, the new market at Geylang Serai, officially opened by the Prime Minister on 17th April, 1964, and the new market at Queenstown Neighbourhood IV (Tanglin Halt), officially opened by the Assemblyman for Ulu Pandan, Mr. Chan Cheok Hock on 28th November, 1964.

The extension to Bukit Panjang Market was officially opened by Mr. Lee Khoo Choy, Political Secretary to the Prime Minister, on 31st May, 1964.

The lock-up stalls at Upper Serangoon Market were demolished by the Public Works Department in order to provide more accommodation for re-siting the unlicensed hawkers selling in the vicinity.

During the year, 5,311 licences were issued for market stalls in the City Areas, of which 118 licences were cancelled during the year, leaving a total of 5,193 licences in force at the end of the year.

A further 1,139 licences were issued in the Rural Areas.

Collection of Revenue.—Total revenue collected by the Department amounted to \$1,740,624.83, of which \$1,563,468.33 came from fees collected in the City Area and the remaining \$177,156.50 from the Rural Areas.

The fees consisted of:

- (i) Street pitches licence fees;
- (ii) Market stalls licence fees;
- (iii) Shelter stalls licence fees;

- (iv) Private markets licence fees;
- (v) Commission on fish auction sales;
- (vi) Itinerant hawkers licence fees.

OFFICE ACCOMMODATION AT NO. 21, CANNING RISE

During the year an unprecedented event took place, namely, a fire broke out at the office of the Branch at No. 21, Canning Rise, on Sunday, 11th October, 1964 at about 10 a.m. So far, the actual cause of the fire has not been determined by the Police.

The fire destroyed parts of the building on the first floor and the ground floor store. Most of the office filing equipment, including some contents; office appliances; part of the office furniture and various records were also burnt.

Since the fire had made the building untenable, on 16th October, 1964 the Department started to shift to a temporary emergency accommodation at the first floor of the Registrar of Vehicles Building, Middle Road and the removal was completed the next day.

Towards the end of the year, extensive efforts were made to look for alternative accommodation. After much time and trouble had been taken, suitable accommodation was found in the Malay Crafts School, Scotts Road, which had been scheduled for demolition.

Estimates were obtained from the Public Works Department for the renovation of the building and approval for use of the building for at least 2 years was given by the Ministry of Education recently.

It is hoped that the Branch would be able to move to its new office in early 1965.

Re-Organisation of the Department.—Mr. Lim Chooi Sian, Director of the Central Complaints Bureau, was seconded for service with the Ministry of Health to take full charge of the re-organisation of the Hawkers and Markets Department on 16th November, 1964 for a year.

Formation of Public Health Advisory Board.—With the dissolution of the *Ad Hoc* Committee on Hawkers towards the end of 1963, the work of this department came within the purview of the Public Health Advisory Board which held its first meeting on 1st June, 1964.

Its terms of reference are as follows:

- (a) To formulate and advise the Minister for Health on simple yet practical and effective measures for the preservation and maintenance of the highest possible public health standards in all its aspects for Singapore,

(b) To give immediate attention to 3 pressing public health problems, namely:

- (i) Collection and disposal of refuse.
- (ii) Hawkers and Markets.
- (iii) Straying cattle on public streets and trespassing of property.

Conclusion.—The three administrative posts of the department and all the six senior executive posts of the department have not been substantively filled up as yet, but the morale of the Inspectorate is still good and work was performed throughout the year in a satisfactory manner.

13. OTHER SERVICES UNDER PUBLIC HEALTH DIVISION

HEADQUARTERS

THE following Sections are directly under the Public Health Division Headquarters administration:

- (1) Public Health Engineering Unit
- (2) Cemeteries and Crematoria Unit
- (3) Labour and Welfare Unit
- (4) Transport Centre.

PUBLIC HEALTH ENGINEERING UNIT

The Public Health Engineering Unit had a very active year's work in 1964, especially in environmental sanitation activities, and in assisting the processing of development projects.

(a) *Staffing.*—This Unit is under the charge of a Public Health Engineer assisted by three Supervisors of Public Health Works, three senior grade Technical Subordinates, and ten Technical Subordinates, with a labour force of 112 men. While this Unit is attached to Public Health Division Headquarters, it functions in close liaison with the Senior Health Officer (Environmental Health) and the Health Officer in the rural districts. An organizational chart is at page 55.

(b) *Kampong Sanitation.*—The improvement of environmental conditions in various kampongs by construction of proper drains including the major repairs and construction of anti-malarial drains, rural latrines, stand-pipe aprons, wells, and bin centres is a responsibility of the Unit. A total of 40 kampongs had such environmental sanitation improvements carried out costing about \$105,570 in Labour and materials.

(c) *Wells, Water Tanks and Pumping Installations in Rural Areas.*—The Unit maintains and operates a total of 7 small water supply schemes for small kampongs in the rural areas including one such installation in Pulau Tekong Besar. These small water supply schemes are provided with intake-wells, supplied by sub-soil water and fitted with pumping units to pump water to elevated water storage tanks. Water from these tanks are then distributed to the Kampong, through supply pipes and communal stand-pipes.

(d) *Minor Works.*—The Unit continues to handle the minor works of the Division. With the strengthening of the Unit by a super scale Technical Subordinate and the recruitment of a plumber and an additional carpenter it was able to cope with and fulfill about 75 per cent of the requisitions for minor works from the various branches. Altogether over two hundred requisitions were handled by departmental labour and thirty-six indents were

issued to the Public Works Department and private firms for minor works and repairs.

(e) *Other Assignments.*—(i) *Spring Cleaning Campaign.*—The Unit assisted in fabricating and supplying at short notice, eight wooden ramps for easier discharge of refuse from hand carts.

(ii) *Development Projects.*—The Unit assisted in the planning and processing of all new development projects of the Public Health Division including the preparation and submission of monthly physical and financial progress reports. During the year one M. & C.H. Clinic and four new markets were completed and the Unit actively participated and made detailed arrangements for the opening ceremonies.

(iii) *Public Cleansing.*—The Unit made a detailed study of composting techniques and prepared a preliminary scheme for the composting of Singapore's garbage. It had also assisted in the preparation and revision of the Public Cleansing and Conservancy By-Laws for enactment under the Local Government Integration Ordinance.

(f) *Malaria Control in Jurong.*—The preliminary phase for the control of malaria in the Jurong Industrial area had been assigned to this Unit. The rapidly changing topographical features especially from the 16th milestone Boon Lay Road to Tanjong Kling, due to the intensive civil engineering works including extensive levelling of hills and filling of swamps, required constant surveillance and adequate coverage of the area by heavy oiling.

The dammed up upper reaches of the Sungei Jurong was still brackish and oiling from a boat to prevent the breeding of *A. sudaicus* had to be continued. There were thirty-four Anopheles larval survey conducted by the A.M. Surveillance Squad but no dangerous Anopheles Larvae were found in this Jurong Industrial area. About 26,880 gallons A.M. oil were used and the cost of oil and labour for 1964 amounted to \$59,000.

CEMETERIES AND CREMATORIA UNIT

Government has made available to the public of Singapore approximately 2,061 acres of land for the use of burial/burning grounds and crematoria in addition to the control within the City of 2,220 acres of land as licensed/registered burial and burning grounds.

There are approximately 471 licensed/registered burial and burning grounds in the State. None of these burial grounds are known to have been closed to further burials. Steps are being taken to ascertain the number of these licensed grounds which are insanitary or no longer required with a view to recommending their closure and also the life span of all licensed or registered burial grounds. There are 19 private burial grounds within the city area still in use.

The latest Government burial ground with an area of 1,700 acres of which only 1/16 is developed is at Chua Chu Kang catering for all denomina-

tions; the Chinese, Hindu, Buddhist and Bahai sections are already in use and within the current rate of burials the Christian section is expected to be brought into use in the latter part of 1965 and the Muslim section sometime in 1988.

Details of Government burial grounds/burning grounds and crematoria are as indicated hereunder:

(a) *Chua Chu Kang Cemetery*, Chua Chu Kang Road 15½ m.s. This cemetery caters for all denominations and has been divided into (i) Chinese Section, (ii) Hindu Section, (iii) Buddhist Section, (iv) Bahai Section, (v) Christian Section, (vi) Muslim Section.

(i) Chinese Section: Number of plots available — paying section 897; free section 3,043. Further development is in progress. Of balance of 3¼ acres of land set aside by Government for the reinterment of exhumed remains of deceased persons buried in licensed/registered burial grounds acquired by Government for development, road alignment, etc., another 2 acres are in the process of being developed and marked out. In addition site clearing is in progress in Block 3 to provide for 4,000 graves and part of Block 4 for exhumed remains of war victims.

(ii) Hindu Cemetery: Number of plots available — paying section 1,272, free section 553.

(iii) Buddhist Cemetery: Number of plots available — bodies 1,112; ashes 1,001.

(iv) Bahai Cemetery: Number of plots available — paying section 178.

(v) Christian Section: Development of this section has been held up by the difficulty in finding resettlement areas for the squatters by the Housing Board. However, the Housing Board expected to clear the squatters by January 1965 and an area providing for 5,000 grave plots for the Protestant section, 7,000 for the Roman Catholics should be ready before the end of the year.

(vi) Muslim Section: It is not envisaged to develop this section at the moment as the Bidadari Muslim cemetery has a life span of approximately another 25 years.

(b) *Bidadari Christian Cemetery*, Upper Serangoon Road, 4 m.s. Area — approximately 54 acres (for all Christian denominations). Number of Plots available — paying section Prot. 158; F.R.C. 938; P.R.C. 260; free section nil, number of reserved plots available 792.

It is anticipated that the cemetery would be closed to current burials within the latter part of 1965 after which all burials would take place at Chua Chu Kang (Christian Section) which is at present under development. The free section has been completely buried in and current burials are in between the plots.

(c) *Bidadari Muslim Cemetery*, Upper Serangoon Road, 4 m.s. Area — approximately 60 acres. Number of plots available 38,620, number of reserved plots 130.

The cemetery was completely buried in 1955 and current burials are taking place between grave plots and is expected to last till 1988 after which burials would take place in Chua Chu Kang Cemetery (Muslim Section) which is at the moment occupied by squatters and undeveloped.

(d) (i) *Hindu Cemetery*, Upper Aljunied Road. Area — approximately 24 acres. The cemetery is completely buried in but is currently used for cremation of Hindu and Sikhs.

(ii) *Singhalese Buddhist Cemetery*. Area — approximately 3 acres. Number of plots available — paying section 1,163, free section 128. There is a crematorium for Singhalese Buddhists and an area of $3\frac{1}{2}$ acres for expansion of the burial ground.

(e) *Infectious Disease Burial Ground*, Upper Serangoon Road, 5 m.s. Area — approximately 6 acres. Number of plots available 3,459. This burial ground is used for burials of dangerous infectious disease cases of all races.

(f) *Bukit Timah Road Christian Cemetery*, Bukit Timah Road, 2 m.s. Area — approximately 22 acres. This cemetery has been closed to current burials since 1909 but there are available 118 reserved plots or family burial grounds held under 999 years lease.

(g) *Bukit Brown Chinese Cemetery*, Kheam Hock Road. Area — approximately 175 acres. This burial ground has been closed to current burials since 1945, but there are available about 1,578 reserved plots or family burial grounds held under 99 years lease.

(h) *Temporary Chinese Cemetery war Emergency Burial Ground*, Coronation Road. Area — approximately 8 acres. This cemetery has been closed to current burials since May 1947.

(i) *Mount Vernon Crematoria*, Upper Aljunied Road. Since the Crematoria came into operation in June 1962, the number of cremations has steadily increased. Sikh corpses which were previously cremated by firewood at the Hindu burning ground are now cremated at the Mount Vernon Crematoria. Cremations among the Christian and non-Christian Chinese Community are also becoming popular.

LABOUR AND WELFARE UNIT

During 1964 the Labour and Welfare Unit of the Public Health Division in the Ministry of Health continued to carry out the same function of duties as in the previous two years.

The head of this Unit was designated as Senior Executive Officer (Labour and Welfare). He also acted as Chairman of the First Departmental Works Committee, working in liaison with the Ministries of Education, Culture, Social Affairs and Labour.

The strength of the staff of the Labour and Welfare Unit remained the same as the previous year although the volume of work involved had not been reduced. A proposal for the increase in the establishment had again been submitted. In fact, during the year there had been increase in disciplinary cases in respect of daily-rated employees, and this had caused increase in the work of this unit.

As a result of the issue of Treasury Circular No. 25/64 dated 24th October, 1964, the Labour and Welfare Unit was reorganised into two separate sections, known as the Personnel (Labour) Unit and the Welfare Unit. Henceforth, Personnel Officers will be responsible in all labour matters (except matters pertaining to welfare) connected with daily-rated employees, and their duties shall normally include:

- (a) application of the Labour Legislation and other regulations governing daily-rated employees in their departments;
- (b) assisting in the efficient recruitment, transfer, trade test and promotion of daily-rated employees;
- (c) assisting in the investigation of grievances and disciplinary matters concerning daily-rated employees;
- (d) advise on personnel and industrial relations matters.

The Welfare Officer of this Unit will be responsible for all welfare matters pertaining to daily-rated employees and his duties shall normally include:

- (a) payment of retirement benefits;
- (b) passage and other repatriation arrangements;
- (c) funeral arrangements and expenses;
- (d) unclaimed wages;
- (e) problems of absenteeism;
- (f) overstay on leave;
- (g) indebtedness;
- (h) hospitalisation;
- (i) matters relating to daily-rated porters;
- (j) other general personal and welfare problems of daily-rated employees.

The Interim Report of the Commission of Enquiry on Government Daily-Rated Employees was published during the year, and action was taken to implement the various recommendations submitted in the report on instructions from Treasury (Establishment).

TRANSPORT CENTRE

(a) *Introduction.*—The Transport Section continued its primary function of providing a central organisation for the control of the fleet of vehicles owned by the Public Health Division during the period under review, entailing the —

- (i) maintenance of a central depot at MacKenzie Road;
- (ii) maintenance of sub-depots in the three Rural Districts;
- (iii) control of the staff, drivers and other employees attached to it;
- (iv) control of the expenditure provided for the maintenance of transport, wages and other expenditure in connection with the running of the Section.

(b) *Staff.*—*Monthly-rated Staff.*—The monthly-rated staff in its employ during the year at the central depot were as follows: 1 Engineer-in-charge (vacant), 1 Supervisor of Transport, 6 General Clerical Officers, 3 Clerical Assistants, 1 Office Boy, 11 General Purpose, Drivers, 3 Watchmen.

Daily-rated Staff.—Three lorry drivers retired on 31st December, 1964. The total number of daily-rated staff excluding those in the three Rural Districts as at 31st December, 1964, was 142.

(c) *Depots.*—There is a central depot at MacKenzie Road and three sub-depots in the Rural Districts, namely: (i) Central Depot, (ii) Sub-depot at Katong District, (iii) Sub-depot at Serangoon District, (iv) Sub-depot at Bukit Panjang/Jurong District.

(d) *Vehicles.*—During the spring cleaning campaign, contract lorries were used to clear the backlog of refuse accumulated at bin centres. The total number of vehicles under the control of the Section was 222 vehicles (excluding one Land Rover SF. 4148 on loan and 5 trailers). During the year, 27 new vehicles were purchased and 17 old vehicles were condemned. Ten old vehicles are maintained temporarily on the road to cope with the increasing demand.

(e) *General.*—The Section continued to supply petrol, oil and lubricants to vehicles of Kandang Kerbau Hospital, and the Abattoirs of the Primary Production Department.

14. MALARIA OUTBREAK AT FUYONG ESTATE

GENERAL

IN August and September 1964, after an absence of 7 years, indigenous malaria reappeared in Singapore in the form of a small outbreak. The site of the outbreak was at Fuyong Estate in the Bukit Panjang District, off 9 milestone, Bukit Timah Road.

Topography and breeding places.—This is an area where typical seepages and spring water abound. The foothills and surfaces of slopes are scarred by granite quarries of which there are 5 in this area. In the early part of 1964 due to the activities of private housing developers hill slopes in the vicinity of Princess Elizabeth Estate were cut, thereby exposing seepages to sunlight and coupled with quarry activities in this area, ideal conditions were created for the breeding grounds of one of the main vectors of malaria in Singapore — viz., *A. maculatus*.

For the purpose of anti-malaria operations in the control of this outbreak, an arbitrary area was determined by using the house of the first reported case as the centre, and drawing a rough circle with half a mile radius thereby enclosing approximately 0.8 of a square mile.

Within this area there were roughly 690 houses with about 4,000 residents who were made up of all the 4 ethnic groups.

The Outbreak.—The first reported case of malaria in this area was that of a Malay boy of 18 years who was a part-time labourer at Hume Industries. His family migrated from Johore in 1956 and he has remained in Singapore since. There was no history of his having suffered from malaria previously and the last time that he went to the States of Malaya was in April 1964. He left for Pontian one morning and returned to Singapore on the evening on the same day.

This boy was first seen at Thomson Road Hospital on 30th July, 1964 and was diagnosed as a malaria case, which was supported by a "positive" blood film.

The Public Health Inspector investigating the case found that there were 17 other people who had bouts of fever, chills and rigors living in the same kampong during the month prior to this first reported case.

Following this first case, 3 weeks later, a lady medical practitioner in the same area sent a Chinese girl, aged 6 years, who was suspected of having malaria, to the Health Officer at Bukit Panjang/Jurong District Office. A blood film was done and the slide was found to be teeming with *Plasmodium Vivax*.

A house-to-house search was carried out for 'fever cases' immediately and blood films were also taken. By these methods 9 cases were found to be

'positive' for malaria. Two of the more serious cases were despatched to hospital as malaria cases.

Subsequently, a medical student following up on a 'social case' of malaria in an infant of 3 months old from a Malay kampong in this vicinity, took blood films of all the 4 members of the same family and found them positive for malaria. Two neighbours were also found to have positive blood films. With these cases, an outbreak of malaria in this area was established.

The following table shows the distribution of malaria cases by ethnic group in the operation area:

| Ethnic Group | Total No. of Cases |
|----------------|--------------------|
| Chinese | 16 |
| Malay | 13* |
| Indian | 4 |
| Others | 0 |
| Total | 33 |

*4 of these were imported cases.

There were 29 indigenous malaria cases in connection with this outbreak although a total of 33 cases were found on investigation in this area. Four of these cases have definite histories of having visited Johore about 2 weeks before they were discovered and they were found just outside the 'operation area' in Bukit Gombak. These may be treated as imported cases and they have been included in the total because of the proximity to the area of the present outbreak.

Incrimination of the Vector.—As the 'operation area' was situated in ideal conditions for the breeding of *A. maculatus*, this was the first suspected vector from the beginning of the outbreak. Vector surveys which include Larvae searching and adult trapping were carried out:

(a) *Larvae surveys* were carried out on 14th August and 15th August, 1964 in the area. Results were:

- (i) *A. maculatus* — in seepages pool from broken subsoil line within the Dairy Farm area (4th instar);
- (ii) *A. Vagus* — in seepage pool;
- (iii) *A. kochi* — in an earth well;
- (iv) *A. aitkeni* — in shaded seepage pool;
- (v) *A. leucosphyrus* — in shaded seepage pool.

(b) *Adult surveys* by the human bait method were done for 3 nights on 24th, 25th and 26th of August, 1964. Only 2 adult *A. maculatus* were caught.

They were not engorged with blood and no Plasmodial parasites were found. No other vectors were caught.

Further larval collections of *A. maculatus* were found in a ravine in the Nature Reserve by the side of the Housing and Development Board Quarry; in the seepages at the fact of Singapore Granite Quarry Ltd., and at the

jungle ravine near the Kramat Habib Ismail off $8\frac{1}{2}$ m.s. Bukit Timah Road. It was therefore confirmed that *A. maculatus* was responsible for the outbreak.

Measures taken to deal with the outbreak

The measures taken may be divided into Epidemiological and Remedial — i.e. to interrupt the transmission of malaria.

Epidemiological measures consisting of: (i) passive detection; (ii) active detection; (iii) focal blood survey; while Remedial measures consisting of: (i) mass drug administration (anti-parasite); (ii) residual spraying (anti-adult); (iii) oiling and ditching (anti-larvae).

Epidemiological Measures

(i) *Passive Detection*.—All persons with fever or chills and other suspicious symptoms were asked to report to the Bukit Panjang District Office. The co-operation of private practitioners and Government Outdoor Clinics in the vicinity was obtained to report suspected cases to the District Office for blood examinations. Thus, 2 cases were confirmed through blood examinations.

(ii) *Active Detection*.—A blood survey team of one doctor and five health inspectors carried out house-to-house enquiries for fever cases. Thick and thin blood films were examined for malaria parasites. The following table shows the result of the blood surveys:

| Date | No. of slide taken | No. found positive | Percentage positive |
|-------------------------|--------------------|--------------------|---------------------|
| 28th August, 1964 ... | 21 | 3 | 14.29 |
| 29th August, 1964 ... | 23 | 6 | 26.09 |
| 1st September, 1964 ... | 4 | 0 | 0 |
| 2nd September, 1964 ... | 12 | 1 | 8.3 |
| 3rd September, 1964 ... | 5 | 0 | 0 |
| 9th September, 1964 ... | 1 | 0 | 0 |
| Total ... | 66 | 10 | 15.1 |

(iii) *Focal Blood Survey*.—This was a blood survey of about 50 persons staying in and around the vicinity of confirmed malarial cases, notwithstanding whether they have symptoms or not. Only 9 cases out of a total of 550 persons surveyed were picked out.

Thus, a total of 21 cases was discovered from an estimated population of 4,000 residents, making a parasite rate of 0.52 per cent.

Measures employed to interrupt transmission and eradicate focus of infection (remedial)

(i) *Mass drug administration (anti-parasite)*.—The drug used was "Camoprime", which is a combination of a 4-Amino quinoline and a 8-Amino quinoline thus making it effective against both the blood and liver phases of the malaria parasite. Handbills explaining the outbreak and the drug

to be administered were distributed to the residents within the operation area. A team consisting of two doctors and 22 public health inspectors was mobilised for this special operation.

The drug administration programme consisted of three doses to be given at weekly intervals. Symptoms of side effects were recorded, and of more than 4,000 persons, only 45 had side effects. This worked out to about 1 per cent of the population.

(ii) In combination with the above measure, residual spraying of houses and swing-fogging were also done against the adult vector. Both "Gammexane" and "D.D.T." were used in this operation. A total of 690 houses were thus covered over a period of six weeks. For swing-fogging, "Dieldrex 15" was used on bushes, out houses and ravines within the 'operation area'.

(iii) *The attack on larvæ of vector.*—Owing to the terrain and the comparatively big area involved, 30 men were employed and it took over three months to complete proper ditching and clearing of the mud drains in this area. Maintenance work on permanent concrete drains was also carried out. After a ravine was cleared, 'heavy oiling' with anti-malaria oil were done and regular oiling, routine was maintained.

Results of measures.—At the end of two months (from the detection of the first case of malaria at Fuyong Estate) the outbreak of malaria was successfully controlled and the transmission and focus of infection eradicated.

Comments.—One of the main causes of this outbreak was found to be a breakdown in the routine working of maintenance oiling by the Daily Rated Labour Force in this area. Oiling of ditches and seepages which are the favourable breeding places of *A. maculatus* cannot be effectively done if vegetation and drains are not prepared or cleared properly. Owing to some dissatisfaction among the oilers, there was no proper ditching in this area for some time thereby resulting in ineffective oiling of these breeding places. Malaria parasite reservoirs are ever present just across the Johore Causeway, and with the increase in the breeding of *A. maculatus* it is not surprising that small outbreaks of this nature can and will occur, if control measures are slackened in any appreciable degree. Although outbreaks of this nature are easily controlled, the need for constant vigilance and the fact that there is no room for complacency in the battle against malaria are important lessons to remember here.

15. INTRODUCTION

The Hospitals and Outpatient Services form the main organizations of the Hospitals Division of the Ministry of Health.

The report is given in two parts. In the first part the events of the year which were of significance to the Hospitals Division are described. This is followed by a general summary of the Hospitals and Outpatient Services, the personnel engaged in them and the work of those services. The second part will consist of the report on the work of the various services.

SECTION III

HOSPITALS DIVISION

EVENTS OF THE YEAR

There is a tendency to magnify the difficulties when looking back through the year as the events are so close and working as close as the positions. There were the continued heavy demands on the services which had to be coped with the financial facilities and a chronic shortage of staff. The staff were also restless, wishing for better conditions of service. Looming in the background was the possibility of the Indonesian rebellion. Whether or not its continuation would eventually have an effect on the services rendered to be seen, but the riots which occurred in July and September probably reflected its sinister influence.

These difficulties and events should not overshadow the achievements made in the year. Construction on several projects was completed and development planning continued. The re-organization of the Outpatient Service which was implemented in the middle of the year and the introduction of charges for outpatients and for delivery of babies at the maternity hospitals marked a major change in the pattern of the services. That the services were maintained, and that some growth was made-up and that major changes in organization were introduced and plans continued to be made for further development was a creditable balance for the year.

DEVELOPMENT

Development was on a modest scale -- in comparison with other social development in schools and public housing. Development has chiefly been in the form of extensions and improvements to existing buildings.

The biggest service completed in the year was the new block at Thomson Road Hospital. This block housed the general surgical, medical, and the hospital as X-ray Department and a Casualty and Outpatient Clinic. When fully completed in 1943 the Hospital will finally be a complete general Hospital serving the northern sector of the island. For the remainder of the

15. INTRODUCTION

THE Hospitals and Outpatient Services form the main components of the Hospitals Division of the Ministry of Health.

The report is given in two parts. In the first part the events of the year which were of significance to the Hospitals Division are described. This is followed by a general summary of the Hospitals and Outpatients Services, the personnel engaged in them and the costs of these services. The second part will consist of the reports of each of the individual institutions.

PART I

EVENTS OF THE YEAR

There is a tendency to magnify the difficulties when looking back through the year as the events are so close and working so close to the problems. There were the continued heavy demands on the service which had to be coped with the limited facilities and a chronic shortage of staff. The staff were also restive, claiming for better conditions of service. Looming in the background was the hostility of the Indonesian neighbour. Whether or not its confrontation would eventually have an effect on the services remained to be seen; but the riots which occurred in July and September probably reflected its sinister influence.

These difficulties and events should not over-shadow the achievements made in the year. Construction on several projects were completed and development planning continued. The re-organisation of the Outpatient Service which was implemented in the middle of the year and the introduction of charges for outpatients and for delivery of babies at the maternity hospital marked a major change in the pattern of the services. That the services were maintained, and that some growth was marked-up and that major changes in organisation were introduced and plans continued to be made for further development was a creditable balance on the whole.

DEVELOPMENT

Development was on a modest scale — in comparison with other social development in schools and public housing. Development has chiefly been in the form of extensions and improvements to existing buildings.

The biggest project completed in the year was the surgical block at Thomson Road Hospital. This block housed the surgical operation theatre suites for the General Surgical and the Obstetrics and Gynaecology Unit for the hospital; an X-ray Department and a Casualty and Outpatient Clinic. When fully completed in 1965 the Hospital will finally be a complete General Hospital serving the northern sector of the island. For the present this is

thinly populated but when the new housing development at Toa Payoh is completed the hospital will probably not be adequate.

Also at Thomson Road Hospital, an Assistant Nurse Training School is being built. The building is expected to be completed at the end of 1965 at a cost of \$249,029 and furniture and equipment \$7,520.

At Tan Tock Seng Hospital the Thoracic Surgical Block was nearing completion. It will be completed in the middle of 1965.

The alterations and renovations to wards in the General Hospital for the Third Medical Unit were also nearing completion and the Unit is expected to function in the first quarter of 1965.

Surgical operation theatres were completed for the Eye Unit, General Hospital and at Trafalgar Home. The theatre for the Eye Unit was, in addition to its existing theatre, and therefore, doubled the surgical facilities in the Eye Unit.

The surgical theatre at Trafalgar Home was built in response to the need for theatre facilities in the Leprosy Hospital. Previously, patients had to be operated on at the General Hospital.

An outpatient dispensary was opened at Maxwell Road on 3rd July, 1964. This dispensary was built in a building which was formerly the St. Andrew's Mission Hospital. This building was taken over by Government after the war and its conversion to a dispensary cost \$87,629 and furniture and equipment \$24,000.

This was the only dispensary opened in the year and in contrast to the previous years represents a tailing off in dispensary building until more staff became available.

RE-ORGANISATION OF THE OUTPATIENT SERVICES

On 1st August, the Outpatient Service was re-organised. The main changes were the closure of the outpatient departments in the General Hospital and the Kandang Kerbau Hospital.

The Outpatient Department in the General Hospital had grown to the largest of all the outpatient dispensaries. It had, at any one time, at least 21 doctors to man the Department and attracted almost as many patients attending in it as all the other 32 outpatient dispensaries combined. There was a historical reason in its growth to such dimensions. The Outpatient Service had originally been part of the admission room of the General Hospital and when it outgrew its premises several satellite outpatient dispensaries were established and spread throughout the island. In spite of these many other outpatient dispensaries its volume of patients continued to increase. It had reached a stage where the number of patients could not be dealt with and it was already not performing its more important function of dealing with emergencies requiring immediate attention on admission to the hospital.

The outpatient dispensary at Kandang Kerbau Hospital was closed for the same reason.

In the place of the outpatient department at the General Hospital an Emergency/Admission Unit was established as a part of the Department of Orthopædic Surgery (no longer under the Outpatient Service). At the Kandang Kerbau Hospital the outpatient department was converted as an extension of the referral or consultation clinics run by the hospital.

The closure of the two outpatient dispensaries was made good by the opening of the Maxwell Road Outpatient Dispensary so that there are now 31 Outpatient Dispensaries instead of 32, prior to the re-organisation.

With the re-organisation patients were required to attend at the outpatient dispensaries nearest their homes. Patients could attend at the Emergency/Admission Unit only in emergencies or had been referred by practitioners or by the doctors in the outpatient dispensaries.

The other change was the introduction of charges for attendance at all the outpatient dispensaries. Previously, charges were levied only in the former City Council Dispensaries (7 in number) and in the two newly-opened outpatient dispensaries. With the re-organisation, charges were extended to all the dispensaries. Exemptions, however, are given to persons under Social Welfare Aid and those suffering from the Infectious Diseases such as tuberculosis where continued treatment is essential.

In effect, the re-organisation was a decentralization of the services to bring about a more even spread of patients to each of the Outpatient Dispensaries, and to establish Emergency and Consultation Clinics at the General and Kandang Kerbau Maternity Hospital.

CHARGES FOR DELIVERIES AT KANDANG KERBAU HOSPITAL

Charges were introduced on 1st December for deliveries of babies which previously had been done free of charge. The charges were at the rate of \$10 for mothers who were Singapore citizens and \$50 for mothers who were non-Singapore citizens. The charges were to replace the toilet articles which mothers previously brought with them on admission. The introduction of charges for outpatients and for deliveries marks a major change in the pattern of Medical Services which hitherto have largely been free.

CONFERENCES

There were an unusual number of Conferences which were held during the year. Between the 27th April and 9th May, the American College of Cardiologists conducted a circuit course in Cardiology. The local sponsors of the project were the University's Committee of Post-Graduate Studies. This was an extremely stimulating and interesting Seminar for all those who participated in it.

Between the 6th and 8th June, an Orthopædic Conference was held in Singapore. This was jointly sponsored by the Government and the University

of Singapore, and Surgeons from India, Ceylon, Pakistan, Burma, Japan, Hongkong, New Zealand and Australia, attended this Conference which was so successful that a second Conference will be held again in August 1966.

A symposium on Cancer of the Nasopharynx was held on 1st-7th August. The symposium was organised by the Committee on Geographic Pathology of the International Union Against Cancer (the Union Internationale Contre le Cancer). This was the first U.I.C.C. Conference held in South-East Asia. Singapore was chosen as the venue because of the high frequency of Nasopharyngeal Cancer which occurs in this part of the world and several investigators in these territories have studied the problem for some time. The Conference was held for a week and was attended by scientific workers locally as well as from the neighbouring territories — India, Thailand, Taiwan, Japan, Australia, U.S.A. and even from Hawaai, Kenya, and U.K.

On the 27th and 28th October, a World Health Organisation Multiple Seminar on Radiological Health was held. This was the second in the series of W.H.O. Seminars on this subject, the first of which was held in the Eastern Mediterranean in 1962. The formal lectures, demonstrations and discussions were highly successful and were of great benefit to the staff who work in the Radiological Departments.

EXHIBITIONS

Two successful exhibitions were held in the year. The first was held in connection with World Health Day in which the theme was, "No Truce for Tuberculosis".

The celebrations were spread over a week from 6th April to 12th April, and during this period an Anti-Tuberculosis Exhibition was held in the Victoria Memorial Hall from 7th to 12th April, and opened by the Minister for Health. All sections concerned with the Anti-Tuberculosis Service such as the Tan Tock Seng Hospital, Tuberculosis Control Unit and others were represented.

The other exhibition was that sponsored by the Malayan Pharmaceutical Association and the theme was to show progress in Pharmacy in Singapore. The exhibition was held in the Victoria Memorial Hall from 6th June to 13th June. This was part of a Pharmacy Week.

THE RIOTS OF JULY AND SEPTEMBER

The first riots began in the late evening of 14th July, and very soon brought a flood of victims to the Casualty Department of the General Hospital, and also quickly filled up beds in the Admitting Surgical Unit. Casualties continued to come in over the next few days but in gradually decreasing numbers as control was brought to bear.

The sudden imposition of curfew while tending to suppress the riots created great difficulties in running the hospital's services. There was difficulty

in the initial phases for patients to return home after they had been seen in the hospital and on the first night there were a good number of patients who could not return home and who had to be put up in the General Hospital. Added to these was the large number of hospital staff who also could not return home and had to be housed in the hospital. These created their own problems of accommodation and feeding which fortunately, in the case of the patients were improvised with assistance of the Social Welfare Department.

There was also the added problem of getting hospital staff to work during the curfew and sending them back after their duties were over. It was fortunate that dedication to work and a sense of duty prevailed generally and there were many individuals whose devotion beyond the call of duty kept the emergency services going.

It is fortunate that during the period of the emergency the Outpatient Dispensaries were closed and the staff were made available to assist in the Casualty Services. In the other hospitals, work on the other hand, was reduced because there were no new admission of patients. The exception was the Maternity Hospital (Kandang Kerbau Hospital) where deliveries continued, in fact, at higher rates. This probably being due to the fact that persons who might normally have given birth at home or under the care of general practitioners and midwives could not get their medical attendants and therefore had to come to the hospital; most of these in Police vans.

The second riot occurred on the 2nd of September, but these were on smaller scale and were chiefly confined to a small sector of the island. The same problems and difficulties were faced, although, to a smaller degree. By this time, the Outpatient Services had been reorganised and the Emergency/Admission Unit at the General Hospital had been established. This Unit was able to show its mettle and proved the wisdom of reorganising.

The riot victims treated in the hospitals were as follows:

| | | No. of Casualties treated as Outpatients | No. Admitted | No. Died |
|---------------------------|-----|---|-----------------|-------------|
| Riots (21st-28th July) | ... | 393 | 127 | 23 |
| Riots (2nd-9th September) | ... | 78 | 31 | 13 |

CHOLERA OUTBREAK

The sporadic outbreaks of Cholera caused by the El Tor Vibrio type in 1963 reappeared. There were three outbreaks each with a smaller incidence. This is reported more fully in the Chapter on the Infectious Diseases Hospital (Middleton Hospital). Although these were small outbreaks the number of persons admitted to the hospital for investigation was more than 16 times the actual number of cholera cases, which kept the hospital quite busy and full.

HOSPITALS

Hospitals Facilities

There are 11 Government hospitals and six private hospitals which in aggregate provide for 7,451 hospital beds. For a mid-year population of 1.82 million, this is a proportion of 4.3 beds per thousand population and more than 90 per cent of these being provided by Government. A list of the hospitals and the beds available is in Table 55.

In Tables 56 and 57 the proportion of the principal type of hospital beds to the population is given for a 5 year span.

Hospitals Activities

The work of the hospitals is recorded in a series of tables which follow. As far as possible these figures are compared with previous years as this may be of interest and may indicate trends in the pattern of the Medical Services for the future.

The records show that there was a slight decrease in the number of patients treated in hospitals. This was due to the two periods of curfew each of about a week, which was imposed during the riots in July and September.

Tables 58 and 59 which is on the average turnover of hospital beds indicates that the whole hospital beds are being put to increasing use and this is at the expense of the length of stay of patients. The length of stay is decreasing. This should not be taken to mean that treatment is entirely more effective and efficient; the heavy demands for hospital beds require that patients are discharged earlier for the more seriously ill.

Table 55

MEDICAL INSTITUTIONS, 1964

| <i>Government Hospitals</i> | Beds |
|---|-----------|
| General Hospital | ... 1,132 |
| District Hospital (Thomson Road Hospital) | ... 396 |
| Maternity Hospital (Kandang Kerbau Hospital) | ... 443 |
| Tuberculosis Hospital (Tan Tock Seng Hospital) | ... 1,320 |
| Venereal Diseases Hospital (Middle Road Hospital) | ... 61 |
| Infectious Diseases Hospital (Middleton Hospital) | ... 250 |
| Leprosy Hospital (Trafalgar Home) | ... 965 |
| Mental Hospital (Woodbridge Hospital) | ... 1,869 |
| Mental Defective Hospital | ... 45 |
| Chronic Sick Hospital | ... 70 |
| St. Andrew's Orthopædic Hospital | ... 120 |
| | 6,671 |

Private Hospitals

| | |
|--|-----|
| Gleneagles Hospital (General Hospital) ... | 80 |
| Kwong Wai Siu Hospital* (Cantonese Community Hospital) ... | 454 |
| Mt. Alvernia Hospital (General Hospital) ... | 85 |
| St. Andrew's Mission Hospital (Children's Hospital) ... | 80 |
| Singapore Nursing Home ... | 14 |
| Youngberg Hospital (General Hospital) ... | 67 |
| | 780 |

Institutional Hospitals

Prisons Hospitals —

| | |
|--|-----|
| Changi Prison ... | 64 |
| Pearl's Hill (January–September) ... | 100 |
| (October–December) ... | 50 |
| Opium Treatment Centre (St. John's Island) ... | 22 |
| Police Advanced Training School Hospital ... | 20 |

* Hospital provides treatment in both "Western" and Chinese systems of medicine.

Table 56

NUMBER OF BEDS AVAILABLE, PRINCIPAL TYPES

(The figures exclude beds in Institutional and Departmental Hospitals and Charitable Homes)

| | 1960 | 1961 | 1962 | 1963 | 1964 |
|---------------------------|-------|-------|-------|-------|-------|
| Total Hospital Beds ... | 7,232 | 7,539 | 7,567 | 7,573 | 7,451 |
| per 1,000 population ... | 4.4 | 4.5 | 4.4 | 4.3 | 4.1 |
| Government Hospital Beds | 6,582 | 6,807 | 6,831 | 6,827 | 6,671 |
| per 1,000 population ... | 4 | 4 | 3.9 | 3.8 | 3.6 |
| Private Hospital Beds ... | 605 | 732 | 736 | 746 | 780 |
| per 1,000 population ... | .4 | .4 | .42 | .42 | .43 |
| General Beds (Government) | 1,627 | 1,647 | 1,629 | 1,627 | 1,528 |
| per 1,000 population ... | 1 | 1 | .94 | .92 | .84 |
| Maternity Beds ... | 390 | 438 | 467 | 443 | 443 |
| per 1,000 population ... | .24 | .26 | .27 | .25 | .24 |
| Psychiatric Beds ... | 1,869 | 1,869 | 1,869 | 1,869 | 1,869 |
| per 1,000 population ... | 1.1 | 1.1 | 1.08 | 1.05 | 1 |
| Tuberculosis Beds ... | 1,200 | 1,234 | 1,250 | 1,320 | 1,320 |
| per 1,000 population ... | .73 | .73 | .73 | .75 | .72 |

Population Mid-Year 1964 = 1,820,000

TABLE 57
HOSPITAL BEDS IN GOVERNMENT HOSPITALS

| | Pre-war | 1946 | 1947 | 1948 | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 |
|---|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| General Hospital | 750 | 550 | 550 | 600 | 700 | 750 | 750 | 800 | 800 | 800 | 957 | 1,205 | 1,182 | 1,191 | 1,231 | 1,231 | 1,231 | 1,231 | 1,231 | 1,132 |
| Thomson Road Hospital | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 396 | 396 | 396 | 396 | 396* | 396 |
| Kandang Kerbau Hospital (Maternity and Gynaecology) | 180 | 200 | 220 | 240 | 240 | 240 | 240 | 240 | 240 | 240 | 316 | 316 | 316 | 316 | 316 | 390 | 438 | 443 | 443 | 443 |
| Tan Tock Seng Hospital (Tuberculosis) | 600 | 400 | 400 | 550 | 572 | 600 | 540 | 565 | 565 | 564 | 564 | 972 | 938 | 1,142 | 1,144 | 1,200 | 1,234 | 1,250 | 1,320 | 1,320 |
| Middle Road Hospital (Venereal Diseases) | .. | 60 | 60 | 60 | 68 | 70 | 70 | 70 | 70 | 60 | 65 | 65 | 65 | 65 | 55 | 58 | 61 | 60 | 61 | 61 |
| Middleton Hospital (Infectious Diseases) | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 200 | 200 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| Trafalgar Home (Leprosy) | 200 | 260 | 347 | 382 | 451 | 536 | 640 | 725 | 790 | 642 | 954 | 973 | 973 | 1,023 | 1,023 | 1,023 | 1,023 | 1,023 | 1,023 | 965 |
| Woodbridge Hospital (Mental illnesses) | 2,000 | 440 | 700 | 1,000 | 1,200 | 1,600 | 1,800 | 1,800 | 1,800 | 1,800 | 1,800 | 1,800 | 2,040 | 2,222 | 1,869 | 1,869 | 1,869 | 1,869 | 1,869 | 1,869 |
| Mental Defective Hospital | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 46 | 46 | 44 | 45 |
| Chronic Sick Hospital | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 35 | 35 | 70 | 70 |
| St. Andrew's Orthopaedic Hospital | .. | 60 | 60 | 60 | 65 | 70 | 70 | 78 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| | 3,980 | 2,220 | 2,587 | 3,142 | 3,546 | 4,116 | 4,360 | 4,528 | 4,635 | 4,426 | 4,976 | 5,701 | 5,884 | 6,329 | 6,404 | 6,537 | 6,703 | 6,723 | 6,827 | 6,671 |

*Staffed Beds 180.

TABLE 58
 STATISTICS SHOWING ACTIVITIES OF PRINCIPAL HOSPITALS 1964
 HOSPITAL UTILIZATION FACTORS

| Hospital | Bed Com- ple- ment | Average Daily Number of Available Beds | Average Daily Bed Occupancy | Average Percent- age Occupancy | Dis- charges and Deaths | Average Length of Stay (1) | Turn- over per Bed (2) | Deaths | Per- centage of Deaths to total Discharges and Deaths | Total Patient Days |
|--|-----------------------------|---|--------------------------------------|---|----------------------------------|--|------------------------------------|--------|---|--------------------------|
| General Hospital | 1,132 | 1,132 | 1047.98 | 92.58 | 43,851 | 8.74 | 38.738 | 2,522 | 5.75 | 383,559 |
| Thomson Road Hospital (District General Hospital) | 396 | 180 | 144.00 | 80.00 | 4,117 | 12.80 | 22.872 | 322 | 7.82 | 52,704 |
| Kandang Kerbau Hospital (Maternity Hospital) | 443 | 443 | 443.81 | 100.23 | 50,407 | 3.22 | 113.786 | 64 | 0.13 | 162,435 |
| Tan Tock Seng Hospital (Tuberculosis Hospital) | 1,320 | 1,284 | 1102.80 | 85.90 | 5,868 | 68.78 | 4.570 | 538 | 9.17 | 403,623 |
| Middle Road Hospital (Social Hygiene Hospital) | 61 | 61 | 27.17 | 44.76 | 1,055 | 9.43 | 17.295 | 3 | 0.28 | 9,946 |
| Middleton Hospital (Infectious Diseases Hospital) | 250 | 250 | 126.88 | 50.80 | 3,465 | 13.40 | 13.860 | 51 | 1.47 | 46,440 |
| Trafalgar Home (Leprosy Hospital) | 965 | 965 | 596.17 | 61.76 | 302 | 722.75 | 0.313 | 6 | 1.98 | 218,270 |
| Woodbridge Hospital (Mental Hospital) | 1,869 | 1,869 | 3466.55 | 185.45 | 2,263 | 560.65 | 1.211 | 125 | 5.52 | 1,268,759 |
| Mental Defective Hospital | 45 | 45 | 45.00 | 100.00 | 2 | 8235.00 | 0.044 | 1 | 50.00 | 16,470 |
| Chronic Sick Hospital | 70 | 70 | 68.23 | 97.14 | 65 | 384.25 | 0.929 | 45 | 69.23 | 24,976 |
| St. Andrew's Orthopaedic Hospital | 120 | 120 | 96.23 | 80.00 | 188 | 186.80 | 1.566 | .. | .. | 35,220 |

TABLE 58—*contd.*
STATISTICS SHOWING ACTIVITIES OF PRINCIPAL HOSPITALS 1964
HOSPITAL UTILIZATION FACTORS

| Hospital | Bed Complement | Average Daily Number of Available Beds | Average Daily Bed Occupancy | Average Percentage Occupancy | Discharges and Deaths | Average Length of Stay (1) | Turnover per Bed (2) | Deaths | Percentage of Deaths to total Discharges and Deaths | Total Patient Days |
|---|----------------|--|-----------------------------|------------------------------|-----------------------|----------------------------|----------------------|--------|---|--------------------|
| <i>Institutional Hospitals:</i> | | | | | | | | | | |
| Prisons: Changi | 64 | 64 | 27.00 | 42.19 | 242 | 40.84 | 3.781 | .. | .. | 9,882 |
| Pearl's Hill from Jan.—Sept. | 100 | } 88 | 44.83 | 51.14 | 499 | 32.88 | 5.670 | 29 | 5.81 | 16,406 |
| Pearl's Hill from Oct.—Dec. | 50 | | | | | | | | | |
| Opium Treatment Centre, St. John's Island | 22 | 22 | 9.86 | 45.45 | 230 | 15.68 | 10.455 | .. | .. | 3,607 |
| Police Advanced Training School Hospital —(formerly Police Training School Hospital) | 20 | 20 | 2.59 | 15.00 | 189 | 5.02 | 9.450 | .. | .. | 948 |

(1) Average Length of Stay = $\frac{\text{Total Patient Days}}{\text{Discharges and Deaths}}$

(2) Turnover Per Bed = $\frac{\text{Discharges and Deaths}}{\text{Average daily number of available beds}}$

TABLE 59
BED TURNOVER IN HOSPITALS*

| Hospital | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 |
|---|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| General Hospital | 29.215 | 26.825 | 29.207 | 29.937 | 33.244 | 33.960 | 33.652 | 37.063 | 38.845 | 38.728 |
| Thomson Road Hospital | .. | .. | .. | .. | .. | .. | .. | .. | 19.839 | 22.872 |
| Kandang Kerbau Hospital (Maternity and Gynaecology) | 94.446 | 102.759 | 114.427 | 125.826 | 141.569 | 123.774 | 112.308 | 107.396 | 113.034 | 113.786 |
| Tan Tock Seng Hospital (Tuberculosis) | 4.521 | 2.639 | 3.317 | 3.444 | 3.858 | 3.652 | 3.714 | 4.076 | 3.987 | 4.570 |
| Middle Road Hospital (Venereal Diseases) | 21.646 | 21.000 | 20.923 | 17.723 | 21.308 | 19.896 | 19.820 | 22.067 | 15.459 | 17.295 |
| Middleton Hospital (Infectious Diseases) | 17.130 | 15.708 | 15.088 | 15.120 | 14.564 | 20.488 | 16.464 | 20.348 | 19.764 | 13.860 |
| Trafalgar Home (Leprosy) | 1.108 | 1.153 | 1.206 | 1.162 | 1.217 | 1.126 | 0.965 | 0.971 | 0.336 | 1.566 |
| Woodbridge Hospital | 1.861 | 2.051 | 1.970 | 1.719 | 1.972 | 2.240 | 2.455 | 2.713 | 1.273 | 1.211 |
| Mental Defective Hospital | .. | .. | .. | .. | .. | .. | .. | .. | 0.023 | .044 |
| Chronic Sick Hospital | .. | .. | .. | .. | .. | .. | .. | .. | 0.643 | .929 |
| St. Andrew's Orthopedic Hospital | 2.108 | 2.783 | 2.917 | 2.092 | 2.017 | 2.141 | 3.375 | 2.958 | 1.200 | 1.566 |

*Figures up to 1962 are for "Crude Bed Turn-over" which is based on:

Total Cases Treated (Patient remaining at the beginning of the year, plus number of patients admitted during the year).

Divided by the average daily number of available beds.

After 1962, figures are calculated:

$\frac{\text{Discharges and Deaths.}}{\text{Average daily number of available beds.}}$

OUTPATIENT SERVICES

There are two categories of outpatients, which are treated in two different organisations and the report of their attendances are given separately:

- (i) outpatients attending at the Outpatient Clinics of hospitals or hospital units. These Outpatient Clinics are considered speciality clinics where patients are referred for consultations or are seen as follow-up for special investigations or treatment;
- (ii) outpatients who attend at the Outpatient Dispensaries. The Outpatient Dispensary services form a separate organisation and consist of all the Government Outpatient Dispensaries, their Mobile Dispensaries, and Staff Dispensaries. These provide a general practitioner type of service.

Until the re-organisation of the Outpatient Services, it undertook as part of its function, the Admissions and Emergency Service for the General Hospital. Since the re-organisation, these functions have been separated out and are now undertaken by a separate unit known as the Emergency/Admission Unit which is a department of the General Hospital.

The figures for attendances in the Outpatient departments are given in Tables 60 and 61.

TABLE 60
ATTENDANCES AT OUTPATIENT DISPENSARIES

| Dispensaries | 1962 | 1963 | 1964 | | | |
|---------------------------------------|-----------|-----------|----------------------------|--------------------|--------------------------|-------------|
| | | | New | Repeats | Injections and Dressings | Total |
| Government Outpatient Dispensaries .. | 2,744,744 | 2,773,663 | .. | .. | .. | .. |
| Static .. | .. | .. | (1) 373,762 (2) 169,488 | 488,341 268,236 | 382,434 181,106 | } 1,890,744 |
| Part-time .. | .. | .. | 12,599 | 14,778 | .. | |
| Travelling Dispensaries .. | 195,967 | 199,154 | 97,905 | 74,297 | .. | 172,202 |
| Staff Dispensaries | 131,525 | 194,723 | 109,197 | 70,186 | 91,528 | 270,911 |
| Total .. | 3,072,236 | 3,167,540 | 762,951 | 915,838 | 655,068 | 2,333,857 |

(1) Attendances 1st January to 31st July.

(2) Attendances 1st August to 31st December.

Table 61

ATTENDANCES AT HOSPITAL OR HOSPITAL UNIT CLINICS

| Clinic | 1962 | 1963 | 1964 | Rate of Attendances per 1,000 Population (*) |
|-----------------------------|------------------|------------------|------------------|---|
| General Hospital ... | 434,347 | 367,401 | 324,587 | 177.5 |
| Thomson Road Hospital ... | 8,874 | 13,752 | 18,895 | 10.3 |
| Kandang Kerbau Hospital ... | 189,552 | 170,148 | 143,721 | 79 |
| Tan Tock Seng Hospital ... | 478,701 | 350,905 | 295,911 | 162 |
| Middle Road Hospital ... | 197,594 | 185,890 | 191,765 | 104.4 |
| Trafalgar Home ... | 11,345 | 13,148 | 9,457 | 5.2 |
| Woodbridge Hospitals ... | 16,668 | 20,766 | 20,558 | 11 |
| Total ... | 1,337,081 | 1,123,010 | 1,004,894 | 549.4 |

(*) Population mid-1964 estimated = 1,820,000

Table 61A

CASUALTY — EMERGENCY UNIT

| | 1962 | 1963 | 1964 |
|-------------------------|---------|---------|---|
| Casualty Unit | 120,014 | 131,995 | 130,213 |
| Casualty-Emergency Unit | | | { 1 January—31 July 70,473 { 1 August—31 December 59,690 |

The total attendances for outpatient in all services have been less than in the previous year. This is due to the riots in July and September when curfew was imposed and when it was not possible for patients to attend at the Outpatient departments then. After the re-organisation, attendances have dropped and this is presumed to be due to the imposition of charges for 50 cents for each attendance. These charges apparently are keeping away persons who are not so sick as to require medical attention. It is too early to tell if attendances will continue to fall, level out or rise.

Personnel

In Tables 62 and 63 is a summary of the personnel working in the Hospitals Services.

Table 62
PROFESSIONAL PERSONNEL — DECEMBER 1964
(Hospitals Division)

| Designations | Approved Establishment | Total No. Filled | University Officers |
|-------------------------------------|------------------------|------------------|---------------------|
| <i>Doctors</i> | | | |
| <i>Superscale:</i> | | | |
| Administrative | 8 | 8 | — |
| Specialists | 44 | 28 | 13 |
| Senior Registrars | 60 | 39 | 17 |
| Medical Officers | 252 | 226 | — |
| Housemen | 55 | 46 | — |
| <i>Nursing Staff</i> | | | |
| Matron, Grade I | 4 | 3 | |
| Matron, Grade II | 13 | 12 | |
| Senior Sister Tutor | 1 | 1 | |
| Sister Tutors | 16 | 16 | |
| Nursing Officer Tutor | 3 | 3 | |
| Nursing Officer, Grade II (Man) | 1 | 1 | |
| Sisters | 224 | 210 | |
| Charge Nurses | 30 | 21 | |
| Staff Nurses and Student Nurses | 1,383 | 1,186 | |
| Male Nurses and Student Male Nurses | 244 | 216 | |
| Senior Assistant Nurses | 7 | 7 | |
| Assistant Nurses | 931 | 875 | |
| Assistant Nurses (Psychiatric) | 100 | 69 | |
| Chief Nurse (Man) Div. II | 1 | 1 | |
| Senior Nurse (Man) Div. II | 1 | 1 | |
| Nurse (Man) Div. II | 11 | 10 | |
| Senior Midwives | 4 | 4 | |
| Staff Midwives | 157 | 149 | |
| Pupil Midwives | 230 | 135 | |
| Pharmacists | 25 | 22 | |
| Senior Dispensing Assistants | 10 | 10 | |
| Dispensing Assistant | 94 | 88 | |
| Chief Hospital Assistant | 3 | 3 | |
| Hospital Assistant, Special Grade | 14 | 12 | |
| Hospital Assistant | 41 | 34 | |
| Senior Laboratory Technician | 1 | 1 | |
| Laboratory Technicians | 101 | 100 | |
| Superintendent Radiographer | 1 | 1 | |
| Senior Radiographers | 2 | 1 | |
| Radiographers | 40 | 26 | |
| Senior Physiotherapists | 1 | — | |
| Physiotherapists | 19 | 19 | |
| Senior Occupational Therapist | 1 | 1 | |
| Occupational Therapists | 12 | 11 | |
| Senior Almoner | 1 | 1 | |
| Almoners | 31 | 18 | |
| Chief Dietitian | 1 | 1 | |
| Dietitians | 6 | 6 | |

TABLE 63
1964 ESTIMATES—HOSPITALS DIVISION

| Institutions | SUPERSCALES | | | | SENIOR REGISTRARS | | Medical Officers | Housemen |
|--|-------------|-----------|-----------|-------------------------|-------------------|------------------|------------------|-----------|
| | "D" | "E" | "G" | Super- numery "E" | Estab. | Super- numery | | |
| | | | | | | | | |
| Headquarters | 1 | .. | .. | 1 | .. | 21 | .. | .. |
| General Hospital | .. | 9 | 15 | .. | 19 | .. | 76 | 55 |
| Outpatient Services | .. | 1 | 1 | .. | 5 | .. | 101 | .. |
| Blood Transfusion Service | .. | .. | 1 | .. | .. | .. | 1 | .. |
| Chronic Hospital | .. | .. | .. | .. | .. | .. | 1 | .. |
| Kandang Kerbau Hospital | .. | 2 | 2 | .. | 3 | .. | 22 | .. |
| Middleton Hospital | .. | .. | 1 | .. | .. | .. | 1 | .. |
| Social Hygiene | .. | .. | 1 | .. | .. | .. | 3 | .. |
| St. Andrew's Orthopedic Hospital | .. | .. | .. | .. | .. | .. | 1 | .. |
| Tan Tock Seng Hospital | .. | 1 | 6 | .. | 4 | .. | 20 | .. |
| Thomson Road Hospital | .. | .. | 6 | .. | 5 | .. | 16 | .. |
| Trafalgar Home | .. | .. | 1 | .. | 1 | .. | 2 | .. |
| Woodbridge Hospital | .. | 1 | 2 | .. | 2 | .. | 8 | .. |
| Total | 1 | 14 | 36 | 1 | 39 | 21 | 252 | 55 |

Sr. Registrars=60.

Superscales=52

Ancillary Services

In Tables 64 and 65 is given a record of the work in some of the ancillary services in the hospitals. Table 64 covers the X-ray Department, Occupational Physiotherapy Departments, while Table 65 is on the Hospital Ambulance Service.

Table 64

ANCILLARY SERVICES: ATTENDANCES AND COURSES OF TREATMENT

| Hospital | X-ray Department Attendances for Diagnostic X-rays | Courses of Treatment | | |
|-------------------------------------|--|----------------------|---------------|-------------------------|
| | | Radiotherapy | Physiotherapy | Occupational Therapy |
| General Hospital | 93,199 | 41,337 | 88,128 | 20,701 |
| Thomson Road Hospital | 418 | — | 7,891 | 8,198 |
| Kandang Kerbau Hospital | 6,858 | — | 7,185 | — |
| Tan Tock Seng Hospital | 83,144 | — | 16,031 | 23,980 |
| Middle Road Hospital | — | — | — | — |
| Middleton Hospital | — | — | 3,357 | — |
| Trafalgar Home | — | — | 873 | 33,269 |
| Woodbridge Hospital | 3,387 | — | — | 61,218 |
| Chronic Sick Hospital | — | — | 1,391 | 1,492 |
| St. Andrew's Orthopædic Hospital | — | — | 6,790 | 2,485 |

Table 65

HOSPITAL AMBULANCE SERVICE

| Hospital | Ambulance Services | | | | |
|---|-------------------------|--------------------------------|---------------------|------------------|--|
| | Number of Ambulances | Number of Calls Answered | Patients Carried | Total Mileage | Average Number of Mileage Per Patient |
| General Hospital Casualty and Emergency Unit | 7 | 7,789 | 7,789 | 91,736 | 11.78 |
| Thomson Road Hospital (District) | 3 | — | 4,653 | 29,832 | 6.4 |
| Kandang Kerbau Hospital (Maternity) | 11 | 2,024 | 2,024 | 17,805 | 8.8 |
| Tan Tock Seng Hospital (Tuberculosis) | 3 | 33 | 33 | 266 | 8.06 |
| Middleton Hospital (Infectious Diseases) | 4 | 1,720 | 1,540 | 18,257 | 11.59 |
| St. Andrew's Orthopædic Hospital | — | — | — | — | — |
| Trafalgar Home (Leprosy) | 3 | — | — | — | — |
| Woodbridge Hospital (Mental) | 2 | — | — | — | — |

The staff working in the Hospitals Services are full-time officers. Like other officers in the Public Service, they do not undertake private practice. Consultants may see private patients in consultations but do not retain fees paid for these services.

There are four specialist doctors who are in private practice who are appointed as honorary consultants. They do not have specified duties in the hospitals but may be consulted by doctors in the hospitals neither are they given any hospital beds to control.

A few general practitioners are employed part-time to work in the Government Outpatient Dispensaries. But the numbers employed are few (6) as the private practitioners generally are not able to find the time away from their practice to take up these appointments.

Training

Training outside the services has continued to be made available. The training schemes have been particularly generous for post-graduate training of doctors, but these have also been extended to Nurses and other categories.

Training is provided by Government study awards but there are also training awards made available by organisations, such as the Colombo Plan, W.H.O. Sino-British Scholarships and others. All these awards are co-ordinated by the Public Service Commission which undertakes to advertise and select the officers.

Table 66 gives the training awards which were provided in 1964.

Table 66
TRAINING COURSES

| | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 |
|----------------------------|------|------|------|------|------|------|
| Government Fellowships ... | 6 | 12 | 6 | 5 | 4 | 3 |
| Colombo Plan Awards ... | 4 | — | — | — | — | 13 |
| W.H.O. Fellowships ... | — | — | 1 | 4 | 2 | 4 |
| Others ... | 1 | 1 | — | — | — | 1 |

Departmental training for other categories are shown in Table 67.

Table 67
NUMBERS IN DEPARTMENTAL TRAINING

| | Total No. in School in 1964 | Admitted in 1964 | Completed Training in 1964 |
|--|-----------------------------|------------------|----------------------------|
| Student Nurses, Nurses' Training School, General Hospital ... | 632 | 250 | 149 |
| Pupil Assistant Nurses, Assistant Nurses' Training School, Thomson Road Hospital ... | 340 | 134 | 165 |
| Pupil Assistant Nurses, Psychiatric Nursing School ... | 70 | 45 | — |
| Pupil Midwives ... | 159 | 98 | 67 |
| Radiographers ... | 19 | 10 | — |
| Laboratory Technicians ... | 54 | 24 | 1 |
| Dispensing Assistants ... | 43 | 11 | 11 |

On the 24th of February, Professor S. B. Roy was brought into the service as a W.H.O. Expert to set up a Cardiovascular Investigatory Laboratory. Several Government and University staff were trained by him in the techniques of Cardiac Catheterization and other Cardiovascular investigations. With the establishment of a laboratory, a further step has been taken for the development of Open Heart Surgery in Singapore.

From March through the end of the year a Research Team sponsored by the Cooper Foundation conducted research into pulmonary hyaline membrane disease in new born infants in the Kandang Kerbau Hospital.

Staff Relationships

The trend towards organisation of labour extends also to staff working in the Hospitals services. Even the professional officers, such as doctors, dentists, pharmacists, nurses, are organised as trade unions.

During the year, the claims on behalf of the technical officers which include the Laboratory Technicians, were heard through the latter half of the year in the Industrial Arbitration Court. The case had not been concluded at the end of the year.

The dispute on the claims of Nurses was also referred to Arbitration and this case will be heard in the following year.

EXPENDITURE

Table 68 gives the actual expenditure of the Division. This amounts to \$35,176,556, which represents 50 per cent of the total Ministry's expenditure and 11 per cent of the total expenditure for the State.

Table 68

ACTUAL EXPENDITURE FOR THE YEAR 1964
HOSPITALS DIVISION

| Institutions | Personal Emoluments | | Recurrent Expenditure | | Special Expenditure | |
|-----------------------------------|---------------------|-----------|-----------------------|-----------|---------------------|-----------|
| | \$ | c. | \$ | c. | \$ | c. |
| Headquarters | 348,025 | 50 | 32,876 | 14 | 348 | 00 |
| General Hospital | 9,029,760 | 00 | 3,376,438 | 14 | 52,295 | 14 |
| Blood Transfusion Service | 166,776 | 48 | 43,151 | 73 | 2,896 | 93 |
| Kandang Kerbau Maternity Hospital | 3,136,153 | 61 | 987,878 | 29 | 19,118 | 82 |
| Thomson Road General Hospital | 1,007,443 | 69 | 315,503 | 10 | 11,954 | 71 |
| Tan Tock Seng Hospital | 4,443,375 | 26 | 1,683,340 | 74 | 3,760 | 08 |
| Social Hygiene | 446,719 | 35 | 125,596 | 08 | 1,470 | 00 |
| Middleton Hospital | 661,687 | 00 | 313,950 | 22 | — | — |
| Trafalgar Home | 333,846 | 27 | 762,049 | 80 | 9,548 | 64 |
| Woodbridge Hospital | 2,515,733 | 50 | 1,176,910 | 18 | 8,282 | 97 |
| Chronic Hospital | 171,827 | 97 | 54,176 | 15 | 5,448 | 00 |
| St. Andrew's Orthopædic Hospital | 223,350 | 00 | 81,755 | 92 | 685 | 33 |
| Outpatient Services | 2,568,777 | 40 | 855,713 | 08 | 197,932 | 82 |
| | <u>25,053,476</u> | <u>03</u> | <u>9,809,339</u> | <u>57</u> | <u>313,741</u> | <u>44</u> |
| Percentage Expenditure | ... | 71% | 28% | | 1% | |

For comparison the expenditure of the Division in the previous year is given in Table 69. The actual revenue collected for the year is given in Table 70.

TABLE 69
STATEMENT OF EXPENDITURE FOR THE YEARS 1962, 1963 AND 1964

| | 1962 | | 1963 | | 1964 | |
|--------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | Provision | Actual | Provision | Actual | Provision | Actual |
| | \$ c. | \$ c. | \$ c. | \$ c. | \$ c. | \$ c. |
| <i>Hospitals Division</i> | | | | | | |
| Personal Emoluments | 23,294,310 00 | 20,840,231 43 | 24,332,350 00 | 23,520,189 36 | 29,612,980 00 | 25,053,476 00 |
| Other Charges Annually Recurrent .. | 11,632,350 00 | 9,421,109 50 | 10,754,140 00 | 9,707,492 41 | 10,423,000 00 | 9,809,339 00 |
| Other Charges Special Expenditure .. | 526,480 00 | 172,359 82 | 418,650 00 | 345,079 03 | 374,000 00 | 313,741 00 |
| Total .. | 35,453,140 00 | 30,433,700 75 | 35,505,140 00 | 33,572,760 80 | 40,409,980 00 | 35,176,556 00 |

Mid-year Population (in millions) 1,732.8 1,775.2 1,820

Gross cost per head of Population \$ 17.8 \$ 18.8 \$ 19.2

Table 70

HOSPITALS DIVISION
ACTUAL REVENUE COLLECTED FOR 1964

| | Actual Revenue collected on 1964 |
|---|--|
| | \$ c. |
| Hospital charges and fees | 1,221,729 01 |
| Outpatient Charges | 414,702 00 |
| Sale of Swill | 21,852 00 |
| Sale of Articles and Stores | 26,361 40 |
| Contribution by Australian Government for treatment of patients from Christmas Island | 25,000 00 |
| Payment by Housing and Development Board for medical treatment of staff | 11,000 00 |
| Payment by the Public Utilities Board for medical treatment of staff | 55,000 00 |
| Rents from Government Buildings (Canteens and bookshops) | 30,694 00 |
| Rents from Government Quarters | 326,536 72 |
| Miscellaneous Receipts | 10,681 09 |
| Miscellaneous (Recoveries, service charges, etc.) | 33,419 73 |
| Total | <u>2,176,975 95</u> |

16. OUTRAM ROAD GENERAL HOSPITAL

THE hospital is now known as the Outram Road General Hospital to distinguish it from the other general hospital at Thomson Road. It retains its premier position by virtue of being an older institution with well established departments; a teaching centre for medical and dental students; nurses and other ancillary services.

In association with the Faculty of Medicine, University of Singapore, the hospital provides training facilities for medical and dental students. Facilities are also provided for the training of student Nurses, Laboratory Technicians, Dispensing Assistants and Radiographers. Post-Basic Courses are also conducted for trained Nurses in Ward Administration, Pædiatric Nursing and Operating Theatre Techniques.

The Clinical Units of the hospital are the two General Surgical Units, two Orthopædic Units, two Medical Units, two Pædiatric Units, an Eye Unit and an Ear, Nose and Throat Unit. The other departments and ancillary services are represented by the Radiology and Radiotherapy Departments, the Anæsthetic Department, the Biochemistry Department, the Clinical Laboratories, Dispensaries, Physiotherapy Department, Occupational Therapy Department, Artificial Limb Workshop, an Almoner's Service and the Dietary and Catering Services.

Situated within the hospital are the Blood Transfusion Services, Pathological Services, Department of Dentistry and the Dental School.

DEVELOPMENT

Work continued on the renovation and alteration of a section of the Bowyer Block for the establishment of the Third Medical Unit. General painting and colour washing of all the hospital buildings have been completed giving the hospital a pleasing appearance.

The Cardiovascular Laboratory, for diagnosis of lesions of the heart and major blood vessels, was established in February 1964. Preliminary training of the surgical team for open-heart surgery is progressing well.

On 1st August, 1964 with the re-organisation of the Outpatient Services the General Outpatient Dispensary and the Headquarters of the Outpatient Services, which occupied an out-building were moved to Maxwell Road and in its place was established an Emergency Unit primarily meant for the treatment of acute medical, surgical cases and traumatic cases.

Staff.—The Medical Superintendent of the Hospital is Dr. S. N. Kapur,

Clinical Units.—The Clinical Units of the hospital and their Heads of Departments are as follows:

General Surgical Unit 'A' — Prof. L. F. Tinckler, M.B., Ch.M., L.R.C.P., F.R.C.S., D.T.M.H.

General Surgical 'B' — Mr. Y. Cohen, F.R.C.S.

Orthopædic Unit 'C' — Prof. D. R. Gunn, M.B., Ch.B., M.Ch., Orth., F.R.C.S. (Ed.).

Orthopædic Unit 'O' and Emergency Unit — Mr. D. W. C. Gawne, M.A., M.D., M.R.C.S. (Ldn.), F.R.C.S. (Ldn.), L.R.C.P., M.B., Ch.B.

Medical Unit I — Prof. G. A. Ransome, F.R.C.P., M.R.C.S.

Medical Unit II — Prof. E. S. Monteiro, C.B.E., M.D., D.C.H., F.R.C.P., F.R.F.P. & S. (Glasgow).

Ophthalmic Unit — Mr. Loh Choo Kiat, F.R.C.S., D.O.M.S.

E.N.T. Unit — Vacant.

Pædiatric Unit (West) — Prof. Wong Hock Boon, M.B.B.S., D.C.H., F.R.C.P. (E.)

Pædiatric Unit (East) — Dr. Quah Quee Guan, L.M.S., M.R.C.P.E., D.Ch. till 30th November, 1964.

Dr. Tan Kwang Hoh, M.B.B.S. (H.K.), M.R.C.P. Ed. D.Ch. Pæd. from 16th October, 1964 (Ag. Head.).

X-Ray (Diagnostic) — Dr. F. Y. Khoo, D.M.R.D.

X-Ray (Therapeutic) — Dr. Chia Kim Boon, D.M.R.T.

Anæsthetic Unit — Dr. B.E.G. D'Bras, F.F.A.R.C.S.

ACTIVITY

During the year 43,795 patients were admitted to the hospital (discharges and deaths numbered 43,851) compared with 47,826 patients in 1963 and 44,661 in 1962. The decrease in the patients is partly attributable to the two periods of curfew during the civil disturbances in July and September 1964 and partly due to the dispersal of the General Outpatient Clinic which was functioning at the Hospital until 31st July, 1964.

Table 71

PATIENT MOVEMENT

| | | |
|---|-----|---------|
| Authorised Bed Complement | ... | 1,132 |
| Available Staffed Beds | ... | 1,132 |
| Number of Admissions | ... | 43,795 |
| Number of Discharges | ... | 41,329 |
| Number of Deaths | ... | 2,522 |
| Average Daily Bed Occupancy | ... | 1,048 |
| Patients Days | ... | 383,559 |
| Percentage of Deaths to Total Discharges and Deaths | ... | 5.75% |

Attendances at the Outpatient Clinics run by the Clinical Units of the hospital totalled 324,587. The Casualty Department of the hospital which was re-organised on 1st August, 1964 as the Emergency Unit dealt with a total attendance of 130,163 during the year (70,473 attendances for period 1st January, 1964 to 31st July, 1964 and 59,690 attendances for period 1st August, 1964 to 31st December, 1964).

Table 72

ADMISSIONS 1964

| Units | Number of Admissions | |
|------------------------------|----------------------|---------------|
| Surgical <i>A</i> Unit | ... | 7,807 |
| Surgical <i>B</i> Unit | ... | 7,534 |
| Orthopædic Unit ' <i>C</i> ' | ... | 2,855 |
| Orthopædic Unit ' <i>O</i> ' | ... | 1,500 |
| Medical Unit I | ... | 4,591 |
| Medical Unit II | ... | 5,225 |
| E.N.T. Unit | ... | 1,109 |
| Ophthalmic Unit | ... | 1,914 |
| Pædiatric Unit (West) | ... | 5,790 |
| Pædiatric Unit (East) | ... | 5,468 |
| Total | ... | <u>43,793</u> |

Table 73

UNIT OUTPATIENTS FOR 1964

| Clinical Units | New Cases | Re-Attendances | Total | Dressings and Injections |
|-------------------------|-------------------|----------------|----------------|--------------------------|
| Surgical ' <i>A</i> ' | ... 16,812 | 41,311 | 58,123 | 19,506 |
| Surgical ' <i>B</i> ' | ... 13,854 | 17,044 | 30,898 | 17,694 |
| Orthopædic ' <i>C</i> ' | ... 11,869 | 25,907 | 37,776 | 20,801 |
| Orthopædic ' <i>O</i> ' | ... 9,856 | 22,422 | 32,278 | 16,615 |
| Medical Unit I | ... 874 | 24,903 | 25,777 | 9,706 |
| Medical Unit II | ... 1,701 | 25,912 | 27,613 | 15,080 |
| E.N.T. | ... 7,622 | 18,252 | 25,874 | 4,689 |
| Ophthalmic | ... 9,249 | 36,919 | 46,168 | — |
| Pædiatric Unit (West) | ... 4,904 | 16,202 | 21,106 | 1,619 |
| Pædiatric Unit (East) | ... 3,608 | 15,366 | 18,974 | 2,055 |
| Total | ... <u>80,349</u> | <u>244,238</u> | <u>324,587</u> | <u>107,765</u> |

Table 74

EMERGENCY UNIT — 1964

(From 1st August, 1964 to 31st December, 1964)

| New Cases | Re-Attendances | Total |
|-----------|----------------|--------|
| 55,457 | 4,233 | 59,690 |

Table 75
HOSPITAL INPATIENT SERVICES 1964

| Department (e.g. Medical, Surgical, Orth., etc.) | Bed Com- plem- ent | Average Daily Number of Available Beds | Average Daily Bed Occupancy | Average Percent- age Occupancy | Discharges and Deaths | Average Length of Stay | Turnover per bed | Deaths | Percent- age of deaths to total Discharges and Deaths | Total Patient Days |
|--|-----------------------------|---|--------------------------------------|---|-----------------------------|------------------------------|---------------------|--------|---|--------------------------|
| Surgical 'A' Unit .. | 152 | 152 | 149 | 98.03% | 7,960 | 7 | 52 | 407 | 5.11% | 54,670 |
| Surgical 'B' Unit .. | 175 | 175 | 158 | 90.29% | 7,459 | 8 | 43 | 343 | 4.60% | 57,683 |
| Orthopaedic 'C' .. | 97 | 97 | 98 | 101.03% | 2,914 | 12 | 30 | 69 | 2.37% | 35,884 |
| Orthopaedic 'O' .. | 57 | 57 | 67 | 117.54% | 1,609 | 15 | 28 | 39 | 2.42% | 24,666 |
| Medical Unit I .. | 106 | 106 | 125 | 117.92% | 4,395 | 10 | 41 | 511 | 11.63% | 45,869 |
| Medical Unit II .. | 131 | 131 | 139 | 106.11% | 5,188 | 10 | 40 | 578 | 11.14% | 50,946 |
| Ear, Nose and Throat Depart- ment .. | 60 | 60 | 41 | 68.33% | 1,169 | 13 | 19 | 67 | 5.73% | 14,925 |
| Ophthalmic Unit .. | 72 | 72 | 74 | 102.78% | 1,914 | 14 | 27 | 5 | 0.26% | 27,198 |
| Pediatric Unit (West) .. | 141 | 141 | 95 | 67.38% | 5,796 | 6 | 41 | 279 | 4.81% | 34,854 |
| Pædiatric Unit (East) .. | 141 | 141 | 101 | 71.63% | 5,447 | 7 | 39 | 224 | 4.11% | 36,864 |
| Total .. | 1,132 | 1,132 | 1,048 | 92.58% | 43,851 | 9 | 39 | 2,522 | 5.75% | 383,559 |

The following is a summary of the operations done in the Surgical Units of the hospital:

Table 76

OPERATIONS FOR 1964

| Units | Major | Minor | Total |
|-------------------------|--------|--------|--------|
| Surgical 'A' Unit ... | 3,071 | 6,304 | 9,375 |
| Surgical 'B' Unit ... | 2,449 | 6,035 | 8,484 |
| Orthopædic Unit 'C' ... | 1,365 | 11,979 | 13,344 |
| Orthopædic Unit 'O' ... | 1,183 | 10,880 | 12,063 |
| E.N.T. Unit ... | 1,223 | 2,670 | 3,893 |
| Ophthalmic Unit ... | 1,487 | 6,286 | 7,773 |
| Total ... | 10,778 | 44,154 | 54,932 |

MEDICAL UNIT I

Accommodation and Equipment

During the year under review, the Cardiovascular Laboratory came into full function as a consequence of the arrival of Professor Sujoy B. Roy, W.H.O. Consultant and Visiting Professor of Cardiology, University of Singapore.

A little additional equipment was purchased in the form of Catheters of various sizes, including left heart catheters.

A Radio-isotope Laboratory was established as a result of a generous grant from the China Medical Board of New York to the Departments of Medicine and Clinical Medicine. Some of the equipment unfortunately arrived severely damaged so that the Laboratory is still unable to function properly. Replacements are in the process of being obtained. The equipment is at present housed in the Radiotherapy Department.

Research

Work on Eosinophilic Lung consists mainly of providing some clinical material for study by the Department of Parasitology, University of Singapore and the Department of Medicine, University of Malaya, Kuala Lumpur. This is a continuation of the previous work.

Hæmorrhagic Dengue Fever is now a well recognised entity. Three types of dengue virus have so far been identified from 18 virologically proven cases.

The study of oral treatment of diabetic patients with the complications of pulmonary tuberculosis is still in progress.

A new study was initiated on the efficacy of two new anti-diabetic drugs — Dimelor and D.B.I. A report is to be published in the near future.

Clinical evaluation of liver enzyme tests is being undertaken in conjunction with the Government Biochemist. Interesting results are beginning to emerge which indicate that a differentiation might be possible between certain types of disease on the basis of these tests.

With the establishment of the Cardiovascular Laboratory the following studies are being conducted:

- (a) Clinical and Hæmodynamic correlation of Pulmonary Hypertension, in patients with mitral stenosis;
- (b) Hæmodynamic patterns in left to right shunt;
- (c) Pulmonary Arterial Hypertension in Atrial Septal defect;
- (d) Intracardiac Electrography in Congenital Heart disease.

Actual work in this laboratory began on 28th February, 1964. Between then and the end of the year the following investigations had been performed:

| | | |
|-----------------------------|-----|-----|
| Cardiac Catheterizations | ... | 249 |
| Angiocardiograms | ... | 36 |
| Phonocardiograms | ... | 228 |
| Dye Dilution Study | ... | 74 |
| Intra Cardiac Electrography | ... | 42 |

During the period of six months up till August 1964, various members of staff from other Units and other Hospitals received training in cardiovascular investigations in this laboratory. This team, under the guidance of Professor Roy was also responsible for Seminars and Symposia on the following subjects: Mitral Stenosis, Continuous Murmurs, Pulmonary Hypertension, Modern Cardiovascular Diagnostic Methods in Singapore.

General

During the year the load of work continued to be heavy both in relation to inpatients and outpatients. A summary of cases seen in the Unit Out-patient Clinic is given below:

| | 1963 | 1964 |
|------------|--------|--------|
| New Cases | 688 | 874 |
| Repeats | 24,005 | 24,903 |
| Injections | 8,867 | 9,706 |
| Dressings | 12 | — |

These figures do not include the cases referred for an opinion only where the cases are not followed-up in the Unit. These amount to more than 3,000 per year.

The establishment of the Emergency Unit in this hospital has improved the lot of the patient, but has not relieved and, in fact, has increased the work-load of the Medical Unit as work which formerly was undertaken by the General Outpatient doctors is now passed on to the doctors of the Unit on duty for the day.

E.C.G. DEPARTMENT

Work continued to mount, and the department is dangerously understaffed. Of the two members of staff in this Department, one has been seconded from the Laboratory. Twice during this year the Department has had to be closed down due to illness of one officer when the other was on vacation

leave until the officer on leave was recalled. At present the work-load is coped with only because the Cardiovascular Laboratory has had a temporary set-back from equipment failure and the staff from this laboratory have been helping in this Department. However, they are University staff.

The following are the returns of work done in the Department:

| | 1963 | | 1964 |
|--------------------------------|-------|---------|-------|
| Basal Metabolic Rate | 2,803 | | 2,380 |
| E.C.G. Standard | 700 | } 6,232 | 409 |
| E.C.G. Direct Written | 4,572 | | 6,206 |
| E.C.G. Portable | 960 | | 1,243 |
| Electroencephalograms | 155 | | 256 |
| Phonocardiograms | 193 | | 98 |
| Vital Capacity Tests | 13 | | 2 |
| Skin Temperature | 2 | | — |
| Tape Recording | 3 | | 1 |
| Resting Ventilation Estimation | 1 | | — |
| Lung Function Test | — | | 1 |
| Tendo-Adults Jerk grape | — | | 1 |

SURGICAL UNIT 'A'

During the tragic events of the civil disturbances in July and August, the Unit played a prominent part in the overall hospital effort in dealing with the sudden and large influx of casualties.

With the establishment of the 'E' Unit, surgical outpatient referral clinics are now being held there for one half day session a week. Previously, these clinics were held in the precinct of the Unit; the new arrangement is a decided improvement by serving to remove some of the congestion in the central hospital area.

The combined surgico-pathological conferences held jointly with 'B' Unit and started early in the year continued to be well attended and supported. These meetings are held in the Pathology Lecture Theatre on the last Tuesday of the month.

Cardiac Surgery

Work on the development of open-heart surgery was pursued along two main lines:

1. Experimental cardio-pulmonary bypass in dogs.
2. Raising of public funds to support the programme.

Through the generous assistance of Professor Lin of the Department of Pharmacology, and the Veterinary Surgeons at the Animal Infirmary, experimental work on cardio-pulmonary bypass in dogs was carried out throughout the year. A total of thirty-nine animal perfusions were performed. The animal experimentation was designed to study the effects of cardio-pulmonary bypass using various diluted blood mixtures as perfusates, and also to train a team for clinical open-heart surgery. The latter objective was adequately realised and it is anticipated that clinical open-heart surgery will be embarked upon early in 1965.

A generous grant of \$25,000 was made by the China Medical Board for the purchase of a four-channel monitor, a pace maker, a defibrillator and a respirator. These will be used for the care of cardiac patients both during and after surgery.

SURGICAL UNIT 'B'

The work done on the Unit is shown in outline in the figures given below:

| | Admissions | Average Occupancy |
|----------------------------------|------------|----------------------|
| Wards 11 and 12 | ... 527 | 33 |
| Ward 7 | ... 4,304 | 75 |
| Ward 9 | ... 2,703 | 50 |
| Surgical Outpatients — New Cases | ... 13,854 | |
| — Repeats | ... 17,044 | |
| Injections and Dressings | ... 17,694 | |
| Major Operations | ... 2,449 | |
| Minor Operations | ... 6,035 | |

It should be noted that there has been a considerable drop in the out-patient attendances, both in new cases and repeats. This is due to the establishment of 'E' Unit which has reduced the burden of minor outpatient work which was so trying at one time.

The departure of Dr. Gellei from the Department of Pathology has been a considerable loss to us. However, the weekly clinico-pathological conferences continue with Dr. Tan Kheng Khoo at the helm. These meetings still continue to be very valuable from the point of view of the patients management and teaching. The monthly inter-Unit meetings with the Professorial Surgical Unit continue.

Work on the Thomson Road Hospital theatres was completed and these theatres were now functioning.

ORTHOPÆDIC SURGERY 'O' AND 'C'

The work of the Unit has been reduced by about 20 per cent. This is due to a reduction in the number of new cases and a reduction in the number of outpatients.

STATISTICS FOR 1964 OUTPATIENTS DEPARTMENT

| | "O" | "C" |
|--------------------------|------------|--------|
| New cases | ... 9,856 | 11,869 |
| Re-attendances | ... 22,422 | 25,907 |
| Dressings and Injections | ... 16,615 | 20,801 |
| Total | ... 48,893 | 58,577 |

This can be attributed to the formation of the Emergency Unit at the General Hospital, where all Minor Cases are being treated, and a considerable number of the more severe cases, not requiring hospitalisation are also being dealt with by the 'O' Unit Staff.

The Traumatic Unit, portion of the Emergency Unit is manned by the 'O' and 'C' Units Medical Officers on duty who are always available to assist the Casualty Officers. There is thus, a continuity amounting almost to an "accident" service, between the Emergency Unit and the Orthopædic Units. This will be developed further in 1965. It will be noted that there has been a considerable reduction in the number of accidents in "R.H.I.S.M." Statistics since August. This is because a greater number of accidents are being treated in the Emergency Units, and fewer required treatment in the 'O' Unit and 'C' Unit.

ANNUAL STATISTICS OF CASUALTIES — 1964

| Month | R | H | I | S | M | Total |
|-----------|-------|-------|-----|-----|-------|-------|
| January | 91 | 256 | 132 | 14 | 324 | 817 |
| February | 135 | 257 | 73 | 14 | 272 | 751 |
| March | 115 | 269 | 104 | 15 | 317 | 820 |
| April | 86 | 252 | 94 | 27 | 381 | 840 |
| May | 105 | 233 | 98 | 29 | 359 | 824 |
| June | 110 | 215 | 88 | 22 | 373 | 808 |
| July | 78 | 185 | 83 | 22 | 179 | 547 |
| *August | 72 | 76 | 48 | 18 | 121 | 335 |
| September | 67 | 111 | 50 | 11 | 114 | 353 |
| October | 90 | 133 | 77 | 22 | 150 | 472 |
| November | 73 | 174 | 72 | 23 | 133 | 475 |
| December | 64 | 122 | 57 | 7 | 145 | 395 |
| Total | 1,086 | 2,283 | 976 | 224 | 2,868 | 7,437 |

TOTAL NO. OF CASUALTIES RESULTING FROM:

| | |
|---------------|-------|
| Road Traffic | 1,086 |
| Home | 2,283 |
| Industrial | 976 |
| Sports | 224 |
| Miscellaneous | 2,868 |
| Total | 7,437 |

* "E" Unit inaugurated. The drop in figures from this time is notable.

The reduction is of considerable advantage to patients, as well as to the Medical Staff. It means that patients can be detained a few days longer in the Wards, and that the Doctors have more time to treat them. It means also that more time can be devoted to organisation and efficiency in the Unit as a whole.

A system of Statistical Analysis has in consequence been introduced. This is of the greatest importance, since it enables the Unit rapidly to assess the type of accident occurring, the kind of treatment being given, its effectiveness, mortality figures, and not least, data for research projects.

The whole department was re-decorated in lighter colours. This has given a considerable fillip to the morale in the Unit, both to the Doctors and patients. Although re-decoration in the lighter colours may require to be done more often — this is far outweighed by the effects on patients whose cheerfulness, and on Staff, whose efficiency has much increased. The effect

has to be seen to be believed. Re-wiring of the department has also been carried out. This has been a valuable measure; since short circuits and fuses blown no longer occur. As this Unit depends much upon electrified equipment for its function, efficiency has been markedly improved in this respect. The operating theatres are in a bad state of disrepair. The worst feature is the mal-functioning of the Air-Conditioning machinery. Breakdowns are frequent, air pressure is low, and in consequence the number of organisms have been rising steadily.

| | | | | Bacterial Counts: Plates exposed. 2 mins. and 5 mins. | |
|----------|-----------|----------------|--|---|------------|
| | | | | 2 mins. exposure — 5 mins. exposure | |
| 25-10-64 | Theatre A | Staphy Aureous | | 2 Colonies | 3 Colonies |
| 25-10-64 | Theatre B | Staphy Aureous | | 1 Colony | 2 Colonies |
| 20-11-64 | Theatre A | Staphy Aureous | | 2 Colonies | 5 Colonies |
| 20-11-64 | Theatre B | Staphy Aureous | | 1 Colony | 2 Colonies |
| 15-12-64 | Theatre A | Staphy Aureous | | 3 Colonies | 5 Colonies |
| 15-12-64 | Theatre B | Staphy Aureous | | 1 Colony | 3 Colonies |

This shows a steady increase in the number of Staphy lococci insensitive to antibiotics, as well as other contamination Bacillus Proteins, Fringe, etc. It is important that the bacterial counts be reduced, as it means that they are "Hospital" organisms, insensitive to Antibiotics. Moreover, the introduction of these organisms into wounds increase patients' stay in Hospital.

Tetanus Unit

A side Ward in 'O' Unit has been set aside for the treatment of Tetanus. This was necessary as the mortality rates were high. Although it is wrong from all points of view to treat Tetanus cases in an Orthopædic Ward, because of the danger of cross infection, which may lead to fatalities, the risk was considered justified in view of the high mortality figures in the Hospital (See Dr. Gwee Ah Leng's study of Tetanus in General Hospital *Malayan Medical Journal* 1961).

The risk has been justified in so far that an interim reviewed indicates that the mortality figure of 17 per cent is among the lowest in the world. This has been almost entirely due to the efforts of Dr. Ganendran, having advised in the organisation; trained the Nursing Staff, and introduced new methods of treatment.

Limb Centre and Appliance Workshop

The workshop is still without a Superintendent, the Senior Appliance Maker is in acting in this post. The work has steadily risen during the past five years. Annual production has risen in 1964 to approximately \$72,000 in value. The total expenditure in wages and materials has been approximately \$60,000. Collections in cash amounted to twenty-two thousand dollars (\$22,000).

The cost of keeping the Workshop functioning is therefore in the region of forty thousand dollars (\$40,000). This expenditure is well worth while, when it is considered that seventeen hundred appliances have been made. These appliances in the open market would have cost the Government about one-third more; with no guarantee of satisfaction.

The appliances moreover mean a considerable man-power increase, since many of the patients fitted with appliances are able to work.

Further Developments in the Unit required

Although pressure of bed space has been relieved, there is still a shortage for emergencies. An increase in bed space is necessary. Two Wards have become available now for development, as soon as staff is available for opening them.

The Gymnasium is no longer in use, since the Orthopædic patients are now attending the Hospital physiotherapy department for their exercises. This centralisation has enabled a better co-ordination of treatment. It is important that a Medical Physical Therapy Officer be trained soon, so that all departments can be co-ordinated, occupational therapy, physiotherapy and rehabilitation under one head.

Rehabilitation

It will be necessary to obtain an Officer trained in Physical Medicine to co-ordinate all departments before Rehabilitation can be effective. An Officer will require at least one and half years training. This can only be done in England at the present time, where a Course has been inaugurated at the Royal College of Surgeons.

REHABILITATION AND GYMNASIUM WARD 62

| Nationalities | NEW CASES | | | | REPETITIONS | | | |
|-----------------|-------------|-------------|--------|-------|-------------|-------------|--------|--------|
| | 'C' Unit | 'O' Unit | Others | Total | 'C' Unit | 'O' Unit | Others | Total |
| Chinese | 391 | 439 | 38 | 868 | 3,756 | 4,466 | 687 | 8,909 |
| Malays | 44 | 67 | 4 | 115 | 318 | 514 | 58 | 890 |
| Indians | 69 | 78 | 7 | 154 | 635 | 786 | 174 | 1,595 |
| Eurasians | 4 | 6 | .. | 10 | 28 | 97 | .. | 125 |
| Europeans | 2 | 1 | .. | 3 | 30 | 7 | .. | 37 |
| Others | 5 | 2 | .. | 7 | 48 | 59 | .. | 107 |
| Total .. | 515 | 593 | 49 | 1,157 | 4,815 | 5,929 | 919 | 11,663 |

New Cases:

| | | |
|----------------------------|-----|-------|
| Fractures and Dislocations | ... | 853 |
| Amputees | ... | 67 |
| Post—Polio and Spastics | ... | 16 |
| Paraplegics | ... | 6 |
| Hemiplegics | ... | 31 |
| Miscellaneous | ... | 184 |
| Total | ... | 1,157 |

St. Andrew's Orthopædic Hospital.—Regular visits continue to be made and satisfactory supervision of all cases is again possible as Dr. Paul has returned to duty as Medical Officer.

The pattern of diseases treated has continued to change tuberculosis of bone and joint now being a relatively minor problem.

Tanah Merah Red Cross Home.—Mr. V. K. Pillay has visited the home regularly and has, with the help of the full time physiotherapist, achieved a great deal. The Matron and staff continue to do a wonderful job.

Trafalgar Home.—Mr. K. H. Yeoh makes weekly visits to Trafalgar Home and a lot of surgery has been successfully undertaken.

Middleton and Tan Tock Seng Hospital.—Regular visits are made to both these hospitals and patients continue to be transferred to the General Hospital for surgery as and when needed.

Research.—The following are some of the subjects in which active research is taking place:

- (1) The Epidemiology of Fractures, specially in relation to the Hip and the Forearm. This is an extension and long term project which will continue for several years.
- (2) The Incidence Ratio Pattern and Genetic Aspects of Congenital Deformities in Singapore.
- (3) The Importance of the Absence of Primary Osteoarthritic Change in Singapore.
- (4) Genu Recurvatum.
- (5) The End Results of Fractures of the Patella and Fractures of the Femur.
- (6) Popliteal Cysts, their Etiology and Treatment.
- (7) Tendon Transplantation in relation to several different procedures.
- (8) The Use of De-Proteinised Non-Antigenic Bone for Grafting. The Material for this clinical trial has been provided by Squibb.

There are other long term research projects in which work is being continued.

OPHTHALMIC UNIT

There was a small decrease in the number of patients attending the Unit in 1964.

| | 1963 | 1964 |
|--------------------------|--------|--------|
| Total new patients | 10,261 | 9,249 |
| Old patients attendances | 42,007 | 36,919 |

This is readily explained by two factors: removal of the General Out-patients Department from the General Hospital to Maxwell Road and civil disturbances in July and September.

| | 1963 | 1964 |
|-------------------|-------|-------|
| Major operations | 1,457 | 1,326 |
| Minor operations | 6,793 | 6,286 |
| Emergency surgery | 251 | 161 |
| Total | 8,501 | 7,763 |

The same factors mentioned above explains the small decrease in the surgical work done by the Unit.

The extension to the Major Theatre is to all intents and purposes complete and the work was done within the specified time of the contract. Equipment and other smaller details in construction will be taken up in 1965. It is hoped that with the new extension to the Theatre the waiting list for cataract surgery will be cut down from the present 6 months to a reasonable period of 3-4 months.

The number registered newly blind for 1964 was 91. Optic Atrophy showed the greatest number. 20 new cases were registered blind due to this cause. The other significant causes were Glaucoma, Inflammations of the Uvea and corneal diseases.

The Unit, at the end of the year, has got its full complement of Medical Officers. The notable shortage is in the nursing staff, especially for the Theatre.

Mr. R. C. K. Loh was invited by the Australian Government to attend Asia-Pacific Academy's International Congress in Ophthalmology in Melbourne in April 1964. He read a paper on the "Decline in the Incidence of Keratomalacia in Singapore". It was also decided at that Congress that the next Congress in 1968 would be held in Singapore. This is a significant honour.

Research

A paper "Adeno-Virus Conjunctivities in Singapore" jointly written by Dr. Coggrave (Department of Bacteriology, Faculty of Medicine) and Mr. Loh has been sent for publication in the American Journal of Ophthalmology.

A paper on the "Use and Abuse of Contact Lenses" was jointly published by Mr. Loh and Mr. Lim in the Singapore Medical Journal. "The use of Preserved Corneae for Lamellar Keratoplasty" written by Mr. Loh was also published in the Singapore Medical Journal.

Investigations continued on these problems: (a) glaucoma, (b) partially sighted, (c) congenital causes of blindness, (d) traumatic injuries and (e) detachment of the retina.

A notable event was the gift of six eyes from the Ceylon Eye Donation Society. These were received in Singapore within 24 hours after removal in Colombo. Five of these eyes were used for corneal grafting on five patients. These were all performed within 48 hours. The results obtained were good.

The draft legislation for the purpose of legalising donations of eyes for corneal grafting is almost completed and should be ready for presentation in 1965.

EAR, NOSE AND THROAT SURGERY UNIT

General

1964 has been a very eventful year for the E.N.T. Department. Negotiations between the Singapore and Australian Governments led to an exchange scheme (Colombo Plan) whereby Dr. Jerry Goh Ewe Hong went to the Royal

Melbourne Hospital and the Royal Victorian Eye and Ear Hospital for post-graduate E.N.T. training, and a series of senior E.N.T. Surgeons from Melbourne came to Singapore as Acting Head of E.N.T. Unit, each for six weeks. Mr. George Swinburne, Senior E.N.T. Surgeon to Royal Melbourne Hospital commenced the scheme in August 1964, and was followed by Mr. D. F. Cossar, and Mr. L. J. Caust and Mr. Rory Willis. The scheme will continue into 1965 with the arrival of Mr. John Thomson and Mr. George Gray.

A very high standard of work has therefore been possible in the unit and the E.N.T. Registrars have all benefited greatly by the specialized instructions available. Micro-surgery of the ear in particular has received close attention during the year, and practice on post-mortem material was instituted.

Lectures to General Practitioners

(a) The Singapore Medical Association members received a lecture from each of the visiting Melbourne E.N.T. Specialists.

(b) The Faculty of Medicine, Committee on Post-Graduate Medical Studies arranged a series of eight courses of instruction to General Practitioners beginning with Course *A* taken by Mr. Swinburne in September 1964 and ending with Course *H* taken by Mr. Willis in December 1964.

Research Project

(a) "Rhinosporidiosis in Singapore" — This particular problem is discussed, its symptomatology and pathology is described, and the treatment is outlined in a paper produced by Dr. Kikuchi and Dr. Teoh of this Unit.

(b) "The Management of Caustic Soda Burns of the Oesophagus" is being intensively studied at the moment in an attempt to minimise the very disabling strictures that so commonly follow. Dr. Kunaratnam of this Unit is co-ordinating this study, which will continue during 1965.

Patients Treated 1964:

| | | | |
|------------------------|-----|--------|--------|
| Inpatient | | 1963 | 1964 |
| Day Patients (lodgers) | ... | 701 | 696 |
| Outpatient — New cases | ... | 8,328 | 7,622 |
| Repeat | ... | 18,943 | 18,252 |
| Operations — Major | ... | 1,412 | 1,223 |
| Minor | ... | 3,145 | 2,670 |
| Emergencies | ... | 172 | 211 |
| Injections | ... | 3,160 | 2,653 |
| Dressings | ... | 1,862 | 2,036 |

PÆDIATRIC UNIT (WEST)

This Unit is the University Department of Pædiatrics is responsible for the running of the West Wing of the Mistri Block which comprises of four wards providing accommodation for 141 beds.

The Professor with an Assistant Lecturer is responsible for the running of the Neonatal Unit at the Maternity Hospital,

All very ill newborns are transferred to the Department in Mistri Wing so that the Department has to deal with quite a large load of extremely ill newborns.

Staff.—The Senior staff consists of: one Professor who is Head of the Department, one Senior Lecturer, two Lecturers, one Assistant Lecturer.

The above is the full complement of the University Staff Department. The Senior Lecturer has been away on study leave for three months during the year and will not be back till March 1965. One of the Lecturers is also attached to the newly created Cardiovascular Laboratory in General Hospital.

Outpatient Clinics.—The number of new and repeat outpatients seen in the Clinics were as follows:

| | | 1963 | 1964 |
|-----------|-----|--------|--------|
| New Cases | ... | 4,047 | 4,904 |
| Repeats | ... | 18,662 | 16,202 |

Admissions.—As with previous years, the largest number of patients were those with gastro-enteritis, upper respiratory tract infections and pneumonias.

Mortality.—The total number of deaths was 280, giving a mortality rate of 4.4 per cent, approximately the same as in 1963.

The major causes of death are: Pneumonia, Congenital heart disease, Kernicterus, Gastro-enteritis.

Pneumonia and gastro-enteritis mortality rates can only be reduced if parents can be induced to bring their infants earlier to hospital for treatment as many of the patients are brought into hospital in a moribund state.

There were 29 kernicterus deaths compared with 34 in 1963 but efforts are still being made to reduce this even further by genetic studies so that families at risk can be warned before-hand to bring their future newborn infants to the pædiatrician the moment they are born so that they can be observed daily for possible exchange transfusion, and that parents also warned not to give these babies drugs both traditional and Western unless seen by a doctor. At present a simple rapid method for erythrocytic G6PD estimation is being evolved so that all newborns in K.K.H. are screened and deficient babies are kept back for observation for one week. Furthermore, such families at risk receive a letter which parents are to hand over to the obstetrician warning them of the risk the newborn may encounter and refer such infants to the pædiatrician. It is to be hoped that as a result of such research the incidence of kernicterus may be further reduced. Kernicterus is again the main cause of death in infants under one week of age admitted to the Unit.

Congenital heart disease again claims a large proportion of infants. The establishment of open heart surgery in the Hospital will definitely salvage some of these infants.

There was an outbreak of Viral Hæmorrhagic Fever in 1964. There were eight deaths out of 80 cases, i.e. a mortality rate of 10 per cent. In collaboration with the Department of Bacteriology, University of Singapore, the patients who died had autopsy and serological results typical of hæmorrhagic fever. Therefore, this disease which was reported previously in Singapore as not causing any mortality in children is erroneous.

Research.—The Department is involved in the following research projects:

- (1) Neonatal hyperbilirubinæmia and kernicterus. It has been found that the causes of kernicterus in Singapore are different from those in other Western countries and that erythrocytic glucose-6-phosphatase deficiency and liver immaturity are the commonest causes. The type of food and drugs taken by the breast-feeding mother and given to the newborn are being studied with a view to elucidating the "triggers" for such hyperbilirubinæmia. It has also been shown by the Department that nearly 100 per cent of our local newborns are jaundiced in the first week of life and that serum bilirubin levels are high and last a longer time than their Western counterparts. The American Research Worker is still working in the Department.
- (2) The pathology and management of hyaline membrane disease with surface-acting inhalants and intravenous electrolyte solutions. A team of seven American research workers were in the Department for a period of about six months working on the project.
- (3) The work on mental deficiency, its causes and management, continue and the Department is closely associated with the Association for the Mentally Retarded in the training of such patients.
- (4) Work on chromosomal abnormalities continues.
- (5) Genetic counselling is now provided for parents of children with genetic diseases as a result of research on genetic problems in this country.
- (6) Relationship of Hb.H.Thalassæmia and Hb. Bart's and a new genetic theory is advanced from the Department.
- (7) The management of Hb.H.Thalassæmia in pregnancy.
- (8) The work on the obstructive jaundice syndrome in infancy continues.
- (9) Xg linkage studies in Chinese in Singapore.
- (10) Congenital heart disease in Singapore.
- (11) Severe type of hæmorrhagic fever and its management.

Laboratory Staff.—The Laboratory is a research laboratory which has developed techniques in the study of various diseases in pædiatrics including human genetics. The Staff consists of a trained laboratory technician and two laboratory technicians in training. As a result of the special investigations carried out by the Research Laboratory, a "routine" service is also provided for other Units in General Hospital, K.K. Hospital, Tan Tock Seng Hospital, Thomson Road Hospital as well as hospitals in Sabah, Sarawak and Johore Bahru. The trained Laboratory technician has been away for three months in 1964 and will be away for another three months in 1965 in U.K. on a University Scholarship to study further techniques in pædiatrics and genetic research.

The type and number of "routine" investigations carried out include following (Table 77):

Table 77

ROUTINE SPECIAL LAB. INVESTIGATIONS

| Tests | No. in 1963 | No. in 1964 |
|--|-------------|-------------|
| Micro blood sugar | ... 503 | 542 |
| Micro serum bilirubin | ... 773 | 1,477 |
| Alkali resistance of Hb. | ... 993 | 1,021 |
| Erythrocytic glucose-6-phosphate dehydrogenase | 963 | 982 |
| Hb. electrophoresis (paper) | ... 983 | 1,011 |
| Hb. electrophoresis (starch) | ... Nil | 239 |
| Hb. H. inclusion bodies | ... 843 | 897 |
| Buccal sexing | ... 366 | 57 |
| Chromosome culture | ... Nil | 73 |

It will be seen that the work has generally increased and that starch electrophoresis and chromosome culture have also been offered as a "routine" service.

PÆDIATRIC UNIT (EAST)

The Unit is the Government Pædiatric Department which has four wards with a bed complement of 141. One of the four wards is the admission ward with 21 beds.

Staff.—The senior medical staff was reduced to three when the head of the Unit resigned in October.

Outpatient Clinics.—The attendances at the Unit's outpatient department remained large. The large numbers at the Unit's outpatients department was because of rapid turnover and patients were discharged who were not completely recovered from their illness.

The striking difference between the 1963 and 1964 figures was the significant increase in the referral cases: 1,057 in 1963 to 2,531 in 1964.

The number of new outpatients was 3,608 and re-attendances 15,366.

Admissions.—The admission rate continued to be high this year for the limited number of pædiatric beds. Although comparing with 1963's figures, it showed a slight drop from 6,576 to 5,481, yet the latter figure still showed an average admission rate of 30 patients per admission day.

The disturbing factor was the high re-admission rate which accounted for 1,803 cases out of 5,468, i.e. about 33 per cent of total admission.

Gastrœnteritis again topped the list as the commonest cause of admission. The mortality rate of this disease had also dropped.

The incidence of Miliary Tuberculosis and Tuberculosis Meningitis had dropped since the introduction of mass B.C.G. inoculations. But unfortunately they were still present and carried a high mortality and morbidity rate. Although many of the children suffering from these two diseases did not receive B.C.G. at birth, yet there were a few cases who had been B.C.G. and yet they contacted these diseases in the severe form.

There was epidemic of Hæmorrhagic Fever in Singapore with quite a number of cases admitted in shock. Since this disease and that of encephalitis are caused by viruses which are transmitted by mosquito bites and there are no curative measures against them, the solution would be adequate control of mosquitoes in the island.

Acute leukæmia again headed the list in malignancies in infant and childhood. The effect of I.V. Methotrexate on the survival rate of affected children was under study. One child had survived for more than two years on this drug. Most other cases perished in six months to one year.

Congenital heart disease headed the list of congenital abnormalities.

The percentage mortality against admission had dropped again this year from 4.36 per cent in 1963 to 4.08 per cent in 1964. The shortage of senior medical staff and experienced medical officers in the Unit would be factors working against the maintenance or improvement of standard in the Unit.

ADMISSIONS, DISCHARGES AND DEATHS EACH MONTH OF 1964

| | ADMISSION | | | DISCHARGE Total | DEATHS | |
|----------------------------|-----------|---------------|-------|--------------------|--------|---------------|
| | New | Re-attendance | Total | | Total | Under 24 hrs. |
| January ... | 360 | 179 | 539 | 528 | 17 | 4 |
| February ... | 227 | 107 | 334 | 345 | 16 | 6 |
| March ... | 378 | 146 | 524 | 480 | 15 | 8 |
| April ... | 348 | 186 | 534 | 498 | 19 | 13 |
| May ... | 420 | 187 | 607 | 591 | 29 | 12 |
| June ... | 301 | 148 | 449 | 412 | 24 | 12 |
| July ... | 288 | 152 | 440 | 458 | 14 | 6 |
| August ... | 247 | 139 | 386 | 363 | 22 | 12 |
| September ... | 228 | 146 | 374 | 335 | 23 | 8 |
| October ... | 295 | 155 | 450 | 410 | 12 | 6 |
| November ... | 295 | 152 | 447 | 431 | 12 | 7 |
| December ... | 278 | 106 | 384 | 371 | 21 | 6 |
| Total ... | 3,665 | 1,803 | 5,468 | 5,222 | 224 | 100 |
| Total admissions: | ... | | | 5,468 | | |
| Transfer to other Units: | ... | | | 506 | | |
| | | | | 4,962 | | |
| Transfer from other Units: | ... | | | 519 | | |
| Total cases: | ... | | | 5,481 | | |
| Percentage mortality: | 4.08% | | | | | |

Research.—The following is a list of research projects undertaken in the Unit:

1. The Study of Hæmorrhagic Fever with regards to
 - (a) Level of Serum Isocitric Dehydrogenase Enzyme — relationship to liver function.
 - (b) Level of Serum α Hydroxybutyric Dehydrogenase — relationship to heart muscle.
2. The Response of Cerebral Palsied Children to Valium in relationship to:
 - (a) Emotional stability;
 - (b) Improved performance;
 - (c) Relaxation of spastic muscles.
3. The Study of Methæmoglobinæmia in Infancy:
 - (a) The reason for the high incidence among
 - (i) infants below the age of two months;
 - (ii) infants suffering from gastrœnteritis;
 - (b) Level of methæmoglobin reductase in infants of various age groups.
4. The incidence of Tuberculosis particularly Miliary Tuberculosis and Tuberculosis Meningitis among
 - (a) patients who had B.C.G.;
 - (b) patients without B.C.G.
5. To Study the Effect of Intravenous Methotraxate on cases of Acute Leukæmia in children from the point of view of:
 - (a) remission where other forms of therapy have failed and the length of such remission;
 - (b) survival rate.
6. To Study the Causes of Jaundice in the Newborn in the first two weeks of life with special reference to enzyme deficiencies.
7. To Study the cases of Cretinism with regards to physical and mental development.
8. The long term study of congenital Heart Disease and Rheumatic Heart Disease.
9. Study of Obstructive Jaundice in Infants:
 - (a) Aetiology, from clinical, biochemical and histological data;
 - (b) Response of disease to corticosteroid.

Laboratory.—There were three laboratory technicians attached to the Pædiatric Unit (East) Laboratory. They served both the East and West Units and had so far did a very good job. The volume of work had again increased as can be seen on the figures provided below. The epidemic of Hæmorrhagic Fever last year probably was responsible for some of the increase.

EXAMINATIONS DONE IN THE PÆDIATRIC (EAST) LABORATORY

| | 1963 | 1964 |
|-----------------------|--------|--------|
| Blood: | | |
| Physiological | 36,027 | 38,409 |
| Micro B.S.R. | 2,737 | 3,354 |
| Urine | 4,799 | 6,018 |
| Stool | 378 | 474 |
| Cerebral spinal fluid | 65 | 403 |
| Smears and scrapings | 135 | 87 |
| Total | 43,841 | 48,745 |

ANÆSTHETIC UNIT

Staff.—The staff consisted of 12 full-time Anæsthetists, two part-time Anæsthetists.

Activities.—Unit Meetings were held every Saturday morning. Administrative problems, morbidity and mortality discussions are the majority considerations. Anæsthetic films and guest lecturers were occasionally given.

Dr. Ganendran continues to manage the majority of cases of severe Tetanus in the hospital.

Resuscitation and management of poisonings and respiratory deficiencies were undertaken in the various Wards of the General Hospital whenever the requests were made.

Trial runs of 'open heart' surgery — using dogs as patients were undertaken by Dr. A. Ganendran and E. O. Goonetilleke during the year whenever freedom from routine anæsthetists permitted. Good progress was made and this type of surgery poised for introduction to the human patient.

ANALYSIS OF ANÆSTHETICS ADMINISTERED IN 1964

The following is an analysis of the anæsthetics administered for the year:

| Unit | General | Spinal | Epidural | Caudal | Local | Total |
|---------------|---------|--------|----------|--------|-------|-------|
| "A" Theatre | 3,326 | 704 | 18 | 283 | 2,852 | 7,183 |
| "B" Theatre | 2,921 | 478 | 14 | 111 | 3,000 | 6,524 |
| "C" Theatre | 2,557 | 67 | — | 30 | 4,461 | 7,115 |
| E.N.T. | 889 | — | — | — | 2,503 | 3,392 |
| Eye | 443 | — | — | — | — | 443 |
| Dental | 4,964 | — | — | — | — | 4,964 |
| X-Ray | 64 | — | — | — | — | 64 |
| K.K. Hospital | 3,919 | 113 | 10 | 314 | 1,293 | 5,649 |

PHYSIOTHERAPY DEPARTMENT

1964 started off badly with the number of staff at its lowest. However, the staff situation improved gradually from March with the return of all the four scholarship trainees and the appointment of four temporary officers.

The present Physiotherapy Establishment is as follows:

In General Hospital:

| | | |
|------------------------|-------------------------|----|
| Senior Physiotherapist | ... | 1 |
| Physiotherapists | ... | 14 |
| Tan Tock Seng Hospital | ... | 3 |
| Thomson Road Hospital | ... | 1 |
| Chronic Sick Hospital | ... | 1 |
| Total: | 1 senior post | |
| | 19 physiotherapy posts. | |

The improved staff situation enabled more expansion of Physiotherapy Services both within General Hospital and outside:

Physiotherapy Service to St. Andrew's Orthopædic Hospital was increased from two to three days a week (full day).

Physiotherapy Service was started in the Chronic Sick Hospital in May 1964 beginning with two mornings a week and progressed to three mornings a week.

Physiotherapy Service resumed again at the Trafalgar Home from May 1964 after a break in late 1963. A physiotherapist visits the Home two afternoons a week.

Number of persons treated was as follows:

| | | | | |
|-----------------------|-----|---------|---------|---------|
| All Hospitals | | 1962 | 1963 | 1964 |
| New Cases | ... | 8,850 | 10,111 | 11,771 |
| Repetitions | ... | 119,999 | 116,157 | 120,816 |
| General Hospital only | | | | |
| New Cases | ... | — | 6,904 | 7,418 |
| Repetitions | ... | — | 78,143 | 80,710 |

In spite of the two civil disturbances which prevented many outpatients turning up for treatment, there is an increased number of New Cases and Repetitions over the previous years.

Two Physiotherapy Aids were sent from Trafalgar Home for six months to observe Physiotherapy work in General Hospital applicable to cases dealt with in Trafalgar Home. They are now working in Trafalgar Home under the supervision of a physiotherapist from General Hospital.

The Gymnasium in Ward 62 was closed in December 1964 and all cases treated there are being done in the Physiotherapy Department. The change over was carried out smoothly without any trouble at all.

OCCUPATIONAL THERAPY DEPARTMENT

Activities

Visits to long-term patients in Kandang Kerbau Hospital were stopped since March as patients were not always present when the Occupational Therapist from the General Hospital paid her weekly visit.

The staff on one of their visits to the St. Andrew's Orthopædic hospital organised a picnic at a bungalow in Tanah Merah for 15 children, and with the help of the hospital staff, packed lunches were brought along and an enjoyable time was had by the children.

At the Spastic Centre, regular visits were made by staff and the standard of articles done by the children has improved to such an extent that one of the articles, a plastic seated stool, displayed in the Combined Social Services Exhibition and Sale of Works at the Victoria Memorial Hall, won first prize. This stool was later bought for \$100.

The annual sale was held as usual on 1st November. About \$1,279.60 was collected.

In early December, a scheme for training of the disabled was introduced in the Hospital and Trafalgar Home. Now for these disabled patients of the hospitals are supported by the Ministry of Labour on a \$50 monthly allowance to be instructed in certain crafts for a period of 6-9 months. The Occupational Therapists also test these trainees for work-tolerance, initiative, educational capabilities, neatness, for future employment in factories or firms.

The average number of patients treated by staff at General Hospital is 300.

SUMMARY OF WORK

| | New Cases | Repeats |
|------------------------------|-----------|---------|
| General Hospital | 984 | 19,717 |
| S.A.O.H. | 78 | 2,208 |
| Spastic Children Centre | 4 | 1,404 |
| Thomson Road Hospital | 358 | 7,840 |
| Tan Tock Seng Hospital | 491 | 23,489 |
| Woodbridge Hospital (Female) | 279 | 30,282 |
| Woodbridge Hospital (Male) | 208 | 30,449 |
| Trafalgar Home | 98 | 33,177 |
| Chronic Sick Hospital | 20 | 1,472 |

CASH FROM SALES OF ARTICLES

| | S | c. |
|------------------------------|-------|----|
| General Hospital | 4,639 | 90 |
| Thomson Road Hospital | 1,667 | 05 |
| Tan Tock Seng Hospital | 5,542 | 20 |
| Woodbridge Hospital (Female) | 2,557 | 40 |
| Woodbridge Hospital (Male) | 458 | 65 |
| | 3,631 | 20 |
| Chronic Sick Hospital | 168 | 60 |
| Trafalgar Home | 5,241 | 40 |

ALMONER'S DEPARTMENT

Staff

Acute Shortage of Staff.—There has been shortage of Almoners not only in General Hospital, but in the Service as a whole.

If the situation is not changed in the next year, it may be necessary to contract down the service and to use the remaining Almoners in a few hospitals to provide a service of food standard, leaving some hospitals without any Almoners at all.

Liaison with Voluntary Organisations

Cheshire Home.—The Almoner of the Chronic Sick Hospital is on the Cheshire Homes Admission Committee and through her offices was able to admit eight patients to Cheshire Home from General Hospital.

Blind Association.—The Almoner in the Ophthalmic Unit has worked in close co-operation with the Welfare Officer of the Blind Association and jointly they arranged for seventeen patients to be admitted to Woodlands Temple.

The Deaf Association.—The Almoner of the Ear, Nose and Throat Unit is a member of the Executive Committee as well as on the Case Committee and has been able to send suitable children for training, assist with purchase of hearing aids.

Spastic Association.—The Spastic Register is kept by the Almoner, Pædiatric Unit and she is a member of the Executive Committee as well as the Case Committee and works in close liaison with the Matron of the Day Centre for spastics.

Singapore Children's Society.—The Pædiatric Unit Almoner is a member of the Convalescent Home Committee and works in close liaison with the Hon. Medical Officer and the Matron, so that suitable children are sent to the Convalescent Home from the Pædiatric Unit.

Singapore Association for Retarded Children.—The Senior Almoner is a member of the Ah Hood Road Centre Committee, as well as the Outram Road Day Care Centre Committee and works in close liaison with these Committees so that mentally retarded children from General Hospital can use all the facilities that are available for them in Singapore.

Society for Aid to the Paralysed.—The Senior Almoner is a member of the Executive Committee of this newly formed Society and is at present responsible for a Register of such patients, as most of the patients are known to Almoners in various hospitals.

Problems

(a) *The Chronic Sick.*—This is the most acute problem that the Almoners have to deal with, and they have had to devise various *ad hoc* programmes to deal with it.

There are at present 23 patients in 319H Aljunied Road and 20 patients in 218F Aljunied Road.

Both are private Homes 'run' by caretakers and the Almoners are responsible for payment for the patients' keep, as well as for their welfare. The district nurse attends regularly. Those whose condition deteriorates are admitted to the chronic wards when a bed is available, and a patient who is ambulant may be discharged from the chronic wards to these Homes.

Woodlands Temple.—In 1964, 46 patients were admitted to Woodlands Temple from General Hospital. Members of Hoc 'H' have been most helpful in providing blankets and other comforts for these patients. They also collect and distribute rations from the Catholic Welfare Services to patients in this Temple. Patients not on Social Welfare Relief are helped with their keep in Woodlands Temple from the various Funds available in General Hospital.

(b) *Mentally Retarded Children.*—This problem is still an acute one although the pressure is not as great as it used to be. The Social Welfare Department gave a grant of \$28,800 to be used for fostering of mentally retarded children, as well as to maintain mentally retarded children in their own homes.

In 1964 22 M.D. children were fostered out, 2 M.D. children were admitted to the mental defective wards and 93 M.D. children were assisted with family grants. A total of \$28,053 was spent for fostering and maintenance.

Funds

(a) *Public Assistance Fares*.—\$30,000 was spent on fares for patients who are on Public Assistance so that they could attend for treatment at General Hospital as well as at Jalan Teck Whye, Pegu Road, Kallang, Paya Lebar and Maxwell Road Outpatient Dispensaries.

(b) *Government Welfare Vote Fund*.—\$10,100 was spent on fares for patients not on Public Assistance but who required assistance to attend at General Hospital or the Outpatient Dispensaries.

(c) *M.D. Vote*.—A total vote of \$28,800 was approved for payment of foster mothers of mental defective children as well as for family grants.

\$10,320 was spent on fostering and \$17,733 was spent on family grants.

(d) *James Craig Trust Fund*.—\$9,441.80 was spent on the "care, maintenance and support of patients". The greater part of this Fund was used to maintain patients at the various 'Temples' and 'Homes'.

(e) *Appliance Fund*.—The Almoner, Orthopædic Unit uses this Fund to supply free appliances to patients on Social Welfare Relief and part payment for those who are unable to meet the total cost.

(f) *Almoner's Samaritan Fund*.—The Fund is used to meet any contingency for which no Government Funds are available. The largest donation to this Fund was \$1,000 which was made by Dato Lee Kong Chian.

DIETETIC DEPARTMENT

All six posts for Dietitians at the various Hospitals were filled by August 1964, and the appointment of a second Steward at General Hospital left only one vacancy for an assistant Steward at Middleton Hospital among the posts for Stewards.

The average daily number of diets and their costs are shown below:

| | | Average No. | Average cost |
|----------------------|-----|----------------|-----------------|
| (i) Paying A (1st) | ... | 41 | \$3.17 |
| (ii) Paying B (2nd) | ... | 98 | \$2.46 |
| (iii) Free (Adult) | ... | 662 | \$1.12 |
| (iv) Free (Children) | ... | 205 | .95 |

MEDICAL RECORDS DEPARTMENT

Accommodation for a Central Records Registry.—The present building which is on lease from the University of Singapore is inadequate as a result of which the old case notes for period 1946 to 1954 had to be temporarily stored at the Maxwell Road Outpatient Dispensing building.

I.C.T. 80 Column Punch Card Equipment.—I.C.T. punch card machines (a hand punch, an electrically operated verifier and a Sorter Counter) were acquired on rental basis for the analysis of admission—discharge data, T.B. Control and medical research work. In the following years, with the availability of full time operators and the implementation of the Medical Records Service it is hoped to undertake analysis of data from all hospitals.

Research.—This office supplied information and statistical data to medical consultants of both the University and Government Units of the hospital for research purposes on the following diseases: Carcinoma of the Liver, Thyroid, Tetanus, infective Hepatitis, Amœbic Hepatitis, Tuberculosis Liver, Liver Abscess, Choletithiasis, Polycystic Liver Hydatid Cyst of Liver, Rheumatic Diseases, Chorea, Endocarditis, Myocarditis, accidents—Poisonings and Violence, Leukæmia, Diverticulitis, Carcinoma Colon, Carcinoma Rectum, Ulcerative Colitis, Crohn's Disease (Regional Ileitis), Structure of Oesophagus due to caustic soda poisonings, Lymphosarcoma and Reticulosarcoma, Hodgkin's Disease, Malignant and Non-malignant Tumours and Dysentery (All forms).

Medical Reports Section.—This section of the Central Records Office dealt with approximately 4,034 medico-legal reports in 1964, in addition to 2,733 workmen compensation reports.

Medical Records Forms.—A number of forms were revised and new forms introduced during the year.

DENTAL CLINIC

The Dental Clinic, General Hospital, functions as a teaching School for the University of Singapore, a specialist unit and an Outpatient Clinic for adults and children.

Staff

The staff consists of two professors, two senior lecturers, eight lecturers and two assistant lecturers in dentistry; a senior dental surgeon and three dental surgeons.

General

Table 78 sets out the details of treatments carried out during the year 1964 and for the last 14 years. Table 79 gives the cases on an ethnic basis.

The total outpatient attendances for 1964 have since last year decreased by 14,350 to a total of 113,850 with a daily average of 379.64. The majority of cases received emergency treatment and the number of extractions has fallen further to 39,252. The number of dressings was reduced to 25,184 and less significant, was a decrease in Oral Surgery operations to 1,727. The institution of four general anæsthetic sessions weekly has allowed for the treatment of 4,869 children and extraction of 22,462 teeth, increases of 9.9 per cent and 24.3 per cent respectively over the figure for 1963. There being

57 students in the clinical years, the work in Conservative Dentistry shows an increase to 7,979, 3.1 per cent over the 1963 figures. The number of dentures provided has increased even further to 3,471 and it is heartening to note an increase in the number of partial dentures supplied. This indicates an increasing awareness of the need to conserve teeth.

A decrease in the number of daily attendances has been noted for February (due to the Chinese festive season and the Muslim fasting month) and for July, August and September. The falls during the latter months were due to the unsettled conditions following the riots and to some extent, the closure of the General Hospital's Outpatient Department.

During the disturbances in July a number of casualties required treatment by the Oral Surgery Unit but the number diminished in the September riots. A plan for mobilization of the Dental Services in future cases of emergency has been adopted.

The acute shortage of space has not been relieved. Although there is some liaison between surgical units of the General Hospital and the Oral Surgery unit, it would be of tremendous advantage if some beds may be allocated for oral surgical cases. At present both local and general anaesthetic cases are treated in the same operating theatre. This, together with the dental unit now forming a part of *E* Casualty Unit in the General Hospital will obtain recognition of the Hospital as a training unit for the Fellowship in Dental Surgery of the Royal Colleges of Surgeons.

Revenue

This has increased by \$1,239 from \$39,305 to \$40,544. A request that payment stamps be available for the collection of small payments is repeated to increase efficiency of the clerks/interpreters in the Admissions office.

Table 78

| Year | Total New Cases | Total Out-patients Attendances | Daily Average | Extractions | Oral Surgery Operations | Fillings | Dressings | Dentures | X-Rays | Revenue |
|------|-----------------|--------------------------------|---------------|-------------|-------------------------|----------|-----------|----------|--------|-----------|
| | | | | | | | | | | \$ c. |
| 1951 | 7,149 | 29,168 | 106.06 | 22,973 | .. | 3,490 | 12,556 | 1,457 | 3,571 | 29,125 65 |
| 1952 | 10,054 | 37,988 | 138.11 | 27,933 | .. | 5,913 | 10,223 | 1,223 | 4,498 | 31,126 67 |
| 1953 | 14,444 | 50,449 | 183.42 | 51,972 | .. | 6,006 | 31,604 | 1,726 | 6,298 | 44,535 59 |
| 1954 | 21,525 | 63,469 | 231.20 | 71,715 | .. | 6,859 | 44,641 | 2,092 | 6,596 | 53,842 84 |
| 1955 | 27,895 | 82,107 | 278.74 | 83,392 | 847 | 6,039 | 52,201 | 1,873 | 6,761 | 34,738 85 |
| 1956 | 32,547 | 99,004 | 334.47 | 82,175 | 898 | 6,741 | 63,338 | 2,348 | 9,137 | 36,341 94 |
| 1957 | 36,508 | 107,700 | 362.05 | 67,785 | 646 | 9,048 | 64,018 | 2,304 | 10,683 | 32,068 65 |
| 1958 | 25,770 | 87,293 | 291.03 | 53,701 | 755 | 5,277 | 23,315 | 2,025 | 15,498 | 21,954 50 |
| 1959 | 33,958 | 101,754 | 340.1 | 61,826 | 887 | 7,660 | 20,314 | 1,638 | 16,610 | 22,368 10 |
| 1960 | 42,948 | 112,211 | 375.87 | 83,259 | 978 | 7,165 | 18,855 | 1,809 | 17,696 | 25,077 25 |
| 1961 | 39,242 | 110,687 | 370.66 | 56,062 | 1,131 | 10,875 | 16,787 | 2,247 | 13,103 | 29,849 75 |
| 1962 | 40,082 | 115,838 | 390.03 | 59,144 | 1,438 | 7,251 | 24,982 | 2,941 | 14,205 | 35,034 10 |
| 1963 | 38,726 | 128,200 | 429.46 | 56,234 | 1,770 | 7,738 | 27,198 | 3,105 | 13,861 | 39,305 00 |
| 1964 | 33,194 | 113,850 | 379.64 | 39,252 | 1,727 | 7,979 | 25,184 | 3,471 | 15,677 | 40,544 00 |

Table 79

DENTAL CLINIC, GENERAL HOSPITAL
OUTPATIENTS—BY ETHNIC GROUPS

| Nationalities | NEW CASES | | | | RE-ATTENDANCES | | | |
|---|-----------|--------|----------|--------|----------------|--------|----------|--------|
| | Male | Female | Children | Total | Male | Female | Children | Total |
| Malays and Other Malaysians .. | 1,709 | 995 | 861 | 3,565 | 2,707 | 2,084 | 1,088 | 5,879 |
| Chinese | 8,538 | 9,007 | 9,322 | 26,867 | 21,077 | 31,829 | 14,746 | 67,652 |
| Indians, Pakistanis and Ceylonese | 1,564 | 625 | 537 | 2,726 | 4,054 | 1,863 | 960 | 6,877 |
| Others | 23 | 7 | 6 | 36 | 145 | 86 | 17 | 248 |
| Total | 11,834 | 10,634 | 10,726 | 33,194 | 27,983 | 35,862 | 16,811 | 80,656 |

Number of Dressings 25,184

Number of Injections 10,047

17. THOMSON ROAD GENERAL HOSPITAL

THE Hospital was completed in 1958 and consists of two ward blocks each of six floors providing accommodation for 396 beds. The staffed wards during the year were five in number having accommodation for 180 beds and were used exclusively for adult medical cases.

The Hospital was originally planned as a Hospital for the Chronic Sick. However, it will become a fully operational general hospital when the new extensions are completed. The extensions will provide for outpatient facilities, a surgical block and an X-ray Department. The extensions were completed in June and the following departments moved in in October: the Medical Records Office, the Follow-up Clinic, X-ray Department and Dispensary.

The Medical Superintendent of the Hospital was Dr. Seah Cheng Siang, who was also the Physician to the Medical Unit. On 1st September, 1964, Dr. H. F. Jackson was appointed as Medical Superintendent, thereby releasing Dr. Seah Cheng Siang to full-time duties as Physician to the Hospital.

Two Medical Officers of Senior Registrar grade formed the other senior medical staff of the Unit.

Construction of a new Nursing School for assistant nurses began in December 1964. In the meantime, assistant nurses continued to be trained in a vacant ward in the Hospital. 149 assistant nurses completed their training in the School during the year.

INPATIENTS

Until the Hospital has its own admitting unit patients for admission were made through the General Hospital and from the nearby outpatient dispensaries. Admissions through the General Hospital are made during two days out of every three days, and are accepted during the hours of 8 a.m. to 4 p.m. on the admitting days. Admissions are also made at any time for those patients who are referred to the Hospital from the nearby outpatient dispensaries.

A record of the patients in the year is as follows:

| | | |
|---|-----|--------|
| Staffed Beds | ... | 180 |
| Number of admissions | ... | 4,161 |
| Number of discharges | ... | 3,795 |
| Number of deaths | ... | 322 |
| Average daily bed occupancy | ... | 144 |
| Patient days | ... | 52,704 |
| Percentage of deaths to total discharges and deaths | ... | 7.8% |

OUTPATIENTS CLINIC

This was conducted daily to (a) treat discharged patients; (b) assess and investigate patients referred by doctors both in Government service and in general practice. In addition, this clinic was responsible for the care of sick staff and their families,

The following table gives a racial and sex breakdown of both groups of patients:

TABLE 80

| Nationalities | NEW CASES | | | | RE-ATTENDANCES | | | |
|---|-----------|--------|-----------|-------|----------------|--------|-----------|--------|
| | Male | Female | Children* | Total | Male | Female | Children* | Total |
| Malays and Other Malaysians | 41 | 36 | 10 | 87 | 699 | 553 | 310 | 1,562 |
| Chinese | 351 | 385 | 38 | 774 | 6,114 | 6,320 | 507 | 12,941 |
| Indians, Pakistanis and Ceylonese | 133 | 64 | 15 | 212 | 1,785 | 861 | 241 | 2,887 |
| Others | 13 | 17 | 4 | 34 | 167 | 208 | 23 | 398 |
| Total .. | 538 | 502 | 67 | 1,107 | 8,765 | 7,942 | 1,081 | 17,788 |

*Under 12 years of age.

18. KANDANG KERBAU HOSPITAL (MATERNITY AND GYNAECOLOGY)

THE Kandang Kerbau Hospital is the only Government institution which provides for a maternity and gynaecology service in the State.

CLINICAL ADMINISTRATION

The bed-strength of the hospital was 443 and made-up as follows:

Obstetric beds — 314; 12 of these are set aside for isolation of “septic”, cases.

Gynæcological beds — 129.

There are 100 nursery beds or “cots” of which 42 are set aside for the Premature Baby Unit, but these are not included in the bed complement of the hospital as a separate admission procedure is not adopted for the babies placed in them. These babies are usually born of mothers delivered in the hospital.

There are 10 “recovery” beds attached to the gynaecological minor surgical theatre. These beds are also not included in the official bed complement.

The hospital is organised into three units: the Government *A* and *B* Units and the University Training Unit. The distribution of beds is as follows:

| | OBSTETRICS | | GYNAECOLOGY | |
|--------------------------|------------|------|-------------|------|
| | Wards | Beds | Wards | Beds |
| University Training Unit | ... 7 & 8 | 52 | 17 | 27 |
| Government Unit ‘A’ | ... 3 & 4 | 48 | 16 & 18 | 42 |
| Government Unit ‘B’ | ... 1 & 2 | 48 | 15 & 18 | 46 |
| <i>B</i> Class Wards | ... 11 | 28 | 20 | 8 |
| <i>A</i> Class Wards | ... 19 | 12 | 20 | 6 |
| Maternity Home Unit | ... 5 & 6 | 126 | | |

The Government *A* and *B* Units are headed by Mr. T. H. Lean, M.B., F.R.C.S.(G), F.R.A.C.S., F.R.C.O.G. and Dr. S. M. Goon, M.B., M.R.C.O.G. respectively and are also responsible for the consultant cover of the fourth unit within the hospital viz: the Maternity Home Unit which technically is run by the Nursing and Midwifery Staff of the hospital and which was responsible for the bulk of the normal deliveries within the hospital. This bulk constituted about 65 per cent of the total hospital deliveries in the year under review.

Staff.—The medical staff consisted of two consultants, two Senior Registrars and an average of 15 Medical Officers. There were many resignations of doctors during the year and the position of medical staff has always been acute due to the fact that the 22 posts on the establishment could not be filled for obvious reasons,

Committees.—The Post-graduate Committee was responsible for the organising of clinical conferences, peri-natal and maternal mortality reviews, courses of post-graduate lectures, clinical symposia and panel discussions. This Committee was also to be responsible for research programmes in the hospital and the maintenance of the hospital medical library.

The Cancer Committee was responsible for all patients with female genital cancer seen in the hospital, and the maintenance of a Female Genital Cancer Registry. The social aspects of such cases had not been overlooked for the Almoner of the hospital was a member of this committee. The satisfying aspect of the work of this committee is the fine liaison between the Gynæcologists of the hospital and the Radiotherapist.

Two other committees which assisted in the clinical management of the hospital were the Surgical Supplies Committee and the Drugs Advisory Committee.

INPATIENTS

Admissions.—(a) The total number of admissions for the year was 50,876 of which 44,108 were maternity and 6,768 were gynæcological as against 50,483 for last year of which 44,329 were maternity and 6,154 were gynæcological.

(b) The average daily number of patients was 444.

Maternity.—(a) The number of admissions for the year was 44,108 and the deliveries were 39,598 as against 44,329 with 39,436 for last year.

(b) The maternal deaths were 24 or 0.5 per thousand as compared with 0.6 per thousand last year.

Gynæcological.—(a) There were 6,768 admissions as against 6,154 for 1963.

(b) The number of deaths was 40 as against 45 for the previous year.

(c) There were 11,523 operations performed of which 6,336 were on inpatients and 5,187 were on outpatients.

(d) The operations performed were chiefly Cæsareans, hysterectomies, colporrhapines, dilatation and curettage, cautery of cervix, myomectomies and sterilization.

OUTPATIENTS

Ante-natal and Gynæcological Outpatients' Departments.—(a) The total number of attendances was 105,674 of which 72,860 were ante-natal and 32,814 gynæcological.

(b) Of the 105,674, 31,530 were new cases and 74,144 repetitions.

(c) Special clinics were held in the afternoons, during week days.

Post-natal Clinic.—The number of mothers who attended the clinic was 19,718 and babies 18,329 as against 25,801 and 23,094 for 1963 respectively.

PREMATURE BABY UNIT

The staff comprised the Professor of Pædiatrics, and an Assistant Lecturer in Pædiatrics. There has therefore been a reduction of one compared to the previous year. This medical staff of two is responsible for the following wards:

- (a) Premature Nurseries one and two;
- (b) Lying-in Wards one and two, three and four, five and six, seven, eleven and nineteen.

The medical staff also sees newborns referred for consultation in the post-natal clinic every morning and in addition runs a follow-up medical out-patients clinic on two afternoons a week.

An American team of doctors and science personnel was attached to the Department under the International Co-operation for Medical Research Training from the Hooper Foundation at the Medical Centre in San Francisco, to carry out observations on pulmonary hyaline disease in newborns and also to assess the efficacy of a surface active substance in the treatment of the disease. The scheme was of great benefit to both the team and the local staff, and preliminary results show that the mortality rate from the disease was reduced during the period when this therapeutic substance was used. The Head would like to express his deep appreciation of the ready assistance from the Ministry of Health in this project. The team has now left and has presented the Hospital with four incubators.

THE DOMICILIARY DELIVERY SERVICE

As usual this service continued the training of medical students, general trained nurses and pupil midwives in the domiciliary field. The service was supervised by a Sister assisted by three staff nurses midwives and 30 trained midwives.

A total of 1,500 cases in labour were attended, of which 86 cases were transferred to hospital due to foetal or maternal reasons and 1,414 cases were delivered in their homes. Puerperal visits paid by staff to patient in their homes were 11,481, including ante-natal and assessment visits.

THE DOMICILIARY AFTER-CARE SERVICE

The After-care Service looked after mothers and babies discharged from hospital without 36 hours of delivery in the homes. During the year 10,009 cases were carried for and the number of visits paid by the staff were 68,993.

EVENTS DURING THE YEAR

Certain events need to be recorded.

On the re-organisation of the Outpatient Services the Outpatient Dispensary for women and children which occupied an out-building was closed on 1st August, 1964. The building has since been put to use for a post-natal clinic, the Family Planning Unit and the Cytology (Cancer Screening) Laboratory.

A start has been made to provide a cytological service for the hospital. A doctor has been sent for post-graduate training in the United States.

The unfortunate racial riots of July and September placed a heavy strains on the hospital and those of its staff who man it during the curfews. Although the hospital was not receiving casualties it had to continue to deal with an increased number of births. Mothers were brought in by police vans and by the fire-brigade ambulances (which normally deal with accidents).

Charges were made for deliveries undertaken in 'C' Class wards where these were performed free of charge previously. The charges were at the rate of \$10 for Singapore citizens and \$50 for non-Singapore citizens. It is too early to predict the effect of these charges on the numbers of deliveries which will be undertaken by the hospital in the future.

19. MIDDLETON HOSPITAL (INFECTIOUS DISEASES)

THE Middleton Hospital is the hospital for the treatment of infectious diseases. It has accommodation for 250 patients. It is one of the oldest of the hospitals in use having been built in 1913. For most of its existence it was under the administration of the former City Council Health Department. In 1960 it was brought into the fold of the Government Medical Services.

The Medical Superintendent was Dr. Leong Kwok Wah, who was confirmed in his appointment on 30th May, 1964. He was assisted by a part-time Medical Officer.

Singapore has been relatively free of the major infectious diseases. The commonly occurring cases admitted to the hospital are the minor infectious diseases such as chicken-pox and measles. The presence of diphtheria, the dysenteries, typhoid fever and the continued outbreaks of cholera are indications of the ever present dangers.

The list of the more important infectious diseases as seen in the hospital in the last 10 years is given in the following table 81.

Table 81
ADMISSIONS OF THE MORE IMPORTANT INFECTIOUS
DISEASES DURING THE LAST 10 YEARS

| | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Amœbic | | | | | | | | | | |
| Dysentery .. | 136 | 126 | 197 | 156 | 112 | 249 | 261 | 285 | 257 | 328 |
| Bacillary | | | | | | | | | | |
| Dysentery .. | 17 | 26 | 74 | 60 | 36 | 70 | 96 | 118 | 152 | 144 |
| Chicken-pox .. | 1,769 | 1,488 | 1,039 | 472 | 987 | 1,453 | 975 | 1,249 | 1,221 | 701 |
| Clinical | | | | | | | | | | |
| Dysentery .. | 35 | 65 | 150 | 92 | 68 | 161 | 224 | 219 | 235 | 215 |
| Cerebro-spinal | | | | | | | | | | |
| Meningitis .. | .. | .. | .. | 4 | .. | .. | .. | 1 | .. | .. |
| Cholera, El Tor | .. | .. | .. | .. | .. | .. | .. | .. | 27 | 23 |
| Diphtheria .. | 460 | 552 | 712 | 547 | 519 | 642 | 587 | 353 | 394 | 204 |
| Erysipelas .. | .. | 2 | 3 | 1 | .. | 3 | .. | 3 | .. | 1 |
| Measles .. | 200 | 301 | 153 | 357 | 146 | 178 | 318 | 403 | 315 | 283 |
| Mumps .. | 54 | 52 | 14 | 43 | 47 | 55 | 47 | 42 | 50 | 29 |
| Pneumonia .. | .. | .. | .. | 1 | 4 | 3 | 1 | .. | 1 | 1 |
| Plague .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Poliomyelitis .. | 19 | 37 | 52 | 405 | 66 | 201 | 48 | 12 | 66 | 12 |
| Rubella .. | .. | 86 | 36 | 7 | 9 | 16 | 5 | 14 | 14 | 21 |
| Scarlet Fever .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Small-pox .. | .. | .. | .. | .. | 10 | .. | .. | .. | .. | .. |
| Tropical Typhus | .. | 1 | .. | 1 | .. | .. | .. | .. | 1 | 1 |
| Typhoid Fever | 114 | 76 | 118 | 127 | 160 | 174 | 155 | 103 | 169 | 120 |
| Whooping Cough | 5 | 85 | 30 | 38 | 15 | 39 | 23 | 37 | 9 | 14 |
| Other Diseases/ Carriers .. | 503 | 936 | 1,083 | 1,368 | 1,272 | 1,680 | 1,187 | 2,097 | 1,997 | 1,433 |
| Total .. | 3,312 | 3,851 | 3,662 | 3,679 | 3,451 | 4,924 | 3,927 | 4,936 | 4,908 | 3,530 |

Table 82

NUMBER OF ADMISSIONS, DAYS IN HOSPITAL AND DEATHS
BY ETHNIC GROUPS

| Ethnic Group | Re- main- ing No. of Patients (1963) | No. of Days in Hospital | Admit- ted of Patients | No. of Days in Hospital (1964) | Total No. of Patients | Total No. of Days in Hospital | Deaths |
|-----------------------|---|-------------------------------|---------------------------------|---|-----------------------------|--|-----------|
| Europeans .. | 1 | 43 | 4 | 21 | 5 | 64 | .. |
| Eurasians .. | 1 | 2 | 39 | 319 | 40 | 321 | .. |
| Chinese .. | 91 | 3,676 | 2,057 | 24,332 | 2,148 | 28,008 | 39 |
| Indians/Pakistanis .. | 8 | 38 | 891 | 8,508 | 899 | 8,546 | 5 |
| Malays .. | 15 | 192 | 483 | 5,638 | 498 | 5,830 | 7 |
| Javanese .. | 1 | 177 | 29 | 361 | 30 | 538 | .. |
| Others .. | .. | .. | 27 | 130 | 27 | 130 | .. |
| Total .. | 117 | 4,128 | 3,530 | 39,309 | 3,647 | 43,437 | 51 |

Table 83

ADMISSIONS, TRANSFERS AND DEATHS BY SEX GROUP

| Sex | Remaining 1963 | Admis- sions 1964 | Transfers | Deaths | Remaining 1964 | Death % |
|-----------------|-------------------|-------------------------|-----------|-----------|-------------------|--------------|
| Male .. | 57 | 2,105 | 20 | 23 | 86 | 1.06% |
| Female .. | 60 | 1,425 | 27 | 28 | 96 | 1.88% |
| Total .. | 117 | 3,530 | 47 | 51 | 182 | 2.94% |

Average daily number of patients = 127
Number of Hospital beds = 250

During the year there were 3,530 admissions and a total of 51 died, giving a mortality rate of 1.4 per cent.

Table 84

ADMISSIONS, DISCHARGES, TRANSFERS AND DEATHS BY DISEASE

| Diseases | Remaining on 31-12-63 | Admission | Discharge | Transfer to Other Hospital | Deaths | Remaining on 31-12-64 |
|---------------------------------------|--------------------------|--------------|--------------|-------------------------------|-----------|--------------------------|
| Amoebic Dysentery .. | 10 | 328 | 308 | 6 | 8 | 16 |
| Amoebic and Bacillary Dysentery .. | .. | 4 | 4 | .. | .. | .. |
| Bacillary Dysentery .. | 6 | 144 | 139 | 2 | 3 | 6 |
| Chicken-pox .. | .. | 701 | 656 | .. | 1 | 44 |
| Chicken-pox with Herpes Zoster .. | .. | 1 | 1 | .. | .. | .. |
| Clinical Dysentery .. | 6 | 215 | 214 | .. | 1 | 6 |
| Cholera El Tor .. | 2 | 23 | 21 | 2 | 2 | .. |
| Diphtheria .. | 23 | 204 | 189 | .. | 15 | 23 |
| Diphtheria, Cultural .. | 3 | 37 | 40 | .. | .. | .. |
| Encephalitis .. | 2 | .. | 1 | .. | .. | 1 |
| Erysipelas .. | .. | 1 | 1 | .. | .. | .. |
| Herpes Zoster .. | .. | 1 | 1 | .. | .. | .. |
| Infective Hepatitis .. | 1 | 8 | 8 | 1 | .. | .. |
| Influenza .. | .. | 55 | 55 | .. | .. | .. |
| Laryngo-tracheo-bronchitis .. | .. | 3 | 3 | .. | .. | .. |
| Measles .. | .. | 181 | 172 | 4 | .. | 5 |
| Measles with Broncho- pneumonia .. | .. | 98 | 89 | 2 | 7 | .. |
| Measles with Encephalitis .. | .. | 1 | .. | .. | 1 | .. |
| Measles with Gastro-enteritis .. | .. | 3 | 2 | .. | 1 | .. |
| Mumps .. | .. | 29 | 28 | .. | 1 | .. |
| Paratyphoid A .. | .. | 1 | 1 | .. | .. | .. |
| Paratyphoid B .. | .. | 1 | 1 | .. | .. | .. |
| Paratyphoid C .. | .. | 1 | 1 | .. | .. | .. |
| Poliomyelitis (Paralytic) .. | 23 | 12 | 27 | .. | .. | 8 |
| Post Poliomyelitis .. | 1 | 36 | 25 | .. | .. | 12 |
| Pulmonary Tuberculosis .. | .. | 4 | 2 | 2 | .. | .. |
| Rubella .. | .. | 21 | 21 | .. | .. | .. |
| Typhoid fever .. | 15 | 120 | 124 | 1 | 2 | 8 |
| Typhoid fever (relapse) .. | 1 | 1 | 2 | .. | .. | .. |
| Typhus (mite) .. | .. | 1 | 1 | .. | .. | .. |
| T.B. Meningitis .. | .. | 1 | 1 | .. | .. | .. |
| Whooping Cough .. | .. | 14 | 12 | 2 | .. | .. |
| Other diseases/carriers .. | 24 | 1,280 | 1,217 | 25 | 9 | 53 |
| Total .. | 117 | 3,530 | 3,367 | 47 | 51 | 182 |

CHOLERA, *EL TOR*

There were three outbreaks during the year. The organism responsible was an Ogawa Strain of *El Tor* Vibrio.

The first outbreak in January followed the discovery of a case in a 49 year old Chinese male living in Pasir Panjang. In this outbreak, three cases of cholera were confirmed.

The second outbreak occurred in April after a male Chinese aged 58 years also from Pasir Panjang was found to be suffering from cholera. There were 19 cases of confirmed cholera during the outbreak.

In the third outbreak in August, a cholera case was found in a 43 year old Chinese woman staying in Stanley Street.

Altogether 23 cases of cholera were confirmed during the year out of 370 suspected cholera cases referred to the Hospital. Many of the cases were in a state of circulatory collapse on admission. There were two deaths. One death occurred in a Chinese female aged 71 brought in a collapsed condition. She was an opium addict with severe malnutrition and pulmonary emphysema. The other fatality occurred in a 51 year old Malay man who died five days after admission from anuria with uræmia.

None of the cholera cases had been immunized during the six months prior to admission.

Cholera Carriers.—Seven cholera carriers were admitted during the year. Six were relatives of the cholera patients. The seventh was a Malay visitor from Trengganu who was found to be a carrier following routine stool examination of families of staff of the Trengganu General Hospital which was treating Cholera cases. As he had left the State when the stool result was known, the Trengganu Health Authorities informed the Ministry of Health in Singapore and he was traced and admitted to Middleton Hospital for investigation and treatment.

Table 85

CHOLERA

ADMISSIONS AND DEATHS — 1964

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---------------|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| Admissions .. | 2 | 1 | .. | 7 | 9 | 3 | .. | 1 | .. | .. | .. | .. | 23 |
| Deaths .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 2 |

DIPHTHERIA

204 cases were admitted during the year. Tracheotomy operation for respiratory obstruction was required in 24 cases and these of eight cases died, showing that these cases were brought in at a late stage of the disease.

There were 15 deaths, a mortality rate of 7.35 per cent.

There has been a fall in the number of diphtheria cases following legislation for the compulsory immunisation of children against diphtheria in 1962. This trend continued in 1964 but there was a slight increase in the number of cases at the end of the year.

Table 86

DIPHTHERIA

ADMISSIONS AND DEATHS FOR THE PAST 10 YEARS

| Year | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 |
|----------------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| Admissions .. | 460 | 552 | 712 | 548 | 519 | 642 | 587 | 353 | 394 | 204 |
| Deaths .. | 41 | 47 | 58 | 34 | 23 | 32 | 27 | 13 | 19 | 15 |
| Mortality Rate | 8.91% | 8.51% | 8.14% | 6.2% | 4.43% | 4.98% | 4.60% | 3.68% | 4.56% | 7.35% |

Table 87

MONTHLY DIPHTHERIA

ADMISSIONS, DEATHS FOR 1964

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---------------|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| Admissions .. | 23 | 19 | 15 | 20 | 8 | 12 | 15 | 22 | 8 | 16 | 25 | 21 | 204 |
| Deaths .. | 2 | 1 | .. | 1 | 1 | 1 | 1 | 3 | 3 | 1 | 1 | .. | 15 |

Table 88

DISTRIBUTION OF DIPHTHERIA BY MONTH AND LOCALITY

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|----------|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| Urban .. | 22 | 17 | 15 | 18 | 8 | 12 | 14 | 17 | 7 | 13 | 23 | 17 | 183 |
| Rural .. | 1 | 2 | .. | 2 | .. | .. | 1 | 5 | 1 | 3 | 2 | 4 | 21 |
| Total .. | 23 | 19 | 15 | 20 | 8 | 12 | 15 | 22 | 8 | 16 | 25 | 21 | 204 |

Table 89

DIPHTHERIA—ADMISSIONS AND DEATHS BY AGE AND SEX GROUP

| Age Group | | | ADMISSIONS | | Total Admissions | DEATHS | | Total Deaths |
|---------------|----|----|------------|-----|------------------|--------|----|--------------|
| | | | M. | F. | | M. | F. | |
| Under 1 year | .. | .. | 9 | 5 | 14 | 1 | .. | 1 |
| 1 year | .. | .. | 12 | 14 | 26 | .. | 1 | 1 |
| 2 years | .. | .. | 19 | 18 | 37 | 3 | 3 | 6 |
| 3 years | .. | .. | 14 | 14 | 28 | .. | 3 | 3 |
| 4 years | .. | .. | 7 | 9 | 16 | 1 | .. | 1 |
| 5 — 9 years | .. | .. | 14 | 30 | 44 | 2 | 1 | 3 |
| 10 — 14 years | .. | .. | 13 | 14 | 27 | .. | .. | .. |
| 15 — 19 years | .. | .. | .. | 7 | 7 | .. | .. | .. |
| 20 + | .. | .. | .. | 5 | 5 | .. | .. | .. |
| Total .. | | | 88 | 116 | 204 | 7 | 8 | 15 |

Table 90

DIPHTHERIA—ADMISSIONS AND DEATHS BY ETHNIC GROUP

| Ethnic Group | | | ADMISSIONS | | Total Admissions | DEATHS | | Total Deaths |
|----------------|----|----|------------|-----|------------------|--------|----|--------------|
| | | | M. | F. | | M. | F. | |
| Europeans | .. | .. | .. | .. | .. | .. | .. | .. |
| Eurasians | .. | .. | .. | 1 | 1 | .. | .. | .. |
| Chinese | .. | .. | 74 | 100 | 174 | 7 | 8 | 15 |
| Indians | .. | .. | 10 | 3 | 13 | .. | .. | .. |
| Malay-Javanese | .. | .. | 4 | 12 | 16 | .. | .. | .. |
| Others | .. | .. | .. | .. | .. | .. | .. | .. |
| Total .. | | | 88 | 116 | 204 | 7 | 8 | 15 |

Table 91

DIPHTHERIA—CLINICAL TYPES OF CASES

| Type | Admissions | Deaths |
|--------------------|------------|-----------|
| Laryngeal | 28 | 8 |
| Pharyngeal | 46 | 7 |
| Faucial | 93 | |
| Nasal | 30 | |
| Aural | 6 | |
| Cutaneous | 1 | |
| Oral | .. | |
| Total .. | 204 | 15 |

Table 92

DIPHTHERIA — TRACHEOSTOMY OPERATIONS

| | | |
|--|-----|--------|
| Number of Tracheostomies done | ... | 24 |
| Percentage of cases requiring Tracheostomies | ... | 11.76% |
| Number of deaths after Tracheostomy | ... | 8 |
| Case fatality after Tracheostomy | ... | 33.3 % |

Diphtheria Carriers.—A total of 37 carriers discovered among diphtheria contacts were admitted for isolation and treatment.

Acute Anterior Poliomyelitis.—12 cases of Poliomyelitis were admitted during the year. There was no death. It is hoped that the routine immunization of children with oral sabin vaccine started in 1962 will help in the control of Poliomyelitis.

36 cases of post polio cases were also admitted for rehabilitation and treatment. More cases of post poliomyelitis including those discharged prematurely during the cholera outbreaks could be admitted for treatment during the year because of the smaller number of acute cases.

Table 93

POLIOMYELITIS

ADMISSIONS DURING THE LAST 10 YEARS

| Year | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Admissions .. | 19 | 29 | 52 | 404 | 66 | 201 | 48 | 12 | 66 | 12 |
| Deaths .. | 2 | .. | .. | 12 | 3 | 6 | 5 | 1 | 1 | .. |

Table 94
POLIOMYELITIS
ADMISSIONS BY MONTH

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---------------|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| Admissions .. | 2 | .. | 3 | 2 | 2 | .. | .. | .. | 1 | .. | 1 | 1 | 12 |
| Deaths .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |

Table 95
POLIOMYELITIS
REGIONAL DISTRIBUTION BY MONTH

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|----------|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| Urban .. | 2 | .. | 3 | 1 | .. | .. | .. | .. | 1 | .. | 1 | 1 | 9 |
| Rural .. | .. | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | 3 |

TYPHOID FEVER

120 cases of typhoid fever were admitted during the year with two deaths.

The cause of death in the two fatal cases was acute toxæmia with cardiac failure. One of the cases had intestinal hæmorrhage as well.

The mother of a typhoid case on investigation was found to be typhoid carrier. She was treated for typhoid six years ago in Middleton Hospital. In 1963, a daughter was admitted for typhoid and in 1964 another daughter was admitted for typhoid. As she did the cooking for the family, it is likely she infected her two daughters. Her stools became negative for *Salmonella typhi* after treatment with a new antibiotic, cephaloridine.

Table 96
TYPHOID FEVER
ADMISSION BY ETHNIC GROUP AGE AND SEX

| | Age | 0-9 | | 10-19 | | 20-29 | | 30+ | | Total | | Total | |
|-----------|-----|-----|----|-------|----|-------|----|-----|----|-------|----|-------|----|
| | | Sex | | Sex | | Sex | | Sex | | Sex | | | |
| | | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | | |
| Europeans | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Eurasians | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Chinese | .. | .. | 11 | 5 | 22 | 4 | 15 | 2 | 7 | 3 | 55 | 14 | 69 |
| Indians | .. | .. | 3 | .. | 7 | 1 | 2 | 2 | 1 | .. | 13 | 3 | 16 |
| Malays | .. | .. | 2 | 4 | 8 | 2 | 5 | 5 | 6 | 2 | 21 | 13 | 34 |
| Javanese | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | 1 |
| Total .. | | 16 | 9 | 37 | 7 | 22 | 9 | 14 | 6 | 89 | 31 | 120 | |

Table 97

TYPHOID FEVER
ADMISSIONS BY MONTH

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---------------|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| Admissions .. | 12 | 9 | 18 | 16 | 7 | 11 | 9 | 2 | 7 | 12 | 7 | 10 | 120 |
| Deaths .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 2 |

Typhoid Carrier Examinations.—During the year, a total of 357 persons from ice-cream factories and stalls, school tuck-shops and various restaurants were investigated for exclusion of the typhoid carrier state.

CHICKEN-POX

701 cases were admitted with one death. The fatal case occurred in an 11 years old Indian girl with encephalitis.

Table 98

CHICKEN-POX
ADMISSIONS BY AGE, SEX AND ETHNIC GROUP

| | Age | 0—10 | | 11—19 | | 20+ | | Total | | Total |
|--------------|-----|------|----|-------|----|-----|----|-------|-----|-------|
| | | M. | F. | M. | F. | M. | F. | M. | F. | |
| Europeans | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 |
| Eurasians .. | .. | 5 | 4 | 1 | 6 | 1 | 3 | 7 | 13 | 20 |
| Chinese .. | .. | 29 | 23 | 22 | 9 | 40 | 12 | 91 | 44 | 135 |
| Indians .. | .. | 59 | 55 | 59 | 32 | 172 | 34 | 290 | 121 | 411 |
| Malays .. | .. | 19 | 13 | 24 | 11 | 43 | 5 | 86 | 29 | 115 |
| Javanese .. | .. | 2 | 1 | 3 | .. | 3 | .. | 8 | 1 | 9 |
| Others .. | .. | 2 | .. | 3 | 2 | 1 | 2 | 6 | 4 | 10 |
| Total .. | .. | 116 | 96 | 112 | 61 | 210 | 56 | 488 | 213 | 701 |

Table 99

CHICKEN-POX

ADMISSIONS BY MONTH

| Month | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---------------|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| Admissions .. | 1 | 6 | 10 | 62 | 55 | 44 | 49 | 63 | 58 | 79 | 107 | 167 | 701 |
| Deaths .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 |

DYSENTERY

There were 691 admissions with 12 deaths. 328 cases had amœbic dysentery, four cases had been amœbic and bacillary dysentery, 144 cases had bacillary dysentery while in 215 cases no specific organisms were isolated.

Table 100

| Type of Cases | Admissions | Deaths |
|--------------------------------|------------|--------|
| Amœbic Dysentery | 328 | 8 |
| Amœbic and Bacillary Dysentery | 4 | — |
| Bacillary Dysentery | | |
| (a) Sonne | 86 | 3 |
| (b) Flexner | 48 | — |
| (c) Shigella | 10 | — |
| Clinical Dysentery | 215 | 1 |
| Total | 691 | 12 |

Amœbic Dysentery Carriers.—24 cases of amœbic dysentery carriers were admitted from the Girls' Homecraft Centre at Yorkhill. They were detected as the result of stool examinations of the inmates and staff following the occurrence of five cases of amœbic dysentery in the centre.

Bacillary Dysentery Carriers.—10 bacillary dysentery carriers were admitted during the year. They were detected during the course of routine stool examination of domestic servants at the Naval Base and of ice-cream sellers applying for licences. They were discharged after treatment and bacteriological clearance.

MEASLES

283 cases of measles were admitted with nine deaths. 98 cases had bronchopneumonia of which seven died. One case with gastroenteritis and another with encephalitis died.

FOOD POISONING

Seven cases of food poisoning following ingestion of *nasi lemak* in the Tanjong Pagar area were admitted in July 1964. This was to assist the pressure of beds at the General and Thomson Road Hospitals. Investigation showed that the poison was arsenic.

One case was in a collapsed state and required intravenous fluids. All the cases recovered after treatment and were discharged.

20. SOCIAL HYGIENE

THE original and main function of the Social Hygiene Service is the treatment and control of venereal diseases. In 1960 it also became the centre for the treatment of skin diseases, and which now forms a large proportion of the work undertaken in its outpatient clinics.

The services are carried out in the following departments:

- (i) The Middle Road Hospital for the inpatient treatment of venereal and skin diseases. It has accommodation for 61 patients;
- (ii) Outpatients Clinics — one is attached to the hospital, the other is at the Tanjong Pagar Clinic which is primarily for seamen and persons living around the dock area;
- (iii) two mobile dispensary units — one for male and the other for female patients in rural communities;
- (iv) an Epidemiological and Control Unit;
- (v) an Almoner's Department;
- (vi) a Serological Laboratory.

Teaching.—Social Hygiene Branch also serves as a centre for the teaching of medical students, nurses, almoners, Public Health inspectors and Social Studies students. Doctors, social workers and Colombo Plan students also attend for observation courses.

Staff.—The Senior Medical Officer was Dr. Koh Kim Yam, L.M.S. There were five medical officers, but two were part-time medical officers.

The Almoner's Department was run by an Almoner working part-time as there were insufficient numbers of the social workers to share around the hospital.

Attendances.—The number of patients treated in the year is compared with the numbers in the previous years:

| | | ATTENDANCES | | | | |
|-------------------|-----|-------------|---------|---------|---------|---------|
| | | 1960 | 1961 | 1962 | 1963 | 1964 |
| Inpatients | ... | 1,331 | 1,179 | 1,285 | 967 | 1,055 |
| Outpatients | | | | | | |
| New | ... | 35,331 | 32,513 | 31,862 | 30,312 | 33,594 |
| Repeats | ... | 165,771 | 180,403 | 165,732 | 155,578 | 158,218 |
| Total Outpatients | ... | 201,102 | 202,916 | 197,594 | 185,890 | 191,812 |

INCIDENCE OF VENEREAL DISEASES

Here follows tables on the incidence of venereal diseases as treated in the departments of the Social Hygiene service.

It is not possible to say if these figures reflect a true picture of the prevalence of the diseases. The diseases are not notifiable neither is treatment compulsory. There are probably a large number of persons who are treated by general practitioners, and many who avoid treatment entirely.

The significance of the figures is that they indicate a fairly constant hospital incidence and a reasonable inference is that the sources of infection remain; and the problems of control, prevention and eradication of the diseases will have to be renewed.

Table 101

INCIDENCE OF VENEREAL DISEASES

| | 1960 | 1961 | 1962 | 1963 | 1964 |
|---------------------------|-------|-------|-------|-------|-------|
| Syphilitic Infections ... | 860 | 626 | 719 | 574 | 662 |
| Gonorrhœa ... | 2,529 | 1,970 | 2,402 | 1,793 | 2,378 |
| Total all V.D. ... | 4,295 | 3,335 | 4,168 | 2,921 | 3,910 |

Syphilitic Infections.—The type of syphilitic infections seen is given in table 102. The incidence of early manifestations — primary syphilis, secondary syphilis and early latent syphilis — is a further indicator that the disease continues to be spread:

Table 102

SYPHILITIC INFECTIONS

| | 1960 | 1961 | 1962 | 1963 | 1964 |
|---|------|------|------|------|------|
| Primary Syphilis ... | 198 | 166 | 114 | 79 | 92 |
| Secondary Syphilis ... | 24 | 21 | 13 | 46 | 27 |
| Early Latent Syphilis ... | 116 | 123 | 212 | 138 | 180 |
| Late Latent Syphilis ... | 431 | 316 | 330 | 272 | 294 |
| Tertiary Syphilis ... | 69 | 49 | 39 | 68 | 47 |
| Congenital Syphilis (over 2 years) ... | 18 | 11 | 21 | 17 | 22 |

Two cases of infantile syphilis were reported in 1964 while there were 22 cases of congenital syphilis over the age of two years.

The manifestations of tertiary syphilis in the main ethnic groups are given in the following tables;

INCIDENCE OF DISEASE
 Table 103
 BREAKDOWN OF TERTIARY SYPHILIS

| Nationality | | | Gummata and Skin | Bones and Joints | Cardio-Vascular | G.P.I. | Tabes Dorsalis | Neuro Syphilis | Others | Total |
|----------------|----|----|------------------|------------------|-----------------|--------|----------------|----------------|--------|-------|
| <i>Male</i> | | | | | | | | | | |
| Chinese | .. | .. | 1 | 1 | 9 | 1 | 4 | 6 | 3 | 25 |
| Indian | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | 2 |
| Malaysian | .. | .. | 1 | 1 | 2 | 1 | 1 | .. | .. | 6 |
| Total .. | | | 2 | 2 | 12 | 2 | 5 | 7 | 3 | 33 |
| <i>Female</i> | | | | | | | | | | |
| Chinese | .. | .. | .. | 1 | 4 | .. | .. | 4 | .. | 9 |
| Malaysian | .. | .. | .. | 1 | 1 | 1 | 1 | 1 | .. | 5 |
| Total .. | | | .. | 2 | 5 | 1 | 1 | 5 | .. | 14 |
| Grand Total .. | | | 2 | 4 | 17 | 3 | 6 | 12 | 3 | 47 |

Table 104

RATIO OF TERTIARY SYPHILIS

| | 1960 | 1961 | 1962 | 1963 | 1964 |
|----------------------|------|------|------|------|------|
| Neuro Syphilis ... | 50.7 | 63.3 | 59.0 | 38.2 | 51.1 |
| Cardiovascular ... | 11.6 | 22.4 | 33.4 | 48.5 | 36.2 |
| Cutaneous ... | 13.0 | 6.1 | 5.1 | 1.5 | 4.2 |
| Bones and Joints ... | 24.7 | 8.2 | 2.5 | 11.8 | 8.5 |

Other Venereal Diseases.--The other venereal diseases as treated by the service are listed in the following table:

Table 105

OTHER VENEREAL DISEASES

| | 1960 | 1961 | 1962 | 1963 | 1964 |
|---|-------|-------|-------|-------|-------|
| Gonorrhœa ... | 2,529 | 1,970 | 2,403 | 1,793 | 2,378 |
| Gonorrhœa Ophthalmia ... | 106 | 107 | 65 | 78 | 94 |
| Gonorrhœa Complications ... | 9 | 9 | 1 | 2 | 23 |
| Gonorrhœa and Non-specific Urethritis ... | 244 | 436 | 487 | 467 | 309 |
| Non-specific Urethritis ... | 773 | 1,472 | 1,127 | 962 | 688 |
| Lymphogranuloma ... | 7 | 16 | 25 | 12 | 20 |
| Soft Sore ... | 692 | 472 | 886 | 420 | 666 |
| Mixed Infections ... | 100 | 36 | 70 | 42 | 86 |

SKIN CLINIC

11,889 new cases were seen during the year.

Infective dermatitis, atopic and neurodermatitis, allergic, contact and occupational dermatitis and mycotic infections formed the majority of the cases. There were also cases of papulo-squamous eruptions, vesiculo-bullous dermatitis and cutaneous tuberculosis, while internal disorders shown by skin manifestations were transferred to other special clinics.

Twenty-three cases of leprosy were referred to Irrawaddy Road Skin Clinic.

MOBILE DISPENSARIES

The main reason for running the service is to be able to follow-up and treat known cases of venereal disease and to be able to investigate women during pregnancy for venereal infection. Its work cannot be entirely confined to such cases: it is offered as a general outpatient facility and it will be seen that out of the many investigated only a small proportion are found to be infected with venereal disease.

The service works at a disadvantage as there is no medical officer who accompanies the dispensary so that fewer persons come forward for treatment or accept the investigations.

SOCIAL HYGIENE MOBILE DISPENSARIES

The following table shows the work done:

Table 106

| Clinic | Male | Female | Ante-Natal | V.D. Cases | Invest. Cases | Total |
|-----------------|------|---------|------------|------------|---------------|---------|
| CENTRAL | | | | | | |
| Yio Chu Kang | } 48 | } 3,811 | } 4,571 | } 12 | } 3,847 | } 3,849 |
| Upper Serangoon | | | | | | |
| Seletar | | | | | | |
| Paya Lebar | | | | | | |

| | | | | | | | |
|---------------|---|----|--------|--------|----|--------|--------|
| RURAL WEST | | | | | | | |
| Bukit Timah | } | 34 | 4,495 | 3,793 | 13 | 4,516 | 4,529 |
| Pasir Panjang | | | | | | | |
| Bukit Panjang | | | | | | | |
| Holland Road | | | | | | | |
| Jurong | | | | | | | |
| Ama Keng | | | | | | | |
| RURAL EAST | | | | | | | |
| Kampong Batak | } | | 4,600 | 4,476 | 24 | 4,576 | 4,600 |
| Changi | | | | | | | |
| Ulu Bedok | | | | | | | |
| Siglap | | | | | | | |
| | | 82 | 12,906 | 12,840 | 49 | 12,939 | 12,988 |

Table 107

ANTE-NATAL CASES

| Nationality | No. of Ante- Natals | Primipara | No. with Syphilis | Multipara | No. with Syphilis |
|-------------|---------------------------|-----------|----------------------|-----------|----------------------|
| Chinese | 7,525 | 1,202 | 5 | 6,323 | 8 |
| Malaysian | 1,066 | 514 | 3 | 3,643 | 14 |
| Indian | 4,157 | 192 | 2 | 874 | 2 |
| Eurasian | 26 | 1 | — | 25 | — |
| Others | 69 | 15 | — | 51 | — |
| | 12,840 | 1,924 | 10 | 10,916 | 24 |

12,840 ante-natal cases were examined of whom 34 cases were found to be positive for syphilis.

EPIDEMIOLOGICAL CONTROL UNIT

This unit is responsible for case finding, contacting defaulters, follow-up of cases, contacting family units, contacting promiscuous women and health propaganda.

13,707 home visits were made to defaulters or contacts of whom 7,633 cases reported.

1,893 cases were contacted by post of whom 504 attended.

340 new family units were registered. These were either treated or kept under surveillance. The total number of family units on the register was 4,899.

144 girls under the age of 18 were sent by the Social Welfare Department, 16 cases had gonorrhœa and 13 had syphilis.

Prophylactic Treatment

There were 1,895 prostitutes on the register. Of these 114 who were newly registered this year, 24 had gonorrhœa, 13 had syphilis and three had both.

There were 37 male prostitutes on the register of whom four were new cases.

5,805 prophylactic injections were given during the year.

ALMONER'S DEPARTMENT

The Senior Almoner reports that because of the overall shortage of almoners it was only possible to send an Almoner once a week on Wednesday mornings.

The major portion of the work dealt with financial and material aid, Social and moral support, rehabilitation and employment as well as total care of the family.

260 cases were on the register of whom 86 were new cases.

Table 108

| LABORATORY EXAMINATIONS | | 1960 | 1961 | 1962 | 1963 | 1964 |
|---------------------------------------|-----|----------|----------|---------|---------|----------|
| Blood specimens for K.T. | ... | 37,831 | 37,420 | 36,812 | 29,830 | 30,456 |
| C.S.F. for K.T. | ... | 330 | 480 | 345 | 191 | 261 |
| Dark Ground Examinations | ... | 2,966 | 3,898 | 3,102 | 1,857 | 1,987 |
| Smears for Gonorrhœa | ... | 27,396 | 28,980 | 22,763 | 28,626 | 30,121 |
| Smears for Culture | ... | 191 | 214 | 121 | 225 | 265 |
| Trichomonas Examinations | ... | — | 548 | 4,469 | 4,582 | 4,692 |
| Aqua Penicillin G. used (3 vials) | ... | 5,386mu | 954mu | 2,764mu | 2,623mu | 4,140mu |
| Procaïn (PAM) Penicillin (3 vials) | ... | 19,000mu | 13,965mu | 4,644mu | 4,326mu | 12,114mu |
| Penidure (Bicillin) (3 vials) | ... | 8,148mu | 10,805mu | 9,168mu | 8,456mu | 605mu |

There were 32 cases of penicillin sensitivity but no deaths were reported.

TABLE 109
PATIENTS BY COURSE

| | INPATIENTS | | | OUTPATIENTS (NEW CASES) | | | OUTPATIENTS (REPEATS) | | |
|----------------------------|------------|--------|-------|-------------------------|--------|--------|-----------------------|--------|---------|
| | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| Primary Syphilis .. | .. | 1 | 1 | 89 | 3 | 92 | 2,368 | 78 | 2,446 |
| Secondary Syphilis .. | 4 | 5 | 9 | 23 | 4 | 27 | 1,026 | 188 | 1,214 |
| Tertiary Syphilis .. | 37 | 13 | 50 | 33 | 14 | 47 | 3,825 | 429 | 4,254 |
| Congenital Syphilis .. | 1 | 4 | 5 | 6 | 16 | 22 | 244 | 185 | 429 |
| Syphilis not specified .. | 76 | 66 | 142 | 258 | 216 | 474 | 8,210 | 4,916 | 13,126 |
| Gonorrhœa .. | 3 | 99 | 102 | 1,979 | 399 | 2,378 | 11,159 | 2,778 | 13,937 |
| Gonorrhœa Complications .. | 2 | 12 | 14 | 1 | 22 | 23 | .. | 3 | 3 |
| Gonorrhœa Ophthalmia .. | .. | 102 | 102 | .. | 94 | 94 | .. | .. | .. |
| Soft Sore .. | .. | .. | .. | 666 | .. | 666 | 5,041 | .. | 5,041 |
| Lymphogranuloma .. | .. | .. | .. | 20 | .. | 20 | 32 | 1 | 33 |
| Mixed Infections .. | .. | .. | .. | 39 | .. | 39 | 1,198 | 1,671 | 2,869 |
| Investigation Cases .. | 8 | 44 | 52 | 4,035 | 13,741 | 17,775 | 13,026 | 3,273 | 16,299 |
| Skin Cases .. | 223 | 373 | 596 | 7,474 | 4,415 | 11,889 | 68,475 | 30,091 | 98,567 |
| Total .. | 354 | 719 | 1,073 | 14,623 | 18,971 | 33,547 | 114,605 | 43,613 | 158,218 |

TABLE 110
PATIENTS BY RACE

| | INPATIENTS | | | OUTPATIENTS (NEW CASES) | | | OUTPATIENTS (REPEATS) | | |
|-------------------------------------|------------|------------|--------------|-------------------------|---------------|---------------|-----------------------|---------------|----------------|
| | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| Malays and Malaysians .. | 54 | 96 | 150 | 1,952 | 4,987 | 6,939 | 13,092 | 6,304 | 19,396 |
| Chinese .. | 221 | 574 | 795 | 8,346 | 12,059 | 20,405 | 68,249 | 32,684 | 100,933 |
| Indian, Pakistanis and Ceylonese .. | 78 | 36 | 114 | 3,341 | 1,657 | 4,998 | 31,951 | 3,216 | 35,167 |
| Others .. | 1 | 13 | 14 | 984 | 268 | 1,252 | 1,313 | 1,409 | 2,722 |
| Total .. | 354 | 719 | 1,073 | 14,623 | 18,971 | 33,594 | 114,605 | 43,613 | 158,218 |

21. TAN TOCK SENG HOSPITAL

(TUBERCULOSIS)

THE Tan Tock Seng Hospital is mainly for the treatment of pulmonary tuberculosis. But this has not always been so. Prior to the Pacific War it was a general hospital for the indigent and was also used for the clinical teaching of medical students.

After the war, its wards were turned over to patients suffering from pulmonary tuberculosis, but not entirely, as there were a few wards which were occupied by chronically sick and to this day there is still one ward still being used to house chronic sick.

In 1963 three wards were given over for adult medical cases. This was to take-off some of the load on the medical units in the General Hospital.

The Hospital consists of three sections; an old section consisting some of the original buildings which were built in 1909; a section consisting of four modern ward blocks which were completed in 1958 and a section known as the Mandalay Road Unit which is used for women and children. The total accommodation available in the wards of the hospital is 1,320.

Within the compound of the hospital is the hospital's Outpatient Department known as the Rotary Clinic as it was built from funds made available by the Rotary Club in 1951.

Construction work on a Thoracic Surgical Block began in April 1964 and is expected to be completed towards the end of 1965. The Surgical Block will house the suites of the surgical operation theatres, and their ancillary rooms which will include monitoring rooms, recovery rooms and X-ray department.

Staff.—The Medical Superintendent of the hospital was Dr. H. F. Jackson until 1st August, 1964 when he went on transfer and Dr. Andrew Chew was appointed in his place. The medical officer staff consisted of a Senior Chest Physician and three chest physicians, and two senior registrars and eleven medical officers.

Although this staff was just over half the authorised complement two medical officers were allowed to go overseas for post-graduate qualifications and a chest physician, Dr. J. Supramaniam, went to various tuberculosis centres in Asia and Africa on a W.H.O. Fellowship.

The shortage of staff extended also to laboratory technicians down to medical and health servants. The shortage is now felt as the tempo of work has increased since the establishment of the medical wards and the treatment of more acutely ill patients.

Special Studies.—Studies were continued on the incidence of positive sputum cultures from patients with minimal pulmonary tuberculosis lesions;

blood levels on PAS, the treatment of drug resistant cases of tuberculosis with second-line anti-tuberculous drugs.

A drug trial using Unitheban is being conducted.

A growing problem is the increasing incidence of drug resistant cases of pulmonary tuberculosis. About a fourth only are being treated with the second-line drugs such as viomycin, kanamycin, cycloserine, pyrazinamide and ethionamide. Trials have been conducted with these drugs used singly but more often in combinations for periods extending over a year. These drugs are comparatively costly and the drug-vote has risen chiefly because of the use of these drugs.

Contract Service.—The tracing of contacts of patients was up to August the responsibility of each of the Chest Units. After this date this function was transferred to the Tuberculosis Control Unit.

As part of the re-organisation, the system of case recording for the tracing of patients who default in their treatment was tested and will be put into operation from 1st January, 1965.

Central Sterile Supply.—The department has been in operation for two years. While it is fulfilling its functions satisfactorily, it is possible that it has not been used to its full capacity. Sputum mugs were being sterilised only twice a week have since November been sterilised daily. For lack of syringe and needle cleaners such instruments are being cleaned by hand.

INPATIENTS

Admission to hospital for inpatient treatment continued to be made according to priorities on medical and social grounds. A return of tuberculosis cases admitted to Government hospitals in the State is shown in Table 111.

Table 111

| TUBERCULOSIS CASES ADMITTED TO GOVERNMENT HOSPITALS | | | | | | | | |
|---|-------|-------|-------|-------|-------|-------|-------|-------|
| Tan Tock Seng Hospital | | | | | | | | |
| | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 |
| Pulmonary | 2,442 | 3,064 | 2,588 | 2,752 | 2,562 | 3,089 | 3,136 | 2,930 |
| Bones and Joints | 133 | 171 | 169 | 115 | 129 | 26 | 95 | 67 |
| Other forms | 27 | 41 | 62 | 43 | 54 | 69 | 91 | 71 |
| General Hospital | | | | | | | | |
| Pulmonary | 942 | 785 | 660 | 703 | 647 | 600 | 594 | |
| Bones and Joints | 302 | 338 | 332 | 157 | 293 | 197 | 189 | |
| Other forms | 122 | 242 | 252 | 230 | 196 | 115 | 119 | |
| St. Andrew's Orthopaedic Hospital | | | | | | | | |
| Pulmonary | — | — | — | 19 | 21 | 5 | 2 | |
| Bones and Joints | 235 | 245 | 121 | 115 | 238 | 138 | 32 | |
| Other forms | — | — | — | — | 1 | 2 | — | |
| | 4,203 | 4,886 | 4,184 | 4,134 | 4,141 | 4,241 | 4,258 | |

This is the Clinic for the treatment of outpatients, and the following table 112 is an indication of the volume of work done:

Table 112

ROTARY TUBERCULOSIS CLINIC

| | 1960 | 1961 | 1962 | 1963 | 1964 |
|--|---------|---------|---------|---------|---------|
| New cases of tuberculosis ... | 2,863 | 3,613 | 3,231 | 3,006 | 2,665 |
| Repeat visits of cases of tuberculosis | 342,760 | 399,211 | 475,470 | 347,899 | 287,769 |
| Cases for assessment seen by Chest Physicians and Senior Registrars: | | | | | |
| (a) New cases ... | 2,703 | 3,613 | 2,597 | 2,210 | 2,004 |
| (b) Repeat cases ... | 47,935 | 49,173 | 50,579 | 39,371 | 37,120 |
| Medical Cases ... | — | — | — | 332 | 1,839 |
| X-Ray Examinations ... | 78,094 | 85,576 | 92,419 | 84,817 | 83,144 |
| Laboratory Examinations ... | 94,034 | 109,125 | 130,407 | 127,529 | 165,211 |
| P.P. Inductions ... | 48 | 21 | 11 | 10 | — |
| P.P. Refulls ... | 6,046 | 3,646 | 2,382 | 1,384 | 707 |

The following investigations were carried out during the year by the various units:

Bronchoscopy.—Bronchoscopies were performed thrice weekly, and a total of 313 were carried out.

Bronchograms.—229 Bronchograms were done by medical officers on specially selected cases.

I.V.P.—Intravenous Pyclography was done on 150 cases.

Sinograms.—Three Sinograms were performed during the year.

Pleural Biopsy.—A total of 55 biopsies were performed.

Bronchoscopies and minor operations were carried out during the year. The following were major thoracic surgeries done by surgeons at the General Hospital:

| | |
|-------------------|----|
| Thoracoplasty ... | 17 |
| Resections: | |
| Segmental ... | 4 |
| Lobectomy ... | 40 |
| Pneumonectomy ... | 9 |
| | — |
| | 70 |
| | — |

PHYSIOTHERAPY DIVISION

The work in the department has increased especially with the establishment of the medical wards and will increase when thoracic surgery is undertaken when the new surgery is opened.

SUMMARY OF WORK

| Year | | Courses of Treatment |
|------|-----|----------------------|
| 1956 | ... | 22,118 |
| 1957 | ... | 18,357 |
| 1958 | ... | 25,032 |
| 1959 | ... | 28,054 |
| 1960 | ... | 20,019 |
| 1961 | ... | 21,786 |
| 1962 | ... | 18,634 |
| 1963 | ... | 12,655 |
| 1964 | ... | 16,031 |

OCCUPATIONAL THERAPY DEPARTMENT

Another Occupational Therapist was appointed to the service. This helped to cope with the increasing demand of occupational therapy. A total of 23,980 were given occupational therapy treatment. Of these 521 were new patients.

In addition, this Department gave training in tailoring, basket and lampshade making, machine art-embroidery and machine-knitting to 96 disabled persons, an increase of 3 when compared with the previous year. The aim behind this training is to restore confidence in disabled persons and to fit them into remunerative employment after training.

RED CROSS LIBRARY

The Red Cross Society continued to help maintain the Library. Magazines and books were distributed to patients by these voluntary helpers on Tuesdays and Thursdays.

During the year, this Society was given a larger room for its Library.

DENTAL CLINIC

A change was instituted during the year towards improving facilities for dental treatment to patient. The Dental Officer was available for consultation in every morning of the week except Saturday. In previous years he visited the Dental Clinic twice a week, on Tuesday mornings and Friday mornings.

Dental treatment included extractions, fillings, minor oral surgery and the fitting of dentures. For dentures, patients previously had to be referred to General Hospital Dental Clinic for the impressions and fitting of the dentures.

Patients requiring major surgical treatment were still referred to General Hospital Dental Clinic. The Thoracic Unit will have a Dental Clinic equipped with modern equipment and it will be possible to cope with the major dental surgery.

ALMONER'S DEPARTMENT

A total of 14,391 cases were seen of which 2,737 were new cases and 11,654 were current cases and 197 non-citizen cases.

Administration of the Tuberculosis Treatment Allowance and Public Assistance was carried on as in previous years. 552 patients for T.B.T. Allowance and 212 for Public Assistance Allowance.

22. TRAFALGAR HOME (LEPROSY)

TRAFALGAR Home is an institution for the segregation and treatment of persons suffering from leprosy. It is situated in a former rubber estate from which it got its name, off the Yio Chu Kang Road, about $8\frac{3}{4}$ miles from the centre of the City.

The total area of the Home is about 125 acres but the area occupied and bounded by a fence is about 25 acres; the remaining land is occupied by squatters several of whom are former patients. The Home comprises of hospital ward blocks which form the infirmary section and outbuildings consisting of semi-detached chalets and dormitories for the accommodation of ambulant patients. The total accommodation available was 965 — the reduction in the bed complement being the withdrawal of a ward and its conversion into a workshop for the Occupational Therapy Department.

Patients are admitted if lepræ bacilli are found in their lesions. Admission and discharge of such patients is controlled by the Leprosy Board. Discharges are approved when smears from the skin lesions are found free of lepræ bacilli on four occasions each taken in consecutive months. The Board has relaxed on discharges somewhat in recent years, allowing for "conditional" discharges which are given in special circumstances.

There is an Outpatient Clinic for the treatment of non-infectious patients and for the follow-up of patients discharged from the Home. The staff of the Clinic is also responsible for the Contact service.

The Contact Service is responsible for maintaining the register of all leprosy patients, tracing contacts, and the surveillance of patients under treatment as outpatients.

Staff.—The Medical Superintendent is Dr. Wong Mook Ow, there are two medical officers.

As mentioned in the previous year's report, there has been a gradual increase in the "healthy" staff in proportion to the number of "patient-workers". Almost the entire staff in the Skin Clinic and all the supervisory staff in the Home are "healthy". But the bulk of the work-force of the Home is drawn from the patients who are engaged as artisans, hospital orderlies, dispensary assistants, laboratory assistants, tailors, cooks and in unskilled jobs.

Two members of the nursing staff went overseas for training. A nursing sister undertook a course sponsored by Colombo Plan in leprosy nursing. Another male nurse, also under Colombo Plan scholarship was undergoing a 6-month training in the rehabilitation of leprosy patients.

A staff nurse who had taken the Public Health Course returned to the staff of the Home after completing successfully the course.

School.—As more qualified staff for the school was available, more vocational subjects such as woodwork, book-binding, silk-screen printing, and needle-work were included in the school curriculum.

Physiotherapy Department.—The department was fortunate to obtain for the first time a qualified physiotherapist. With the assistance of the physiotherapist's aide who was a patient trained in the routine and simpler physiotherapy procedures, patients can now be attended entirely in the Home without having to be sent to the General Hospital.

Occupational Therapy Department.—Sales of patients' work reached a record in 1964. This was due largely to voluntary help. In this connection special mention is made to a dedicated couple, Mr. & Mrs. Rexter, for their kind services.

During the latter half of the year, a training scheme was introduced in which all new patients had to undergo training in a suitable craft. The training was based on a fairly comprehensive syllabus and included some theoretical instruction. The purpose of the scheme was to help patients on discharge to organise themselves into a productive project and eventually work in sheltered workshops or factories.

Dental Clinic.—The demand for dental treatment and for dentures continues to increase. There is a great problem of maintaining good oral hygiene among patients who have maimed hands. Frequently, patients who have just had their teeth scaled and filled return a short while after with caries and abundant calculus due to neglect of their hygiene. It is important that the nursing staff should assist in the constant supervision of patients in the wards to maintain good oral hygiene.

The total attendances for dental treatment were 1,381.

Almoner's Department.—The Almoner's responsibilities lie not only with the inpatients but also with all the patients seen at the Skin Clinic. The work in the department continued at very much the same level as the problems remain as in previous years. The first being to assist the patient to institutional life when segregated and to assist in the care of the family when its bread winner or mother is under treatment in the Home. The other is to assist in the rehabilitation of a discharged patient, which is mainly the finding a new job — which is not an easy one because of the prejudice towards and the stigma of the disease.

Valuable assistance continued to be given by the State's social services, voluntary organisations, particularly the Singapore Leprosy Association, Women's Guilds.

Development.—A Community Hall was completed at the beginning of the year and opened by Mr. Ng Kah Ting, Assemblyman for Ponggol on 7th March, 1964 at a cost of \$23,750.

The Hall was built from money realised from the sale of S.S. Debenture Stock which had been donated by the trustees in memory of the late Mr. Gaw Kek Law and from the Singapore Leprosy Association which donated \$13,000 and the balance of \$3,000 was drawn from the Leper Aid Fund.

A Surgical Operation Theatre was completed on 8th December, 1964 at a cost of \$17,600. Construction work was chiefly in extensions and

remodelling of a small dressing theatre in the main hospital block. With the theatre it is now possible to perform operations on leprosy patients in the Home itself without having to send them to the General Hospital. But the surgeons and anaesthetists will still be drawn from the General Hospital.

Record of Work.—The record of hospital activity is given in the following tables 113, 114, 115, 116 and 117. The downward trend in the numbers of patients treated continues. The average occupancy is now 596 as compared to 630 for the previous year and represents about 61 per cent occupancy of its total accommodation.

Perhaps the more significant figures are given in Table 115 of the different types of patients admitted to the Home. Newly discovered patients with "positive" smears numbered 75 which is a small drop over the previous year's figure of 85 but is again part of a continuing downward trend in the numbers of fresh infections found.

Table 113
PATIENTS ON 31ST DECEMBER, 1964—ADULTS AND CHILDREN
(Under 12 years of age)

| Males | | Females | | Total |
|--------|-------|---------|-------|-------|
| Adults | Child | Adults | Child | |
| 382 | 46 | 142 | 24 | 594 |

Table 114
ADMISSIONS AND DISCHARGES

| | Males | Females | Total |
|--|-------|---------|-------|
| Total patients remaining on 31-12-63 ... | 441 | 171 | 612 |
| Admissions ... | 233 | 67 | 300 |
| Transferred from other hospitals ... | 32 | 8 | 40 |
| Discharges ... | 230 | 66 | 296 |
| Absconded ... | 9 | 1 | 10 |
| Transferred to other hospitals ... | 36 | 10 | 46 |
| Deaths ... | 3 | 3 | 6 |

Table 115
ADMISSIONS IN 1964 — BY RACE

| | Chinese | | Indians | | Malays | | Eurasians | |
|------------|---------|----|---------|---|--------|---|-----------|---|
| | M | F | M | F | M | F | M | F |
| Adults ... | 181 | 52 | 23 | 1 | 11 | 2 | — | 1 |
| Child ... | 16 | 9 | 1 | — | — | 2 | — | — |

Table 116
ADMISSIONS IN 1964 — BY CAUSE

| | Males | Females | Total |
|--|-------|---------|-------|
| New positive cases ... | 53 | 22 | 75 |
| Returned absconders ... | 6 | — | 6 |
| Relapsed cases ... | 15 | 2 | 17 |
| Others for treatment for orthopaedic treatment ... | 158 | 43 | 201 |
| Total ... | 232 | 67 | 299 |

Table 117

DISCHARGES IN 1964

| | Males | Females | Total |
|--|-------|---------|-------|
| Disease-arrested cases discharged by Board ... | 80 | 32 | 112 |
| Conditional discharge ... | 21 | 6 | 27 |
| "Negative" cases ... | 129 | 28 | 159 |
| Total ... | 230 | 66 | 298 |

Skin Clinic.—An additional outpatient session was opened in June. It was held every Friday morning for patients referred as possible cases of leprosy. The majority of the patients were suffering from skin diseases. Out of 276 patients seen in the Clinic during the seven months only one patient was found to be suffering from leprosy.

622 persons were brought to the Clinic by the Contact Service and 15 were found to have leprosy.

The numbers of patients seen in the Skin Clinic are given in the following table 118.

Table 118

GOVERNMENT SKIN CLINIC, IRRAWADDY ROAD
OUTPATIENTS FOR THE YEAR 1964

| Nationalities | NEW CASES | | | | RE-ATTENDANCES | | | |
|--|-----------|--------|----------|-------|----------------|--------|----------|-------|
| | Male | Female | Children | Total | Male | Female | Children | Total |
| Malays and Other Malaysians | 9 | 3 | 6 | 8 | 319 | 114 | 40 | 473 |
| Chinese | 122 | 40 | 21 | 183 | 3,892 | 3,049 | 249 | 7,190 |
| Indians, Pakistanis, and Ceylonese | 34 | 1 | 3 | 38 | 1,359 | 116 | 39 | 1,514 |
| Others | .. | 2 | .. | 2 | 11 | 21 | 7 | 39 |
| Total .. | 165 | 46 | 30 | 241 | 5,581 | 3,300 | 335 | 9,216 |

23. WOODBRIDGE HOSPITAL (PSYCHIATRY)

THE psychiatric services are centred chiefly in the Woodbridge Hospital and in outpatient centres. One of the outpatient centres is in the General Hospital, the others are in the premises of Outpatient Dispensaries of Kallang, Paya Lebar and Bukit Timah.

Staff.—The Medical Superintendent was Dr. Yap Meow Foo and Deputy was Dr. E. C. Winslow. There were two senior registrars and seven medical officers on the staff during the year.

The nursing staff was strengthened, the numbers standing at 296 nurses of all grades in comparison to the number of 227 in the previous year. It is clear that the numbers are far short of the optimum, but it will take some time before there will be sufficient nurses to provide for the entire nursing care of patients.

Inpatients.—The large number of patients requiring admission and who had to be maintained in the hospital constituted the biggest problem faced by the hospital.

The average occupancy was 3,466 or an occupancy rate of 185 per cent. The overcrowding in the wards needs no imagination to visualise. During the year, a Committee of Inquiry into the Overcrowding was studying the problem and its solution.

There is no doubt, however, that the position has been reached because of a failure to expand the psychiatric services in proportion with the natural increase in demands from a growing population and where there has perhaps been a real increase in mental disease in the population.

There are a large proportion of patients who have become so institutionalised and many who have lost all contacts with relatives that it has not been possible to discharge them when they have become stabilised.

Much has been achieved by the Social Workers to return some of these patients home. The Outpatient Psychiatric Clinics have also played a significant role in allowing for the early discharge of patients for allowing their continued treatment outside the hospital. These clinics might be increased and day-centres might be formed to take on a bigger load off the hospital, but it is apparent that additional hospital beds are still required.

Psychiatric Clinics.—The return for outpatients treated in the Psychiatric Clinics is given in the following tables 119 and 120.

Table 119

PSYCHIATRIC CLINICS
OUTPATIENTS—DISTRIBUTION BY RACE

| Race | GENERAL HOSPITAL CLINIC | | KALLANG CLINIC | | PAYA LEBAR CLINIC | | BUKIT TIMAH CLINIC | | Total |
|---|-------------------------|----------------|----------------|----------------|-------------------|----------------|--------------------|----------------|--------|
| | New | Re-attendances | New | Re-attendances | New | Re-attendances | New | Re-attendances | |
| Chinese | 679 | 3,035 | 844 | 8,753 | 288 | 2,806 | 145 | 1,242 | 17,792 |
| Indians, Pakistanis, Ceylonese | 127 | 354 | 102 | 546 | 45 | 156 | 27 | 139 | 1,496 |
| Malays | 68 | 135 | 73 | 456 | 14 | 87 | 12 | 40 | 885 |
| Others | 14 | 54 | 30 | 189 | 9 | 87 | 1 | 1 | 385 |
| Total | 888 | 3,578 | 1,049 | 9,944 | 356 | 3,136 | 185 | 1,422 | 20,558 |

TABLE 120

PSYCHIATRIC CLINICS
OUTPATIENTS—DISTRIBUTION BY SEX

| Sex | GENERAL HOSPITAL CLINIC | | KALLANG CLINIC | | PAYA LEBAR CLINIC | | BUKIT TIMAH CLINIC | | Total |
|--------------|-------------------------|----------------|----------------|----------------|-------------------|----------------|--------------------|----------------|--------|
| | New | Re-attendances | New | Re-attendances | New | Re-attendances | New | Re-attendances | |
| Male | 487 | 1,956 | 584 | 5,209 | 201 | 1,421 | 90 | 618 | 10,566 |
| Female | 401 | 1,622 | 465 | 4,735 | 155 | 1,715 | 95 | 804 | 9,992 |
| Total | 888 | 3,578 | 1,049 | 9,944 | 356 | 3,136 | 185 | 1,422 | 20,558 |

24. THE OUTPATIENT SERVICES

THE following are grouped under the Outpatient Services:

- (i) The Outpatient Dispensaries;
- (ii) The Travelling Dispensaries;
- (iii) The Government-Staff Dispensaries;
- (iv) The Institutional Hospitals:
The Prison Hospitals at Pearl's Hill and Changi Prison.
The Opium Treatment Centre at St. John's Island, and
prior to the re-organisation of the Outpatient Service,
- (v) The Casualty Unit of the General Hospital.

The Outpatient Service is essentially a general practitioner type of service. It should be noted that the Outpatient Clinics run by the hospitals and hospital units are quite separate from this organisation. These clinics are speciality clinics where patients are followed-up or where consultations are undertaken.

HISTORY

It may be relevant to recount the history of the service which was given in the previous year's report. The re-organisation of the service culminates the development of the service as an independent organisation.

The Outpatient Service has a short history going back only a decade. It began as an Admission Room of the General Hospital manned by the hospital's doctors. In 1952, it separated out as an independent department and in 1953 moved into its own building in the grounds of the General Hospital.

It extended outside the General Hospital by the establishment of satellite dispensaries throughout the island. At first, these dispensaries were opened in shop houses. In 1958, it acquired its first specially-designed building at Pegu Road and thereafter its growth continued rapidly with the development of all types of dispensaries and in many different places. These are new dispensaries of standard design, specially-designed dispensaries; dispensaries combined with Maternal and Child Health Centres and dispensaries incorporated in Community Centres or Housing Board flats.

In 1960, the former City Council Public Dispensaries and Staff Clinics were incorporated in the service as part of the integration of City Council Departments with Government.

The pace of development was accelerated in the last six years. A total of ten Outpatient Dispensaries were built during the period 1959 to 1964, four of which were built in 1963 alone.

The tempo of building was deliberately slackened during the year although the building programme had not yet been realised. Only the Maxwell Road Dispensary was completed during the year. It seemed unrealistic to continue adding buildings to run ahead of the available staff.

Continuing with the development was aggravating the staff shortages, and was adversely affecting the other sectors in the medical services.

It was timely that a review of the development programme was undertaken which also gave opportunity for a hard look to be taken on the service itself. The result was the decision to define its functions and the re-organisation of the service.

Reorganisation

The main purpose of the re-organisation was the definition of the functions of the Outpatient Service. It was to provide a dispensary service for the treatment of minor ailments (and injuries) in outpatients.

In contrast, patients of a different category who were sent in consultation, or recalled for follow-up treatment; patients suffering from serious illnesses and injuries requiring immediate and urgent attention, were to be seen in the hospitals clinics.

The aim was to complete the separation of the Outpatient Service as an independent organisation while the hospitals developed their own speciality and emergency services.

For this end, the significant changes were the withdrawal of the Outpatient Service Office and its Outpatient Dispensary in the General Hospital to Maxwell Road, and for the same reason its dispensary for female and children at Kandang Kerbau Hospital was closed.

In its place in the General Hospital was formed the Emergency-Admission Unit of the hospital. At Kandang Kerbau Hospital the premises vacated by the Outpatient Dispensary was turned over to some of the speciality clinics run by the hospital.

On August 1, 1964, the following changes were effected:

- (i) The Outpatients Departments at the General Hospital and at the Kandang Kerbau Hospital were closed;
- (ii) The Casualty Department which was run as part of the Outpatients Department at the General Hospital was transferred to the Department of Orthopædic Surgery *O* and renamed the Emergency Unit, General Hospital;
- (iii) The Maxwell Road Dispensary was opened and the administrative office of the Outpatient Service was transferred to this building. The Service came out with one less Outpatient Dispensary in these changes: whereas there were 32 dispensaries before, there were now 31;

- (iv) A nominal charge of 50 cents for each attendance was extended to 26 Outpatient Dispensaries (12 dispensaries were already charging these rates before — see previous year's report). Charges were not made for attendances at the part-time dispensaries at Jalan Eunos, Gulega Road, Changi Road and at the Island Dispensaries at Pulau Tekong and Pulau Brani.

Development

The Maxwell Road 4-storey building was renovated at the cost of \$88,000. The ground and first floor are occupied by the Maxwell Road Outpatient Dispensary and the 2nd floor houses the Outpatient Service Administrative Headquarters. The 3rd floor is used as quarters and stores. The Maxwell Road Outpatient Dispensary was opened to the public on 1st August, 1964.

The extension to the Thomson Road Outpatient Dispensary was started in November 1964, and it is expected to be completed by February 1965.

Staff

The staff consists of a Superscale *E* Administrative Medical Officer-in-Charge of Outpatient Services, Dr. Toh Chiong Hieng.

Dr. Leong Hon Koon was appointed Senior Registrar in March 1964, and he has been the Acting Deputy Medical Officer-in-Charge Outpatient Services, Grade *G* since 12th August, 1964.

The other categories of staff are given in two lists. Table 121 shows the staff before the re-organisation and Table 122 shows the staff after the re-organisation.

Table 121
DISTRIBUTION OF STAFF, OUTPATIENT SERVICES
(Before Re-organisation)

| Outpatient Dispensaries | Medical Officers | Pharmacists | Matron | Sisters | Nurses | Nurses (Man) | Hospital Assistants | Clerks | Dispensing Assistants | Laboratory Technicians |
|-------------------------|------------------|-------------|--------|---------|--------|--------------|---------------------|--------|-----------------------|------------------------|
| Aljunied Road | 1 | .. | .. | .. | 2 | .. | .. | 1 | 1 | .. |
| Bukit Panjang | 2 | 1 | .. | 1 | 2 | .. | .. | 1 | 2 | .. |
| Bukit Timah | 1 P.T. | .. | .. | .. | 1 | .. | .. | .. | .. | .. |
| Deskter Road | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. |
| Dunearn Road | 1 | .. | .. | .. | 3 | .. | .. | .. | .. | .. |
| G. H. and Casualty Unit | 2 | .. | 1 | 2 | 20 | 16 | .. | 15 | .. | 2 |
| Holland Road | 1 P.T. | .. | .. | .. | 1 P.T. | .. | 1 P.T. | 1 P.T. | .. | .. |
| Jalan Kayu | 1 | .. | .. | .. | 1 | .. | .. | 1 | 1 | .. |
| Kallang | 4 | 1 | .. | 1 | 4 | .. | .. | 3 | 4 | 1 |
| Kampong Bugis | 1 | .. | .. | .. | 1 | .. | .. | 1 | 1 | .. |
| Kandang Kerbau | 2 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. |
| Kee Seng Street | 1 | .. | .. | .. | 2 | .. | 1 | 1 | 1 | .. |
| Lim Ah Pin | 1 | .. | .. | .. | 2 | .. | .. | 1 | .. | .. |
| New Bridge Road | 1 | .. | .. | .. | 2 | .. | 1 | 1 | .. | .. |
| Pasir Panjang | 1 | .. | .. | .. | 2 | .. | .. | 1 | .. | .. |
| Paya Lebar | 2 | .. | .. | 1 | 1 | .. | .. | 1 | 1 | .. |
| Pegu Road | 3 | 1 | .. | .. | 3 | .. | .. | 1 | 3 | 1 |
| Prince Philip Avenue | 1 | .. | .. | .. | 2 | .. | 1 | 1 | 1 | .. |
| Queenstown | 1 | 1 | .. | 1 | 1 | .. | .. | 2 | 1 | .. |
| | 1 P.T. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Rochore | 1 | .. | .. | .. | 2 | .. | .. | 2 | 1 | .. |
| Sembawang | 1 | .. | .. | 1 | 1 | .. | .. | 2 | 1 | .. |
| Somapah | 1 | .. | .. | 1 | 1 | .. | .. | 1 | 1 | .. |
| Still Road | 2 | 1 | .. | 1 | 1 | .. | .. | 2 | 2 | .. |
| Stirling Road | 1 | .. | .. | .. | 2 | .. | 1 | 1 | .. | .. |
| Thomson Road | 1 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. |
| Tiong Bahru | 2 | 1 | .. | 1 | 1 | .. | .. | 1 | 1 | .. |
| Upper Serangoon Road | 1 | .. | .. | .. | 2 | .. | .. | 1 | 1 | .. |

P.T. = Medical Officer in attendance at the dispensary part-time, e.g. twice weekly or in the mornings only.

Table 122
DISTRIBUTION OF STAFF, OUTPATIENT SERVICES
(After Re-organisation)

| Outpatient Dispensaries | Medical Officers | Pharmacists | Matron | Sisters | Nurses | Nurses (Man) | Hospital Assistants | Clerks | Dispensing Assistants | Laboratory Technicians |
|-------------------------|------------------|-------------|--------|---------|--------|--------------|---------------------|--------|-----------------------|------------------------|
| Aljunied Road | .. | .. | .. | .. | 3 | .. | .. | 1 | 2 | .. |
| Bukit Panjang | 2 | .. | .. | 1 | 2 | .. | .. | 2 | 2 | 1 |
| Bukit Timah | 2 | 1 | .. | .. | 2 | .. | .. | 2 | 1 | .. |
| Desker Road | 1 | .. | .. | .. | 2 | .. | .. | 1 | .. | .. |
| Duncearn Road | 1 | .. | .. | .. | 3 | .. | 1 | 1 | .. | .. |
| Holland Road | 1 | .. | .. | .. | 1 | .. | 1 | 1 | .. | .. |
| Jalan Kayu | 1 | .. | .. | .. | 1 | .. | .. | 1 | 1 | .. |
| Kallang | 5 | 1 | .. | 1 | 4 | .. | .. | 4 | 4 | 1 |
| Kampong Bugis | 1 | .. | .. | .. | 2 | .. | .. | 2 | 1 | .. |
| Kee Seng Street | 1 | .. | .. | .. | 2 | .. | 1 | 1 | .. | .. |
| Lim Ah Pin | 1 | .. | .. | .. | 2 | .. | .. | 2 | 1 | .. |
| Maxwell Road | 3 | 1 | .. | 1 | 3 | 2 | .. | 3 | 2 | 1 |
| New Bridge Road | 2 | .. | .. | .. | 2 | .. | 1 | 1 | .. | .. |
| Pasir Panjang | 1 | .. | .. | .. | 1 | .. | 1 | 1 | .. | .. |
| Paya Lebar | 3 | .. | .. | 1 | 3 | .. | 1 | 2 | 1 | .. |
| Pegu Road | 3 | 1 | .. | .. | 2 | .. | .. | 2 | 1 | 3 |
| Prince Philip Avenue | 1 | .. | .. | .. | 2 | .. | 1 | 1 | .. | .. |
| Queenstown | 2 | 1 | .. | .. | 2 | .. | .. | 2 | 3 | .. |
| | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | P.T. | 1 | .. | .. | 3 | .. | .. | 2 | 2 | .. |
| Rochore | 3 | 1 | .. | .. | 2 | .. | .. | 2 | 1 | .. |
| Sembawang | 1 | .. | .. | .. | 2 | .. | .. | 2 | 1 | .. |
| Somapah | 1 | .. | .. | .. | 2 | .. | .. | 1 | 1 | .. |
| Still Road | 3 | 1 | .. | .. | 3 | .. | .. | 2 | 3 | .. |
| Stirling Road | 1 | .. | .. | .. | 2 | .. | 1 | 1 | .. | .. |
| Thomson Road | 1 | .. | .. | .. | 2 | .. | .. | 1 | 1 | .. |
| Tiong Bahru | 3 | 1 | .. | .. | 2 | .. | .. | 2 | 3 | 1 |
| Upper Serangoon Road | 1 | .. | .. | .. | 2 | .. | .. | 1 | 1 | .. |

P.T. = Medical Officer in attendance at the dispensary part-time, e.g. twice weekly or in the mornings only.

Charges

There was an economic reason for the extension of charges to all the dispensaries: this was to re-coup some of the expenses for the service. The service had been entirely free previously and extended to the supply of free medicine bottles and containers. The total expenditure for the service in the year was \$3,622,423 and represented about 10 per cent of the Hospitals expenditure, and the cost for treating a patient in the service was estimated to cost about \$1.

It was estimated that revenue will be about \$550,000 for a year. The collection of fees in the 26 Outpatient Dispensaries for the months of August to December amounted to \$228,224.

Exemptions extend to fairly wide classes of patients: the Government officer and his family, persons on social assistance, persons suffering from tuberculosis, leprosy and diabetes. About 26 per cent are in the exempted classes.

The other reason was to discourage persons, to attend at dispensaries, who really did not need any attention at all.

Observations of Changes in the Outpatient Services after Re-organisation

There has been a noticeable change in the types of patients that attend the dispensaries following the charging of 50 cents:

- (a) increase in the genuine sick patients;
- (b) reduction in the "perpetually weak" type of patients;
- (c) reduction in the "family might as well be seen" type.

(b) and (c) are the types of patients used to take advantage of the free medical services.

Cases of minor injuries and abscesses are now treated at the Outpatient Dispensaries. These types of cases take up considerable time from all levels of staff.

It is noticed that since re-organisation on 1st August, 1964, the number of cases seen by doctors (not including dressings and injections) continue to increase. The total number of patients seen during the five months from August to December 1964, were:

| | | | Number of Patients seen by Doctors | Number of Injections and Dressings |
|-----------|-----|--------|--|--|
| August | ... | 79,981 | 37,033 | |
| September | ... | 80,933 | 30,511 | |
| October | ... | 93,408 | 38,785 | |
| November | ... | 88,531 | 36,405 | |
| December | ... | 94,651 | 40,193 | |

OUTPATIENT DISPENSARIES

The figures of attendances for two periods: one before and one after re-organisation are given in Tables 123 and 124. As in the previous year, the attendances are given for those who attend for the first time and those who re-attended at the dispensaries.

Attendances for injections and dressings are given separately instead of being added to the figures for re-attendances as these were for patients who went directly for treatment without seeing the doctors again.

Table 123

OUTPATIENT ATTENDANCES FROM 1ST JANUARY TO 31ST JULY, 1964
(Before the Re-organisation of Outpatient Services)

| Outpatient Dispensaries | New Cases | Repeats | Injections and Dressings | Total |
|---|-----------|---------|-----------------------------|---------|
| Aljunied Road ... | 8,782 | 16,667 | 4,930 | 30,379 |
| Bukit Panjang ... | 12,511 | 17,686 | 21,099 | 51,296 |
| Bukit Timah ... | 318 | 8,187 | 2,895 | 11,400 |
| Desker Road ... | 10,979 | 13,495 | 9,538 | 34,012 |
| Dunearn Road ... | 6,362 | 11,167 | 7,911 | 25,440 |
| General Hospital Outpatient Department ... | 123,334 | 94,309 | 144,023 | 361,666 |
| General Hospital Casualty Department ... | 56,242 | 14,281 | 71,404 | 141,927 |
| Holland Road ... | 886 | 1,106 | 504 | 2,496 |
| Jalan Kayu ... | 3,244 | 14,540 | 9,862 | 27,646 |
| Kallang ... | 19,594 | 49,233 | 73,229 | 142,056 |
| Kampong Bugis ... | 3,864 | 12,662 | 9,083 | 25,609 |
| Kandang Kerbau Hospital ... | 1,713 | 16,269 | 17,982 | 35,910 |
| Kee Seng Street ... | 5,967 | 7,246 | 4,562 | 17,775 |
| Lim Ah Pin ... | 3,525 | 15,339 | 26,338 | 45,202 |
| Maxwell Road ... | — | — | — | — |
| New Bridge Road ... | 6,989 | 11,722 | 5,199 | 23,910 |
| Pasir Panjang ... | 6,073 | 12,127 | 10,270 | 28,470 |
| Paya Lebar ... | 7,423 | 26,504 | 40,815 | 74,742 |
| Pegu Road ... | 13,907 | 30,779 | 34,069 | 78,764 |
| Prince Philip Avenue ... | 18,223 | 5,410 | 11,152 | 34,785 |
| Queenstown ... | 7,207 | 13,748 | 6,099 | 27,054 |
| Rochore ... | 6,966 | 10,401 | 4,934 | 22,301 |
| Sembawang ... | 5,926 | 6,870 | 7,027 | 19,823 |
| Somapah ... | 6,411 | 12,208 | 25,244 | 43,863 |
| Still Road ... | 10,744 | 16,668 | 15,161 | 42,573 |
| Stirling Road ... | 7,125 | 4,508 | 4,993 | 16,626 |
| Thomson Road ... | 7,162 | 4,993 | 12,055 | 24,075 |
| Tiong Bahru ... | 7,088 | 24,323 | 25,249 | 56,660 |
| Upper Serangoon Road ... | 5,197 | 15,893 | 10,216 | 31,306 |
| Total ... | 373,762 | 488,341 | 382,434 | 920,389 |

Table 124

OUTPATIENT ATTENDANCES FROM 1ST AUGUST TO 31ST DECEMBER, 1964
(After the Re-organisation of Outpatient Services)

| Outpatient Dispensaries | New Cases | Repeats | Injections and Dressings | Total |
|----------------------------|-----------|---------|-----------------------------|---------|
| Aljunied Road | 7,361 | 15,100 | 4,036 | 26,497 |
| Bukit Panjang | 6,205 | 11,629 | 6,244 | 24,078 |
| Bukit Timah | 5,637 | 4,180 | 5,878 | 15,695 |
| Desker Road | 6,699 | 8,640 | 6,152 | 21,491 |
| Dunearn Road | 5,422 | 6,406 | 3,050 | 14,878 |
| Holland Road | 594 | 373 | 41 | 1,008 |
| Jalan Kayu | 1,806 | 7,276 | 3,679 | 12,761 |
| Kallang | 18,365 | 26,976 | 23,025 | 68,366 |
| Kampong Bugis | 2,936 | 8,398 | 2,781 | 14,115 |
| Kee Seng Street | 5,667 | 4,997 | 3,845 | 14,509 |
| Lim Ah Pin | 4,784 | 6,578 | 7,241 | 18,603 |
| Maxwell Road | 17,751 | 13,428 | 16,480 | 47,659 |
| New Bridge Road | 7,209 | 10,387 | 10,185 | 27,781 |
| Pasir Panjang | 2,856 | 4,658 | 4,849 | 12,363 |
| Paya Lebar | 8,097 | 14,846 | 15,250 | 38,193 |
| Pegu Road | 8,230 | 18,159 | 4,853 | 31,242 |
| Prince Philip Avenue | 4,157 | 9,552 | 2,808 | 16,517 |
| Queenstown | 8,241 | 12,075 | 7,988 | 28,304 |
| Rochore | 9,885 | 18,223 | 8,187 | 36,295 |
| Sembawang | 4,211 | 6,215 | 3,097 | 13,523 |
| Somapah Road | 5,829 | 5,018 | 6,528 | 17,375 |
| Still Road | 8,697 | 17,688 | 10,938 | 37,323 |
| Stirling Road | 2,549 | 6,248 | 2,141 | 10,938 |
| Thomson Road | 4,180 | 2,603 | 3,511 | 10,294 |
| Tiong Bahru | 7,502 | 21,006 | 14,651 | 43,159 |
| Upper Serangoon Road | 4,518 | 7,677 | 3,668 | 15,863 |
| Total | 169,488 | 268,236 | 181,106 | 618,830 |

Table 125

Part-time Outpatient Dispensaries

| | New Cases | Repeats | Total |
|---------------|-----------|---------|--------|
| Changi Point | 2,451 | 1,646 | 4,097 |
| Gulega Road | 1,457 | 601 | 2,058 |
| Kampong Batak | 4,056 | 1,975 | 6,031 |
| Pulau Brani | 1,864 | 3,710 | 5,574 |
| Pulau Tekong | 2,771 | 6,846 | 9,617 |
| Total | 12,599 | 14,778 | 27,377 |

TRAVELLING DISPENSARIES

There are five travelling dispensaries. Each has a Hospital Assistant in charge and each dispensary does a specified route on a fixed item schedule. Attendances were as follows:

| | New | Repeats | Total |
|-----------------------------|--------|---------|---------|
| Travelling Dispensary No. 1 | 21,326 | 19,691 | 41,175 |
| Travelling Dispensary No. 2 | 21,632 | 10,713 | 36,857 |
| Travelling Dispensary No. 3 | 20,788 | 13,866 | 36,798 |
| Travelling Dispensary No. 4 | 14,242 | 19,598 | 38,011 |
| Travelling Dispensary No. 5 | 19,917 | 10,429 | 31,300 |
| Total | 97,905 | 74,297 | 184,141 |

STAFF DISPENSARIES

There are five staff dispensaries which are for the treatment of staff in the Government service. Two of the clinics known as the Senior Officials' Clinic and the Junior Officials' Clinic are for the treatment of Government officers and members of their immediate families. The other three clinics are the former City Council staff dispensaries, and treatment is provided for members of the staff only. By arrangement the staff dispensaries also treat the staff of the Public Utilities Board and the Housing and Development Board.

Government officers may choose to attend at any other Government out-patient dispensary if this is convenient but they will be treated as members of the public although no charges will be made for such treatment. Government officers, of course, may be treated by their own private practitioners, in which case, they pay for the medical treatment on their own. Table 126 gave the record of attendances at the Staff Dispensaries:

Table 126
STAFF DISPENSARIES

| | NEW CASES | | | REPEATS | | | Injections and Dressings | Total |
|-------------------|-----------|--------|-------|---------|--------|-------|--------------------------|---------|
| | Male | Female | Child | Male | Female | Child | | |
| | | | | | | | | |
| Alexandra Road | 27,570 | 164 | .. | 10,553 | 4 | .. | 20,015 | 58,306 |
| Jalan Barseh | 45,968 | .. | .. | 21,974 | .. | .. | 44,644 | 112,586 |
| Junior Officials* | 3,453 | 1,449 | 1,000 | 13,566 | 3,340 | 2,368 | 9,307 | 34,483 |
| Rochore House | 22,875 | 1,492 | .. | 8,730 | 642 | .. | 15,498 | 49,237 |
| Senior Officials* | 2,195 | 2,110 | 921 | 4,205 | 3,485 | 1,319 | 2,064 | 16,299 |
| Total | 102,061 | 5,215 | 1,921 | 59,028 | 7,471 | 3,687 | 91,528 | 270,911 |

Government Officials' Dispensaries

The two dispensaries for Government officials are at the General Hospital. Besides providing treatment for Government officers and their families, the medical officers attached to them are responsible for conducting medical examinations for recruits into Government service, medical boards and inoculations for travel requirements and immunization against common diseases.

A record of their work is given in the following table:

| | | Recruits Examined | Medical Boards | Vaccinations and Inoculations |
|------------------|-----|----------------------|-------------------|----------------------------------|
| Senior Officials | ... | 975 | 32 | 2,206 |
| Junior Officials | ... | 5,153 | | |

Staff Dispensaries for former City Council Employees

There are three dispensaries:

- (1) The Rochore House Staff Dispensary;
- (2) Alexandra Staff Dispensary, and;
- (3) The Jalan Berseh Staff Dispensary.

The staff of the Public Utilities Board and the Housing and Development Board are treated in these dispensaries. For this service, the Boards pay respectively \$55,000 and \$11,000 a year to Government.

Police Hospital and Clinic

The Police Training School Clinic and Hospital are situated at the Police Training School, Thomson Road, and this provides medical services for the members of Police Force.

During the year, 17,181 outpatients attended the Clinic and 1,018 recruits were examined. There were 187 patients admitted to the Police Training School Hospital in 1964.

Police Families Clinic

The Police Family Clinic is situated at the Hill Street Police Quarters. The Staff Nurse in-charge of the Clinic visits the various Police Stations and gives advice to Police families and children who are having minor illness and sends more serious cases to the nearest outpatient dispensary or to General Hospital.

During the year, 27,017 outpatients attendances were recorded.

Reformatory Training Centre at Ulu Bedok

During the period from January to July 1964, the inmates of Reformatory Centre, requiring medical attention were transferred to Changi Prison for treatment. After 1st August, 1964, the Medical Officer-in-charge Changi Prison and a male nurse visited the Centre daily to administer treatment to the inmates.

In May 1964, 300 inmates were inoculated against cholera.

A Dental Officer of the Mobile Unit visited the Centre fortnightly and treated an average of 10 inmates per visit.

INSTITUTIONAL HOSPITALS

Local Prison, 1964

In the course of demolition of Outram Road Prison to make way for a Housing Development project, one ward of the Hospital, G Ward was closed. Patients were housed in one part of the old Prison Hospital, while parts of it were given over to administrative officers.

In September 1964, with the closure of G Ward, the services of the part-time medical officer were discontinued, so there remained one full time medical officer for Prison and Opium Treatment Centre. The staff now comprise one medical officer who is also medical officer i/c Opium Treatment Centre, one hospital assistant and seven male nurses. Other staff were recruited from prisoner-helpers.

The total number of prisoners admitted to Local Prison was 6,205 and the daily population was 670.8.

There were 638 admissions to hospital giving a ratio of Hospital admissions to Prison admissions of 10.3 per cent. The daily average bed occupancy was 44.8 per cent.

There were 238 admissions for drug addiction giving 37.3 per cent of admissions.

There were 88 cases of pulmonary tuberculosis, giving a rate of 1.4 per cent of the Prison population, and 13 cases of malaria, four of leprosy.

Of the 238 admissions for drug addiction there were 193 opium, 42 morphine, and three ganja addicts making respectively 81 per cent opium, 18 per cent morphine and one per cent ganja.

A total of 536 persons were admitted to Prison on charges of being drunk, constituting 8.6 per cent of the total prison admission.

Of the 238 drug addicts admitted however there were 36 with pulmonary tuberculosis and this gives a rate of 15.1 per cent. This bears out with the observation that pulmonary tuberculosis has a higher incidence in opium addicts, then in the general population.

The 13 cases of malaria during the year were all Indonesians.

The total number of outpatients was 11,916, comprising 657 New Cases, 11,259 referred cases with a daily average of 32.5 cases. With a daily bed occupancy of 44.8 and an average daily prison population of 670.8 the daily sickness rate was 11.5 per cent.

The Dental Surgeon treated 621 cases. The number of vagrants is increasing. Of 512 prisoners in the Local Prison on 31st December, 1964, 204 were vagrants, i.e. 39.5 per cent.

There were 31 deaths of prisoners and vagrants in the Prison Hospital and in other hospitals. 29 or 94 per cent of the deaths were of vagrants and 26 out of the 29 vagrants who died were 60 years and above.

There were no executions.

Changi Convict Prison

The Changi Prison Clinic and Hospital was staffed by a medical officer, three hospital assistants and three prison orderlies for the most part of last year. A new Prison Hospital block was completed last year and with the opening of the new block, four male nurses were posted to the Prison Hospital in November 1964.

A regular inspection of the Prison health and sanitation was maintained throughout the year.

The daily average of prisoners in the Prison was 1,090. The total number of outpatient attendances during the year was 32,305. A total of 241 patients were admitted into the Prison Hospital. The number of minor operations performed during the year was 416. The Dental Officer visited the Prison once a week and examined 2,086 cases in the year.

OPIUM TREATMENT CENTRE

The Opium Treatment Centre, St. John's Island, established on 8th February, 1955, has since 8th August, 1963, become a hospital for the treatment and rehabilitation of opium addicts.

The staff consist of one full-time medical officer, who is also medical officer-in-charge Local Prison, one lay superintendent, three rehabilitation officers, two male nurses, clerical staff and a warder/attendant complement of 28.

The treatment of the addict is based upon the two principles of looking upon the addict as a patient to be treated medically and treating the whole patient.

Treatment is carried out in three phases — withdrawal, rehabilitation, and follow-up. The first phase and second phases take place on St. John's Island and take two weeks and three months respectively. The third phase is carried out by means of a follow-up clinic at Maxwell Road Outpatient Dispensary.

In 1964, a total of 285 persons (males) were admitted to the Opium Treatment Centre, comprising 214 volunteers and 71 convicted persons. There were 287 discharged from the Centre in 1964, comprising 183 volunteers and 104 convicted prisoners. Of the 183 volunteers, 138 completed their rehabilitation while 45 were discharged without completing treatment and rehabilitation, making 24.6 per cent.

Since 1963, when Opium Treatment Centre ceased to be a Prison Institution the number of volunteers has increased. There were 60 volunteers out of 189 admissions in 1963 making 32 per cent and in 1964 there were 214 volunteers out of 285 admissions, giving 75 per cent.

Opium Treatment Centre Advisory Committee

The Opium Treatment Centre Advisory Committee continued its weekly meetings and interviewed a total of 285 persons during the year.

Opium Treatment Centre Follow-up Clinic

This is a special clinic which is attached to the Opium Treatment Centre. It is now at the Maxwell Road Outpatient Dispensary. The Medical Officer-in-charge Opium Treatment Centre mans the sessions on Friday afternoons. Here volunteers who have applied for admission to the Opium Treatment Centre are registered and interviewed by rehabilitation officers, and undergo medical examination and preparation prior to being admitted to Opium Treatment Centre.

Here also patients who have been discharged from the Opium Treatment Centre are followed up and treatment and other assistance, is given by Medical Officer and Rehabilitation Officers.

A total of 547 visits were made to the Clinic; of these 273 were from volunteers being seen prior to admission to St. John's and 274 were follow-up visits.

DISTRICT NURSING SERVICE

The District Nursing Service has continued to give follow-up and Nursing care to patients in their own homes and help in their rehabilitation. The patients referred for such care are from General Hospital and Outpatient Dispensaries. The total number of new patients received during the year was 647.

Total number of nursing visits paid to the homes was 11,327. Total number of supervisory visits made was 664. The staff comprised of one Sister and six staff nurses.

The District Nurses are attached to the following six centres:

- (1) Pegu Road Outpatient Dispensary;
- (2) Kallang Outpatient Dispensary;
- (3) Jalan Kayu Outpatient Dispensary;
- (4) Bukit Panjang Outpatient Dispensary;
- (5) Queenstown Outpatient Dispensary;
- (6) General Hospital.

Table 127
INSTITUTIONAL HOSPITALS

| | NEW CASES | | | REPEATS | | | Injections and Dressings | Total |
|--|-----------|--------|-------|---------|--------|--------|--------------------------|---------|
| | Male | Female | Child | Male | Female | Child | | |
| | | | | | | | | |
| Police Families' Clinic | 623 | 607 | 542 | 8,936 | 8,881 | 7,859 | 122 | 27,570 |
| Changi Prison Hospital and Reformatory Training Centre | 7,056 | .. | .. | 25,249 | .. | .. | 8,636 | 40,941 |
| Local Prison Hospital | 570 | 87 | .. | 9,709 | 1,550 | .. | 7,190 | 19,106 |
| Police Training School Hospital | 3,905 | 1,042 | 2,015 | 13,604 | 7,379 | 14,411 | 21,642 | 63,998 |
| Changi Prison Staff Hospital | 182 | 101 | 250 | 607 | 208 | 752 | 832 | 2,932 |
| Total | 12,336 | 1,837 | 2,807 | 58,105 | 18,018 | 23,022 | 38,422 | 154,547 |

25. DEPARTMENT OF RADIOLOGY

TABLE 128 shows that the total number of cases X-rayed in 1964 was 279,130 compared with 286,166 of 1963, i.e., a slight overall decrease of 7,036 cases or 2.5 per cent. This decrease could be accounted for by the 1964 July and September disturbances.

Table 128

NUMBER OF CASES RADIOGRAPHED IN THE VARIOUS HOSPITALS AND INSTITUTIONS (DIAGNOSTIC) IN 1964, COMPARED WITH 1963

| | 1964 | 1963 | Percent Increase | Percent Decrease |
|--|---------------|---------------|-----------------------------------|---------------------|
| General Hospital (Appendix A and B) ... | 92,596 | 106,856 | — | 14.8 |
| Tan Tock Seng Hospital (Appendix C) ... | 83,144 | 85,423 | — | 2.6 |
| Kandang Kerbau Hospital (Appendix D) ... | 6,858 | 7,226 | — | 5 |
| Woodbridge Hospital (Appendix E) ... | 3,387 | 3,530 | — | 4 |
| Institute of Health (for chest only) ... | 18,651 | 18,495 | 2.6 | — |
| T.B. Control Unit (for chest only) ... | 74,076 | 68,636 | 14.6 | — |
| Thomson Road Hospital (Appendix G) | 418 | — | N.A. | N.A. |
| | <hr/> 279,130 | <hr/> 286,166 | <hr/> Overall decrease of 2.5% | |

DIAGNOSTIC

Radiologists.—Dr. J. C. K. Yin was appointed as Radiologist, General Hospital, Grade G, from January, 1964.

Dr. Oon Chong Lin was appointed Senior Registrar from March, 1964.

Two medical officers, Dr. Boey Hong Khim and Dr. Kho Kwang Mui joined as Trainees in February and October, 1964, respectively.

Dr. Yu Sheng Fong obtained his D.M.R.D. on 22nd October, 1964.

Dr. Boey left for the United Kingdom in September, 1964, on a Colombo Plan Fellowship for a course leading to the D.M.R.D.

Radiographers.—The staffing situation improved somewhat in 1964, but there were insufficient radiographers available locally to fill all posts.

School of Radiography.—Two officials of the Society of Radiographers, London, namely, Messrs. W. J. Ashworth and E. R. Hutchinson, who visited Kuala Lumpur in April, 1964, were invited by the Singapore Government for a three-day inspection of our School of Radiography from 3rd to 5th May. These two officials also visited the X-ray Departments of various hospitals and were greatly impressed by our set-up and facilities. The new School of Radiography building was considered by Mr. Ashworth a model school.

Following the return of these two officials to London, the Council of the Society of Radiographers agreed that their official Adviser/Tutor in Radiography would need to spend only six months supervision instead of the usual

twelve before any overseas School of Radiography could be recognised. On this information the Singapore Government formally approached the Colombo Plan authorities for aid in securing the services of an U.K. Adviser/Tutor in Radiography for a period of six months from January–June, 1965.

Regular class for Pupil Radiographers were conducted through 1964. Ten new pupil radiographers were recruited in October, the second year of the School since its inception in October, 1963.

Part I Examination for the first batch of pupil radiographers was to have been held in October, 1964, but was postponed till April, 1965, pending recognition by the Society of Radiographers.

Teaching was done by the W.H.O. Lecturer in Radiography, Mr. D. R. E. Ernborg, the Senior Radiologist, the Superintendent Radiographer and the Hospital Physicist.

Acknowledgement is given here for lectures and demonstration in nursing given by the School of Nursing through the courtesy of the Principal Matron and Sister Tutor, and for anatomy and histology through the courtesy of the Professor of Anatomy, University of Singapore.

Cardiovascular Laboratory.—Specialised cardiovascular examinations based on cardiac catheterisation were begun with the arrival of Professor S. B. Roy, W.H.O. Consultant Cardiologist, in February 1964. He remained till 11th August, 1964, and helped to train many physicians. 248 cardiac catheterisations were performed during Professor Roy's brief stay in Singapore.

W.H.O. Multiple Seminar on Radiological Health.—A highlight of the year was a two-day Multiple Seminar on Radiological Health held in Singapore on 27th and 28th October, 1964. This was sponsored by the World Health Organisation, and with delegates coming from all parts of Malaysia, as well as from Hongkong, Philippines and South Vietnam.

The Seminar was declared open by Mr. Yong Nyuk Lin, Minister for Health.

The W.H.O. experts consisted of Professor R. H. Chamberlain, Dr. S. B. Osborne and Dr. R. C. Dobson.

Lectures were interspersed by a film show and a visit to the Department of Radiology of the General Hospital. Discussions of a fruitful nature followed the lecture sessions. The Seminar was a great success and undoubtedly delegates benefited greatly from it.

THERAPEUTIC

The total number of cases treated in the General Hospital was 815 for 1964, compared with 780 in 1963, i.e. an increase of 13 per cent. Of these, malignant cases numbered 738 for 1964 as against 647 for 1963, i.e. an increase of 14 per cent. It is of interest to note that 191 cases of nasopharyngeal carcinoma were treated in 1964, compared with 151 in 1963, representing an increase of 26.5 per cent.

For the Kandang Kerbau Maternity Hospital, 214 radium insertions were performed in 1964 compared with 137 in 1963, i.e. an increase of 77 per cent.

The present stock of radium available in the Kandang Kerbau Maternity Hospital is already inadequate for routine needs.

New Radiotherapy Department.—The official report of Professor Ralston Paterson, W.H.O. Consultant in Radiotherapy, was released in 1963. Professor Paterson favoured the construction of a new radiotherapy block in the open stretch of ground between the Chemistry Building and Housemen's Quarters, within the compound of the General Hospital. This site is eminently suitable because it has a natural embankment which can be economically employed to shield off penetrating radiation. Another advantage is that this site is near to surgical, medical and diagnostic X-ray Departments. But only a token vote of \$10 was provided in the 1965 Estimates for the new Radiotherapy Department.

The awareness of the public to the problem of cancer was in great part due to the efforts of the Minister for Health. Following an opening address in a one-week Symposium devoted to Cancer of the Nasopharynx sponsored by the U.I.C.C. in August, 1964, a Singapore Cancer Society was established within four months in December, 1964.

Staff.—Dr. Chia Kim Boon, Radiotherapist, left in November, 1964, on a six-month W.H.O. Fellowship which would carry him to well known radiotherapy centres in the U.K. in the Continent and in North America.

Dr. Chia's mission has two objectives: one, to enable him to pick up the latest methods in the treatment of malignant disease, with special reference to the use of radioisotopes, and the other to enable him to gather the best of what is found in up-to-date radiotherapy centres and equipment and to select what are most suitable for the needs of our new Radiotherapy Department.

Dr. Tan Ban Cheng was appointed Senior Registrar, Department of Radiotherapy from March, 1964.

Other X-Ray Departments.—The new wing of the Thomson Road Hospital was completed early 1964, following which new up-to-date X-ray machines were installed. These included three large diagnostic units, a skull table and one tomographic attachment. A fully automatic processing unit was also installed, the first of its kind in Singapore. Dark room equipment also included a continuous X-ray film drier, etc.

Routine day radiographic service was started in December, 1964. The activities of the X-ray Department would be gradually stepped-up according to the expanding needs of the Thomson Road Hospital.

Planning and equipment for the new X-ray Department located in the Thoracic Wing of the Tan Tock Seng Hospital were brought up-to-date in 1964.

A small X-ray service was made available in the 'E' (Casualty) Unit of the General Hospital from 24th August, 1964. A borrowed Mobile X-ray Unit was installed for X-rays of limbs, with a radiographer on duty there during office and evening hours only.

Publications

Some Sagittal Measurements of the Neck in Normal Adults. *British Journal of Radiology*, September, 1964.

A New Method of Pinael Localization. *American Journal of Roentgenology*, December, 1964.

Ureteric Irregularity due to Collateral Vessels in Renal-artery Stenosis, by H. O. Wong and K. W. Chow. *British Medical Journal*, 15th February, 1964, Vol. I, page 418.

X-Pelvimetry. *The Bulletin of the Kandang Kerbau Hospital*, Singapore. 3 : 27-35. March, 1964.

SUMMARY OF WORK DONE IN THE RADIOTHERAPEUTIC IN 1964

| | 1963 | 1964 |
|--|------|------|
| <i>Deep X-Ray Therapy</i> | | |
| Malignant Cases | 647 | 738 |
| Non Malignant Cases | 8 | 17 |
| Superficial X-Ray Therapy | 61 | 48 |
| Radium Cases: Treated in General Hospital | 4 | 12 |
| Total Number of Radium Insertion performed at Kandang Kerbau Hospital | | 214 |

26. BLOOD TRANSFUSION SERVICE

GENERAL

THE Blood Transfusion Service based at the Centre at the General Hospital has continued to serve all hospitals in Singapore.

The demand for blood transfusion in Singapore's hospitals has continued to increase. This increased demand was to a certain extent met by an increase in the number of donations received, though there were still occasions during the year when urgent operations have had to be postponed due to the inavailability of blood of one or other group.

The work of the Department has increased not only in volume, but also in scope and a number of new techniques and investigations previously not available have been included.

Donor recruitment has continued on similar lines as in the past with emphasis firstly on persuading the locally domiciled population to come forward as donors. Secondly, a greater effort has been made to persuade the relatives and friends of patients who have received or will be receiving transfusions to volunteer as donors.

A Lucky Donor of the Month Draw was introduced as an incentive to the public to come forward and donate blood.

Staff.—The head of the Department is Dr. Kwa Soon Bee.

The establishment of the Department has remained the same with two medical officers, one supervisor, one donor organiser, 13 laboratory technicians, four assistant nurses, three clerical assistants, 11 medical and health servants, and three drivers. Two medical officers have been seconded from the Ministry of Health to work in the Department. One medical officer is at present in U.K. undergoing a course of study in Clinical Hæmatology and Blood Transfusion organisation.

Donations received and transfusions given.—During the year 17,379 blood donations were received by the Blood Transfusion Service. This represents an increase of 11.06 per cent over the previous year (see Table 129).

During the same period 16,081 transfusions were given to patients in Hospitals in Singapore. This represents an increase of 7.75 per cent over the previous year. The proportion donated and used by the different racial groups has remained the same during the year (see Table 130).

The distribution of blood to the various hospitals in Singapore is given in Table 131. It will be noted that 9,910 or 61.7 per cent of all transfusions given were given at the General Hospital and that 4,224 or 26.2 per cent were given at Kandang Kerbau Maternity Hospital.

A total of 1,110 (6.9 per cent) transfusions were given in private hospitals during the year.

Relative Donors.—In spite of an increased effort by the doctors and nursing staff, it was possible to obtain a total of 2,226 (2,681 in 1964) donations from relatives and friends of patients. This represents only 12.78 per cent of all donations received.

Laboratory Service.—The Blood Transfusion Laboratory has continued to provide a 24 hour service for all hospitals in Singapore. The large increase in volume of work undertaken has put a heavy strain on the existing staff whose establishment of 13 laboratory technicians has not been increased since 1955 although the volume of work has increased by about 100 per cent.

During the year 38,549 (35,438 in 1963) compatibility tests were carried out.

In addition 2,761 special investigations into various Hæmological disorders like Neonatal Jaundice, hæmolytic anæmia, antenatal screening of mothers for abnormal antibodies, and cases with a hæmorrhagic diathesis were carried out.

Research Projects.—Studies into the serum iron values of the donors' population is still continuing. In addition the study of the congenital hæmorrhagic disorders is still in progress. A study into the causes of anæmia seen in the maternity hospital was started during the year.

Blood Fractions.—During the year a total of 1,254 plasma transfusions were given, 235 of which were used by patients in Kandang Kerbau Maternity Hospital.

The use of fresh frozen plasma which is a rich source of anti-hæmophilic globulin needed for the treatment of cases of hæmophilia has continued.

In addition, platelet rich blood and platelet concentrates prepared in plastic disposable equipment has continued on a small scale.

Production of Infusion Apparatus.—During the year a total of 19,736 (18,771 in 1963) blood giving sets and 20,003 (19,423 in 1963) saline giving sets were assembled and sterilised for distribution to all the hospitals in Singapore.

Mobile Session.—During the year, a total of 139 (150 in 1963) outdoor sessions were held at various police, military, and work brigade camps, factories and offices, educational institutions and the prisons. A total of 6,611 donations were received at these sessions representing 38.04 per cent of the year's total donations received.

Publicity and Propaganda.—This has continued along the same lines as in the past. There has been an increased use of Television and radio during the past year, to publicise the work of the department. A number of programmes and news items in both English and Mandarin were shown on Television during the year. Spot announcements have continued on Television in all four languages daily.

In addition, lantern slides have continued to be shown at all major Chinese and English cinema theatres in the State throughout the year.

A Lucky Donor of the Month Draw in which donors were issued with tickets which were to be drawn for prizes at the end of each month was organised. The main prizes of \$1,000 cash and a Single Return Air ticket to Hong Kong were donated by the Singapore Turf Club and Malaysian Airways Ltd. In addition a large number of commercial organisations made donations of consolation prizes for the Draw. The Singapore Blood Transfusion Service would like to place a record its appreciation and thanks to these organisations for their valuable donations.

A six-week publicity campaign was launched in December 1964. This was aimed at bringing the attention of the public to the urgent need to support the blood bank.

A Malaysia wide poster design competition was also organised. This publicity campaign ended with a Gift of Life Exhibition at the Victoria Memorial Hall in January 1965.

During the year, a Medal Presentation Ceremony was held which the Political Secretary to the Ministry of Health, Mr. Chor Yeok Eng presented awards to a total of 158 regular donors.

Donations from Commercial Firms

The Service acknowledges with thanks the donations of various refreshments and cigarettes, etc. throughout the year from the following organisations:

- Fraser & Neave Ltd. — Beer and Aerated Waters.
- Diethelm & Co. Ltd. — Barlova.
- Sime Darby (Singapore) Ltd. — Guinness Stout.
- Singapore Tobacco Co. Ltd. — Player's Cigarettes.
- Nestle's Products (Malaya) Ltd. — Milo, Nescafe and Milkmaid Milk.
- Borneo Co. Ltd. — Bovril.
- A. Wander Ltd. — Ovaltine.
- Vernat Eastern Agencies Ltd. — Horlicks.
- Singapore Cold Storage Ltd. — Still-Orange and Grape-Fruit.
- Guthrie & Co. Ltd. — Bulldog Stout.
- Rothmans of Pall Mall — Rothman and Consulate Cigarettes.

Table 129

DONATIONS RECEIVED AND TRANSFUSIONS GIVEN — 1960-64

| | | Total Donations Received | Percentage Increase Over Previous Year | Total Transfusions Given | Percentage Increase Over Previous Year |
|------|-----|--------------------------------|--|--------------------------------|--|
| 1960 | ... | 12,874 | 11 | 12,595 | 11.5 |
| 1961 | ... | 13,189 | 2.4 | 12,913 | 2.5 |
| 1962 | ... | 14,183 | 7.5 | 13,775 | 6.7 |
| 1963 | ... | 15,649 | 10.3 | 14,925 | 8.3 |
| 1964 | ... | 17,379 | 11.06 | 16,081 | 7.75 |

Table 130

ANALYSIS OF DONATIONS RECEIVED AND TRANSFUSIONS
GIVEN BY RACIAL GROUPS — 1964

| | Donations Received | Percentage | Transfusions Given | Percentage |
|---------------|-----------------------|------------|-----------------------|------------|
| Chinese ... | 6,113 | 35 | 12,213 | 75.95 |
| Malay ... | 4,818 | 28 | 1,872 | 11.64 |
| Indian ... | 2,018 | 12 | 1,369 | 8.52 |
| Europeans ... | 3,404 | 19 | 358 | 2.22 |
| Eurasian ... | 848 | 5 | 144 | .90 |
| Others ... | 178 | 1 | 125 | .77 |
| | <u>17,379</u> | <u>100</u> | <u>16,081</u> | <u>100</u> |

Table 131

ANALYSIS OF DISTRIBUTION TO HOSPITALS

| | Transfusions Given | Percentage |
|-----------------------------------|--------------------|------------|
| General Hospital ... | 9,910 | 61.7 |
| Kandang Kerbau Maternity Hospital | 4,224 | 26.2 |
| Other Government Hospitals ... | 837 | 5.2 |
| Private Hospitals ... | 1,110 | 6.0 |
| | <u>16,081</u> | <u>100</u> |

27. DENTAL HEALTH

The public dental services were fully maintained during 1964 as the working situation was good throughout the year. The Head of the Dental Branch, Mr. Wang Mook On, controlled an establishment of 55 dental surgeons, 76 school dental nurses, 24 dental technicians and 151 other staff. There were 51 dental clinics in operation by the end of the year providing services for all schoolchildren, to patients and patients attending the Hospital and Child Health Centre, to hospital in-patients, and other groups of the population.

SECTION IV

OTHER SPECIAL DEPARTMENTS

The provision of adequate dental services for Singapore schoolchildren continued to be a serious problem as the school population increased to over 450,000 last year. There were about 120,000 primary school pupils and 85 per cent of these children are still awaiting school dental service treatment, but only very few of them were actually receiving dental care from their own private dentists. Their dental needs were great, and it was therefore necessary to devote over half of the members of the department to run the School Dental Service.

During 1964 six new dental clinics were established in various primary schools, bringing the total number of school clinics to 34, including 2 Special School Dental Centres. Near the end of the year, the construction of 10 new dental clinics in certain existing primary schools was completed. Arrangements for a dental clinic were also provided in each of six new primary schools opened by the Ministry of Education during the year. Therefore, a total of 16 new clinics were made available for opening early in 1965. This feature is one of steady expansion during the last 5 years and promising for the future.

In order to provide adequate dental staff to run the expanded School Dental Service, a Dental Nurses' Training School had been established early in 1962 at the Institute of Health in their auxiliary dental premises. This School provided a two-year course and planned to graduate 20 school dental nurses a year, and the first batch of 17 dental nurses duly graduated in January 1964. These trained dental nurses had since been posted at various school dental clinics. They worked under the supervision of Dental Officers and were found to be effective in providing routine conservative dental treatment to school-children. The system whereby a number of dental nurses worked under the direct supervision of a Dental Officer was being developed carefully and should become standardised and adopted generally in the School Dental Service within the next two years. The volume of work for the year showed a substantial increase over that of 1963, and the total number of patient-attendants reached a new record of 151,113. Dental radiographs totalled 98,594, and 29,934 permanent dental filling had been done by the school-children under their dental work.

TABLE 10

ANALYSIS OF DONATIONS RECEIVED AND EXPENDITURE
 GIVEN BY RACIAL GROUPS - 1964

| | Donations Received | Percentage | Expenditures Given | Percentage |
|----------|--------------------|------------|--------------------|------------|
| Chinese | 6,118 | 34 | 10,773 | 33.95 |
| Malay | 4,377 | 24 | 7,472 | 24.04 |
| Indian | 7,014 | 39 | 12,269 | 39.27 |
| European | 2,562 | 14 | 4,571 | 14.52 |
| Others | 20 | 0 | 44 | 0.14 |
| Total | 20,089 | 100 | 31,109 | 100 |

SECTION IV

OTHER SPECIAL DEPARTMENTS

STATEMENT OF CONTRIBUTIONS TO HOSPITALS

| | Total Contribution | Percentage |
|----------------------------|--------------------|------------|
| General Hospital | 2,070 | 41.7 |
| Queen Elizabeth Hospital | 1,274 | 25.1 |
| Other Government Hospitals | 277 | 5.5 |
| Private Hospitals | 1,179 | 23.7 |
| Total | 5,000 | 100 |

27. DENTAL HEALTH

THE public dental services were fully maintained during 1964 as the staffing situation was good throughout the year. The Head of the Dental Branch, Mr. Wong Mook Qui, controlled an establishment of 58 dental surgeons, 76 school dental nurses, 26 dental technicians and 151 other staff. There were 51 dental clinics in operation by the end of the year providing dental care to school-children, to mothers and infants attending the Maternal and Child Health Centres, to hospital patients and out-patients, and other groups of the population.

SCHOOLS DIVISION

The provision of adequate dental attention for Singapore school-children continued to be a serious problem as the school population increased to over 450,000 last year. There were about 358,000 primary school pupils and 95 per cent of these children on first entering school needed dental treatment, but only very few of them were actually receiving dental care from their own private dentists. Their dental needs were great, and it was therefore necessary to devote over half of the resources of the department to run the School Dental Service.

During 1964 six new dental clinics were established in certain primary schools bringing the total number of school clinics to 34, including 2 large School Dental Centres. Near the end of the year, the construction of 10 new dental clinics in certain existing primary schools was completed. Accommodation for a dental clinic was also provided in each of six new primary schools opened by the Ministry of Education during the year. Therefore, a total of 16 new clinics was made available for opening early in 1965. The picture is one of steady expansion during the last 5 years and promising for the future.

In order to provide adequate dental staff to man the expanded School Dental Service, a Dental Nurses' Training School had been established early in 1962 at the Institute of Health to train ancillary dental personnel. This School provided a two-year course and planned to graduate 20 school dental nurses a year, and the first batch of 19 dental nurses duly graduated in January 1964. These trained dental nurses had since been posted at various school dental clinics. They worked under the supervision of Dental Officers and were found to be effective in providing routine conservative dental treatment to school-children. The system whereby a number of dental nurses worked under the close supervision of a Dental Officer was being developed carefully and should become standardised and adopted generally in the School Dental Service within the next two years. The returns of work for the year showed a substantial increase over that of 1963, and the total number of patient-attendances reached a new record of 151,112. Dental extractions totalled 98,594, and 69,934 permanent dental filling had been done for the school-children beside other dental work.

HOSPITALS DIVISION

The Hospitals Division comprised a large dental clinic at the General Hospital and 3 other dental clinics located in the Tan Tock Seng Hospital, the Woodbridge Hospital and the Trafalgar Home. During 1964 a new dental clinic was being completed at the Thomson Road Hospital, and a similar clinic was also under construction in the new Thoracic Unit Block of the Tan Tock Seng Hospital. Both clinics should be in operation in the following year. Inmates of the St. Andrew's Orthopædic Hospital and the Red Cross Home for crippled children continued to receive dental attention from a mobile dental clinic which visited these institutions regularly.

The dental clinic at the General Hospital continued to provide treatment to hospital patients and out-patients. Professor J. A. Jansen, Head of the Department of Dentistry of the University of Singapore, was in charge of this clinic, and he had under him Government dental staff as well as University personnel working in the clinic. These staff provided a wide range of dental treatment, including specialist treatment, to patients attending this clinic. The work at this department was well maintained during the year and the total number of patient-attendances was 113,850. This was slightly lower than the figure recorded in 1963, but the decrease was accounted for by the decreased attendances of patients during the July and September civil commotions. This clinic functioned throughout the period of the civil commotions, and afforded prompt treatment to a small number of casualties who had sustained dental and oral injuries. Towards the end of the year, the Senior Dental Surgeon, Mr. George Paul, resigned from the service and left for the United Kingdom. He was replaced by Mr. Lim Kheng Ann who took over in an acting capacity.

The chronic sick in the Tan Tock Seng Hospital, the Woodbridge Hospital and Trafalgar Home were given attention by a Dental Officer at the dental clinics located in these institutions. The work done showed a slight increase over that of the previous year.

MATERNAL AND CHILD HEALTH DIVISION

Pregnant and nursing mothers and their young children of pre-school age received dental treatment at 7 dental clinics located in the following centres:

- Prinsep Street M. & C.H. Centre
- Bukit Timah M. & C.H. Centre
- Ama Keng M. & C.H. Centre
- Mandai M. & C.H. Centre
- Yio Chu Kang M. & C.H. Centre
- Kampong Batak M. & C.H. Centre
- Buona Vista M. & C.H. Centre

Dental Officers at these clinics attended to patients referred by the above Centres and other M. & C.H. Centres in Singapore. Dental treatment at these clinics was provided free of charge as in the case of medical services which

were being provided by Government to mothers and infants at M. & C.H. Centres. The work of this division was satisfactory, and the total patient-attendances of these clinics was 24,240. The number of permanent dental fillings done was 3,482, and 20,510 teeth were extracted. The number of dentures issued was 1,549.

MISCELLANEOUS DENTAL SERVICES

For the police rank and file in Singapore, dental care was provided by one Dental Officer at the dental clinic located at the Central Police Station. This Dental Officer also visited Outram and Changi Prisons weekly to attend to prisoners and detainees who had dental complaints.

Dental treatment was provided by mobile dental clinics to inmates of several institutions and charitable homes, including the Blind School, Cheshire Home, the Spastic Children's Association Centre, Boys' Town, and the Lee Kuo Chuan Nursery. A mobile dental clinic regularly attended to inmates at Gimson School, Mt. Emily Girls' Home and the Girls' Home-Craft Centre.

Young children attending various children's centres in Singapore were provided with dental care at two clinics sited at the Geylang Community Centre and the Siglap Community Centre. It was noted during the year that the number of such children was gradually decreasing owing to the fact that more of these children had found places in the regular schools.

Preventive Dentistry

Nearly half of the population in Singapore consists of children and adolescents, and among these young people dental caries is prevalent. In order to reduce the incidence of dental decay among this young population, fluoridation of the entire municipal water supply in Singapore was instituted in 1958. It came into its 7th year of operation in 1964, and promising results had been recorded by means of an annual dental survey carried out among school children.

During the year, several dental exhibitions were held in conjunction with the official openings of several new primary schools, each of which having provision for its own dental clinic. These exhibitions helped to propagate dental health knowledge among school children and their parents. Dental Officers and school dental nurses were making a better effort to impart dental health education as well as providing dental treatment to their patients.

TRAINING OF STAFF

During the year there were 44 student dental nurses under training in the Dental Nurses' Training School at the Institute of Health. The first batch of 19 dental nurses graduated from the School in January, followed by an intake of 23 new trainees in June. Among the student dental nurses, two girls came from Thailand under the auspices of the Colombo Plan and two girls were sent by the Sarawak Government.

Two small batches of student dental assistants were under departmental training during the year. This was done largely on the basis of 'in-service' training.

A group of 7 probationer dental technicians was undergoing the second year of training in the department. They were taking a 3-year training course in dental mechanics in the Government Dental Laboratory at the Institute of Health.

One Dental Officer, Mr. Chua Sui Yeow, who left for the United Kingdom for higher studies under a departmental fellowship in the previous year, succeeded in obtaining the F.D.S.R.C.S. (England) and the F.D.S.R.C.S. (Edin.). He returned to Singapore in August, and had resumed duty in the Oral Surgery Unit of the General Hospital Dental Clinic.

During the year, two other Dental Officers left for higher studies in the United Kingdom, namely Mr. Yeo Seng Sit and Mr. Wong Hee Deong who left in August and September respectively. Mr. Wong was to undergo a course leading to the D.P.D. (St. Andrew's), and Mr. Yeo intended to study for the Fellowship in Dental Surgery.

DENTAL BOARD

The Inspecting Officer, Dental Board, had reported that by the end of 1964 there were 334 registered dentists practising in Singapore, of which 115 were fully qualified dental surgeons. Of the qualified dentists, 55 were in Government service, 14 were teaching in the Dental School of the University of Singapore, and 46 were in private practice. There was an increase of 6 qualified dentists in the Dental Register.

During the year, the Inspecting Officer carried out a total of 352 inspections on the premises of Division II dentists, and 21 warning notices had been issued to certain dentists who were found to be practising dentistry under unsatisfactory conditions.

ANNUAL RETURNS OF WORK IN GOVERNMENT DENTAL CLINICS

Table 132 showed the return work in respect of all Government dental clinics.

TABLE 132
DENTAL SERVICES, SINGAPORE
RETURN OF WORK
Period Covered 1964

| Clinic | PATIENTS SEEN | | | | TREATMENT GIVEN | | | | | | | | | | PATIENTS | |
|---|---------------|---------------------|--------------------|-------------|-------------------|----------------|----------|--------|-----------------|-----------------|----------------------|-----------------------|-------------------|------|-----------------|---------------------|
| | NEW CASES | | | | Total attendances | FILLINGS | | | EXTRACTIONS | | Scalings (per visit) | Dressings (per visit) | DENTURES INSERTED | | Other treatment | Treatment completed |
| | Examined | Requiring treatment | Refusing treatment | Re-examined | | Silver Amalgam | Silicate | Other | Deciduous teeth | Permanent teeth | | | Partial | Full | | |
| <i>Schools Division</i> | | | | | | | | | | | | | | | | |
| School Dental Clinic, Institute of Health .. | 11,954 | 11,917 | 55 | .. | 31,187 | 4,694 | 1,356 | 2,819 | 16,406 | 12,190 | 370 | 670 | 342 | 3 | 1,350 | 517 |
| School Dental Centre, Pegu Road .. | 2,016 | 2,016 | 3 | 499 | 28,576 | 16,487 | 1,218 | 5,659 | 8,969 | 3,506 | 2,567 | 542 | 116 | .. | 2,060 | 2,421 |
| Dental Nurses' Training School .. | 905 | 905 | .. | 615 | 12,154 | 6,895 | 343 | 4,652 | 1,496 | 152 | 2,472 | 320 | .. | .. | 1,052 | 1,143 |
| Dental Nurses' Clinics .. | 1,335 | 1,237 | 101 | 4,152 | 17,228 | 6,792 | 502 | 1,660 | 4,808 | 794 | 3,539 | 1 | .. | .. | 903 | 3,433 |
| Mobile Dental Clinics .. | 3,712 | 3,640 | 92 | 1,986 | 9,235 | 2,360 | 174 | 1,534 | 4,563 | 1,932 | 297 | 67 | .. | .. | 278 | 987 |
| Tanjong Katong Girls' School Dental Clinic .. | 919 | 905 | 44 | 1,486 | 7,543 | 4,712 | 689 | 1,430 | 2,130 | 557 | 808 | 58 | 66 | 2 | 857 | 1,070 |
| L. Bradar School Dental Clinic .. | 523 | 511 | 8 | 103 | 2,859 | 1,358 | 89 | 402 | 1,376 | 204 | 125 | .. | 5 | .. | 58 | 307 |
| Kaki Bukit School Dental Clinic .. | 1,516 | 1,513 | 2 | 2,485 | 4,002 | 902 | 207 | 395 | 2,644 | 545 | 599 | 109 | 38 | .. | 330 | 333 |
| Mattar (East) School Dental Clinic .. | 1,262 | 1,239 | 10 | 1,025 | 2,406 | 1,363 | 242 | 665 | 2,509 | 826 | 358 | 36 | 54 | .. | 703 | 193 |
| Telok Kurau (West) School Dental Clinic .. | 419 | 417 | 88 | .. | 1,567 | 563 | 17 | 213 | 971 | 73 | 22 | 1 | 4 | .. | 28 | 166 |
| Guillemard School Dental Clinic .. | 876 | 876 | 52 | .. | 2,196 | 680 | 13 | 282 | 1,188 | 289 | 20 | 2 | 1 | .. | 41 | 187 |
| Geylang Community Centre Dental Clinic .. | 501 | 501 | .. | 19 | 1,671 | 727 | 52 | 237 | 1,711 | 227 | 129 | 5 | 7 | 4 | 38 | 285 |
| <i>Carried forward ..</i> | 25,938 | 25,677 | 455 | 12,370 | 120,624 | 47,533 | 4,902 | 19,948 | 48,771 | 21,295 | 11,306 | 1,810 | 635 | 9 | 7,698 | 11,042 |

Notes:

TABLE 132—*contd.*
DENTAL SERVICES, SINGAPORE
RETURN OF WORK
Period Covered 1964

| Clinic | PATIENTS SEEN | | | | TREATMENT GIVEN | | | | | | | | | | PATIENTS | | |
|---|---------------|---------------------|--------------------|-------------|-------------------|----------------|----------|--------|-----------------|-----------------|----------------------|-----------------------|-------------------|------|-----------------|---------------------|--|
| | NEW CASES | | | Re-examined | Total attendances | FILLINGS | | | EXTRACTIONS | | Scalings (per Visit) | Dressings (per Visit) | DENTURES INSERTED | | Other treatment | Treatment completed | |
| | Examined | Requiring treatment | Refusing treatment | | | Silver Amalgam | Silicate | Other | Deciduous teeth | Permanent teeth | | | Partial | Full | | | |
| <i>Schools Division</i> | | | | | | | | | | | | | | | | | |
| <i>Brought forward ..</i> | 25,938 | 25,677 | 455 | 12,370 | 120,624 | 47,533 | 4,902 | 19,948 | 48,771 | 21,295 | 11,306 | 1,810 | 635 | 9 | 7,698 | 11,042 | |
| Bedok Boys' School Dental Clinic .. | 428 | 428 | .. | 3 | 2,114 | 1,609 | 122 | 382 | 1,349 | 286 | 319 | .. | 6 | .. | 16 | 353 | |
| Siglap Community Centre Dental Clinic .. | 616 | 602 | .. | 33 | 1,880 | 441 | 21 | 438 | 2,256 | 380 | 71 | 3 | 6 | .. | 11 | 62 | |
| Aroozoo Avenue School Dental Clinic .. | 374 | 353 | 38 | 18 | 1,259 | 783 | 51 | 441 | 1,364 | 96 | 87 | 9 | 1 | .. | 5 | 126 | |
| Telok Ayer School Dental Clinic .. | 587 | 587 | 12 | .. | 1,938 | 836 | 165 | 309 | 604 | 293 | 185 | 48 | 5 | .. | 2 | 174 | |
| Hua Yi School Dental Clinic .. | 4 | 4 | .. | .. | 1,151 | 744 | 4 | 193 | 639 | 51 | 101 | .. | .. | .. | 60 | 55 | |
| Selegie School Dental Clinic .. | 295 | 295 | 5 | 36 | 3,181 | 2,552 | 78 | 519 | 1,176 | 156 | 425 | 92 | 7 | .. | 348 | 338 | |
| Balestier Hill School Dental Clinic .. | 346 | 346 | 25 | 183 | 2,187 | 1,424 | 26 | 167 | 1,686 | 225 | 143 | 32 | .. | .. | 14 | 165 | |
| Kim Keat School Dental Clinic .. | 656 | 656 | 73 | 186 | 2,016 | 1,082 | 16 | 160 | 1,582 | 177 | 101 | 21 | .. | .. | 10 | 116 | |
| Cambridge School Dental Clinic .. | 153 | 150 | 24 | 66 | 1,232 | 872 | 38 | 269 | 733 | 81 | 105 | .. | 5 | .. | 92 | 142 | |
| Bukit Ho Swee English School Dental Clinic .. | 522 | 522 | 15 | .. | 1,513 | 166 | 3 | 352 | 1,039 | 173 | 9 | 1 | 2 | .. | 47 | 49 | |
| Bukit Ho Swee Chinese School Dental Clinic .. | 207 | 207 | .. | .. | 1,028 | 967 | 4 | 269 | 569 | .. | 201 | .. | .. | .. | 80 | 44 | |
| Jalan Kembangan School Dental Clinic .. | 406 | 396 | 23 | 1,546 | 1,952 | 1,941 | 27 | 1,299 | 1,079 | 40 | 315 | 26 | .. | .. | 191 | 190 | |
| <i>Carried forward ..</i> | 30,532 | 30,223 | 670 | 14,441 | 142,075 | 60,950 | 5,457 | 24,746 | 62,847 | 23,253 | 13,368 | 2,042 | 667 | 9 | 8,574 | 12,856 | |

Notes:

28. TUBERCULOSIS CONTROL UNIT

STAFF

DR. Wong Hin Sun was the Assistant Director of Medical Services (Tuberculosis). For the period 5th November, 1964 to 11th November, 1964 he was at Kuala Lumpur as a participant in the W.H.O. Inter Regional Tuberculosis Seminar and from 12th November, 1964 to 14th November, 1964 he was in Bangkok on a Post Seminar Tour.

At the end of the year the composition of the Staff was as follows:—

| | |
|--|-----------------------------------|
| Assistant Director of Medical Services (Tuberculosis). | 2 General Clerical Officers. |
| 4 Medical Officers, | Clerical Officer (Interpreter). |
| Higher Executive Officer (Registrar, Tuberculosis Registry). | 10 Clerical Assistants. |
| 2 Radiographers. | Senior Assistant Nurse. |
| 5 Laboratory Technicians. | 22 Assistant Nurses. |
| 2 Laboratory Technicians in Training. | Typist. |
| Sister. | 6 Junior Photographic Assistants. |
| 12 Staff Nurses. | 6 Laboratory Attendants. |
| | 10 Drivers, General Purpose. |
| | 2 Office Boys. |

ADMINISTRATION

The Tuberculosis Control Unit serving as the centre of all activities against tuberculosis continued the following functions:—

- (a) The maintenance of a Central Tuberculosis Registry which is the centre for accurate, complete and current information on all notified tuberculosis cases.
- (b) The maintenance of a Central Tuberculosis Laboratory (previously known as Central Culture Laboratory) for the examination and culture of sputum and sensitivity tests of mycobacterium tuberculosis to anti-tuberculosis drugs.
- (c) The maintenance of a Diagnostic Clinic (previously known as Recall Clinic) for the follow-up of cases recalled from X-ray Surveys, the periodical check-up of cases initially diagnosed as "Scars" and the assessment of cases not yet proven as active.
- (d) The maintenance of a Contact Clinic for the follow-up and examination, including home visits and clinic attendances, of all contacts of known cases.
- (e) To direct and supervise the State B.C.G. campaign.
- (f) To provide the School Tuberculosis Service.
- (g) To conduct Mass and Group X-Ray Surveys.
- (h) To teach and train personnel in all aspects of Tuberculosis Control, such as home visitors, laboratory technicians and Staff Nurses on the Public Health Nursing Course.
- (i) To formulate plans for the effective control of tuberculosis.

WORLD HEALTH DAY 1964

The theme for the celebration of World Health Day for 1964 was "No Truce for Tuberculosis". As Tuberculosis is an important problem in Singapore it was thought appropriate to celebrate the World Health Day by holding an Anti-Tuberculosis Week from 6th April to 12th April. The high light of the Anti-Tuberculosis Week was an exhibition on the treatment and prevention of the disease, open houses at the Tuberculosis Institutions and extensive press and Radio and Television publicity. The Tuberculosis Control Unit, Tan Tock Seng Hospital and S.A.T.A. took part in the Week's activities. The Anti-Tuberculosis Exhibition was held in the Victoria Memorial Hall from April 7th to 12th and was opened by the Minister for Health Mr. Yong Nyuk Lin. A Mobile X-Ray Unit was available at the exhibition to X-ray visitors coming to see the exhibits. A total of 1,940 X-rays was taken. All sections of the Tuberculosis Control Unit, Tan Tock Seng Hospital and SATA were represented in the Exhibition. The exhibition was a great success.

CENTRAL TUBERCULOSIS REGISTRY

The number of tuberculosis notifications registered was 4,452. The following statement shows the number of notifications received for the year by month. For comparison figures for 1960, 1961, 1962 and 1963 are also given.

STATEMENT SHOWING NUMBER OF NOTIFICATIONS REGISTERED IN 1960, 1961, 1962, 1963 AND 1964 BY MONTHS

| Month | Number Registered | | | | |
|--------------|-------------------|-------|-------|-------|--------|
| | 1960 | 1961 | 1962 | 1963 | 1964 |
| January | 287 | 295 | 528 | 331 | 367 |
| February | 298 | 267 | 476 | 179 | 256 |
| March | 507 | 600 | 438 | 336 | 316 |
| April | 370 | 568 | 382 | 346 | 357 |
| May | 454 | 614 | 495 | 194 | 228 |
| June | 464 | 497 | 551 | 273 | 542 |
| July | 604 | 510 | 500 | 436 | 416 |
| August | 554 | 425 | 400 | 522 | 379 |
| September | 449 | 511 | 605 | 420 | 290 |
| October | 323 | 660 | 503 | 606 | 461 |
| November | 353 | 628 | 372 | 483 | 416 |
| December, | 394 | 724 | 523 | 528 | 504 |
| Total | 5,057 | 6,299 | 5,773 | 4,654 | 4,532* |
| Monthly Avg. | 421 | 525 | 481 | 388 | 377 |

* Provisional only.

The position of the Central Tuberculosis Register as at 31st December, 1964 was as follows:—

CENTRAL TUBERCULOSIS REGISTER

| | | | | | |
|---|-----|-----|-------|-----|--------|
| Cases as at 1-1-64 | ... | ... | ... | ... | 25,666 |
| Add cases registered in 1964 | | | | | |
| (a) Pulmonary | ... | ... | 4,430 | | |
| (b) Extra-Pulmonary | ... | ... | 102 | | 4,532 |
| | | | | | <hr/> |
| | | | | | 30,198 |
| Less Cases removed from Register in 1964 | ... | ... | | | 1,012 |
| | | | | | <hr/> |
| Number of cases on the register as at 31st December, 1964 | ... | | | | 29,186 |
| | | | | | <hr/> |

Further statistics on tuberculosis appear in Tables 133–139.

CENTRAL TUBERCULOSIS LABORATORY

(Previously known as Control Culture Laboratory.)

The Central Tuberculosis Laboratory continued its function of performing bacteriological examinations in connection with tuberculosis and cultures and sensitivity tests for mycobacterium tuberculosis for all Government Hospitals and Outdoor Dispensaries. Positive cultures were also received from the Royal Singapore Chest Clinic for drug sensitivity tests. Specimens, though small in number were also received from the Youngberg Memorial Hospital, British Military Hospital, and from Sabah and Sarawak. The study on the virulence of tubercle bacilli in co-operation with the medical Research Council in London was continued.

The laboratory equipment donated by the UNICEF in 1963, have been installed and put into operation. The hot air oven is being utilised for drying the increased number of culture bottles and sterilizing all glass wares used in bacteriological work. Towards the end of the year the thermo-graph incubator apparatus was installed and the incubator room extended thereby increasing the incubating area for the cultures. The accurate registration of the required temperature shown on the weekly thermo-graph and the safety thermostatic control has eliminated the uncertainty of over-heating the cultures, thus enabling this laboratory to produce more accurate and a higher standard of work.

Cultures.—38,052 cultures were done in 1964 as compared with 30,300 in 1963. Out of the 34,492 cultures reported, 4,795 specimens were positive, showing a positive percentage of 13.9. As before, specimens of pus, tissues and currettings yielded the highest percentage of positives. Out of 232 specimens done, 39 cultures were positive (16.8%). Again, the cultures of larygeal swabs had the lowest contamination rate. Under the new system of collecting sputa under the direct supervision of a laboratory technician, the percentage of positives from Mass X-ray cases had been increased. The old system of supplying bottles to patients to collect sputa at home was discontinued.

Sensitivity Tests.—Drug sensitivity tests were carried out as in 1963 by the Resistance Ratio method of Dr. Michison on all positive cultures. The results had been very constant for the 3 main drugs.

Research.—Towards the end of the year laboratory in conjunction with Tan Tock Seng Hospital undertook a study on the comparative efficiency of Isoniazide in Combination with Thiacetazone against PAS plus Isoniazide. The laboratory is responsible for all the culture work including the sensitivity tests to the drugs used.

Training.—Lectures on the bacteriology of Tuberculosis were conducted in this Laboratory to the various batches of Public Health Nurses, and trainee nurses from General Hospital and Tan Tock Seng Hospital.

During the year, a number of doctors on W.H.O. Fellowship visited the laboratory. These doctors were highly impressed by the work and the whole set up of the laboratory.

Again the staff of the laboratory worked short-handed but despite this they had been able to cope most efficiently with the noticeably increase in the volume of work.

The work done during the year is tabulated below:—

CULTURES DONE DURING THE YEAR 1964

| | | | |
|---|-----|-----|--------|
| Number of Cultures done ... | ... | ... | 38,052 |
| Number of Cultures already reported ... | ... | ... | 34,492 |
| Number of Cultures still in incubation | ... | ... | 3,560 |

| Nature of Specimens | Total Re-reported | Number Negative | Number Positive | Unclas. A.F.B. | Contaminated | % Positive | % Contaminated |
|--|-------------------|-----------------|-----------------|----------------|--------------|-------------|----------------|
| Laryngeal Swabs .. | 25,095 | 20,004 | 4,028 | 31 | 42 | 16.05 | 0.17 |
| Sputum, Glavage and Mucous from Bronchus | 1,793 | 1,534 | 218 | 3 | 38 | 12.15 | 2.11 |
| Urine | 1,345 | 1,235 | 44 | 5 | 61 | 3.27 | 4.54 |
| Cerebro-spinal Fluid .. | 418 | 404 | 5 | .. | 9 | 1.2 | 2.15 |
| All Aspiration Fluids | 501 | 461 | 34 | .. | 6 | 6.7 | 1.20 |
| Pus, Tissues, Bones, Currettings .. | 232 | 185 | 39 | .. | 8 | 16.81 | 3.45 |
| Stool and Miscellaneous | 35 | 28 | 2 | .. | 5 | 5.71 | 14.29 |
| Mass X-Ray L.S. .. | 3,311 | 3,085 | 215 | 6 | 5 | 6.5 | 0.15 |
| Mass X-Ray Sputum | 1,762 | 1,550 | 210 | 1 | 1 | 11.9 | 0.05 |
| Total .. | 34,492 | 29,476 | 4,795 | 46 | 175 | 13.9 | 0.5 |

CONCENTRATED SMEARS DONE

| Number of Smears done | Negatives | Positives | % Positive |
|-----------------------|-----------|-----------|------------|
| 1,990 | 1,852 | 138 | 6.9 |

DRUG SENSITIVITY TESTS DONE IN 1964

| | | | | |
|--|-----|-----|-----|-------|
| Number of Strains tested | ... | ... | ... | 5,342 |
| Number of Strains reported | ... | ... | ... | 4,801 |
| Number of Strains still in incubation | ... | ... | ... | 541 |
| Number of Strains unsuccessful or contaminated | ... | ... | ... | 94 |

DRUG SENSITIVITY TESTS DONE BY RESISTANCE RATIO METHOD

| Drugs | Strains | Sensitive | Doubtful | Resistant | Contaminated |
|--------------|---------|-----------|----------|-----------|--------------|
| INH | 4,524 | 2,697 | 414 | 1,320 | 93 |
| Streptomycin | 4,524 | 2,767 | 205 | 1,459 | 93 |
| P.A.S. | 4,524 | 2,867 | 158 | 1,406 | 93 |
| Cycloserine | 277 | 232 | 39 | 5 | 1 |
| Kanamycin | 277 | 260 | 13 | 3 | 1 |
| Viomycin | 277 | 232 | 37 | 7 | 1 |
| Ethionamide | 277 | 227 | 37 | 12 | 1 |

MASS X-RAY CASE-FINDING SURVEYS

The Mass X-ray programme to X-ray the whole community who were above 14 years of age and resident in Singapore was continued. The area included in postal district one which was examined in the pilot survey in 1958 was re-surveyed. 8,114 residents were x-rayed and 656 of them were found to have suspicious lung Tuberculosis requiring investigation. In the latter part of the year the Mass X-ray Case-finding Unit was moved to Postal District 19. The fully mobile X-ray Unit donated by UNICEF was used completely in this survey. A total of 10,615 residents in the district was examined and 485 persons with suspicious lung tuberculosis were investigated.

In addition the Mass X-ray Units participated in the X-ray examinations of special groups in the Government Service and elsewhere. A total of

47,538 X-ray examinations was made in the year. A detail break down of the Mass X-ray Community and Group Survey appears in the table below:—

| | No. X-Rayed | Suspicious lung T.B. requiring investigation | Scars as a result of healed tuberculosis | Bronchiectasis and Cysts | Other non-Tuberculous lung diseases | Heart abnormalities | Total of abnormalities | Technical Fault and Artefact |
|---|---------------|--|---|-----------------------------|--|---------------------|------------------------|---------------------------------|
| <i>Community X-Ray Survey</i> | | | | | | | | |
| Anti-T.B. Week .. | 1,940 | 90 | 39 | 4 | 26 | 4 | 163 | 5 |
| Postal District 1 .. | 8,114 | 656 | 296 | 22 | 90 | 25 | 1,089 | 11 |
| Postal District 19 .. | 10,615 | 485 | 117 | 32 | 140 | 43 | 817 | 14 |
| Southern Islands .. | 1,112 | 43 | 7 | 3 | 8 | 11 | 72 | 6 |
| Total .. | 21,781 | 1,274 | 459 | 61 | 264 | 83 | 2,141 | 36 |
| <i>Group X-Ray Survey</i> | | | | | | | | |
| Police Dept. .. | 3,792 | 115 | 37 | 1 | 27 | 6 | 186 | .. |
| Telecommunication Dept. .. | 20 | 1 | .. | .. | .. | .. | 1 | .. |
| Work Brigade .. | 107 | 3 | 2 | .. | 2 | .. | 7 | .. |
| Public Health Div. Cleansing Section .. | 1,853 | 142 | 32 | 1 | 26 | 9 | 210 | 4 |
| School Teachers .. | 13,490 | 334 | 318 | 3 | 114 | 23 | 792 | 15 |
| School Staff and School Hawkers .. | 5,219 | 224 | 118 | 4 | 47 | 18 | 411 | 5 |
| Granite Quarries Workers .. | 1,335 | 126 | 36 | 2 | 37 | 3 | 204 | 1 |
| Govt. Medical Stores .. | 105 | 2 | 1 | .. | 2 | .. | 5 | .. |
| Immigration Dept. .. | 165 | 8 | 2 | .. | .. | 2 | 12 | .. |
| University of Singapore .. | 798 | 15 | 9 | 1 | 7 | 2 | 34 | 3 |
| Secondary School Leavers .. | 14,123 | 159 | 200 | 5 | 141 | 15 | 520 | 10 |
| General Electric Co. .. | 109 | 7 | 1 | 1 | 1 | .. | 10 | .. |
| Singapore Telephone Board | 159 | 6 | 2 | .. | 2 | .. | 10 | .. |
| S.I.R. (Temasek Camp) .. | 174 | 2 | 1 | .. | 2 | .. | 5 | 1 |
| E.B.I. Ayer Rajah Road .. | 17 | 1 | .. | .. | .. | .. | 1 | .. |
| School Children (Tuberculin Reactors) .. | 4,865 | 118 | 341 | 1 | 42 | 9 | 511 | .. |
| R.S.P.C.A. Staff .. | 4 | .. | .. | .. | .. | .. | .. | .. |
| Social Welfare Workers .. | 7 | .. | .. | .. | .. | .. | .. | .. |
| Health Inspector (IOH) .. | 6 | .. | .. | .. | .. | .. | .. | .. |
| National Service Recruits .. | 990 | 46 | 16 | 1 | 7 | 9 | 79 | 1 |
| Total .. | 47,338 | 1,309 | 1,116 | 20 | 457 | 96 | 2,998 | 40 |
| <i>X-Ray Service Only</i> | | | | | | | | |
| T.T.S.H. Staff .. | 2,550 | .. | .. | .. | .. | .. | .. | .. |
| Teachers New Recruits .. | 722 | .. | .. | .. | .. | .. | .. | .. |
| Diagnostic Clinic .. | 1,722 | .. | .. | .. | .. | .. | .. | .. |
| | 4,994 | .. | .. | .. | .. | .. | .. | .. |
| Grand Total .. | 74,113 | 2,583 | 1,575 | 81 | 721 | 179 | 5,139 | 76 |

Static X-Ray Centre.—The Static X-ray Centre established temporarily on the ground floor of the Tuberculosis Control Unit in November, 1963 was expanded so that two X-ray Units (one 70 mm unit and one 100 mm unit) were in operation simultaneously. Groups that could be brought to the Static X-ray Units were examined in the Static Centre.

Diagnostic Clinic.—Persons with abnormality found in the Chest X-rays after a Mass X-ray Survey were referred to the diagnostic Clinic for investigation. The previous "recall" rate after Mass X-ray examination of 10 per cent in 1948 had now dropped in recent years to 6.6 per cent (1964).

In the year 2,630 new patients were registered for investigation after Mass X-ray examination. The total attendance at this clinic was 8,819 visits.

TUBERCULIN TESTING AND B.C.G. VACCINATION

Newborn Infants.—The B.C.G. team at Kandang Kerbau Maternity Hospital continued its work of giving B.C.G. vaccination to newborn infants delivered in the hospital. Of 34,437 infants discharged as fit from the institution in 1964, B.C.G. vaccinations were given to 34,252 showing a response of 99.5 per cent.

B.C.G. vaccination of newborn infants, delivered in the rural areas started in 2 Maternal and Child Health Clinics in 1957 and subsequently extended to all rural maternal and Child Health Clinics, was continued. The mobile rural B.C.G. teams in this year were able to double their sessional time at the various clinics. A total of 7,128 Infants were given B.C.G. in these rural Clinics in 1964.

B.C.G. vaccination at the City Maternal and Child Health Clinics started in July 1958 was also continued. 7,745 infants were given B.C.G. vaccination in the year.

Institutions.—During the year, tuberculin testing and B.C.G. vaccination were carried out in 16 institutional homes, 7 creches and 2 nursing schools. 650 children newly admitted to the Homes and Creches were tested with tuberculin, 122 of them were vaccinated with B.C.G. 647 new nursing students were also tested and 89 of them were vaccinated with B.C.G.

CONTACT EXAMINATION

Contact investigations offer an important source in the finding of active cases. All immediate contacts of all the notified cases in the central register were examined. Contacts below the age of 15 years were first tuberculin tested. Negative reactors to Tuberculin were given B.C.G. vaccination. Positive reactors were given Chest X-ray examinations. Contacts above the age of 15 years were all X-rayed.

During the year the Contact investigation section was re-organised. Contacts are now examined with the family as a unit, thus making sure that no one in the family was missed. The clinic sessions were increased in September from 3 to 5 sessions per week to deal with the increased work.

New contacts examined in the contact clinic numbered 15,203. During the year 12,397 contacts under 15 years were Tuberculin Tested. 12,379 of them completed the test and 2,250 were read as Tuberculin negative 2,109 of the negative reactors were given B.C.G. vaccination.

10,830 contacts above the age of 15 were X-rayed and after investigation 244 were found to have active pulmonary Tuberculosis giving a rate of 2.2 per cent.

102 new cases for chemoprophylaxis were added to the 1,521 cases carried forward from the previous year.

Home Visits.—Home visits were made by nurses of this section to initiate the contact investigations of all notified cases and also to ensure that those under treatment in Tan Tock Seng Hospital were taking their treatment as advised. Defaulter checking forms an important part of the work of this section.

During the year home visits were made to 4,301 families of the new cases notified in 1964. 559 of them could not be traced. 8,944 revisits were also made to the homes of the new and old notified cases making a total of 13,250 visits in this year.

During the Mass X-Ray Surveys of Postal Districts one and nineteen a total of 12,884 visits was made to the residents of the area to encourage them to attend for the X-ray examinations.

SCHOOL TUBERCULOSIS SERVICE

This service consists of

- (1) Tuberculin Testing and B.C.G. Vaccination of School Children.
- (2) Casefinding in Schools.
- (3) Investigation and treatment of cases found in the schools.
- (4) Contact investigation of Index cases found in schools.
- (5) Supplementary feeding of infected and undernourished school children.

Tuberculin Testing and B.C.G. Vaccination in Schools

Tuberculin Testing and B.C.G. vaccination were done in 465 schools (37 Malay schools, 232 Chinese schools, 15 Indian schools and 181 English schools) in Singapore. All Primary I and Primary VI classes with parental consent, were given tuberculin tests. Negative reactors to these were given B.C.G. vaccination. Severe reactors to the test were X-rayed.

During the year 83,440 children were tuberculin tested. Of the 80,930 children available for reading of the test 33,186 children were negative and 32,925 given B.C.G. vaccination. 3,534 children were severe reactors to the Tuberculin tests and were x-rayed. 28 cases of active pulmonary tuberculosis and one case of Pleural effusion were discovered (0.8 per cent active).

TUBERCULIN TESTING AND B.C.G. VACCINATION SCHOOL CHILDREN

NUMBER OF SCHOOLS COVERED

| Year | Malay | Chinese | Tamil | English | Total |
|------|-------|---------|-------|---------|-------|
| 1957 | 31 | 123 | 12 | 157 | 323 |
| 1958 | 20 | 28 | — | 140 | 188 |
| 1959 | 53 | 401 | 12 | 235 | 701 |
| 1960 | 62 | 397 | 16 | 267 | 742 |
| 1961 | 49 | 283 | 12 | 250 | 594* |
| 1962 | 35 | 234 | 15 | 162 | 446 |
| 1963 | 35 | 229 | 15 | 173 | 452 |
| 1964 | 37 | 232 | 15 | 181 | 465 |

* After 1960 Primary Schools having morning and afternoon sessions are counted as one instead of two schools.

TUBERCULIN TESTING AND B.C.G. VACCINATION
IN SCHOOLS

| Year | Tuberculin Test done | No. Read | No. Negative | No. given B.C.G. |
|------|----------------------|----------|--------------|------------------|
| 1959 | 61,436 | 59,822 | 19,571 | 19,532 |
| 1960 | 70,172 | 67,538 | 23,710 | 23,144 |
| 1961 | 59,301 | 57,925 | 18,456 | 18,439 |
| 1962 | 75,763 | 73,538 | 25,247 | 25,247 |
| 1963 | 81,484 | 79,270 | 27,696 | 27,672 |
| 1964 | 84,524 | 82,003 | 33,370 | 33,104 |

Case-finding in Schools

Active case-finding to detect tuberculosis was continued. Cases with symptoms amongst the school population were as usual referred by the School Health Service to the School Tuberculosis Clinic at the Institute of Health.

For this year routine X-ray examinations were performed on

- (a) All Secondary School Leavers.
- (b) Primary I and Primary VI children who reacted severely to Tuberculin.
- (c) School Teachers.
- (d) Other school employees including canteen staff.

Of 14,123 Secondary School Leavers X-rayed, 530 had abnormalities in the chest X-ray film of which 159 were due to tuberculosis requiring investigation and 200 inactive tuberculous scars.

Out of 3,534 severe reactors to Tuberculin from Primary I and VI school children 28 cases of active Tuberculosis. One case of Pleural Effusion and 4 cases of Tuberculosis Spine were discovered. In addition 356 cases of inactive Tuberculosis and heal scars were investigated.

The two-yearly compulsory X-ray Examination of all school teachers and other staff was due in this year. Altogether 13,490 teachers were examined by mass X-ray, 334 of them were found to have suspicious lung tuberculosis and 318 scarring as the result of healed tuberculosis. From this survey 5 new active cases were discovered and given treatment.

Amongst the 5,219 school other staff and school hawkers X-rayed 224 were referred for investigation with suspicious lung tuberculous lesions, another 118 had healed scars requiring no treatment. After investigation 11 of the 224 for investigations were confirmed as active new tuberculosis cases.

School Tuberculosis Clinic

All active cases discovered by the X-ray Surveys amongst the school population were treated at the School Tuberculosis Clinic at the Institute of Health. In addition suspected chest cases found by the school Medical Officers were referred to this clinic for investigation and treatment.

The table below shows the routine clinic attendances at the School Tuberculosis Clinic in 1964.

| | | School Children | Teachers | Other Staff and Hawkers | Total |
|-----------|-----|-----------------|----------|-------------------------|-------|
| New cases | ... | 298 | 8 | 35 | 341 |
| Re-Visits | ... | 4,921 | 168 | 369 | 5,458 |
| Total | ... | 5,219 | 176 | 404 | 5,799 |

Contact Investigation of Index cases found in Schools

Any active Tuberculosis case from the schools irrespective of their place of treatment (viz. Tan Tock Seng Hospital, SATA and General Practitioners etc.) were notified to the school Tuberculosis Clinic. On receipt of the information the school contacts of the index case were examined. Those in the primary schools were tuberculin tested and positive reactors were sent for chest X-rays. In the secondary school all contacts in the class were X-rayed.

In 1964, 339 class contacts from the primary schools were enrolled. Out of these 259 were tuberculin tested 251 of those tested were available for reading of the test. 151 children were naturally positive and 63 positive due to previous B.C.G. vaccination. Of the 31 read negative to tuberculin, B.C.G. were given to all of them. X-ray examination of these 339 class contacts reveal 7 cases of scarring due to previous tuberculosis infection.

889 class contacts from the secondary schools were X-rayed and investigated. The result was 901 (97 per cent) normal X-rays 14 (1.5 per cent) Scars 5 (0.5 per cent) Active pulmonary Tuberculosis one (0.1 per cent) inactive pulmonary tuberculosis, 2 due to non-tuberculous condition and 6 still under investigation.

Supplementary Feeding of Infected and Undernourished School Children

This Feeding Scheme started in April 1949 was continued. For 1964 the sum of \$25,000 was allotted for this purpose. 351 new cases were put on feeding during the year. Altogether 7,198 "feeds" were given to 597 children. The feeding was a fortnightly distribution and each "feed" consisted of:—

| | |
|--|-------------------|
| 1 lb. Full Cream Milk Powder. | 6 Eggs. |
| $\frac{1}{2}$ lb. Skimmed Powdered Milk. | 6 Oranges. |
| $\frac{1}{4}$ lb. Ovaltine. | 1 lb. Groundnuts. |
| $\frac{1}{2}$ lb. Butter. | |

In addition 10,800 lbs. of skimmed milk powder donated by UNICEF were distributed to other school children and contacts.

Feeding 1964

| | | |
|--|-----|-----|
| Cases on feeds carried forward from December, 1963 | ... | 246 |
| New cases | ... | 351 |
| Total | ... | 597 |
| Cases off feeds in 1964 | ... | 309 |
| Cases carried toward to 1965 | ... | 288 |

TABLE 134
TUBERCULOSIS NOTIFICATIONS FOR THE YEAR 1964
SHOWING FORM OF DISEASE, RACE AND SEX

| Form of Disease | CHINESE | | | MALAYS | | | INDIANS AND PAKISTANIS | | | OTHERS | | | PERSONS | | |
|----------------------|------------------|--------|-------|--------|--------|-------|------------------------|--------|-------|--------|--------|-------|---------|--------|-------|
| | Male | Female | Total | Male | Female | Total | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| | PULMONARY | | | | | | | | | | | | | | |
| Minimal .. | 1,111 | 415 | 1,526 | 163 | 40 | 203 | 89 | 18 | 107 | 13 | 5 | 18 | 1,376 | 478 | 1,854 |
| Moderately Advanced | 954 | 287 | 1,241 | 130 | 33 | 163 | 81 | 12 | 93 | 9 | 4 | 13 | 1,174 | 336 | 1,510 |
| Far Advanced | 452 | 141 | 593 | 57 | 33 | 90 | 38 | 7 | 45 | 2 | 2 | 4 | 549 | 183 | 732 |
| Extent not stated .. | 173 | 56 | 229 | 12 | 10 | 22 | 11 | 1 | 12 | .. | .. | .. | 196 | 67 | 263 |
| Primary .. | 7 | 5 | 12 | 3 | 1 | 4 | 1 | .. | 1 | .. | .. | .. | 11 | 6 | 17 |
| Miliary .. | 13 | 2 | 15 | 1 | 4 | 5 | .. | 1 | 1 | .. | .. | .. | 14 | 7 | 21 |
| Meningitis .. | 6 | 6 | 12 | 2 | 3 | 5 | .. | .. | .. | .. | .. | .. | 8 | 9 | 17 |
| Pleural Effusion .. | 19 | 22 | 41 | 5 | 1 | 6 | 5 | 2 | 7 | .. | .. | .. | 29 | 25 | 54 |
| Other Forms .. | 18 | 23 | 41 | 6 | 6 | 12 | 6 | 5 | 11 | .. | .. | .. | 30 | 34 | 64 |
| Total .. | 2,753 | 957 | 3,710 | 379 | 131 | 510 | 231 | 46 | 277 | 24 | 11 | 35 | 3,387 | 1,145 | 4,532 |

TABLE 135
TUBERCULOSIS NOTIFICATIONS FOR THE YEAR 1964
SHOWING AGE, SEX AND FORM OF DISEASE

| Age Group in years | MALES | | | | | | FEMALES | | | | | | PERSONS | | | | | | | | |
|--------------------|-----------|---------|---------|------------|---------------|-------------|---------|-----------|---------|---------|------------|---------------|-------------|-------|-----------|---------|---------|------------|---------------|-------------|-------|
| | Pulmonary | Primary | Miliary | Meningitis | Pleur. Effus. | Other Forms | Total | Pulmonary | Primary | Miliary | Meningitis | Pleur. Effus. | Other Forms | Total | Pulmonary | Primary | Miliary | Meningitis | Pleur. Effus. | Other Forms | Total |
| | 0-4 | 3 | 1 | 2 | 2 | 1 | .. | 8 | 3 | 1 | .. | 3 | .. | .. | 7 | 6 | 2 | 2 | 5 | .. | .. | 15 |
| 5-9 | 7 | 9 | .. | 1 | 3 | 5 | 23 | 3 | 3 | 3 | 1 | 1 | 2 | 13 | 10 | 12 | 3 | 2 | 4 | 7 | 36 |
| 10-14 | 30 | .. | .. | 1 | 4 | 2 | 36 | 24 | 2 | .. | 1 | 4 | 32 | 54 | 2 | .. | .. | 4 | 6 | 6 | 68 |
| 15-19 | 219 | 1 | 1 | .. | 4 | 4 | 229 | 100 | .. | 1 | 2 | 5 | 111 | 319 | 1 | 2 | .. | 7 | 9 | 9 | 340 |
| 20-24 | 225 | .. | 1 | 1 | 5 | 6 | 238 | 116 | .. | 1 | .. | 6 | 128 | 341 | .. | 1 | .. | 10 | 12 | 10 | 366 |
| 25-29 | 263 | .. | .. | .. | 1 | 4 | 268 | 91 | .. | .. | .. | 4 | 101 | 354 | .. | .. | .. | 5 | 10 | 4 | 369 |
| 30-34 | 238 | .. | 1 | .. | 2 | 1 | 242 | 103 | .. | 1 | .. | .. | 107 | 341 | .. | 2 | .. | 2 | .. | .. | 349 |
| 35-39 | 285 | .. | 2 | .. | .. | 3 | 290 | 114 | .. | .. | .. | .. | 117 | 399 | .. | 2 | .. | .. | .. | 6 | 407 |
| 40-44 | 295 | .. | .. | .. | 2 | .. | 297 | 102 | .. | .. | 1 | .. | 106 | 397 | .. | .. | .. | 5 | .. | .. | 403 |
| 45-49 | 314 | .. | 1 | .. | 3 | .. | 318 | 82 | .. | .. | .. | .. | 85 | 396 | .. | 1 | .. | 4 | 2 | .. | 403 |
| 50-54 | 406 | .. | 2 | .. | 1 | 2 | 411 | 92 | .. | 1 | .. | 2 | 98 | 498 | .. | 3 | .. | 4 | 4 | 4 | 509 |
| 55-59 | 409 | .. | .. | 1 | 4 | 1 | 415 | 88 | .. | .. | 1 | 1 | 91 | 497 | .. | .. | .. | 5 | 2 | 2 | 506 |
| 60-64 | 303 | .. | 1 | .. | 2 | 2 | 308 | 71 | .. | .. | .. | .. | 72 | 374 | .. | 1 | .. | 3 | 2 | .. | 380 |
| 65-69 | 163 | .. | 1 | .. | 1 | .. | 165 | 35 | .. | .. | .. | 1 | 36 | 198 | .. | 1 | .. | 2 | .. | .. | 201 |
| 70-74 | 75 | .. | .. | 1 | .. | .. | 76 | 24 | .. | .. | .. | .. | 25 | 99 | .. | .. | .. | 1 | .. | .. | 101 |
| 75 Over | 57 | .. | 2 | 1 | .. | .. | 60 | 16 | .. | .. | .. | .. | 16 | 73 | .. | .. | 1 | .. | .. | .. | 76 |
| Not Stated | 3 | .. | .. | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | 3 |
| Total | 3,295 | 11 | 14 | 8 | 29 | 30 | 3,387 | 1,064 | 6 | 7 | 9 | 25 | 34 | 1,145 | 4,359 | 17 | 21 | 17 | 54 | 64 | 4,532 |

TABLE 136

TUBERCULOSIS NOTIFICATIONS FOR THE YEAR 1964

SHOWING AGE, RACE AND SEX

| Age Group in years | CHINESE | | | MALAYS | | | INDIANS AND PAKISTANIS | | | OTHERS | | | PERSONS | | |
|--------------------|---------|--------|-------|--------|--------|-------|------------------------|--------|-------|--------|--------|-------|---------|--------|-------|
| | Male | Female | Total | Male | Female | Total | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| | 0-4 | 5 | 2 | 7 | .. | 3 | 3 | 2 | 1 | 3 | 1 | 1 | 2 | 8 | 7 | 15 |
| 5-9 | 17 | 9 | 26 | 5 | 4 | 9 | 1 | .. | 1 | .. | .. | 23 | 13 | 36 | |
| 10-14 | 27 | 27 | 54 | 6 | 2 | 8 | 3 | 3 | 6 | .. | .. | 36 | 32 | 68 | |
| 15-19 | 200 | 97 | 297 | 24 | 8 | 32 | 3 | 5 | 8 | 1 | 1 | 2 | 229 | 111 | 340 |
| 20-24 | 195 | 104 | 299 | 29 | 15 | 44 | 12 | 7 | 19 | 2 | 2 | 4 | 238 | 128 | 366 |
| 25-29 | 221 | 81 | 302 | 38 | 13 | 51 | 8 | 6 | 14 | 1 | 1 | 2 | 268 | 101 | 369 |
| 30-34 | 190 | 86 | 276 | 24 | 17 | 41 | 24 | 4 | 28 | .. | .. | 4 | 242 | 107 | 349 |
| 35-39 | 210 | 94 | 304 | 44 | 15 | 59 | 32 | 7 | 39 | 1 | 1 | 5 | 290 | 117 | 407 |
| 40-44 | 203 | 90 | 293 | 49 | 11 | 60 | 42 | 4 | 46 | 1 | 1 | 4 | 297 | 106 | 403 |
| 45-49 | 244 | 68 | 312 | 38 | 13 | 51 | 34 | 3 | 37 | 1 | 1 | 3 | 318 | 85 | 403 |
| 50-54 | 345 | 87 | 432 | 38 | 9 | 47 | 24 | 2 | 26 | .. | .. | 4 | 411 | 98 | 509 |
| 55-59 | 352 | 80 | 432 | 39 | 8 | 47 | 24 | 2 | 26 | 1 | 1 | 1 | 415 | 91 | 506 |
| 60-64 | 269 | 62 | 331 | 24 | 9 | 33 | 15 | 1 | 16 | .. | .. | 2 | 308 | 72 | 380 |
| 65-69 | 147 | 33 | 180 | 15 | 2 | 17 | 2 | .. | 2 | 1 | 1 | 2 | 165 | 36 | 201 |
| 70-74 | 70 | 24 | 94 | 3 | .. | 3 | 3 | .. | 3 | 1 | 1 | 1 | 76 | 25 | 101 |
| 75-Over | 55 | 13 | 68 | 3 | 2 | 5 | 2 | 1 | 3 | .. | .. | .. | 60 | 16 | 76 |
| Not Stated | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | 3 |
| Total .. | 2,753 | 957 | 3,710 | 379 | 131 | 510 | 231 | 46 | 277 | 24 | 11 | 35 | 3,387 | 1,145 | 4,532 |

TABLE 137
TUBERCULOSIS NOTIFICATIONS FOR THE YEAR 1964
SHOWING OCCUPATION, RACE AND SEX

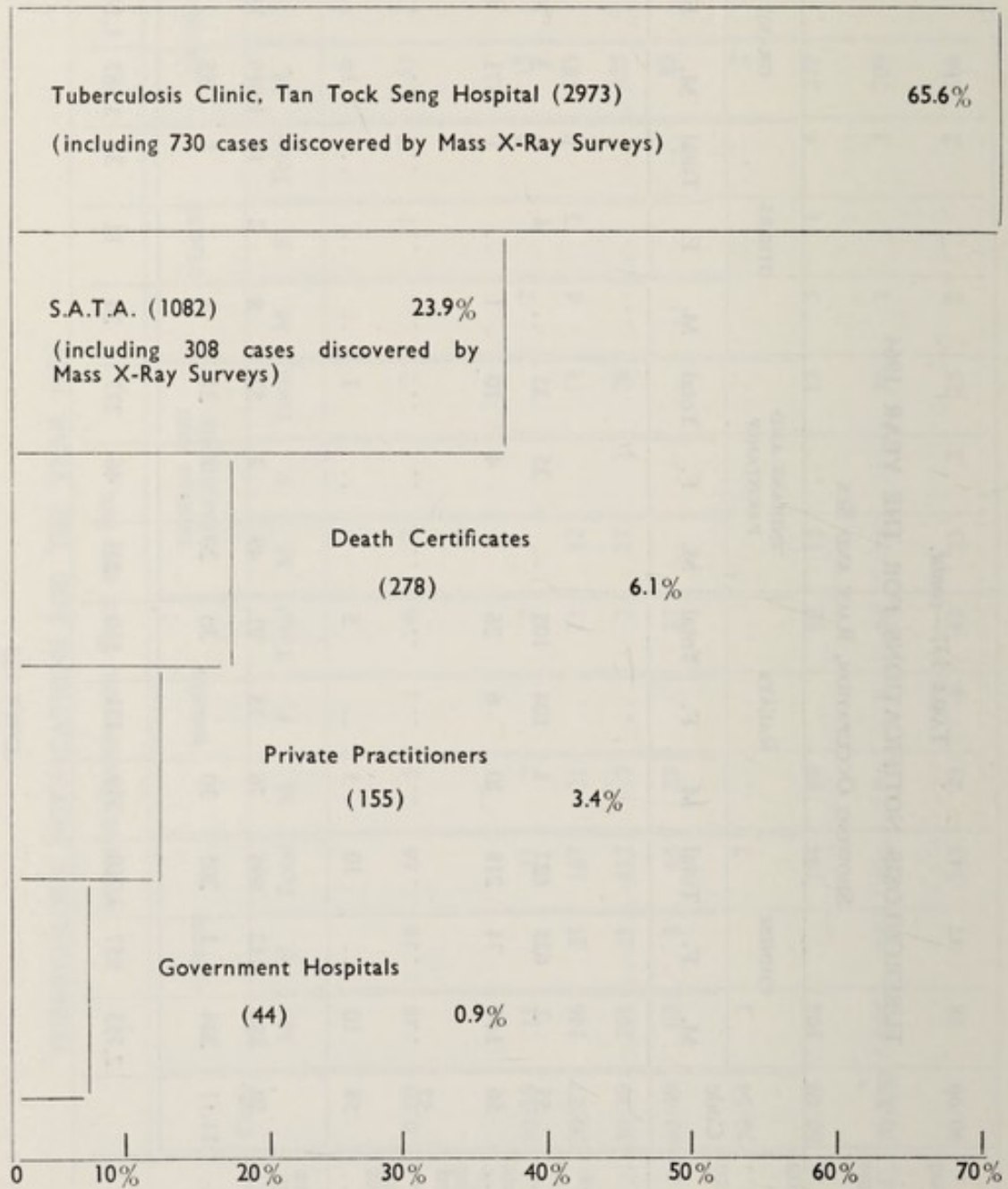
| Occupation | Code | CHINESE | | | MALAYS | | | INDIANS AND PAKISTANIS | | | OTHERS | | | GRAND TOTAL | | |
|---|---------|---------|----|-------|--------|----|-------|------------------------|----|-------|--------|----|-------|-------------|----|-------|
| | | M. | F. | Total | M. | F. | Total | M. | F. | Total | M. | F. | Total | M. | F. | Total |
| Professional, Technical and Related Occupation .. | 0/09 | 48 | 18 | 66 | 5 | 1 | 6 | 2 | .. | 2 | .. | 1 | 1 | 55 | 20 | 75 |
| Administrative, Executive and Managerial Occupations (Excluding Those in Agriculture and Retail Trade) .. | 10/19 | 11 | .. | 11 | 2 | .. | 2 | .. | .. | .. | 2 | .. | 2 | 15 | .. | 15 |
| Clerical Occupations .. | 20/27 | 146 | 21 | 167 | 21 | .. | 21 | 12 | .. | 12 | 4 | 3 | 7 | 183 | 24 | 207 |
| Sales and Related Occupations .. | 30/39 | 391 | 21 | 412 | 7 | .. | 7 | 27 | 1 | 28 | .. | .. | .. | 425 | 22 | 447 |
| Agricultural Occupations .. | 40/49 | 62 | 3 | 65 | 27 | .. | 27 | .. | .. | .. | .. | .. | .. | 89 | 3 | 92 |
| Mines, Quarrying and Related Occupations .. | 50/54 | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 2 |
| Transport and Communication Occupations .. | 60/69 | 194 | .. | 194 | 69 | .. | 69 | 13 | .. | 13 | 3 | 1 | 4 | 279 | 1 | 280 |
| Craftsmen, Production Process Workers and Labourers N.E.C. | 70 & 80 | 555 | 35 | 590 | 73 | 1 | 74 | 78 | .. | 78 | 3 | .. | 3 | 709 | 36 | 745 |
| Service, Sport, Entertainment and Recreation Occupations .. | 90/99 | 98 | 47 | 145 | 43 | 4 | 47 | 23 | 2 | 25 | 2 | .. | 2 | 166 | 53 | 219 |

TABLE 137—*contd.*
 TUBERCULOSIS NOTIFICATIONS FOR THE YEAR 1964
 SHOWING OCCUPATION, RACE AND SEX

| Occupation | Code | CHINESE | | | MALAYS | | | INDIANS AND PAKISTANIS | | | OTHERS | | | GRAND TOTAL | | | |
|---|-------|---------|-----|-------|--------|-----|-------|------------------------|----|-------|--------|----|-------|-------------|-------|-------|-------|
| | | M. | F. | Total | M. | F. | Total | M. | F. | Total | M. | F. | Total | M. | F. | Total | |
| PERSONS ECONOMICALLY ACTIVE | | | | | | | | | | | | | | | | | |
| Home Housework .. | 55 | 2 | 625 | 627 | 1 | 104 | 105 | .. | 35 | 4 | 35 | .. | 4 | 4 | 3 | 768 | 771 |
| Full Time Student .. | 56 | 144 | 74 | 218 | 20 | 6 | 26 | 6 | 4 | 10 | 10 | 1 | .. | 1 | 171 | 84 | 255 |
| Inmates of Mental Hospitals and Penal Institutions .. | 57 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pensioners and Persons with Private Means .. | 58 | 10 | .. | 10 | 5 | .. | 5 | 1 | .. | 1 | 1 | .. | .. | .. | 16 | .. | 16 |
| All Other Economically Inactive (e.g. 'Disabled', 'Too Old', 'Too Young', 'Inactive', etc.) | 59 | 886 | 112 | 998 | 76 | 15 | 91 | 49 | 3 | 52 | 8 | 8 | 2 | 10 | 1,019 | 132 | 1,151 |
| Occupation Not Stated .. | 11.11 | 204 | 1 | 205 | 30 | .. | 30 | 20 | 1 | 21 | 1 | 1 | .. | 1 | 255 | 2 | 257 |
| Total .. | | 2,753 | 957 | 3,710 | 379 | 131 | 510 | 231 | 46 | 277 | 24 | 11 | 35 | 3,387 | 1,145 | 4,532 | |

Table 138

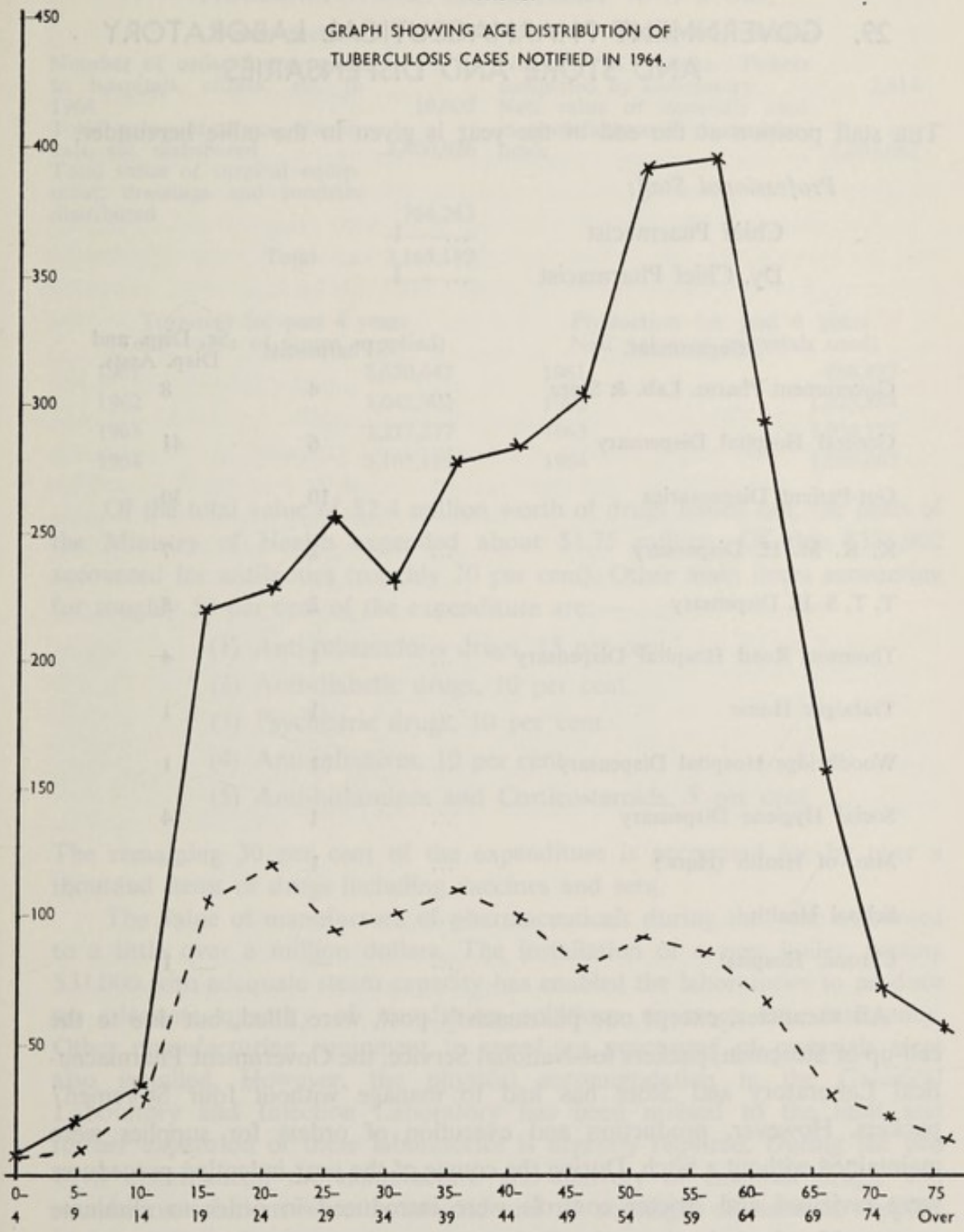
Histogram showing the source of discovery of cases of tuberculosis percentage of total notifications for the year 1964.



As at 31-12-64, a total of 4,532 notifications was received.

Table 139

GRAPH SHOWING AGE DISTRIBUTION OF TUBERCULOSIS CASES NOTIFIED IN 1964.



Age Group in Years.

Male —————

Female - - - - -

29. GOVERNMENT PHARMACEUTICAL LABORATORY AND STORE AND DISPENSARIES

THE staff position at the end of the year is given in the table hereunder.

Professional Staff:

| | | |
|----------------------|-----|---|
| Chief Pharmacist | ... | 1 |
| Dy. Chief Pharmacist | ... | 1 |

| Department. | Pharmacist | Sr. Disp. and Disp. Assts. |
|----------------------------------|------------|-------------------------------|
| Government Pharm. Lab. & Store | 4 | 8 |
| General Hospital Dispensary | 6 | 41 |
| Out-Patient Dispensaries | 10 | 30 |
| K. K. M. H. Dispensary | 2 | 7 |
| T. T. S. H. Dispensary | 2 | 8 |
| Thomson Road Hospital Dispensary | 1 | 4 |
| Trafalgar Home | 1 | 1 |
| Woodbridge Hospital Dispensary | 1 | 1 |
| Social Hygiene Dispensary | 1 | 4 |
| Min. of Health (Hqrs.) | 1 | — |
| School Health | — | 3 |
| Chronic Hospital | — | 1 |

All vacancies, except one pharmacist's post, were filled, but due to the call-up of Storemen/packers for National Service, the Government Pharmaceutical Laboratory and Store has had to manage without four Storemen/packers. However, production and execution of orders for supplies were maintained without a hitch. During the course of the year indenting procedures were reviewed and stricter controls were introduced in order to eliminate over stocking by indenting units. Orders for new items of drugs etc. had to be approved by a Drugs Advisory Committee or by the head of the Dept. All surplus, or unused drugs in Out-Patient Dispensaries were transferred to units that could use them. The following table gives an idea of the work undertaken by Government Pharmaceutical Laboratory and Store in 1964.

COMPARATIVE TABLE WORK AT GOVERNMENT
PHARMACEUTICAL LABORATORY AND STORE

| Stores Section | | Laboratory Section | |
|---|------------------|--|-----------|
| Number of order for supplies to hospitals, clinics, etc. in 1964 | 10,605 | Number of Works Tickets completed by Laboratory | 2,614 |
| Total value of drugs, chemicals, etc. distributed | 2,400,926 | Nett value of materials used in manufacture of pharmaceuticals | 1,003,667 |
| Total value of surgical equipment, dressings and sundries distributed | 764,263 | | |
| Total | 3,165,189 | | |

| Turnover for past 4 years (Total value of stores supplied) | | Production for past 4 years (Nett value of materials used) | |
|---|-----------|---|-----------|
| 1961 | 2,620,447 | 1961 | 886,877 |
| 1962 | 3,042,902 | 1962 | 1,025,864 |
| 1963 | 3,227,277 | 1963 | 1,034,127 |
| 1964 | 3,165,189 | 1964 | 1,003,667 |

Of the total value of \$2.4 million worth of drugs issued out, the units of the Ministry of Health expended about \$1.75 million. Of this \$326,902 accounted for antibiotics (roughly 20 per cent). Other main items accounting for roughly 50 per cent of the expenditure are:—

- (1) Anti-tuberculosis drugs, 15 per cent.
- (2) Anti-diabetic drugs, 10 per cent.
- (3) Psychiatric drugs, 10 per cent.
- (4) Anti-infectives, 10 per cent.
- (5) Anti-histamines and Corticosteroids, 5 per cent.

The remaining 30 per cent of the expenditure is accounted for by over a thousand items of drugs including vaccines and sera.

The value of manufacture of pharmaceuticals during the year amounted to a little over a million dollars. The installation of a new boiler, costing \$31,000 with adequate steam capacity has enabled the laboratories to produce an adequate quantity of transfusion solutions to meet any emergency. Other manufacturing equipment to speed up processing of materials were also installed. However, the physical accommodation in the Galenical Laboratory and Injection Laboratory has been utilised to the limit and further expansion of these laboratories is urgently required. During the two Civil disturbances, the manufacture and delivery of essential drugs, and transfusion solutions were maintained and no shortages of essential supplies were experienced.

The Stores Section, which has had a very good record in respect of losses and write-offs over a number of years, reported losses of drugs valued at \$556 on three separate occasions. These were thoroughly investigated by me and the police who came to the conclusion that the thefts were inside affairs. The employment of a large number of division IV officers who are known

to be in financial difficulties poses a constant security problem. One of the suspected officers has been transferred and another officer's confirmation on pensionable establishment has been deferred. Decision on one other officer, who has a police record is pending. The security arrangements at the Stores were reviewed with the assistance of the Commissioner of Police and work is in progress to improve security by raising the height of the perimeter fence and to fence off the drivers' quarters in the premises, so that the residents and visitors will not have access to the stores premises.

The closure of the O.P. Department at General Hospital on August 1st and the introduction of charges for outpatients has contributed significantly to lowering of the consumption of drugs. The Unallocated stores provision of \$85,000 intended to cover the estimated increase in consumption was not utilised and has been offered as savings to meet the deficit in the personal emoluments vote of Headquarters. In spite of additional expenditure on expensive anti-tuberculosis drugs to treat cases resistant to P.A.S. — I.N.H. and Streptomycin which are the standard drugs, available at low cost, the reduction in expenditure is heartening. The total drug cost of \$1.75 million represents an expenditure of \$1 per head of population per year. The comparative figure for U.K. is 8/6 (\$3.64) per prescription and total drug bill amounts to about £60 millions.

The Poisons Schedules were amended by addition of new substances and relaxation of control over annual feeds containing antibiotics. Chlorates, which could be used as explosives, were controlled by inclusion in the Poisons Schedule. The Inspector of Poisons, in conjunction with the Police prosecuted offenders under the Poisons Ordinance and Med. (Advt. & Sale) Ordinance and several convictions were recorded. The licences of two pharmacists were withdrawn during the year for offences under the Poisons Ordinance.

30. LABORATORY SERVICES

PATHOLOGY DEPARTMENT

THE volume and scope of work shows the yearly upward trend in all sections. Besides ordinary routine more new specialised tests have been introduced. We have been able to do this in spite of staff shortage and rising costs of chemicals, sera and glass ware. OCAR vote has been insufficient and we were forced to draw upon savings from other votes. The report of the Department is outlined as below :

Development Projects

(a) *Extension to Biochemical Laboratories.*—Three rooms on the top floor have been converted into laboratories. Water, gas, electrical installations and work benches have been installed. A fume cupboard has been added. This will reduce occupational hazard to workers from noxious and poisonous fumes. The cost of this project is \$15,000. Phase II costing \$20,000 will start this year for additional development.

(b) *Conversion of Animal Rooms into Virology laboratories.*—This project costing \$11,630 was completed in December 1964. Two rooms which housed animals have been converted into laboratories. Water, gas, electrical fittings and work benches have been installed. Necessary equipment to start virology arrived in 1963. The animals were transferred to the covered passage way connecting the old and new building. We would require about \$2,000 for additional furniture.

Bacteriological Section

(a) There were three small outbreaks of El Tor cholera. A total of 2,646 stools specimens from suspects, contacts were sent to the Department for investigation. Out of this, 24 cases were proven bacteriologically to be El Tor. Twenty-six specimens of water from ponds and 6 from cockles were examined as well. No El Tor organism was isolated from these specimens.

(b) *The City Laboratory.*—The staff shortage especially of Laboratory Technicians was acute: 2 vacancies since 1962 were only filled in 1964. The vacancies could not be filled until the findings of the Board of Inquiry into Rates of Pay and Conditions of Service of City Council Employees transferred to the Government were published. The staff worked under pressure and it is to their credit and devotion to duty that they worked without protest.

(c) *Lighting facilities.*—This has been improved by the installation of tubular fluorescent lights. The illumination obtained from the previous existing lights was unsuitable as technicians found difficulty in picking up tiny colonies from plates.

Morbid Histology

(a) This section was depleted by the departure of the Supernumerary Pathologist in June, along with his wife. The remaining Pathologist was fully occupied with technical work as well as undertaking the training of Medical Officers (trainees), Department of Pathology. Efforts to recruit a Senior Registrar from U.K. elicited no response. Negotiations are still going on with the Australian Government for a Colombo Plan expert in Pathology. It is hoped that this will be successful otherwise there is every possibility of a break down in this service. It has been the policy to encourage local graduates to take up Pathology as a career but over the years medical officers in the Ministry of Health have shown a decided reluctance to do so. However, in 1964 the position has improved and two medical officers have decided to remain in the Department. The action of the Ministry in securing two scholarships for training in the D.C.P. Course has been a major factor in this issue. Both these officers are undergoing training and it is expected to send one overseas in August this year. It was suggested to the Ministry that medical officers posted to Surgical and Gynæcological units be posted to the Department for 1-2 months for training. This was accepted in principle but somehow never implemented.

(b) The working conditions of staff in the main Histology room have been uncomfortable. The two air conditioners have never been working satisfactorily in spite of repairs. They had been switched off for some months. Due to vigorous agitation by the Department the D.P.S.C. finally agreed to our proposal to replace these two units by new ones. As from January this year the new units have been installed to the satisfaction of the staff concerned.

(c) *Senior Lecturer in Medical Jurisprudence.*—Dr. E. B. La'Brooy of the Faculty of Medicine was appointed in September 1964 to the above post working under the Senior Pathologist. He is available for consultation by trainee medical officers of the Department as well as doing a small number of the important medico-legal post mortems.

(d) *Racial Riots. Work in G.H. Mortuary.*—It is with satisfaction that we record that the staff of doctors, laboratory technicians, mortuary attendants carried out their duties in an admirable manner and with close co-operation with Police.

Biochemistry Section

(a) Expansion of this section has been referred to previously under Development Projects under (1).

(b) *Schedule of Medical Laboratory Service Fees.*—As from 1st October, 1964 a scale of charges has been laid for Biochemical investigations. This was the only section where no fees were charged. As a result of this action a sum of \$13,000 approximately has been collected as revenue for October to December. This works out to about \$52,000 per year in revenue.

(c) The output in the varied work of the section was made possible only by the development of new, cheaper and faster methods adapted to routine jobs. There is a continual need for this development work in Clinical Biochemistry. It arises from the rapid progress of this subject in the field of medicine. Many of the tests which have been used in the past have now become obsolete and introduction of new tests requires numerous initial investigatory experiments before they can be put on a routine basis. The danger that faces the section now is the ever increasing demand for the established routine work with stationary staff numbers. This can only reduce the available resources devoted to these essential investigational developments in techniques. This retrograde reduction should be avoided at all costs.

The Training of Laboratory Technicians

The new Scheme of Service for Laboratory Technicians came into force on 1st February, 1959. There has been a shortage of professional staff from 1959-1962 to give the full measure of training. This was to a certain extent improved by the recruitment of 2 expatriates from Israel in 1962. There are still a number of administrative problems involved in regard to the training. The reorganisation of the laboratories is a must and is long overdue if we are to have an efficient and co-ordinated service. There is a long felt need to set up a School for Laboratory Technicians just like the Nurses and Radiographers. One solution would be for the Ministry to obtain the assistance of the Singapore Polytechnic in starting a school for Technicians. This suggestion must be seriously considered for the present training programme needs revision and be placed on a systematic basis. The training of laboratory technicians lags far behind. The expansion of the Health Services due to its peculiar arrangement whereby a technician has to complete his three-year training before the Department which has recruited him can utilize his services. The revised programme suggested by the Department should be implemented as soon as possible.

In conclusion one looks back with satisfaction that a number of difficult problems have been solved satisfactorily. There are still a number to be settled but with perseverance, co-operation and good will of the staff there is no reason that further progress will be maintained in 1965.

BIOCHEMISTRY SECTION

For the fifth year in succession there has been a large increase in the number of samples analysed and examinations carried out. The increase is shown in the table below:

| Year | No. of analyses performed | % increase over previous years | Increase in No. of analyses over previous years |
|------|---------------------------|--------------------------------|---|
| 1960 | 15,221 | | |
| 1961 | 20,391 | 34% | 5,170 |
| 1962 | 26,458 | 30% | 6,067 |
| 1963 | 38,053 | 44% | 11,595 |
| 1964 | 52,408 | 38% | 14,355 |

This growth of more than 350 per cent in the number of samples between 1960 and 1964 has been achieved with a nominal staff increase of less than 30 per cent. The results achieved reflect very creditably on the staff at all levels and I wish to express my appreciation to all my staff for the co-operation they had given me throughout the year.

The section is also responsible for the training of laboratory technicians in clinical biochemistry for all the other health and hospital establishments in Singapore. The system of training is essentially that of apprenticeship learned at the bench. This enables the technician during training to make some contribution to the work of the laboratory. There were four such trainees at the beginning of the year and this number increased to 9 towards the end of the year. Besides these there were two other university staff here for training. One of these returned to his Department at the end of the year.

Full details of the staff are given in Table 140.

It would not have been possible for the Section's own staff of 3 professional officers (one of whom started work only in September) and 7 technicians to cope with the work of the Section without the assistance of the trainees which numbered approximately 11. The staffing position was very critical during the greater part of the year and was easier by the end of 1964 as the third biochemist post was filled and nine technicians-in-training were posted to the Section instead of the usual four.

It can be seen that the Section is very dependent on the contribution of the trainees towards the Section's routine. This has many undesirable features, the first being the fluctuating number of trainees which the Section has no control over. This makes the planning of work most difficult. The other objection is that the service is relying upon students whose knowledge, skill and experience are not very high and this seriously limit the efficient working of the Section. The ideal should be to have fully trained staff to conduct all investigations.

During the last quarter of the year, major reconstruction work was undertaken to convert 5 vacant rooms into laboratories. Three of these are already in use and the others will be completed by this year. After the completion of the project there will be six proper biochemical laboratories instead of the two makeshift ones which housed the Section for the past five years. A new fume cupboard was also built in these laboratories.

In the past the number of tests available were rather limited. This was because of the lack of professional staff. Although the first Biochemist was appointed in 1953, it was not until 1962, (10 years later) that the second biochemist's post was filled. It is now realised that although the present section is the biggest Clinical Biochemistry Laboratories in Malaysia, the Section is still at the development stage and much has still got to be done in order to keep pace with the progress and expansion already made by the other branches of the medical service. Biochemical examination plays a very important part in modern medicine and the three biochemists can never hope to cope with the demands for biochemical investigations from more than 300

doctors in the Government service itself, let alone the University clinical departments which also make use of our services for research and teaching purposes. However a start has been made. Many new tests have been introduced since 1961 and many new methods which are cheaper, faster, more reliable and more adaptable to routine work had also been developed by the Section. The new methods that were developed recently by the Section are for determination of the following:

- (1) Lactic dehydrogenase in blood and body fluid
- (2) Glutathione in blood
- (3) Glutamate dehydrogenase in serum
- (4) Isocitric acid dehydrogenase
- (5) Fibrinogen in plasma
- (6) Cystine in urine (combine and free)
- (7) Ultra micro method for serum protein
- (8) Palladium combining capacity of serum used for diagnosis of cirrhosis liver or nephrosis
- (9) Glucose-6-phosphate dehydrogenase in cells
- (10) 6-phosphogluconolactone dehydrogenase in erythrocytes
- (11) Methamoglobin reductase
- (12) Sorbital dehydrogenase
- (13) Ascorbic acid in urine.

Besides the development of methods the Section is also conducting research in collaboration with other departments on projects of mutual interests. Among these may be cited the following:—

- (1) Biochemical causes of neonatal jaundice
- (2) Biochemical investigations of various types of liver diseases
- (3) Tetanus
- (4) Effects of repeated donations on serum iron levels of blood donors.

Enzymes play a very important role in metabolism and in diseases. Many of these enzymes can be determined and their activities in serum, erythrocytes or body fluids have been found to be useful for the confirmation of diagnosis of many disease states.

The usefulness of these tests is reflected by the number of such examinations as shown in Table 141. In 1961 the Section was only doing 5 types of enzymes. In 1964 the list of enzymes that can be assayed has increased to 24 and the examinations done numbered 7,779 as against 862 in 1961.

There is a laboratory specially set aside for enzymology. The tests are usually costly but the development of our own methods had made it possible for several of them to be put on a routine basis. What is required now is the technician staff to run them. This will relieve the biochemists of a very burdensome as well as time consuming job of doing the routine and enable them to concentrate more on their proper work of carrying out investigating and development work, library searching and trying out new methods which can be adapted to the work undertaken by the Section.

There is plenty of scope for expansion. As it is there is an urgent need to start a laboratory for micro and ultramicro analysis for the benefit of our very small patients.

When staff permits it is hoped that this laboratory will be started in 1965. There is also a need for a hormone laboratory for the study of endocrine disorders. At present the biochemical investigations are limited to the estimation of 17-ketosteroids and 17-hydroxycorticosteroids and 4 hydroxy-3 methoxymandelic acid. So much is now known about endocrine disorders and hormone metabolism that the setting up of a special laboratory for hormone estimations such as aldosterone, oestrogens, pregnandiols, and pragnantriols and catecholamines are now long overdue.

In March 1964 the Section started for the first time to open its laboratories to do urgent biochemical examinations for the hospitals during Sundays and public holidays. The urgent specimens for blood urea, sugar, amylase, bilirubin etc. has been done in the Central Laboratory of General Hospital for a long time. Because of the acute shortage of staff the laboratories of the Section are opened to do only urgent determinations on serum electrolytes. It is hoped that the range can be expanded as the staffing position improves.

As from October 1st 1964 the Section started charging fees for biochemical investigations from paying patients, private cases as well as those from Sarawak and Sabah. The fees collected for biochemical examinations alone (including those done in the Central Laboratory) amounted to \$13,445 for the last three months of the year. It is estimated that biochemical investigations will bring in approximately an additional \$50,000 to \$60,000 to revenue every year. As has been stated in the past it is hoped that this new income for the first few years should be channelled back to the Section for its much needed development.

Table 140

STAFF LIST

Senior Biochemist: Lee Kum Tatt, B.Sc., Ph.D., M.C.I.C., F.R.I.C.

Biochemists: Tan It Koon, B.Sc., Irene Giam, B.Sc., M.S.

Laboratory Technicians: Ow Ah Kit, Goh Tuan Cheng, N. Thurairaja, Leong Chan Kay, Sharon Chow (Miss), J. D. Singh, Wee Toon Loon, Goh Boon Kang*, Tan Kee Teng*.

Technicians-in-training trained in the Section during the year: Koh Beng San, Cheng Yew Kee, Ray Tan Wee Lee, Chung Weng Kum, Choo Kim Leng, Ng Bee Tong, Sim Peck Seng, Lee Cheow Liang, Low Fatt Hing, Sim Hee Hua, Seet Poh Kwee, Dorothy Seet (Miss), Kwong Yoke Kuen (Miss), Teng Ah Too, Leo Jiah Sim.

*University staff who worked in the Section during the year.

Table 141

| | | 1961 | 1964 |
|-----|---|-------|--------|
| | Blood | | |
| 1. | Potassium | 5,108 | 10,786 |
| 2. | Sodium | 5,088 | 10,656 |
| 3. | Chlorides | 5,069 | 10,637 |
| 4. | Calcium | 527 | 707 |
| 5. | Inorganic P. | 394 | 550 |
| 6. | Bilirubin, total | 82 | 102 |
| 7. | Electrophoresis of Proteins | 596 | 1,793 |
| 8. | Glucose Tolerance Test | 4 | 20 |
| 9. | Alkali reserve | 83 | 30 |
| 10. | Abnormal pigments | 127 | 93 |
| 11. | Methæmoglobin | 255 | 784 |
| 12. | Pyruvic acid | 235 | 297 |
| 13. | Cholesterol | 346 | 844 |
| 14. | Urea | 16 | 45 |
| 15. | Uric acid | 1 | 9 |
| 16. | Creatinine | 123 | 358 |
| 17. | Creatine | 4 | 11 |
| 18. | Serum Lipids | 54 | 1 |
| 19. | Iron | 26 | 2,059 |
| 20. | Copper | 3 | 3 |
| 21. | Fibrinogen | — | 314 |
| 22. | N.P.N. | — | 21 |
| 23. | Amino acid Nitrogen | — | 2 |
| 24. | Magnesium | — | 16 |
| 25. | Congo Red | — | 9 |
| 26. | B-carotene | — | 7 |
| 27. | U.I.B.C. | — | 684 |
| 28. | Salicylate | — | 12 |
| 29. | Palladium combining power, neutral | — | 378 |
| 30. | Palladium combining power, acid | — | 131 |
| 31. | Glutathione | — | 343 |
| 32. | Protein Bound Iodine | — | 81 |
| 33. | pH | — | 1 |
| 34. | Packed Cell Volume | — | 464 |
| 35. | Pormimino-glutanic acid | — | 2 |
| | Urine | | |
| 36. | Calcium | 58 | 94 |
| 37. | Inorganic P | 99 | 94 |
| 38. | 17 ketosteroids | 147 | 411 |
| 39. | 17 hydroxycorticosteroids | 20 | 399 |
| 40. | Urea | 14 | 2 |
| 41. | Amino acid N | 15 | 27 |
| 42. | Creatinine | 217 | 357 |
| 43. | Potassium | 174 | 129 |
| 44. | Sodium | 172 | 121 |
| 45. | Chlorides | 173 | 109 |
| 46. | Nature of sugar, identification | 2 | 4 |
| 47. | Total Protein | 3 | 7 |
| 48. | Bence-Jones Protein | 6 | 5 |
| 49. | Electrophoresis of Protein | 3 | 5 |
| 50. | Mæmoglobin | 64 | 61 |
| 51. | Methæmoglobin | 64 | 57 |
| 52. | Coproporphyrin, quantitative | 7 | 4 |
| 53. | Ascorbic acid | 6 | 10 |
| 54. | 5-hydroxy-indole-acetic acid | 54 | 16 |
| 55. | Catecholamines | 10 | 2 |
| 56. | Glucose | — | 18 |
| 57. | Bile salts | — | 1 |
| 58. | Copper | — | 3 |
| 59. | Salicylate | — | 1 |
| 60. | Phenol red | — | 64 |
| 61. | Sulphonarides | — | 1 |
| 62. | Chondroitin Sulphate | — | 4 |
| 63. | 4-hydroxy-3-methony-mandelic acid | — | 137 |
| 64. | Sulkavitchs Test | — | 10 |

Table 141 — *continued*

| | | | 1961 | 1964 |
|--|--------------------------------------|--------|--------|--------|
| Fæces | | | | |
| 65. | Fat | ... .. | 41 | 101 |
| 66. | Trypsin | ... .. | 4 | 1 |
| 67. | Urobilinogen, quantitative | ... .. | — | 5 |
| Gastric Contents | | | | |
| 68. | Free acids | ... .. | 1 | 12 |
| 69. | Total acids | ... .. | 1 | 12 |
| 70. | Sodium | ... .. | 1 | 14 |
| 71. | Potassium | ... .. | — | 6 |
| 72. | Chlorides | ... .. | — | 10 |
| 73. | pH | ... .. | — | 12 |
| 74. | Specific gravity | ... .. | — | 2 |
| Sweat | | | | |
| 75. | Sodium | ... .. | 9 | 3 |
| 76. | Chlorides | ... .. | 3 | 3 |
| 77. | Calculi, chemical analysis | ... .. | 5 | 34 |
| 78. | Heart tissue for potassium | ... .. | — | 1 |
| C.S.F. and other Fluids | | | | |
| 79. | Potassium | ... .. | 1 | 1 |
| 80. | Sodium | ... .. | 1 | 1 |
| 81. | Chlorides | ... .. | 1 | 1 |
| 82. | Total protein | ... .. | 1 | 4 |
| 83. | Bile salts | ... .. | 1 | 1 |
| 84. | Glucose | ... .. | — | 1 |
| 85. | Bile pigments | ... .. | — | 1 |
| Enzymes | | | | |
| Blood | | | | |
| 86. | Alkaline phosphatase | ... .. | 106 | 222 |
| 87. | Acid phosphatase | ... .. | 23 | 5 |
| 88. | SGOT | ... .. | 552 | 3,719 |
| 89. | SGPT | ... .. | 186 | 1,679 |
| 90. | Aldolase | ... .. | — | 22 |
| 91. | Lactic Dehydrogenase | ... .. | — | 428 |
| 92. | I.C.D. | ... .. | — | 415 |
| 93. | Glutamate Dehydrogenase | ... .. | — | 167 |
| 94. | Sorbitol | ... .. | — | 183 |
| 95. | Phospho-hexose isomerase | ... .. | — | 7 |
| 96. | x-hydroxy butyric acid dehydrogenase | ... .. | — | 138 |
| 97. | Leucine-amino-peptidase | ... .. | — | 27 |
| 98. | G-6-P Dehydrogenase | ... .. | — | 41 |
| 99. | G-P-G. dehydrogenase | ... .. | — | 40 |
| 100. | Cholinesterase | ... .. | — | 12 |
| 101. | S.C.P.K. | ... .. | — | 5 |
| 102. | Gæruloplasmin | ... .. | 5 | 24 |
| 103. | Glutathione stability test | ... .. | — | 396 |
| 104. | Meth HG reduction test | ... .. | — | 167 |
| (C.S.F. and Gastric contents and other fluids) | | | | |
| 105. | Trysin | ... .. | — | 2 |
| 106. | Amylase, quantitative | ... .. | — | 2 |
| 107. | SGOT | ... .. | — | 31 |
| 108. | SGPT | ... .. | — | 35 |
| 109. | Pepsin | ... .. | — | 12 |
| Grand Total | | | 20,391 | 52,408 |

HISTOLOGY SECTION

| | | | | | |
|----------------------------------|-----|-----|-----|--------|--------|
| <i>Total number of sections:</i> | ... | ... | ... | ... | 30,672 |
| <i>Sections from Biopsies:</i> | | | | | |
| Total number of cases | ... | ... | ... | 12,644 | |
| *Total number of Tissues | ... | ... | ... | 15,427 | |
| *Total number of Sections | ... | ... | ... | 20,123 | |
| (* Including Cytological Exam.). | | | | | |
| <i>Sections from Necropsies:</i> | | | | | |
| Total number of cases | ... | ... | ... | 1,292 | |
| Total number of sections | ... | ... | ... | 10,449 | |

Table 142

ANALYSIS OF TISSUES EXAMINED — 1964

| | | | | |
|--|-----|-----|-----|-------|
| 1. Anal and ischio-rectal tissues | ... | ... | ... | 233 |
| 2. Animal tissues | ... | ... | ... | 7 |
| 3. Appendix | ... | ... | ... | 1,062 |
| 4. Adrenals | ... | ... | ... | 5 |
| 5. Ascitic Fluid | ... | ... | ... | 79 |
| 6. Ampulla of Vater | ... | ... | ... | 1 |
| 7. Bladder | ... | ... | ... | 89 |
| 8. Bladder washout | ... | ... | ... | 4 |
| 9. Blood vessels | ... | ... | ... | 33 |
| 10. Bones | ... | ... | ... | 165 |
| 11. Bone marrow | ... | ... | ... | 15 |
| 12. Brain and meninges | ... | ... | ... | 25 |
| 13. Fluid from Brain | ... | ... | ... | 4 |
| 14. Broad Ligament and Parametrial tissues | ... | ... | ... | 6 |
| 15. Breast | ... | ... | ... | 241 |
| 16. Aspiration Breast | ... | ... | ... | 1 |
| 17. Bronchus | ... | ... | ... | 78 |
| 18. Bronchial smears | ... | ... | ... | 143 |
| 19. Blood Films | ... | ... | ... | 3 |
| 20. Cervix and cervical smear | ... | ... | ... | 1,333 |
| 21. Colon and rectum | ... | ... | ... | 106 |
| 22. Conjunctiva and cornea | ... | ... | ... | 16 |
| 23. Cerebro-spinal Fluid | ... | ... | ... | 28 |
| 24. Ear | ... | ... | ... | 59 |
| 25. Endometrium | ... | ... | ... | 4,786 |
| 26. Eye and Eyelids, etc. | ... | ... | ... | 87 |
| 27. Fallopian Tube | ... | ... | ... | 398 |
| 28. Faeces | ... | ... | ... | 2 |
| 29. Gall Bladder | ... | ... | ... | 152 |
| 30. Heart muscle | ... | ... | ... | 27 |
| 31. Hydrocele Fluid | ... | ... | ... | 4 |
| 32. Intestines | ... | ... | ... | 102 |
| 33. Joints and synovial tissues | ... | ... | ... | 117 |
| 34. Aspiration joints | ... | ... | ... | 4 |
| 35. Kidney | ... | ... | ... | 163 |
| 36. Larynx | ... | ... | ... | 100 |
| 37. Liver | ... | ... | ... | 492 |
| 38. Aspiration Liver | ... | ... | ... | 5 |
| 39. Lung | ... | ... | ... | 116 |
| 40. Aspiration lung | ... | ... | ... | 3 |

Table 142 — *continued*ANALYSIS OF TISSUES EXAMINED — 1964 — *continued*

| | | | | |
|---|-----|-----|-------|--------|
| 41. Lymph node | ... | ... | ... | 616 |
| 42. Mastoid autrum | ... | ... | ... | 3 |
| 43. Mesentery | ... | ... | ... | 15 |
| 44. Muscles | ... | ... | ... | 66 |
| 45. Mouth and Dental Diseases | ... | ... | ... | 61 |
| 46. Mediastinum | ... | ... | ... | 1 |
| 47. Nerves and sympathetic ganglia | ... | ... | ... | 144 |
| 48. Nose and Nasopharynx and sinuses | ... | ... | ... | 396 |
| 49. Oesophagus | ... | ... | ... | 167 |
| 50. Omentum | ... | ... | ... | 48 |
| 51. Ovary | ... | ... | ... | 448 |
| 52. Fluid from ovary | ... | ... | ... | 1 |
| 53. Palate | ... | ... | ... | 25 |
| 54. Pancreas | ... | ... | ... | 16 |
| 55. Parathyroid | ... | ... | ... | 2 |
| 56. Penis | ... | ... | ... | 39 |
| 57. Peritoneum | ... | ... | ... | 47 |
| 58. Peritoneal Fluid | ... | ... | ... | 14 |
| 59. Pharynx | ... | ... | ... | 8 |
| 60. Placenta | ... | ... | ... | 36 |
| 61. Pleura | ... | ... | ... | 135 |
| 62. Pleural Fluid | ... | ... | ... | 246 |
| 63. Prostate | ... | ... | ... | 124 |
| 64. Pus | ... | ... | ... | 1 |
| 65. Pericardial Fluid | ... | ... | ... | 5 |
| 66. Pituitary | ... | ... | ... | 2 |
| 67. Retroperitoneal tissues | ... | ... | ... | 8 |
| 68. Intra-Abdominal tissues | ... | ... | ... | 5 |
| 69. Salivary gland | ... | ... | ... | 55 |
| 70. Scrotum | ... | ... | ... | 21 |
| 71. Skin and subcutaneous tissues | ... | ... | ... | 1,207 |
| 72. Aspiration from skin and subcutaneous tissues | ... | ... | ... | 7 |
| 73. Spleen | ... | ... | ... | 72 |
| 74. Sputum | ... | ... | ... | 20 |
| 75. Stomach | ... | ... | ... | 312 |
| 76. Stomach contents | ... | ... | ... | 2 |
| 77. Spinal cord | ... | ... | ... | 3 |
| 78. Spermatic cord | ... | ... | ... | 1 |
| 79. Testes, Epididymis and Vas deferens | ... | ... | ... | 39 |
| 80. Thyroid Gland | ... | ... | ... | 163 |
| 81. Aspiration from Thyroid gland | ... | ... | ... | 1 |
| 82. Tongue | ... | ... | ... | 63 |
| 83. Tonsils | ... | ... | ... | 30 |
| 84. Trachea | ... | ... | ... | 5 |
| 85. Thymus and Thoracic tissues | ... | ... | ... | 2 |
| 86. Urethra | ... | ... | ... | 30 |
| 87. Ureter | ... | ... | ... | 19 |
| 88. Urine | ... | ... | ... | 6 |
| 89. Uterus | ... | ... | ... | 301 |
| 90. Umbilicus and cord | ... | ... | ... | 7 |
| 91. Vagina | ... | ... | ... | 60 |
| 92. Vaginal smear | ... | ... | ... | 1 |
| 93. Vulva | ... | ... | ... | 39 |
| 94. Worms | ... | ... | ... | 1 |
| | | | | <hr/> |
| | | | Total | 15,427 |
| | | | | <hr/> |

Table 143

AN ANALYSIS OF HISTOLOGICAL DIAGNOSIS

1964

| | | | |
|---|-----|-------------------|-------|
| 1. <i>Inflammatory:</i> | | | |
| (a) Acute Inflammation | ... | ... | 568 |
| (b) Acute and chronic (subacute inflammation) | ... | ... | 107 |
| (c) Chronic Inflammation | ... | ... | 1,652 |
| (d) Granulomatous Inflammation | ... | ... | 445 |
| (1) Tuberculosis | ... | ... | 305 |
| (2) Leprosy | ... | ... | 138 |
| (3) Filariasis | ... | ... | 3 |
| (4) Other Helminths | ... | ... | 71 |
| (5) Fungal | ... | ... | 6 |
| (e) Inflammation with Repair and/or Fibrosis | ... | ... | 201 |
| (f) Inflammation with Subsequent Morpho/Alteration | ... | ... | 23 |
| (g) Inflammation Superimposed on Morpho/Alteration | ... | ... | 261 |
| (h) Fibrosis and/or Repair | ... | ... | 134 |
| 2. <i>Traumatic Abnormalities:</i> | | | |
| (1) Effects of Surgical Procedures | ... | ... | 4 |
| (2) Wounds | ... | ... | 42 |
| (3) Fractures | ... | ... | 1 |
| (4) Miscellaneous | ... | ... | 4 |
| (5) Disorganisation | ... | ... | 8 |
| 3. <i>Congenital Malformations:</i> | | | |
| (1) Abnormalities of Pregnancy and POC | ... | ... | 2,720 |
| (2) Ectopic Pregnancy | ... | ... | 112 |
| (3) Malformations and Deformities of Parts of Body | ... | ... | 17 |
| (4) Congenital absence, accessory, supernumerary organs and tissues | ... | ... | 8 |
| (5) Estopis (Heterotopia) | ... | ... | 3 |
| (6) Intersex (8334-12133) | ... | ... | 2 |
| 4. <i>Mechanical Abnormalities:</i> | | | |
| (1) Foreign body | ... | ... | 4 |
| (2) Dilatation and Diverticula | ... | ... | 73 |
| (3) Retention of Contents (Cystic and noncystic) | ... | ... | 309 |
| (4) Obstruction, Stenosis, Thrombus and Embolus | ... | ... | 106 |
| 5. <i>Degeneration, Necrosis and Deposition:</i> | | | |
| (1) Degeneration which usually occurs in only one kind of tissue | ... | ... | 57 |
| (2) Necrosis | ... | ... | 82 |
| (3) Deposition | ... | ... | 23 |
| (4) Deposition of Pigments | ... | ... | 25 |
| (5) Collagen Disease | ... | ... | 39 |
| 6. <i>Alteration of Growth and Atrophy:</i> | | | |
| (1) Atrophy | ... | ... | 42 |
| (2) Dystrophy | ... | ... | 2 |
| (3) Hypertrophy | ... | ... | 115 |
| (4) Metaplasia with/without Atypia | ... | ... | 118 |
| (5) Dysplasia | ... | ... | 23 |
| (6) Hyperplasia with/without Atypia | ... | ... | 529 |
| 7. <i>Neoplasia:</i> | | | |
| (1) Tumours of Glandular Epithelium | ... | (M) 603 (B) 330 | |
| (2) Tumours of Nonglandular Epithelium | ... | (M) 1,072 (B) 157 | |
| (3) Leukaemia | ... | (M) 10 (B) — | |
| (4) Lymphoma | ... | (M) 50 (B) 1 | |
| (5) Tumours of Nervous tissues and Associated structures | ... | (M) 20 (B) 53 | |
| (6) Tumours of Vascular tissues | ... | (M) 1 (B) 136 | |
| (7) Tumours of Connective tissues and muscle | ... | (M) 31 (B) 332 | |
| (8) Tumours of Non-epithelial tissues | ... | (M) 16 (B) 19 | |
| (9) Tumours of Embryonal and mixed tissues | ... | (M) 12 (B) 54 | |

Table 144

NEOPLASIA

| | Malignant Tumours | Benign Tumours |
|---|----------------------|-------------------|
| 1. Anal and ischio-rectal tissues ... | 84 | 19 |
| 2. Appendix ... | 3 | — |
| 3. Ascitic fluid ... | 12 | *3 |
| 4. Adrenals ... | — | 3 |
| 5. Ampulla of Vater ... | 1 | — |
| 6. Bladder and bladder washout ... | 31 | 8 |
| 7. Bones and aspiration from bones ... | 21 | 12 |
| 8. Bone marrow ... | 5 | — |
| 9. Brain and meninges ... | 5 | 6 |
| 10. Broad ligament and Parametrial tissues ... | — | 3 |
| 11. Breast and nipple discharge ... | 77 | 77 |
| 12. Bronchus ... | 35 | — |
| 13. Bronchial smears ... | 9 | *3 |
| 14. Blood Films ... | — | 3 |
| 15. Cervix ... | 156 | 58 |
| 16. Colon and rectum ... | 58 | 2 |
| 17. Cerebro-spinal fluid ... | 1 | — |
| 18. Ear ... | 4 | 17 |
| 19. Endometrium ... | 41 | 23 |
| 20. Eye and eyelids, etc. ... | 19 | 17 |
| 21. Fallopian tube ... | 1 | 1 |
| 22. Gall bladder ... | 5 | — |
| 23. Intestines ... | 6 | 6 |
| 24. Joints and synovial tissues and aspiration joints ... | 2 | 12 |
| 25. Kidney ... | 11 | 1 |
| 26. Larynx ... | 52 | 11 |
| 27. Liver and aspiration liver ... | 116 | — |
| 28. Lung and aspiration lung ... | 20 | 3 |
| 29. Lymph node ... | 203 | — |
| 30. Mesentery ... | 6 | 1 |
| 31. Mouth and dental diseases ... | 28 | 12 |
| 32. Mediastinum ... | 1 | — |
| 33. Nerves and sympathetic ganglia ... | — | 4 |
| 34. Nose and nasopharynx and sinuses ... | 182 | 27 |
| 35. Oesophagus ... | 105 | — |
| 36. Omentum ... | 24 | — |
| 37. Ovary ... | 40 | 114 |
| 38. Palate ... | 11 | 4 |
| 39. Pancreas ... | 3 | — |
| 40. Parathyroid ... | 1 | — |
| 41. Penis ... | 24 | 2 |
| 42. Peritoneum ... | 3 | — |
| 43. Peritoneal fluid ... | 4 | — |
| 44. Pharynx ... | 8 | — |
| 45. Placenta ... | — | — |
| 46. Pleura ... | 28 | 1 |
| 47. Pleural fluid ... | 42 | *11 |
| 48. Prostate ... | 13 | — |
| 49. Pus ... | 1 | — |
| 50. Pituitary ... | — | 2 |
| 51. Retroperitoneal tissues ... | 3 | — |
| 52. Intra-abdominal tissues ... | 2 | — |
| 53. Salivary gland ... | 6 | 25 |
| 54. Scrotum ... | 2 | 1 |
| 55. Skin and subcutaneous tissues ... | 162 | 307 |
| 56. Spleen ... | 1 | — |
| 57. Sputum ... | 2 | — |
| 58. Stomach ... | 93 | 4 |
| 59. Spinal cord ... | 1 | 1 |
| 60. Testes, Epididymis and Vas deferens ... | 5 | 1 |

* Probably malignant.

Table 145

POST MORTEM EXAMINATIONS

1964

Total number of Necropsies ... 2661
 (1) Coroner's Cases ... 1274

These necropsies were conducted by the Staff of the Government Department of Pathology.

(2) Hospital Cases ... 1387

AGE, SEX, RACE DISTRIBUTION OF AUTOPSIES ON ALL DEATHS

CORONER'S AND WARD CASES 1964

| Age | CHINESE | | INDIANS | | MALAYS | | OTHERS | | TOTAL | | Grand Total |
|------------------------------------|--------------|------------|------------|-----------|-----------|-----------|-----------|-----------|--------------|------------|--------------|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. | |
| Under 1 year .. | 572 | 419 | 28 | 28 | 2 | .. | 3 | 2 | 605 | 449 | 1,054 |
| 1 — 10 .. | 105 | 72 | 6 | 5 | 1 | 3 | 1 | 2 | 113 | 82 | 195 |
| 11 — 20 .. | 79 | 35 | 3 | 2 | 3 | 1 | 1 | 1 | 86 | 39 | 125 |
| 21 — 30 .. | 105 | 27 | 17 | 2 | 21 | 5 | 5 | 1 | 148 | 35 | 183 |
| 31 — 40 .. | 68 | 45 | 20 | 5 | 12 | 2 | 8 | 2 | 108 | 54 | 162 |
| 41 — 50 .. | 118 | 32 | 32 | 4 | 10 | 2 | 5 | 1 | 165 | 39 | 204 |
| 51 — 60 .. | 227 | 47 | 29 | 2 | 7 | 1 | 6 | .. | 269 | 50 | 319 |
| 61 — 70 .. | 182 | 42 | 13 | 3 | 3 | 1 | 6 | 2 | 204 | 48 | 252 |
| Over 70 .. | 81 | 26 | 6 | .. | 2 | .. | 4 | .. | 93 | 26 | 119 |
| Total .. | 1,537 | 745 | 154 | 51 | 61 | 15 | 39 | 11 | 1,791 | 822 | 2,613 |
| Autopsies of unknown Cases .. + 48 | | | | | | | | | | | |
| Total .. 2,661 | | | | | | | | | | | |

Table 146

DEATHS FROM VIOLENCE

1964

| | |
|---|-----|
| 1. Hanging ... | 57 |
| 2. Traumatic Asphyxia ... | 1 |
| 3. Strangulation ... | 3 |
| 4. Drowning ... | 83 |
| 5. Firearms ... | 14 |
| 6. Explosives ... | 4 |
| 7. Blast Injuries ... | 1 |
| 8. Cutting and Piercing Instruments ... | 34 |
| 9. Injuries by Blunt Instruments ... | 20 |
| 10. Train Accident ... | 1 |
| 11. Vehicle Accidents ... | 247 |
| 12. Fall from Heights ... | 61 |
| 13. Falls ... | 30 |
| 14. Injuries Unascertainable ... | 10 |
| 15. Decomposed Corpses and Human Remains ... | 16 |
| 16. Injuries by Falling objects ... | 13 |
| 17. Burns ... | 2 |
| 18. Scalds ... | 2 |
| 19. Choking ... | 1 |
| 20. Electrocution ... | 7 |
| 21. Lightning ... | 1 |
| 22. Suffocation ... | 5 |
| 23. Snakes and Insect Bites and Wasp stings ... | 3 |
| 24. Machinery ... | 2 |
| 25. Caisson Disease ... | 3 |
| 26. Fat Embolism ... | 1 |
| 27. Submersion ... | 1 |
| 28. Still Birth ... | 215 |
| Total ... | 838 |

Table 147

DEATHS FROM POISONING

| | |
|-----------------------|----|
| 1. Caustic Soda ... | 18 |
| 2. Morphine ... | 1 |
| 3. Tuba Root ... | 1 |
| 4. Barbiturates ... | 6 |
| 5. Salicylate ... | 1 |
| 6. Largactil ... | 2 |
| 7. D.D.T. ... | 2 |
| 8. Diazinon ... | 1 |
| 9. Eucalyptus oil ... | 1 |
| 10. Malathion ... | 1 |
| Total ... | 34 |

Table 148

DEATHS FROM ILL-DEFINED CAUSES

| | |
|---|----|
| 1. Post — operative ... | 9 |
| 2. Unestablished and obscure causes ... | 10 |
| Total ... | 19 |

Table 149

CAUSE GROUPS

| | | | | |
|------------------|--|---------------|-------|----------------|
| 1. Tuberculosis: | (1) Respiratory System | ... | ... | 149 |
| | (2) Meninges, Central Nervous System | ... | ... | 5 |
| | (3) Intestines, Peritoneum and Mesenteric glands | ... | ... | 12 |
| | (4) Bones and Joints | ... | ... | 1 |
| | (5) All other forms | ... | ... | 35 |
| | | | Total | 202 |
| 2. | All other Syphilis | ... | ... | 4 |
| 3. | Congenital Syphilis | ... | ... | 2 |
| 4. | Cholera | ... | ... | 1 |
| 5. | Dysentery -- All Forms: | (1) Bacillary | ... | 1 |
| | | (2) Amœbic | ... | 4 |
| 6. | Septicæmia and Pyæmia | ... | ... | 29 |
| 7. | Diphtheria | ... | ... | 3 |
| 8. | Meningococcal Infections | ... | ... | 1 |
| 9. | Leprosy | ... | ... | 1 |
| 10. | Tetanus | ... | ... | 7 |
| 11. | Acute Infectious Encephalitis | ... | ... | 13 |
| 12. | Measles | ... | ... | 3 |
| 13. | Infective Hepatitis | ... | ... | 15 |
| 14. | Malaria | ... | ... | 2 |
| 15. | Schistosomiasis | ... | ... | 4 |
| 16. | Filariasis | ... | ... | 1 |
| 17. | Leptospirosis | ... | ... | 4 |
| 18. | All other Diseases Classified as Infective and Parasitic | ... | ... | 3 (Clonorchis) |
| 19. | Malignant Neoplasus: | | | |
| | (1) Buccal cavity and Pharynx | ... | ... | 1 |
| | (2) Oesophagus | ... | ... | 15 |
| | (3) Stomach | ... | ... | 23 |
| | (4) Intestines (except rectum) | ... | ... | 8 |
| | (5) Rectum | ... | ... | 2 |
| | (6) Larynx | ... | ... | 2 |
| | (7) Trachea, Bronchus and Lung | ... | ... | 63 |
| | (8) Breast | ... | ... | 2 |
| | (9) Cervix uteri | ... | ... | 4 |
| | (10) Other and unspecified parts of uterus | ... | ... | 5 |
| | (11) Prostate | ... | ... | 2 |
| | (12) Bone and Connective tissues | ... | ... | 9 |
| | (13) Others and Unspecified sites | ... | ... | 126 |
| | (14) Leukæmia and Aleukæmia | ... | ... | 8 |
| | (15) Lymphosarcoma and other Neoplasms of Lymphatic and Hæmopoetic Systems | ... | ... | 7 |
| | | Total | ... | 277 |
| 20. | Benign Neoplasms and Neoplasms of Unspecified nature | ... | ... | 55 |
| 21. | Non-toxic Goitre | ... | ... | 4 |
| 22. | Thyrotoxicosis with/without Goitre | ... | ... | 3 |
| 23. | Diabetes Mellitus | ... | ... | 10 |
| 24. | Avitaminosis and other Deficiency States | ... | ... | 19 |
| 25. | Anæmias | ... | ... | 8 |
| 26. | Allergic Disorders, All other endocrine, Metabolic and Blood disease | ... | ... | 3 |
| 27. | Vascular Lesions affecting Central Nervous System (Intraventricular Hæm.) | ... | ... | 197 |
| 28. | Non-Meningococcal Meningitis | ... | ... | 49 |
| 29. | Epilepsy | ... | ... | 2 |
| 30. | All other Diseases of the Nervous System and sense organs | ... | ... | 93 |
| 31. | Chronic Rheumatic Heart Disease | ... | ... | 7 |
| 32. | Arteriosclerotic and Degenerative Heart Disease (Heart Failure) | ... | ... | 84 |

Table 149 — *continued*

| | |
|---|-----|
| 33. Other Diseases of Heart | 269 |
| 34. Hypertension with Heart Disease | 20 |
| 35. Hypertension without mention of Heart | 17 |
| 36. Diseases of Arteries | 264 |
| 37. Lobar Pneumonia | 31 |
| 38. Broncho-Pneumonia | 572 |
| 39. Primary, Atypical, other and Unspecified Pneumonia | 102 |
| 40. Acute Bronchitis | 5 |
| 41. Bronchitis, chronic and unspecified | 30 |
| 42. Hypertrophy of Tonsils and adenoids | 1 |
| 43. Empyema and Abscess Lung | 40 |
| 44. Pleurisy | 2 |
| 45. All other Respiratory Diseases | 232 |
| 46. Pulmonary Hæmorrhage | 95 |
| 47. Ulcer Stomach | 36 |
| 48. Ulcer Duodenum | 12 |
| 49. Gastritis and Duodenitis | 2 |
| 50. Appendicitis | 5 |
| 51. Intestinal Obstruction and Hernia | 18 |
| 52. Gastro-enteritis and Colitis, except Diarrhœa of Newborn | 77 |
| 53. Cirrhosis of Liver | 50 |
| 54. Cholelithiasis and Cholecystitis | 28 |
| 55. Other Diseases of Digestive System | 114 |
| 56. Acute Nephritis | 1 |
| 57. Chronic, other and Unspecified Nephritis | 116 |
| 58. Calculi of Urinary System | 2 |
| 59. Hyperplasia of Prostate | 57 |
| 60. Other Diseases of genito-urinary system | 165 |
| 61. Toxæmias of Pregnancy and The Puerperium | 5 |
| 62. Hæmorrhage of Pregnancy and childbirth | 3 |
| 63. Abortion without mention of Sepsis and Toxæmia | 2 |
| 64. Abortion with Sepsis | 8 |
| 65. Other complications of Pregnancy, childbirth and Puerperium | 1 |
| 66. Infections of skin and subcutaneous tissues | 3 |
| 67. Osteomyelitis and Periostitis | 3 |
| 68. Ankylosis and acquired Musculo-skeletal Deformities | 1 |
| 69. All other Diseases of skin and Musculo-skeletal system | 3 |
| 70. Spina-Bifida and Meningocœle | 3 |
| 71. Congenital Malformations of Circulatory System, (Congenital Heart Disease) | 77 |
| 72. All other Congenital Malformations | 54 |
| 73. Post-natal Asphyxia and Atelectasis (Pulmonary) | 386 |
| 74. Hæmolytic Disease of the New-Born | 44 |
| 75. Ill-defined Diseases peculiar to Early Infancy, and Immaturity Unqualified (Prematurity) | 580 |
| 76. Fatty Liver | 113 |
| 77. Peritonitis | 61 |
| 78. Hirschprung's Disease | 4 |
| 79. Acute Hæmorrhagic Pancreatitis | 6 |
| 80. Fungal Infections (Cryptococcosis — Brain) | 3 |
| 81. Beri-Beri | 1 |
| 82. Thrombocytopenic Purpura | 1 |
| 83. Hæmorrhagic Fevers | 15 |
| 84. Gas Gangrene | 1 |
| 85. Wilson's Disease | 1 |
| 86. Hæmochromatosis | 2 |
| 87. Intussusception | 2 |

BACTERIOLOGY SECTION

The Bacteriology Section occupies the ground floor of the Department of Pathology. It consists of three routine laboratories, two research laboratories cum office for Bacteriologist and Assistant Bacteriologists, and two Virology laboratories. Also one media room, one sterilization room, one glassware preparation room, one washing room, and one animal inoculation room.

Staff

| | | | |
|----------------------------------|-----|-----|-----------------------------------|
| Medical Officer | ... | ... | 1 (on scholarship for Div. Bact.) |
| Medical Officer | ... | ... | 1 |
| Science Graduate in Bacteriology | ... | ... | 1 |
| Senior Laboratory Technician | ... | ... | 1 |
| Qualified Laboratory Technicians | ... | ... | 8 |
| Technicians-in-training | ... | ... | 6-8 (Number is variable) |
| Laboratory attendants | ... | ... | 10 |

The average number of examinations carried out by each member of staff was 14,500.

BACTERIOLOGY

| | | | |
|--|-----|-----|--------------|
| Total number of Bacteriological investigations | ... | ... | 264,383 |
| Total amount of media prepared | ... | ... | 6,436,000 cc |
| 1. Throat Swab for Culture | ... | ... | 3,774 |
| <i>Organisms isolated</i> | | | |
| Corynebacterium diphtheriae | ... | ... | 40 |
| Streptococcus haemolyticus | ... | ... | 237 |
| Staphylococcus aureus | ... | ... | 629 |
| Monilia | ... | ... | 196 |
| Klebsiella pneumonia | ... | ... | 28 |
| Other organisms | ... | ... | 89 |
| 2. Nasal Swabs for Culture | ... | ... | 587 |
| <i>Organisms isolated</i> | | | |
| Corynebacterium diphtheriae | ... | ... | 8 |
| Streptococcus haemolyticus | ... | ... | 15 |
| Staphylococcus aureus | ... | ... | 144 |
| Monilia | ... | ... | 5 |
| Klebsiella pneumonia | ... | ... | 3 |
| Other organisms | ... | ... | 11 |
| 3. Sputum for Culture | ... | ... | 3,216 |
| <i>Organisms isolated</i> | | | |
| Beta haemolytic streptococcus | ... | ... | 61 |
| Staphylococcus aureus (Coagulase + Ve) | ... | ... | 202 |
| B. friedlander | ... | ... | 61 |
| Candida sp. | ... | ... | 41 |
| B. coli | ... | ... | 36 |
| Ps. pyocyanea | ... | ... | 258 |
| B. proteus | ... | ... | 58 |
| Strept. pneumococcus | ... | ... | Nil |
| Aerogenic E. coli | ... | ... | 1 |
| Aerobacter aerogenes | ... | ... | 60 |

4. Ear Swab and Pus for Culture ... 5,254

Organisms isolated

| | | |
|--|-----|-------|
| Beta haemolytic streptococcus | ... | 328 |
| Alpha streptococcus | ... | 47 |
| Non Haemolytic streptococcus | ... | Nil |
| Staphylococcus aureus (coagulase + Ve) | ... | 1,977 |
| Strept. pneumococcus | ... | 3 |
| Ps. Pyocyanea | ... | 831 |
| B. proteus | ... | 468 |
| Enterococcus | ... | 12 |
| B. coli | ... | 552 |
| B. coli areogenes | ... | 446 |
| Actinomyces sp. | ... | Nil |
| Paracolon | ... | 48 |
| Salmonella typhi | ... | 1 |
| Candida sp. | ... | 24 |
| B. friedlander | ... | 1 |
| C. diphtheriae | ... | 3 |
| Cl. nelchii | ... | 10 |
| Staphylococcus albus | ... | 43 |
| Anaerogenic E. coli | ... | 4 |
| B. alkaligenes | ... | 71 |
| Anaerobic strep. | ... | 1 |
| Cl. tetani | ... | 1 |
| G.C. | ... | 1 |
| Anaerobic spore-bearer | ... | 6 |
| Anaerobic H.S. | ... | 1 |

5. Pleural and other Fluids for Culture ... 831

Organisms isolated

| | | |
|--|-----|-----|
| Beta haemolytic streptococcus | ... | 8 |
| Streptococcus faecalis | ... | 3 |
| Staphylococcus aureus (Coagulase + ve) | ... | 45 |
| Streptococcus pneumoniae | ... | 1 |
| Ps. Pyocyanea | ... | 18 |
| B. Proteus | ... | 4 |
| B. coli | ... | 12 |
| Salmonella group | ... | Nil |
| Aerobacter aerogenes | ... | 19 |
| B. alkaligenes | ... | 7 |
| Staphylococcus albus | ... | 5 |
| Alpha streptococcus | ... | 6 |
| Monilia | ... | 1 |

6. Cerebral Spinal Fluid for Culture ... 1,091

Organisms isolated

| | | |
|--|-----|----|
| Cryptococcus | ... | 13 |
| Beta haemolytic streptococcus | ... | 2 |
| Alpha haemolytic streptococcus | ... | 2 |
| Meningococcus | ... | 1 |
| Strept. pneumococcus | ... | 7 |
| Staphylococcus aureus (coagulase + ve) | ... | 21 |
| B. coli | ... | 9 |
| Ps. pyocyanea | ... | 4 |
| Aerobacter aerogenes | ... | 10 |
| Staphylococcus albus | ... | 4 |
| B. proteus | ... | 3 |

7. Vaginal, Cervical, Urethral Swab for Culture ... 2,665

Organisms isolated

| | | |
|--|-----|-----|
| Beta haemolytic streptococcus | ... | 79 |
| Alpha haemolytic streptococcus | ... | 110 |
| Staphylococcus aureus (Coagulase + ve) | ... | 305 |
| N. gonorrhoeae | ... | 18 |
| Cl. welchii | ... | 5 |
| Enterococcus | ... | 14 |
| B. proteus | ... | 65 |
| Ps. pyocyanae | ... | 65 |
| B. coli | ... | 56 |
| Candida sp. | ... | 394 |
| Paracolon | ... | 37 |
| Aerobacter aerogenes | ... | 128 |
| Anaerogenic E. coli | ... | 5 |
| Staphylococcus albus | ... | 9 |
| B. alkaligenes | ... | 10 |

8. Eye Swab for Culture ... 1,310

Organisms isolated

| | | |
|--|-----|----|
| Beta haemolytic streptococcus | ... | 21 |
| Streptococcus pneumoniae | ... | 3 |
| Staphylococcus aureus (Coagulase + ve) | ... | 85 |
| B. Proteus | ... | 13 |
| Ps. Pyocyanae | ... | 73 |
| B. Coli aerogenes | ... | 18 |
| B. Alkaligenes | ... | 7 |
| Alpha streptococcus | ... | 14 |
| Staphylococcus albus | ... | 8 |
| Diphtheroids | ... | 5 |
| B. Paracolon | ... | 7 |
| Anaerogenic B. Coli | ... | 1 |

9. Urine for Culture ... 8,837

Organisms isolated

| | | |
|--|-----|-------|
| B. Coli | ... | 2,381 |
| B. Coli aerogenes | ... | 2,050 |
| B. Proteus | ... | 1,211 |
| Enterococcus | ... | 714 |
| Ps. Pyocyanae | ... | 704 |
| Non haemolytic streptococcus | ... | 315 |
| Staphylococcus aureus (Coagulase + ve) | ... | 285 |
| Alpha haemolytic streptococcus | ... | 111 |
| Beta haemolytic streptococcus | ... | 7 |

10. Stool for Culture ... 6,222

Organisms isolated

| | | |
|---------------------------------|-----|-----|
| Vibrio Cholera el Tor | ... | 31 |
| Pathogenic B. Coli | ... | 208 |
| Shigella flexneri | ... | 19 |
| Shigella sonnei | ... | 11 |
| Salmonella typhi | ... | 8 |
| Salmonella group B | ... | 7 |
| Salmonella group C | ... | 6 |
| Salmonella group E | ... | 8 |
| Salmonella group (unidentified) | ... | 6 |
| Salmonella typhimurium | ... | 2 |
| Salmonella newport | ... | 2 |
| Salmonella thompson | ... | 1 |

| | | | |
|---|-----|---------------------------|--|
| 11. Blood (including blood clot) for Culture | ... | ... | 5,158 |
| <i>Organisms isolated</i> | | | |
| Salmonella typhi | ... | ... | 68 |
| Staphylococcus aureus | ... | ... | 103 |
| Beta haemolytic streptococcus | ... | ... | 33 |
| Streptococcus viridans | ... | ... | 5 |
| Pseudomonas pyocyanea | ... | ... | 27 |
| B. Alkaligenes | ... | ... | 193 |
| 12. Miscellaneous Specimens for Culture | ... | ... | 332 |
| | | Total No. of Specimens | Organisms isolated |
| (a) Bile | ... | 54 | Salmonella typhi ... 1 B. coli ... 9 B. proteus ... 2 B. paracolon ... 1 A. aerogenes ... 5 Monilia ... 1 |
| (b) Bone | ... | 45 | — |
| (c) Biopsy tissue | ... | 43 | Staphylococcus aureus ... 3 B. coli ... 1 Anaerobic spore bearing organism ... 3 B. proteus ... 2 |
| (d) P. M. organs | ... | 18 | B. coli ... 3 A. aerogenes ... 1 |
| (e) Food specimens | ... | 68 | Staphylococcus aureus 5 |
| (f) Stomach contents | ... | 55 | Staphylococcus aureus ... 10 B. coli ... 4 Streptococcus faecalis ... 1 A. aerogenes ... 3 |
| (g) Dressings | ... | 2 | — |
| (h) Theatre air samples | ... | 12 | Staphylococcus ... 12 B. subtilis ... 3 |
| (i) B. subtilis cultures | ... | 23 | |
| (j) Cough and Finger Print Plates | ... | 10 | |
| 13. Serological Examination | ... | ... | 6,359 |
| Blood for Widal | ... | 1,635 | |
| Blood for Weil Felix | ... | 1,635 | |
| Blood for V1 agglutination | ... | 26 | |
| Blood for Brucella agglutination | ... | 30 | |
| Blood for Paul Bunnell Sensitized Erythrocytes Lysis Test (SEL) | ... | 596 | |
| C Reactive Protein test | ... | 755 | |
| Antistreptolysin "O" test | ... | 1,267 | |
| Antithyroid antibodies | ... | 241 | |
| Aga gel diffusion tests for Drug Sensitivity | ... | 36 | |
| Blood for Cholera anti- bodies | ... | 4 | |

| | | | | |
|---|-----------|-----|-----|-------|
| 14. Medico Legal Specimen Examination | ... | ... | ... | 280 |
| Urethral Swabs | ... | ... | ... | 116 |
| Vaginal Swabs | ... | ... | ... | 87 |
| Prostatic Swabs | ... | ... | ... | 36 |
| Mouth Swab | ... | ... | ... | 1 |
| Urine for Pregnancy test | ... | ... | ... | 40 |
| 15. Culture for Amoeba and Intestinal Parasites | ... | ... | ... | 2,210 |
| | Specimens | | | Total |
| (1) Stool | ... | ... | ... | 2,088 |
| (2) Rectal Swab | ... | ... | ... | 12 |
| (3) Pus from Liver and other sources | ... | ... | ... | 55 |
| (4) P. M. specimens | ... | ... | ... | 7 |
| (5) Miscellaneous | ..... | ... | ... | 48 |

POSITIVE M. E.

| | E. Histolytica Trophozoites or Cysts | Giardia Lamblia | Trichomonas Intestinalis | Balantidium Coli |
|---|--------------------------------------|-----------------|--------------------------|------------------|
| (1) Stool | 82 | 75 | 14 | 1 |
| (2) Rectal Swab .. | .. | .. | .. | .. |
| (3) Pus from Liver and other Sources .. | 3 | .. | .. | .. |
| (4) P. M. Specimen .. | .. | .. | .. | .. |
| (5) Miscellaneous .. | .. | .. | .. | .. |

POSITIVE CULTURES

| | E. Histolytica | E. H. Small-race | E. Coli | Dient-amoeba Fragilis | E. Nana | Balanti-dium Coli | Trich. Intest. |
|---|----------------|------------------|---------|-----------------------|---------|-------------------|----------------|
| (1) Stool | 180 | 66 | 10 | 10 | 46 | 1 | 59 |
| (2) Rectal Swab .. | .. | .. | .. | .. | .. | .. | .. |
| (3) Pus from Liver and other Sources .. | 4 | .. | .. | .. | .. | .. | .. |
| (4) P. M. Specimen .. | .. | .. | .. | .. | .. | .. | .. |
| (5) Miscellaneous .. | 1 | .. | .. | .. | .. | .. | .. |

| | | | | |
|--|----------|------------|--------------------------------|---------|
| 16. Mycological Investigations | ... | ... | ... | 3,921 |
| | | | Total No. | |
| (a) Cultures for Fungi (See Appendix A) | ... | ... | 1,156 | |
| (b) Direct M.E. for Fungi | ... | ... | 1,156 | |
| (c) Sensivity Tests for Fungi | ... | ... | 1,330 | |
| (d) Bio-chemical reactions | ... | ... | 279 | |
| 17. Sensitivity Tests | ... | ... | ... | 209,848 |
| Penicillin. | | | Erythromycin. | |
| Streptomycin. | | | Sigmamycin. | |
| Chloromphenicol. | | | DMC Tetracycline (Ledermycin). | |
| Tetracycline Hyd. | | | Furadantin. | |
| Oxytetracycline. | | | Bacitracin. | |
| Trisulfonamide. | | | Framygen. | |
| Neomycin. | | | Polymixin. | |
| Spiramycin. | | | Rifocin. | |
| Kanamycin. | | | | |
| 18. Culture for Leptospira | | | | |
| | Urine | ... | 27 | |
| | Blood | ... | 18 | |
| | | | | 45 |
| 19. Animal Inoculation | ... | ... | ... | 33 |
| (a) Tuberculosis — CSF | ... | ... | 1 | |
| Urine | ... | ... | 1 | |
| Sputum | ... | ... | 1 | |
| Pleural fluid | ... | ... | 3 | |
| Miscellaneous | ... | ... | 8 | |
| (b) Leptospirosis | ... | ... | 1 | |
| (c) Experimental Inoculation | ... | ... | 18 | |
| | Rabbit | Guinea Pig | Mice | Hamster |
| Tetanus | — | — | 5 | — |
| Friedlanders' Bacillus | — | — | 5 | — |
| Toxoplasmosis | — | — | 1 | — |
| Erysipelothrix | — | — | 1 | — |
| Pasteurella pestis | — | 1 | 3 | — |
| Parvobacterium | — | — | 1 | — |
| Entomoeba histolytica | — | — | — | 1 |
| 20. Standardization of Drugs and Sterility Test of Biological Preparation etc. | ... | ... | ... | 1,658 |
| (a) Sterility Tests | | | | |
| Biological preparations | ... | ... | 1,071 | |
| Surgical dressings and instruments etc | ... | ... | 153 | |
| Blood and plasma (from B.T.S.) | ... | ... | 380 | |
| Bone (from bone bank) | ... | ... | 5 | |
| (b) Potency tests of antibiotic preparations | ... | ... | 43 | |
| (c) Phenol coefficient of Disinfectants | ... | ... | 4 | |
| (d) Disinfectant Potency against coliforms | ... | ... | 2 | |
| 21. Toad Test for Pregnancy | ... | ... | ... | 685 |
| | Positive | ... | 253 | |
| | Negative | ... | 432 | |

| | | | | |
|--|---|-----|------------|----|
| 22. Clinical Examinations | ... | ... | ... | 68 |
| | Blood M.E. | ... | 1 | |
| | Blood count | ... | 1 | |
| | Stool | ... | 8 | |
| | Stool occult blood | ... | 1 | |
| | Urine | ... | 3 | |
| | Dark ground | ... | 54 | |
| 23. Preparation of Vaccine | | | | |
| | T.A.B. Vaccine (Prophylactic) | ... | 6,600 c.c. | |
| | Autogenous Vaccine | ... | 40 c.c. | |
| | Tobacco Allergen | ... | 120 c.c. | |
| 24. Preparation of Agglutinable Suspensions | ... | ... | 5,200 c.c. | |
| | Salmonella typhi "H" concentrated | ... | 600 c.c. | |
| | Salmonella typhi "O" concentrated | ... | 600 c.c. | |
| | Salmonella paratyphi "AH" concentrated | ... | 500 c.c. | |
| | Salmonella paratyphi "AO" concentrated | ... | 500 c.c. | |
| | Salmonella paratyphi "BH" concentrated | ... | 500 c.c. | |
| | Salmonella paratyphi "BO" concentrated | ... | 500 c.c. | |
| | Salmonella paratyphi "CH" concentrated | ... | 500 c.c. | |
| | Salmonella paratyphi "CO" concentrated | ... | 500 c.c. | |
| | Proteus OXK | ... | 500 c.c. | |
| | Proteus OX19 | ... | 500 c.c. | |
| 25. Media Preparation | <i>See Table 151</i> | | | |
| 26. Preparation of Antibiotic Discs | ... | ... | 2,098,000 | |
| | Penicillin, Streptomycin, Chloramphenicol, Tetracycline Hyd., Oxytetracycline, Trisulfonamide, Neomycin, Spiramycin, Kanamycin, Erythromycin, Sigmamycin, DMC Tetracycline Bacitracin, Polymixin. | | | |
| 27. Maintenance of Stock Cultures | ... | ... | 226 | |
| | 1. Fungi: dermatophytes, candida | ... | 110 | |
| | 2. Salmonella and Shigella | ... | 28 | |
| | 3. Leptospira | ... | 6 | |
| | 4. V. Cholera | ... | 6 | |
| | 5. V. Cholera el Tor strains | ... | 58 | |
| | 6. Pathogenic B. coli | ... | 2 | |
| | 7. Brucella | ... | 3 | |
| | 8. Clostridium | ... | 2 | |
| | 9. Proteus | ... | 2 | |
| | 10. Staphylococcus aureus | ... | 1 | |
| | 11. Bacillus subtilis | ... | 1 | |
| | 12. Klebsiella friedlanderii | ... | 1 | |
| | 13. Entamoeba histolytica | ... | 6 | |
| 28. Dr. J. Stein continued his term as Bacteriologist until July 1964, | | | | |

During this time there were two further outbreaks of cholera cases. In January and February 1964, the third cholera outbreak in Singapore occurred, when three cases of cholera were diagnosed.

From April until June 1964, the fourth outbreak occurred, when 20 cases were isolated. Out of these, there were three deaths. Seven carrier cases were discovered on examination of contacts.

In August, one case of cholera was confirmed. During the year a total of 2,370 stool specimens were examined for cholera.

Virology Laboratory

Previous conditions for Virology work were unsatisfactory due to the fact that this work, which requires the highest standards of cleanliness and bacteriological sterility, was being carried out in a room serving as an office and bacteriology laboratory.

However, during 1964, two rooms, previously housing animals for Bacteriology work, were converted into Virology laboratories, and the animals transferred to a new animal room converted from an unused corridor.

The Virology equipment, purchased the previous year 1963, has been installed into the new laboratories and work will commence in 1965.

Amoeba Cultures

During the month of December, and extending into January 1965, in addition to routine specimens, a further 253 stool specimens were examined for *Entamoeba histolytica*. These specimens were from children and staff of Girls' Homecraft Centre following the discovery of Amoebic Dysentery in children recently entering the home. *Entamoeba histolytica* was isolated from six specimens, *E. H.* (smallrace) from 35 specimens and *Giardia lamblia* seen in 23 specimens.

Theatre Sterility

Another field in which preliminary work has been carried out is the theatres of General Hospital and Thomson Road Hospital. Here investigation into pathogenic bacteria present in the air in theatres, and tests to determine the sterility of autoclaved articles to be used in theatres has been done.

Continuous supervision and testing of autoclaves serving operating theatres is essential, and the laboratory is ready to assume this responsibility.

However, with the increasing demands on Bacteriology, the laboratory is finding it difficult with shortage of staff and limited budget to meet these new responsibilities.

The number of routine tests increases year by year, and in 1964, the total number of specimens has increased by 70,802 to 262,680.

Again this year there has been no increase in staff. The trainees do a large section of the practical work. We depend on them so much for routine work that if less than the usual number of trainees are allotted to the laboratory, it is difficult to complete the work.

The staff responded very well during the emergency conditions — July and September, when although many routine specimens were suspended, staff arrived during non curfew hours to complete necessary investigations.

In June 1964, Dr. Moses Yu obtained his Diploma in Bacteriology and has since done work in Mycology and Virology.

He will be returning to the Department in March 1965.

Table 150

MYCOLOGY SECTION
STRAINS OF FUNGI ISOLATED

| | Skin Scrapings | Sputum | Nails | Pus | Other Sources | Total |
|-----------------------------|----------------|--------|-------|-----|---------------|-------|
| No. of Specimens .. | 127 | 267 | 29 | 12 | 142 | 578 |
| Trichophyton Tonsurans .. | 3 | .. | 1 | .. | .. | 4 |
| Trichophyton Rubrum .. | 1 | .. | .. | .. | .. | 1 |
| Trichophyton Gypseum .. | 3 | .. | .. | .. | .. | 3 |
| Trichophyton Verrucosum .. | 2 | .. | .. | .. | .. | 2 |
| Microsporum Canis .. | 4 | .. | .. | .. | .. | 4 |
| Epidermophyton Floccosum .. | 1 | .. | .. | .. | .. | 1 |
| GlaDOSporium Species .. | 1 | .. | .. | .. | .. | 1 |
| Tinea Vesicolor .. | 1 | .. | .. | .. | .. | 1 |
| Hormodendrum Species .. | 7 | .. | 3 | .. | .. | 10 |
| Cryptococcus Neoformans .. | .. | .. | .. | .. | CSF 13 | 13 |
| Candida Albicans .. | .. | 3 | .. | .. | .. | 3 |
| Candida Tropicalis .. | 5 | 18 | 1 | 1 | 4 | 29 |
| Candida Krusei .. | 2 | 9 | 2 | 1 | 2 | 16 |
| Candida Parakrusei .. | 11 | 30 | 5 | 3 | 8 | 57 |
| Candida Stellatoidea .. | 11 | 113 | 3 | 2 | 6 | 135 |
| Candida Guilliermondi .. | 4 | 1 | .. | .. | .. | 5 |
| Candida Species .. | 11 | 12 | 10 | .. | 1 | 34 |
| Geotrichum Candidum .. | 8 | 4 | 1 | 1 | .. | 14 |
| Aspergillus Niger .. | 5 | 3 | 2 | 1 | 1 | 12 |
| Aspergillus Fumigatus .. | 3 | 1 | .. | 1 | 1 | 6 |
| Aspergillus Species .. | 3 | 2 | 1 | .. | 1 | 7 |
| Helminthosporium .. | 5 | 1 | .. | .. | 1 | 7 |
| Penicillium Species .. | 9 | 4 | .. | 1 | 2 | 16 |
| Phialophora Verrucosa .. | 1 | .. | .. | .. | 1 | 2 |
| | | | | | (hair) | |
| Black Yeast .. | 1 | .. | .. | .. | .. | 1 |
| Red Yeast .. | 2 | .. | 1 | .. | .. | 3 |
| Fusarium .. | .. | 1 | .. | .. | .. | 1 |
| Monosporium Apiospermum .. | .. | .. | 1 | .. | .. | 1 |
| Phoma .. | .. | .. | .. | .. | 1 | 1 |
| Sensitivity Tests .. | 1,330 | .. | .. | .. | .. | .. |

Table 151

| | | |
|----------------------------|------------------------------------|-----------------------|
| <i>Agar Media:</i> | Nutrient Agar | 2,290,000 c.c. |
| | Blood plate | 1,860,000 c.c. |
| | EMB | 425,000 c.c. |
| | Chocolate plate | 14,500 c.c. |
| | Chlamyospore agar | 10,000 c.c. |
| | Kligler agar | 61,000 c.c. |
| | Sabouraud agar | 50,000 c.c. |
| | Total ... | 4,710,500 c.c. |
| <i>Broth Media:</i> | Brewer's broth | 35,000 c.c. |
| | BCT | 9,000 c.c. |
| | Blood culture broth | 247,000 c.c. |
| | Filde's broth | 120,000 c.c. |
| | Hartley's broth | 200,000 c.c. |
| | Koser's citrate | 60,000 c.c. |
| | Nutrient broth | 280,000 c.c. |
| | Ox gall broth | 10,000 c.c. |
| | Sabouraud broth | 8,000 c.c. |
| | SF broth | 12,000 c.c. |
| | Sod. taurocholate broth 10% | 10,000 c.c. |
| | Selenite F broth | 55,000 c.c. |
| | Stuart's medium | 20,000 c.c. |
| | Tryptone 1% broth | 14,000 c.c. |
| | Tetrathionate broth | 60,000 c.c. |
| UMI broth | 17,000 c.c. | |
| Miscellaneous media | 50,000 c.c. | |
| | Total ... | 1,207,000 c.c. |
| <i>Meat Media:</i> | Robertson's media | 88,000 c.c. |
| <i>Serum Media:</i> | Amœba medium | 24,000 c.c. |
| | Hiss serum base broth | 7,000 c.c. |
| | Loeffler slope medium | 6,000 c.c. |
| | Hiss serum glucose | 1,000 c.c. |
| | Hiss serum dextrin | 1,000 c.c. |
| | Hiss serum maltose | 1,000 c.c. |
| | Hiss serum starch | 1,000 c.c. |
| | Hiss serum sucrose | 1,000 c.c. |
| | Total ... | 42,000 c.c. |
| <i>Sugar Media:</i> | Plain peptone broth | 40,000 c.c. |
| | Glucose peptone broth | 7,000 c.c. |
| | Lactose peptone broth | 7,000 c.c. |
| | Maltose peptone broth | 7,000 c.c. |
| | Mannite peptone broth | 7,000 c.c. |
| | Sucrose peptone broth | 7,000 c.c. |
| | Total ... | 75,000 c.c. |
| <i>Saline:</i> | Physiological saline | 200,000 c.c. |
| | Buffer saline | 114,000 c.c. |
| | Total ... | 314,000 c.c. |

BACTERIOLOGICAL LABORATORY, CITY HALL

The following is the report on the work done in the Bacteriological Laboratory, City Hall, Singapore, during the year 1964.

| | 1963 | 1964 |
|--|---------------|---------------|
| <i>Public Health Specimens</i> | | |
| 1. From Health Officers | 3,690 | 2,373 |
| 2. From M.O. i/c Staff | 1,740 | 1,689 |
| 3. From M.O. i/c Outdoor Dispensaries ... | 258 | 96 |
| 4. From Cleansing Department | 31 | 46 |
| 5. From Sewerage Department | 18 | 25 |
| 6. From Maternity and Infant Welfare Clinics ... | 3,964 | 9,083 |
| 7. From Middleton Hospital | 31,877 | 26,663 |
| 8. From Johore and Tebrau Water Works ... | 225 | — |
| 9. From Private Practitioners | 1,350 | 434 |
| 10. From Others, (Cold Storage Creameries, and other Manufacturers) | 197 | 181 |
| 11. Special specimens for Virulence tests, Amoebae cultures, Diphtheria Confirmatory tests, etc. ... | 4,171 | 2,236 |
| 12. Rats from Plague Prevention Department ... | 3,290 | 2,940 |
| 13. Ecto-parasites from Plague Prevention Dept. ... | 2,535 | 2,115 |
| | <u>53,346</u> | <u>47,881</u> |
| <i>Water Samples</i> | | |
| 14. Public Utilities Board (Water Department) ... | 11,793 | 12,469 |
| 15. Public Swimming Pools | 4,572 | 3,894 |
| 16. Miscellaneous Sources | 418 | 470 |
| 17. Algae and other samples | 129 | 105 |
| | <u>70,258</u> | <u>64,819</u> |

The shortage of staff has compelled this laboratory to curtail certain examinations. The examination of faeces for ova was resumed sometime in March 1964 giving the increase of specimens from 3,964 to 9,083 from the M.I.W. Clinics. There were two periods of civil disturbances during the year when curfew had to be imposed. This produced a drop in the number of specimens received.

Malaria.—280 blood films were examined for malarial parasites. Only one was found to be positive (*Plasmodium vivax* parasites).

Tuberculosis.—76 specimens were examined.

| | Positive | Negative | Total |
|------------------|----------|-----------|-----------|
| 1. Sputum | 1 | 42 | 43 |
| 2. Milk | — | 33 | 33 |
| | <u>1</u> | <u>75</u> | <u>76</u> |

| <i>Salmonella</i> | | Positive | Negative | Total |
|-----------------------------|-----------|----------|----------|-------|
| Faeces for Culture ... | ... | 293 | 5,468 | 5,761 |
| (S. typhi isolated | 166) | | | |
| (S. Para typhi "A" isolated | 2) | | | |
| (S. Para typhi "B" isolated | 15) | | | |
| (S. typhi-murium isolated | 26) | | | |
| (S. Group "B" isolated | 37) | | | |
| (S. Group "C" isolated | 32) | | | |
| (S. Group "D" isolated | 2) | | | |
| (S. Group "E" isolated | 13) | | | |
| Urine for Culture ... | ... | 1 | 1,444 | 1,445 |
| (S. typhi isolated | 1) | | | |
| | Total ... | 294 | 6,912 | 7,206 |

Salmonella (Widal Reaction)

| | | | | |
|------------------------------------|-----|----|-----|-----|
| Agglutination with Sal. typhi ... | ... | 87 | 634 | 721 |
| Agglutination with Salpara typhi A | ... | — | 373 | 373 |
| Agglutination with Salpara typhi B | ... | 3 | 370 | 373 |
| Agglutination with Salpara typhi C | ... | 6 | 367 | 373 |
| Blood clot Culture ... | ... | 51 | 322 | 373 |
| (S. typhi isolated | 49) | | | |
| (S. Paratyphi "A" isolated | 1) | | | |
| (S. Group "C" | 1) | | | |
| Agglutination with Vi Antigen ... | ... | 43 | 678 | 721 |

Typhus (Well Felix Reaction)

| | | | | |
|------------------------------------|-----------|-----|-------|-------|
| Agglutination with B. proteus OXK | ... | — | 370 | 370 |
| Agglutination with B. proteus OX19 | ... | — | 370 | 370 |
| | Total ... | 190 | 3,484 | 3,674 |

A total of 348 persons were examined for typhoid-carrier state and from each case three specimens were examined—blood, faeces and urine.

Amæbic Dysentery.—4,152 specimens of faeces were examined for amœbæ.

| | |
|-------------------------------|-----------------|
| E. histolytica was present in | 80 specimens |
| E. Coli was present in | 6 specimens |
| Negative | 4,066 specimens |

Total ... 4,152 specimens

Shigella.—5,761 specimens of faeces were cultured.

| | | |
|--|-----------|-------------|
| Shigella flexneri was isolated in | ... | 158 cases |
| Shigella sonnei was isolated in | ... | 107 cases |
| Shigella shiga was isolated in | ... | 1 case |
| Shigella boydii was isolated in | ... | 1 case |
| Shigella flexneri and sonnei (mixed infection) was isolated in | ... | 1 case |
| Negative | ... | 5,493 cases |
| | Total ... | 5,761 cases |

V. Cholera

| | Positive | Negative | Total |
|---------------------|----------|----------|-------|
| 1. Faeces ... | 27 | 229 | 256 |
| 2. Water ... | — | 13 | 13 |
| 3. Fresh Prawns ... | — | 1 | 1 |
| 4. Cockles ... | — | 6 | 6 |
| | — | — | — |
| Total ... | 27 | 249 | 276 |

Out of the 276 specimens, 256 specimens were from human sources.

There were three outbreaks of Cholera in Singapore in January, April and August 1964 respectively. Specimens of faeces were collected from suspected cases of Cholera and from contacts of diagnosed cases. The positives were all of the El Tor variety.

Faeces for Ova and Intestinal Parasites.—In 3,939 specimens ova were present, 7,964 being negative in a total of 11,802 specimens received. Multiple infestation was fairly common.

| | |
|----------------------------------|-------|
| Ankylostome ova found in ... | 947 |
| Ascaris ova found in ... | 1,815 |
| Trichuris ova found in ... | 2,095 |
| Oxyuris ova found in ... | 46 |
| Strongyloides Larva found in ... | 13 |
| Lambliia cysts ... | 126 |
| Trichomonas ... | 27 |
| Balantidium ... | 2 |
| Hymenolepsis ... | 1 |

Diphtheria.—There was a further drop in the number of specimens in 1964, (from 18,522 specimens in 1962 to 8,154 specimens in 1963 and 4,154 specimens in 1964). The compulsory diphtheria immunisation of infants since early 1962 may be showing its protective effect now.

| | Positive | | Negative | | Total | |
|-------------------------|----------|------|----------|-------|-------|-------|
| | 1963 | 1964 | 1963 | 1964 | 1963 | 1964 |
| 1. Throat Swabs ... | 607 | 253 | 5,705 | 3,246 | 6,312 | 3,499 |
| 2. Nasal Swabs ... | 151 | 62 | 820 | 607 | 971 | 669 |
| 3. Ear Swabs ... | 65 | 15 | 585 | 287 | 650 | 302 |
| 4. Sore Swabs, etc. ... | 32 | 13 | 189 | 96 | 221 | 109 |
| | — | — | — | — | — | — |
| Total ... | 855 | 343 | 7,299 | 4,236 | 8,154 | 4,579 |

Miscellaneous Examinations:

| | | | |
|--|-----|-----|-------|
| 1. Urine/Pus for Gonococci (25 positive) | ... | ... | 345 |
| 2. Blood for Total White Cell Count | ... | ... | 133 |
| 3. Blood for Differential Count | ... | ... | 136 |
| 4. Blood for Haemoglobin estimation | ... | ... | 7 |
| 5. Blood for Sedimentation rate | ... | ... | 39 |
| 6. Blood for Microfilaria | ... | ... | 2 |
| 7. Blood for Salmonella | ... | ... | 2 |
| 8. Pathological exudates for General Examination | ... | ... | 1 |
| 9. Urine for General Examination | ... | ... | 2,256 |
| 10. Faeces for Occult blood | ... | ... | 2 |
| 11. Faeces for Food Poisoning | ... | ... | 1 |
| 12. Sundried Humus and Sludge | ... | ... | 36 |
| 13. Wash Water from Nightsoil Pails | ... | ... | 35 |
| 14. Contents from Chemical Closets of Aircrafts | ... | ... | 456 |
| 15. Aerated Water | ... | ... | 3 |
| 16. Still Drinks | ... | ... | 16 |
| 17. Ice Cream, Popsicles, etc. | ... | ... | 640 |
| 18. Milk and Milk Products | ... | ... | 98 |
| 19. Condensed Milk | ... | ... | 4 |
| 20. Bottles for Sterility Tests | ... | ... | 12 |
| 21. Cooked Food | ... | ... | 8 |
| 22. Canned Food (Mushroom, Ham, Vegetable, Kaya, Butter etc.) | ... | ... | 33 |
| 23. Sweets | ... | ... | 1 |
| 24. Raw Fish | ... | ... | 1 |
| 25. Dried Prawn | ... | ... | 3 |
| 26. Water for Salmonella | ... | ... | 3 |

Biochemical tests, faeces for Pathogenic *E. Coli* and sensitivity tests to antibiotics were not done due to the acute shortage of staff.

Plague.—2,940 rats were dissected; none of them showed any signs of plague infection.

2,115 ecto-parasites were combed out from the rats and examined.

The species and distribution of the rats and ecto-parasites are given in the attached table.

Internal organs from 103 rats, 46 live rats and also three gassed rats were collected by a research student from the Department of Zoology, University of Singapore.

Six live rats, infected with *Trypanosoma lewisi* were sent to the Department of Parasitology, and another five to the Department of Zoology, University of Singapore.

Five live rats were given to the Hygiene Section, R.A.F. Tengah, Singapore.

These 62 live rats and the three gassed rats are not included in the figures mentioned above.

Water Samples.—The condition of tap water was satisfactory throughout the year.

Samples received from sources other than the Water Department of the Public Utilities Board and the public swimming pools were as follows:

| | | | |
|-------------------------------|-----|-----|-----|
| Singapore Swimming Club | ... | ... | 200 |
| Tanglin Club | ... | ... | 80 |
| Chinese Swimming Club | ... | ... | 45 |
| Connell House | ... | ... | 21 |
| Singapore Island Country Club | | ... | 27 |
| American Club | ... | ... | 14 |
| Other sources | ... | ... | 83 |

Space in the incubators and waterbaths is inadequate to meet present-day requirements. Had more space been available in them more samples of water from the Public Utilities Board could have been accepted for examination and the revenue therefrom increased. The position is likely to become even worse when Johore River Scheme of the Water Department goes into full operation.

Staff.—The staffing position remained very unsatisfactory. There were only four technical staff, in an establishment total of seven, except in October and November when Miss Lam was posted here as a Bacteriologist. Towards the end of the year two persons were recruited to fill the vacancies of Technicians. Since then they were away for training.

In spite of such shortage efforts were made to carry out the more important work of the laboratory with as much efficiency and promptness as was possible in the circumstance. The co-operation and diligence of the technical staff are very much appreciated.

Laboratory technicians under training continued to be sent here for periods of two to four weeks for training in Public Health Bacteriology.

PLAGUE PREVENTION

The following is a return of Rats caught for the year 1964

| Source | R Norvegicus | | R Rattus | | R Concolor | | M Musculus | | Crocidura | Total Rats | Total Preg. Rats | Total Dead Rats | Fleas X. Cheopis | Fleas Others | Total Fleas | Mite | T. Lewisi | | Average Fleas Live per rat | Remarks |
|------------------|--------------|-------|----------|-----|------------|-----|------------|-----|-----------|------------|------------------|-----------------|------------------|--------------|-------------|------|-----------|-----|----------------------------|--------------|
| | M. | F. | M. | F. | M. | F. | M. | F. | | | | | | | | | +ve | -ve | | |
| | | | | | | | | | | | | | | | | | | | | |
| City Health | 602 | 975 | 12 | 21 | 140 | 215 | 20 | 22 | 13 | 2,020 | 136 | 11 | 1,754 | .. | 1,754 | 98 | .. | .. | 0.87 | |
| Gcvt. Health | 6 | 25 | 46 | 73 | 28 | 31 | 39 | 72 | 19 | 339 | 8 | 97 | 118 | .. | 118 | 97 | .. | .. | 0.49 | |
| S.H.B. | 22 | 56 | 42 | 106 | 4 | 7 | .. | .. | .. | 237 | 4 | .. | 36 | .. | 36 | 12 | .. | .. | 0.15 | |
| Ships .. | 2 | 3 | 13 | 20 | .. | .. | 130 | 176 | .. | 344 | 11 | 344 | .. | .. | .. | .. | .. | .. | .. | Fumigate HCN |
| Total .. | 632 | 1,059 | 113 | 220 | 172 | 253 | 189 | 270 | 32 | 2,940 | 159 | 452 | 1,908 | .. | 1,908 | 207 | .. | .. | | |
| Grand Total .. | 1,691 | | 333 | | 425 | | 459 | | 32 | 2,940 | 159 | 452 | 1,908 | .. | 1,908 | 207 | .. | .. | | |
| Pregnant Rats .. | .. | 134 | .. | 9 | .. | 7 | .. | 9 | .. | .. | 159 | .. | .. | .. | .. | .. | .. | .. | .. | |

All the Rats were dissected and none were found infected with Plague.

Remarks: (1) Internal organs from one hundred and three (103) rats, forty-six live rats and three gassed rats were collected by Miss S. K. Gatha of the Department of Zoology, University of Singapore.

(2) Six live rats infected with *T. Lewisi* were sent to the Department of Parasitology, University of Singapore.(3) Five live rats infected with *T. Lewisi* were sent to the Department of Zoology, University of Singapore.

(4) Five live rats were supplied to Hygiene Section, R.A.F. Tengah, Singapore. Sixty-two (62) live rats and three (3) gassed rats are not included in the above totals.

SEROLOGY

ANNUAL RETURN FOR THE YEAR 1964

| | | |
|---|--------|--------|
| Total number of tests performed on Blood and C.S.F. | = | 95,578 |
| <i>Blood</i> | | |
| V.D.R.L. Test (Qualitative) | | 73,088 |
| Kahn Test (Qualitative) | | 13,543 |
| Kahn Test (Quantitative) | | 64 |
| Wassermann Reaction | | 4,194 |
| Gonococcus Complement Fixation Test | | 779 |
| Rheumatoid Factor (Rose-Waaler Test) | | 125 |
| | | <hr/> |
| Total ... | | 91,793 |
| <hr/> | | |
| <i>Cerebrospinal Fluid (C.S.F.)</i> | | |
| V.D.R.L. Test (Qualitative) | | 1,947 |
| Kahn Test (Qualitative) | | 1,537 |
| Wassermann Reaction | | 21 |
| Lange's Colloidal Gold Curve | | 280 |
| | | <hr/> |
| Total ... | | 3,785 |
| <hr/> | | |
| Total number of tests performed on Blood and C.S.F. | = | 95,578 |
| Blood | | 91,793 |
| Cerebrospinal Fluid | | 3,785 |
| <hr/> | | |
| <i>Blood</i> | | |
| Total number of V.D.R.L. Test | | 73,088 |
| number of Positive = | 1,119 | |
| number of Doubtful = | 2,960 | |
| number of Negative = | 69,009 | |
| Total number of Kahn Test (Qualitative) | | 13,543 |
| number of Positive = | 1,088 | |
| Number of Doubtful = | 2,338 | |
| Number of Negative = | 10,117 | |
| Total number of Kahn Test (Quantitative) | | 64 |
| Total number of Wassermann Reaction | | 4,194 |
| number of Positive = | 845 | |
| number of Doubtful = | 839 | |
| number of Negative = | 2,492 | |
| Anti-complementary = | 18 | |
| Total number of Gonococcus Complement Fixation Test | | 779 |
| Number of Positive = | 57 | |
| Number of Doubtful = | 99 | |
| Number of Negative = | 615 | |
| Anti-complementary = | 8 | |
| Total number of Rose-Waaler Test for Rheumatoid Factor | | 125 |
| | | <hr/> |
| Total ... | | 91,793 |
| <hr/> | | |

Cerebrospinal Fluid (C.S.F.)

| | | | | |
|--|-----|-------|-----------|-------|
| Total number of V.D.R.L. Test ... | ... | ... | ... | 1,947 |
| Number of Positive | = | 91 | | |
| Number of Doubtful | = | 8 | | |
| Number of Negative | = | 1,848 | | |
| Total Number of Kahn Test ... | ... | ... | ... | 1,537 |
| Number of Positive | = | 63 | | |
| Number of Doubtful | = | 8 | | |
| Number of Negative | = | 1,466 | | |
| Total number of Wassermann Reaction ... | ... | ... | ... | 21 |
| Number of Positive | = | 3 | | |
| Number of Doubtful | = | 3 | | |
| Number of Negative | = | 14 | | |
| Anti-complementary | = | 1 | | |
| Total number of lange's Colloidal Gold Curve ... | ... | ... | ... | 280 |
| | | | Total ... | 3,785 |
| Total number of Paying cases from Private Clinics, and Hospitals, etc. | | | | 40 |

31. SINGAPORE HOSPITAL RESERVE

ADMINISTRATION

THIS Unit comes under the jurisdiction of the Principal Matron, Ministry of Health. A training officer is in charge of the unit and is assisted by a clerical staff.

Singapore Health Reserve Strength

The strength of the Reserve Force stood at 714 in the beginning of 1964. The number now stands at 631. Below is the breakdown figures:

| | | |
|--------------------|-----|----|
| (i) Enrolments | ... | 57 |
| (ii) Disenrolments | ... | 84 |
| (iii) Written-off | ... | 56 |

Many of them resigned from the Corps as they have found employment and were thus unable to attend to its training. Others resigned as they wished to devote full-time to their domestic duties.

The fifty-six nursing auxiliaries who were written-off consisted mainly of the old members — some of them had been in the Corps for over a period of ten years — who had become inactive or disinterested in its activities.

Trained Reservists

Twenty-seven nursing auxiliaries have qualified as trained reservists for the year. The total number of trained reservists now stand at 458. The remaining 173 nursing auxiliaries are still under the different stages of training viz:

- (1) To attend a ten-period First Phase Training.
- (2) Attend eighty hours at the General Hospital.
- (3) To attend a ten-period Class I.
- (4) Attend twenty hours at the General Hospital.
- (5) To attend a ten-period Class II.

Classes and Examinations

Classes were conducted by the Singapore Hospital Reserve Instructors in English and Mandarin, viz:

- (a) First Phase Training.
- (b) Class I.
- (c) Class II.
- (d) Refresher Course for Instructors.

The above classes were held at the Singapore Hospital Reserve classroom. Examinations were held on completion of the classes except courses for (a) and (d) of above.

The refresher course was conducted by the training officer.

Sisters and staff nurses from the General Hospital conducted the Class I (English) and Class II (English); and Class I (Mandarin) and Class II (English) Examinations in August and November respectively.

Altogether, seven classes were conducted in the Singapore Hospital Reserve premises for the whole year.

Emergency Duty

The State is fortunate to be free from any outbreak of any disease for the year. It was unfortunate, however, to have had two civil disturbances. Since there was no directive — as the Health Ministry had the pressure well in hand — for the Singapore Hospital Reserve to render assistance, its nursing auxiliaries were not called up.

Annual Picnic

The annual picnic scheduled for September, was inevitably cancelled.

32. DEPARTMENT OF CHEMISTRY AND INSPECTORATE OF DANGEROUS AND HAZARDOUS MATERIALS

GENERAL

Development

As mentioned in last year's report, steps were taken to erect a new apparatus store and to convert the existing apparatus store into a laboratory. These two development projects were completed at the end of July this year. The conversion involved only removal of existing work benches, fume chamber from the laboratory of the former City Analyst's Department and installation of these benches, fume chamber, electrical, gas and water fittings in the old apparatus store. With this conversion, the congestion in the Food and Drugs Section was relieved by shifting the Drugs Section into the new laboratory.

At the end of August, the painting of the whole building of the Department of Chemistry was completed. In October, the Public Works Department carried out the rewiring of the building. The left portion of the Department of Chemistry's compound had no perimeter fence, thus leaving the whole of the compound accessible to trespassers. In September, a perimeter chain-link fence and an entrance gate were erected for security reason.

Paint Committee

Mention was made in last year's annual report of the *ad hoc* Committee for the purpose of determining what unmixed raw materials used in the manufacture of paints should qualify for exemption of duties. The recommendation that this *ad hoc* Committee be a Standing Committee to hold meetings when required to consider problematical borderline cases in order to assist the Customs and Excise Department was accepted by the Permanent Secretary (Treasury). This Standing Committee comprised the Chief Chemist as Chairman, one representative from paint manufacturers, one from painter importers, one from the Economic Development Board and one from the Customs and Excise Department. One meeting in 1963 and four meetings in 1964 were held.

Training

Under the Colombo Plan Technical Co-operation Scheme offers by the State of Singapore, the Department of Chemistry gave training in the analysis of water and sewage for a period of three months to two trainees from Thailand, Miss Sunee Mayura and Miss Pradit Valyasevi and to two trainees from Laos, Messrs. Chansom Manivong and Khamsing.

In September, a newly appointed Laboratory Technician of the Primary Production Department, Mr. Choo Boon Seng was attached to the Department

of Chemistry for a period of three months to gain practical experience in the analysis of food and drugs. After completion of his training, he reported for duty at the Primary Production Department.

Through the co-operation and courtesy of the Police Force, the Deputy Chief Chemist, Mr. Chia Hong Hoe, and three Chemists, Messrs. Theng Chye Yam, Lim Han Yong and Chua Teck Hock attended a Weapon Familiarisation Course at the Advance Training School in October. The weapons dealt with were sterling gun, 0.38 revolver, shot gun, riot gun, 0.303 rifle and smoke grenades.

Staffing

The staffing position at the end of the year is shown in Table 157. In April, the Deputy Chief Chemist and Deputy Chief Inspector of Dangerous Materials, Mr. Chia Hong Hoe, returned after six months training in France. His training in Paris included periods with the Laboratoire de Police Scientifique de l'Identite' Judiciaire, the Laboratoire Municipal de la Prefecture de Police, the Laboratoire de Toxicologie and the Laboratoire National de Controle des Medicaments. During his absence, the Senior Chemist, Mr. Lim Chin Hua acted as Deputy Chief Chemist and Mr. Phang Sing Eng acted as Senior Chemist.

With the appointment in June of two Chemists, Mr. Ng Seng Choew, B.Sc. (Hons.) and Mr. Chia Hong Kuan, B.Sc. (Hons.), all the eleven established posts of chemists were filled.

In January, the one vacant post of Assistant Inspector of Dangerous Materials arising from resignation last year was filled by Mr. Lee Yang Hern, B.Sc. In April, Mr. Ch'ng Beng Han, Assistant Inspector of Dangerous Materials, who has acted as Document Examiner for slightly over three years, was appointed as Document Examiner. The vacancy arising was filled in August by the appointment of Mr. P. C. Narendran, B.Sc. However, in December, Mr. Aw Soon Cheong, Assistant Inspector of Dangerous Materials resigned.

At the beginning of the year, the two Special Grade Laboratory Assistants, Messrs. Pwee Sye Cheow and Chow Weng Sing, were promoted to Senior Laboratory Technicians. In March, Mr. Ong Beng Guan, Senior Laboratory Assistant (City Analyst's Department) retired after approximately 36 years of service. During the year, with the recruitment of five Laboratory Technicians with Higher School Certificate qualification, all the post of Laboratory Technicians were filled.

Excepting for one vacant post of Assistant Inspector of Dangerous Materials, which has not been filled, the total strength of the technical staff is now 36 which include 17 degree-holders.

Visits

In February, this Department was honoured by the visit of the Minister for Health, Mr. Yong Nyuk Lin, who was conducted round the laboratories and given an insight of the types of work carried out.

During the year, groups of students from Crescent Girls' School, Nanyang University, Beatty Secondary School, Anglo-Chinese School and Montfort School visited the Department of Chemistry. On seven occasions, police officers from the Advanced Training School visited the Department and were given an insight of the work carried out in the Forensic Laboratory. Among these visitors were 12 Senior Laotian Officers. On four occasions, Colombo trainees attached to the Singapore Customs and Excise Department visited the Department and were given an insight of the work carried out in the Customs Laboratory. They comprised Customs Officers from Laos, South Korea, Aden, Ceylon and Thailand. The Department was also visited by the City Health Officer, Penang, the Principal Medical Officer of Sabah, the Deputy Commissioner and Director of Provincial Hygiene, Taiwan and Professor Ralph Turner of Michigan State University, a world-renowned forensic scientist.

Lectures

Lectures on forensic science as an aid to police investigations were given to detectives of the Advance Training School on three occasions by the Senior Chemist, Mr. Lim Chin Hua, and the chemist in charge of Forensic Laboratory, Mr. Phang Sing Eng.

Lectures on a number of topics were also given by the Chief Chemist, Deputy Chief Chemist and chemists to students of the upper forms of secondary schools. These lectures were arranged by the Ministry of Education with co-operation of the Malaysia Branch of the Royal Institute of Chemistry.

Work of the Department

There were 35 attendances in Courts by chemists or document examiner to give expert evidence as compared with 54 attendances in 1963. Approximately 14 per cent of these court appearances were in connection with opium cases and 23 per cent in connection with document cases.

In connection with document examination 419 photographs were made to clarify certain reports.

This year the number of samples analysed and/or examined was 44,484 compared with 46,248 for 1963. The number of samples from the various sources of origin for the two years were as follows:

| | 1963 | 1964 |
|--|---------------|---------------|
| Customs and Excise Department ... | 7,531 | 7,637 |
| Medical Department ... | 4,378 | 3,734 |
| Police Force ... | 3,783 | 2,764 |
| Water Department, Public Utilities Board ... | 19,340 | 19,358 |
| Public Works Department ... | 3,470 | 3,168 |
| Parks and Recreation Division ... | 4,136 | 3,953 |
| Other Government Departments ... | 1,111 | 1,208 |
| Commercial firms, Statutory Boards, etc. ... | 2,499 | 2,662 |
| Total ... | <u>46,248</u> | <u>44,484</u> |

The main contributing factors for the decrease in samples were the samples from the Police Force and the Medical Department.

The total samples analysed and/or examined by the combined City Analyst's Department and the Department of Chemistry this year as compared with those for the past five years is shown on the chart on page 320. A summary of the work of the various sections is shown in Table 158.

Publications of research work in scientific journals were "The Detection of Orange RN and Orange II in Meat" by Mr. M. C. Dutt (The Analyst, February 1964, Vol. 89, No. 1055, pp. 142-144), and "Spectrophotometric Determination of Isoniazid in Excess p-Aminosalicylate" by Messrs. M. C. Dutt and Chua Teck Hock (J. Pharm. Pharmacol., 1964, Vol. 16, pp. 696-699).

Finance

Under Special Expenditure, three refrigerators with a total storage capacity of approximately 30 cubic feet were bought as a replacement for one condemned 18 cubic feet refrigerator used for storing toxicological and clinical specimens. This much needed extra storage space has since proved of value. A centrifuge was also bought as a replacement for a condemned one left behind by the Japanese.

This year the amount of fees collected was approximately \$192,981 as compared with \$194,940 collected for last year. Details are shown below:

| | 1963 | 1964 |
|--|-------------------|-------------------|
| Work done for the Public Utilities Board ... | 72,381 50 | 73,048 00 |
| Flash Point Tests ... | 11,650 00 | 15,220 00 |
| Methylation ... | 551 00 | 526 00 |
| Ship Inspection ... | 94,602 50 | 89,370 00 |
| Miscellaneous ... | 5,750 00 | 14,817 00 |
| Total ... | <u>194,935 00</u> | <u>192,981 00</u> |

The co-operation of the staff and the assistance given by the Deputy Chief Chemist, Document Examiner and those Chemists to the Chief Chemist in making his annual report are gratefully acknowledged.

FORENSIC SECTION

There was a decrease this year, in both the number of exhibits examined and cases. The number of exhibits fell from 4,163 in 1963 to 3,065 in 1964, and the number of cases decreased from 703 in 1963 to 660 in 1964.

There was a mark decrease in the number of documents and opium exhibits. The number of documents examined was 1,108 this year as compared with 1,945 in 1963, and the number of opium exhibits decreased from 631 in 1963 to 365 this year. Apart from documents and opium exhibits, there was also a decrease in other types of exhibits such as vehicles, drugs, adulterated and illicit liquors and miscellaneous exhibits. There were small

increases in exhibits under the headings of arson, blood and semen, and firearms.

The monthly Police Criminal Investigation Department conference was attended by the Senior Chemist until the month of May 1964. From June until the end of the year, the Deputy Chief Chemist attended the conference. The purpose of attending such conferences was to establish a closer liaison between the two departments.

This year, officers from this department, at the request of the Police, visited scenes of crimes on twenty occasions both during and outside office hours. The increase in the visits to scenes of crimes was due to the numerous explosions by saboteurs.

Arson

Exhibits from arson cases, including attempted or suspected arson, showed a slight increase in number. A total of 52 exhibits from 29 cases were examined. The exhibits examined included pieces of partially burnt rags, charred attap, tins containing liquid, partially burnt wood, gunny sacks, rolls of cotton wool soaked in petrol, sponged rubber soaked in kerosene and match sticks.

Of the total number of cases investigated, over one-third were proved to be arson by the isolation of inflammable volatile mineral oil such as kerosene or petrol from the exhibits submitted.

At the request of the Police, nine visits were made to the scenes of fires.

Two cases of fire, occurring within 24 hours inside the Port of Singapore Authority premises, were investigated.

In the first fire, two railway wagons loaded with rubber were affected. In one wagon, there were two separate and independent seats of fire and in the other wagon, two burnt match sticks were discovered on the bale of partially burnt rubber.

The second fire occurred early the next morning. This time, one bale of partially burnt rubber from a railway wagon was affected. Three partially burnt match sticks were found adhering to this bale, while four partially burnt match sticks were found beneath the bale. Thus, in the above cases, arson was proved, and these discoveries appeared to put a stop to further incidence in the Port of Singapore Authority premises.

Another case of arson leading to an arrest of an accused person occurred in Woodlands. The roof of an attap hut was found to be partially burnt, and a broken piece of cardboard was found near the burnt area. This piece of cardboard was found to fit another piece of cardboard found in the room of the suspect, thus connecting him with the crime.

One case of fire occurred in Woodlands Road involving an air filter. This air filter consisting of a metal cylinder packed with activated carbon and coconut husks was always kept bolted. An examination of this cylinder revealed three separate charred areas on the outside surface of the air filter. The three independent seats of fire strongly indicated arson.

Blood and Semen Stains

The number of cases and exhibits under this heading showed an increase (717 exhibits as compared with 618 exhibits for 1963).

Of the total of 717 exhibits, 624 were for the examination of blood, and of these 112 were found to give negative results. Two hundred and ninety-six exhibits gave a positive precipitin reaction for human blood, and of these, more than two-thirds were grouped as well.

Of the total number of exhibits examined for blood, 15 were from the Naval Base Police, 24 from the Sarawak Police and 22 from the Brunei Police.

Among the unusual cases was one involving the examination of bloodstains in a house at Coronation Road West. The occupants of the house saw some dark red spots on the verandah of the house and they were afraid that a burglar might have been lurking around the house and cut himself. The dark red stains were taken back to the laboratory for examination and found to be blood. But no positive precipitin reaction for human blood could be obtained. When the bloodstain was tried out with anti-sera of the various common animals, a positive precipitin reaction was obtained with anti-dog serum, thus confirming that the bloodstains belonged to a dog and not a human being.

Of the 93 exhibits investigated for seminal stains, 37 per cent of them were successfully confirmed to be stained with semen by the microscopic identification of the spermatozoa. This percentage of positive results was much higher than that of the previous year (19 per cent).

Chandu and Opium

The number of these exhibits decreased considerably, being about half the number for last year (365 exhibits in 1964 as compared with 618 exhibits in 1963). The decrease in exhibits was from Police source.

As in previous years, most of the exhibits were submitted either by the Singapore Police or the Customs and Excise Department. They ranged from small two-hoon packets to large consignments of smuggled raw opium. The large quantities of raw opium were usually submitted by the Customs, and in such exhibits, the morphine and moisture contents were also determined for assessing their value as a pharmaceutical commodity. Forty-five such determination were carried out.

Less than one per cent of the total number of exhibits were found to be not chandu or opium as originally suspected.

Drugs

The number of exhibits under this heading showed a decrease when compared with that for the previous year.

The exhibits usually consisted of indian hemp, morphine, or patented medicines examined to see whether they contained any listed poisons or dangerous drugs.

There were 11 exhibits of vegetable matter submitted by the Police and the Customs and Excise Department. These exhibits were found to be Indian hemp.

A total of 23 exhibits were examined for the presence of morphine. These exhibits were in the form of small packets of white powder, hypodermic syringe and needles, small pieces of sponge and earthenware spoons. In 22 exhibits, morphine was detected. But in one exhibit, the white powder was found to be heroin. The drug, heroin, is not commonly encountered in Singapore.

One sample of dog and cat repellent was analysed and found to contain pyridine and isopropyl alcohol.

One exhibit used as an agricultural antiseptic was found to contain dipterex.

There was one sample of powder submitted by the Health Division for the presence of organo-phosphorus compound. This powder had been used as a sticking agent for the manufacture of mosquito spirals and joss sticks. On analysis, no organo-phosphorus compound was detected in this powder.

Other poisons encountered were acetanilide, adrenaline, amphetamine, bromvaletone, chlorpheniramine, chlortetracycline, codeine phosphate, cyclizine, ephedrine hydrochloride, meclozine hydrochloride, methyl-amphetamine, penicillin, potassium cyanide, sulphanilamide, sulphapyridine and sulphathiazole.

Firearms

The number of exhibits and cases under this heading showed an increase over that for last year.

A number of these exhibits were weapons for evidence of recent firing. One automatic pistol was examined for erasure of serial numbers.

However, the majority of firearm cases involved the more specialised microscopic matching of the characteristic fine lines markings on bullets and cartridge cases to determine the particular firearms used to fire them. Sometimes the range of firing was also determined from a comparison of the powder pattern around the bullet holes of the clothings.

Five samples of skins taken from around the bullet holes of the dead persons were submitted by the Pathologist for the detection of explosives powder.

An unusual firearm case involved a 0.22 automatic pistol. This automatic pistol was recovered by the Police in the course of their investigation. It was believed that this pistol was involved in four shooting incidents in Singapore. The Police also submitted four cartridge cases recovered from the scenes of the shooting incidents to ascertain whether or not they were connected with the automatic pistol. Unfortunately the automatic pistol has a broken firing pin and failed to fire test bullets. Hence, it was not possible to connect the the automatic pistol with the cartridge cases found at the scenes of the crimes.

However from a comparison of the markings on the four recovered cartridge cases, it was established that all of them had been fired from one and the same weapon.

Gold

Only one case involving gold was submitted by the Customs and Excise Department. The exhibits consisted of three packages of grains of gold and two packages of grains of silver. Representative samples were taken from the packages and the gold was found to be of 99.9 per cent purity and the silver 99.8 per cent purity.

Liquors

There were a slight decrease in the number of illicit liquors this year when compared with that of last year. The majority of the illicit liquor exhibits was submitted by the Customs and Excise Department. As usual, they consisted of final distilled rice spirit and the fermented rice mashes. As all these exhibits were found to have alcoholic contents of more than two per cent proof spirit, they were all certified as "intoxicating liquor" as defined in the Customs Ordinance.

One case involving eight bottles of beer of a well-known brand was from the Naval Police Force. On analysis, the contents of five of the bottles were found to be adulterated.

Another case involved a shop which was not licensed to sell liquor. The Police raided this shop and seized three bottles for analysis of alcoholic contents. Although alcohol was detected in the contents of the three bottles, the amount of liquid in two bottles were insufficient for quantitative estimation of alcohol. However the spirit strength of the content of one bottle was found to be over two per cent proof spirit and was thus certified as "intoxicating liquor" as defined in the Customs Ordinance.

Tobacco

The number of tobacco exhibits was about the same as that for last year. The exhibits consisted of packets of smuggled cigarettes and tobacco and have to be examined for the benefit of the courts.

Vehicles

The number of vehicle cases showed a slight decrease. Out of a total of 47 exhibits submitted, 13 were from the Registrar of Vehicles, and the remainder were from the Police. More than half of the total exhibits were submitted for the restoration of erased engine and/or chassis numbers. Of these, in about 85 per cent of the exhibits, the erased numbers were either fully or partially developed.

There were four cases in which acids were thrown on the vehicles. The acids encountered were nitric acid, hydrochloric acid and sulphuric acid. In three cases organic type of paint removers were thrown on cars. This type of paint remover usually consisted of a mixture of organic solvents and a small amount of wax which prevented the escape of volatile solvents, thus making it more effective.

There were also two cases in which the vehicles were submitted for the examination of the various paint layers in order to determine the original colours of the vehicles.

In "hit and run" cases involving a vehicle and a person, the vehicle was examined for presence of bloodstains, hairs and torn pieces of clothings. If two vehicles were involved, besides the above, the examination of paints and broken pieces of headlamp glass can also yield useful evidence in solving the case.

In one accident case involving "hit-and-run", fragments of broken glass found at the scene of the accident and a suspect car were submitted. On examination, one of the pieces of glass found at the scene was found to fit the piece of glass still adhering to the parking lamp of the car, thus connecting the car with the scene of the accident. See Plate I.

Miscellaneous

Although the number of exhibits under this heading showed a slight decrease, there was an actual increase in the number of cases (98 cases this year as compared with 67 cases in 1963).

There were the non-routine type of exhibits covering a wide variety of crimes and required special examination.

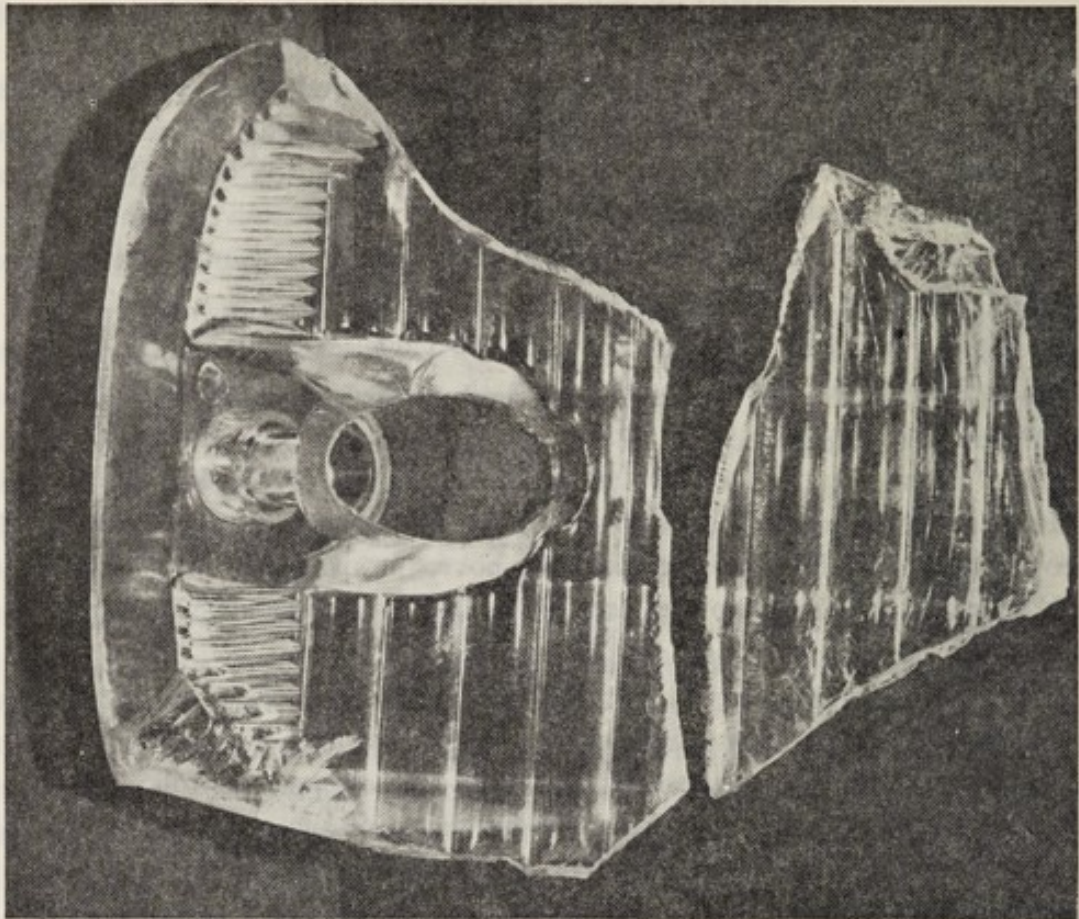
Of the total of 98 cases, more than ten per cent involved acid throwing. The most common acid used was sulphuric acid. Other acids used were nitric acid, hydrochloric acid and formic acid. In acid throwing cases, not only the contents of the containers or electric bulbs filled with acid were analysed, but also the clothings of the victims were examined for the presence of acids.

There was also one case in which two persons had an argument. One of them took a tin containing some liquid and threw it on the face of the other person. On analysis, the liquid was found to contain sodium hydroxide. The throwing of acids or sodium hydroxide is an offence under the Corrosive Substances Ordinance, 1955.

Another case involved the throwing of a brown liquid on a person. This liquid was found to contain cresol which came under the class of phenols listed in the Schedule to the Corrosive Substances Ordinance, 1955.

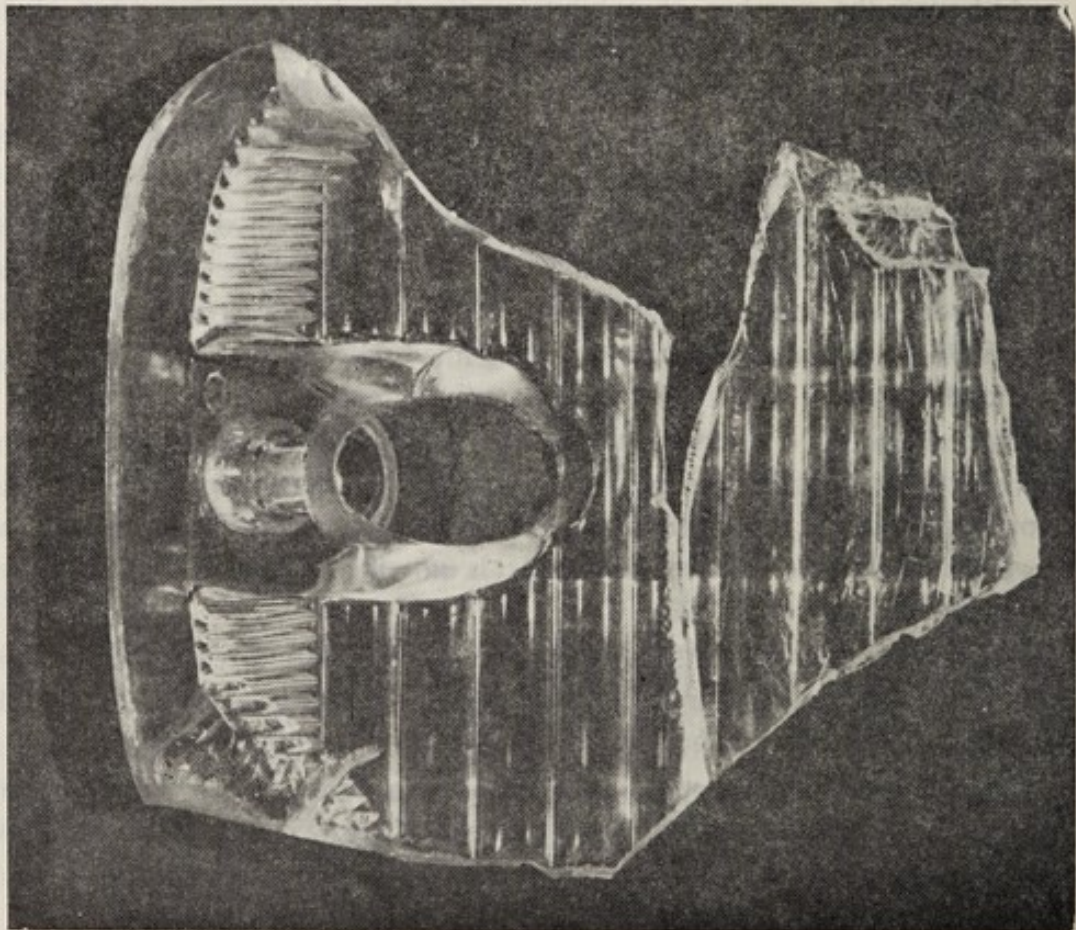
One case involving pepper throwing in an unsuccessful "hit-and-run" wage robbery was investigated. The clothings of the victim was found to be stained with pepper.

PLATE I



from car

from scene



There was one case of counterfeiting "50 cents" coins. Information was received by the Police that a certain shopkeeper was making use of "50 cents" counterfeit coins when returning the change to customers. These counterfeit coins were submitted together with 10 genuine "50 cents" coins obtained from the Treasury. From a comparison of the physical properties, without destroying the coins, the counterfeit coins were found to be different from the genuine coins in respect of specific gravity, thickness and the weight.

Cases involving fraud were also encountered. There were two cases in which the contents of a popular brand of insecticide were analysed and found to be different from the contents of the genuine samples.

There was also one case involving a well-known brand of shampoo, the contents of which were different from that of the genuine samples.

In connection with five cases of imitation shirts of a well-known brand, the labels on the suspect shirts were found to be different from the labels on the genuine shirts. In some of the above cases, the material of the suspect shirts was found to be different from that of the genuine shirts.

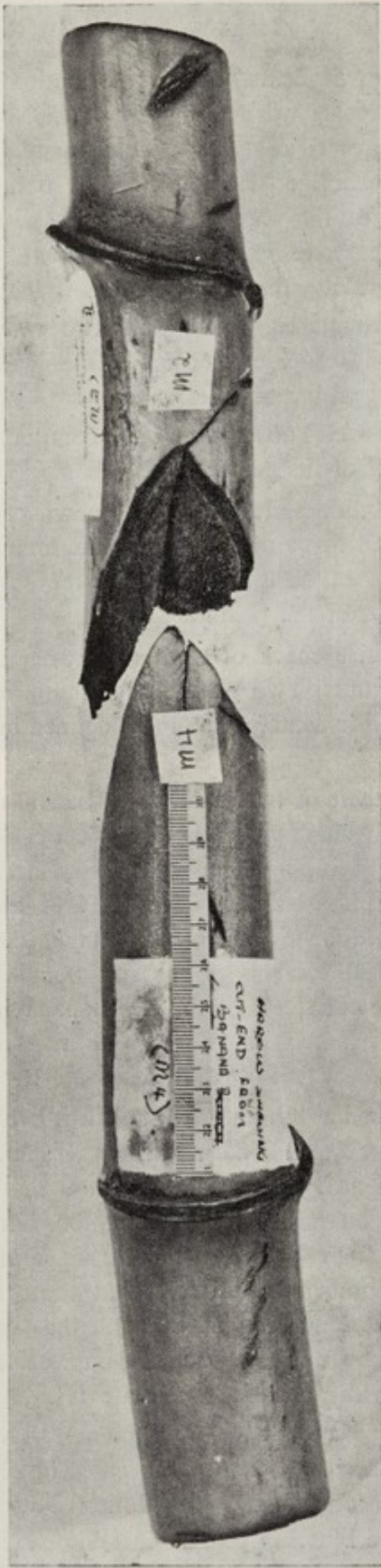
In one case, the police made a surprise check of a premises after midnight and found customers consuming liquors. Two glasses containing liquid were seized. The liquid was found to be "intoxicating liquor" as defined in the Customs Ordinance.

There was one case concerning the theft of two bunches of bananas. At about midnight, the complainant found an Indian with two freshly cut bunches of bananas on the carrier of his bicycle. The complainant also found that the stems of two of the banana trees in his compound had been cut. The Indian was charged in court for the theft of the bunches of bananas, but he denied the charge. On examination, the ends of the stems of the two bunches of bananas were found to fit the ends of the cut stems of the two banana trees, thus proving that the two bunches of bananas came from the two trees. Photographs were taken in this case for production in court. See Plate II.

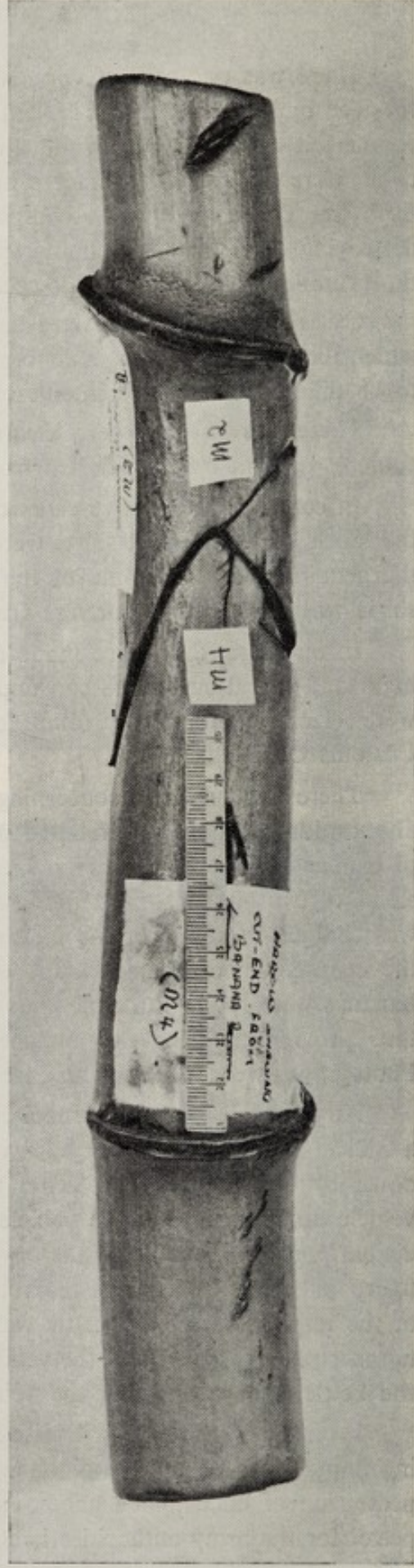
An unusual case from Brunei concerned a "hit-and-run" accident between a vehicle and a cyclist. The cyclist was carrying a kettle when he was knocked down by the vehicle. The kettle was dented and both the kettle and the vehicle number plate of the vehicle were submitted for examination. On the dented portion of the kettle there was an impression of a mirror image of the figure "2" and an outline of the vehicle number plate. A reversed photograph of the impression on the kettle was taken, and comparison with the vehicle number plate revealed that the vehicle number plate caused the impression on the kettle, thus connecting the vehicle with accident. See Plate III.

From the Customs and Excise Department, there were three cases involving importation of sodium glutamate without licence and six cases involving possession of uncustomed goods and evasion of petroleum duties. Duty free petrol for the army authorities is coloured blue.

PLATE II



from banana tree



from bunch of banana

PLATE III



Dent and impression on kettle



Vehicle number plate

In the exhibits submitted this blue dye was detected.

There were several cases involving the examination of exhibits for explosives. Two of these cases were from the Sarawak Police.

The first case consisted of a piece of brown material which was found in a booby trap. This brown material was found to be T.N.T.

In the second case, greyish flakes were found wedged inside a section of a bamboo. On analysis these greyish flakes were found to be of the nitro-cellulose type of explosives.

In Singapore, a Customs' party raided a house for narcotics. Besides finding opium, they also found tins of brownish powder, drums of white powder and sticks of gelatinous material. Analysis revealed that the brownish powder was T.N.T., the white powder potassium chlorate and the sticks of gelatinous material nitroglycerine explosives.

A Police party raided a store and recovered three tins of brownish powder, which on analysis was found to be T.N.T. This store was being used by fishermen to keep their fishing equipment. It was believed that the T.N.T. was used for fishing by the fishermen.

In another case, the Police recovered large quantities of explosives which included rectangular slabs of T.N.T., each block weighing either half a pound or one pound. These slabs have ready-made holes in the centre for the insertion of detonators and fuse, and presumably were for use by saboteurs.

Because of the number of explosions by saboteurs, visits to scenes were made and analysis carried out on materials collected at the scenes of explosions. No less than ten visits, usually outside office hours, were made to the scenes of explosions.

In one case, at about 10 p.m., at the request of the Police, the Chemist in charge of Forensic Laboratory proceeded to the scene of explosion at Merdeka Bridge. The crater caused by the explosion was approximately 12 inches in diameter and 6 inches deep, but the atmosphere around this crater had an almond like odour consistent with nitroglycerine type of explosives having been used. Small pieces of metal and earth around the crater were collected for subsequent analysis in the laboratory. Nitroglycerine type of explosives such as gelignite and blasting gelatine was detected on these exhibits.

In another explosion at night the Deputy Chief Chemist proceeded to the scene. This time, the piece of wire, metal and broken pieces of concrete near the seat of explosion were found to give a colour test consistent with T.N.T.

In those cases where no visits were made to the scenes of explosions, the Police collected the exhibits at the scenes of explosions and submitted them for analysis. A detailed analysis was always carried out on each of the exhibits for explosives such as T.N.T., nitroglycerine, picric acid, chlorate and perchlorate. The analysis for the products of explosion such as nitrite, nitrate, chloride and sulphate was also carried out.

In one case, a bomb exploded on the staircase of a block of flats. Among the exhibits submitted by the Police were small pieces of metal on which were detected nitrite, nitrate and residual T.N.T.

An unusual exhibit received was a home made grenade found in the jacket of a person. This grenade consisted of a length of metal pipe packed with gun powder. Strands of paper, tied together in a bunch, protuded from the centre of this metal pipe to serve as a fuse.

Documents

The Document Examiner was on duty this year attending to a total of 102 cases involving 1,108 documents. Of these, about 44 per cent involved examination of handwriting in English, 24 per cent in Chinese and six per cent in Rumi Malay. The remainder were cases involving fraudulent erasures and alterations, forgeries of documents such as admission tickets, and identification of typewriters.

A case in which documents submitted by the Police proved of value was in connection with an anonymous letter claiming that a bomb had been planted at a certain locality. The Police were alerted but it was found to have been a hoax. Investigations led to a suspect in whose room was found a writing pad which showed indented writing impressions. Oblique light photography produced a readable copy of the indentations which, when compared, was proved to match the anonymous in details. Further comparison between the specimen handwriting of the suspect and the anonymous handwriting on the letter showed similar writing characteristics pointing to common authorship. The suspect pleaded guilty. See Plate IV.

In January, the Document Examiner was requested by the Sarawak Police to make an urgent trip to Kuching in order to give expert evidence in court in a trial in which, for technical reasons, his written report was not admissible as evidence in court. The handwriting evidence identifying the accused as the probable writer of a series of extortion letters involved in the case formed a very important part of the evidence by the prosecution leading to the conviction of the accused.

In a case of cheating by a person purported to be a Royal Air Force personnel, who disappeared after buying a tape recorder on a hire-purchase basis, investigations pointed to a possible suspect. His specimen handwriting was submitted to the Document Examiner for comparison with the writing on the hire-purchase agreement. The evidence gathered by the Document Examiner showed that the suspect was not the person who wrote the questioned writing on the agreement.

Besides the Singapore Police, the Document Examiner also rendered his services to the Royal Malaysian Navy, Royal Air Force, Naval Base Police, Sarawak Police and various Departments of the Singapore Government, namely, Income Tax Department, Customs, Corruption Practices Investigations Bureau and the General Hospital.

PLATE IV

A. U. A. Date:
Teacher's Training College,
Patterson Road.
27. 1. 64.

To Kandang Kerbau Police Station,
Singapore

Dear Sir,
It has come to my notice that
there is a bomb planted in the pre-
mises of Dah Sin Optical Home, in North
Bridge Road, next to Coleon. Please take
action before the bomb explodes.

Yours truly
P. S. S. S. S.

cc 'c'

The 'hoax' letter

The photograph shows the reverse side of the letter, with the text from the front side indented into the paper. The text is: "A. U. A. Date: Teacher's Training College, Patterson Road. 27. 1. 64. To Kandang Kerbau Police Station, Singapore Dear Sir, It has come to my notice that there is a bomb planted in the premises of Dah Sin Optical Home, in North Bridge Road, next to Coleon. Please take action before the bomb explodes. Yours truly P. S. S. S. S." The impressions are most visible in the center and right-hand side of the page.

The indented impressions by oblique light photography

FORENSIC SECTION
DISTRIBUTION OF WORK 1964

| Class of Work | SOURCE | | | | | | Total Samples | Total Cases |
|---------------------|---------|---------|--------|-------------------|--------------|-------|---------------|-------------|
| | Customs | Medical | Police | Other Departments | Non-Official | | | |
| Arson | .. | .. | 50 | 2 | .. | 52 | 29 | |
| Blood and Semen .. | .. | 2 | 641 | 15 | 59 | 717 | 189 | |
| Chandu and Opium .. | 86 | .. | 278 | .. | 1 | 365 | 105 | |
| Documents | 2 | 3 | 947 | 60 | 96 | 1,108 | 102 | |
| Drugs | 13 | 5 | 157 | .. | 1 | 176 | 46 | |
| Firearms Cases .. | .. | 5 | 159 | 4 | .. | 168 | 24 | |
| Gold | 3 | .. | .. | .. | .. | 3 | 1 | |
| Liquors: | | | | | | | | |
| Adulterated .. | .. | .. | .. | 8 | .. | 8 | 1 | |
| Illicit .. | 106 | .. | 3 | .. | .. | 109 | 22 | |
| Tobacco | 11 | .. | .. | .. | .. | 11 | 5 | |
| Vehicles | .. | .. | 35 | 12 | .. | 47 | 38 | |
| Miscellaneous .. | 54 | .. | 235 | .. | 12 | 301 | 98 | |
| Total .. | 275 | 15 | 2,505 | 101 | 169 | 3,065 | 660 | |

HEALTH SECTION

Food and Drugs Ordinance

The Environmental Health Section, Public Health Division of the Ministry of Health, submitted a total of 1,422 samples mainly in connection with the enforcement of the Food and Drugs Ordinance. The number of samples was somewhat lower than that of 1962 namely 1,624. Of the total number of food and drugs samples, 87.3 per cent consisted of foodstuffs, 11.1 per cent medicine and drugs and 1.6 per cent cosmetics, etc.

Foodstuffs

The total number of formal food samples was 809 as compared with 1,036 for 1963 and the total number of informal food samples was 432 as compared with 353 for 1963. Though the figure for the formal samples is

lower than the 1963 figure, it was about 64 per cent higher than the 1962 figure of 496. Increase in buttermilk and apples which were sampled informally, contributed substantially to the increase of informal samples this year.

Of the 809 formal food samples examined, approximately 29 per cent were found to be either adulterated, below standard or otherwise defective and appropriate certificates were issued (vide Table 152, for details including those for informal samples).

A wide variety of food, such as "tow kuah", "char-siew", iced drinks, cakes and syrups were submitted for the presence of non-permitted dyes. In spite of prosecutions, the use of Metanil Yellow, a non-permitted dye, continued to be in use in "tow kuah" in preference to other permitted yellow dyes. It was, however, gratifying to note that the use of Orange II, a non-permitted dye, in "char-siew", has to a great extent been replaced by permitted dyes. Out of 50 samples, only 12 were found to contain Orange II.

Towards the end of the year, in the course of analysis of routine samples, one sample of apples was found to contain 1.5 parts per million arsenic, the permitted limit being 1.0 parts per million. In view of this, samples from all further consignments from the country of origin were first subjected to analysis and if they contained excessive arsenic advice was given to wash the apples. Samples from the washed apples were resubmitted for analysis to ensure that the arsenic content was below the permitted limit before release for sale to the public. Two samples from two consignments were also found to contain excessive arsenic — 1.3 and 1.4 parts per million respectively. The wrappers of one of these samples contained 6.1 parts per million arsenic.

During the second half of the year eight samples of margarine were found to contain excessive water, about 24 per cent, which exceeded the permitted limit of 16 per cent. It would appear that water has been added to imported genuine margarine for purposes of adulteration.

Arising from a complaint, one sample of a proprietary brand of essence of chicken was submitted for analysis and was found to contain insignificant amount of protein when compared with a genuine sample.

One sample of brandy was submitted for compliance with the Food and Drugs Regulations. This sample was found to contain dyes which were not present in genuine brandy.

Saccharin continued to be used fairly extensively in all types of foods, especially in still drinks. Its use in food without licence is prohibited under the Food and Drugs Regulations.

A few samples of brown sugar were found to contain Orange II, a non-permitted dye.

Out of about 180 samples of coffee and coffee mixtures analysed, 26 or about 15 per cent, were found to be adulterated.

Two samples of tea were found to contain dyes. The use of dyes in tea is prohibited.

One brand of syrup on analysis was found to contain no black-currant, phosphoric acid and caffeine as claimed on the label. A number of this fake

syrup has been disposed to unsuspecting customers before the person responsible was apprehended.

Medicine and Drugs

A total of 158 samples were submitted for examination of which 131 samples were formal. As in previous year, these consisted of British Pharmacopoeia or British Pharmaceutical Codex preparations and patented medicines. These were examined either for conformity to British Pharmacopoeia or British Pharmaceutical Codex specifications or for checking the ingredients declared on the labels.

A number of irregularities were detected as listed in Table 153. Among these, seven samples of medicated oil were found to be either deficient in methyl salicylate or to have excessive methyl salicylate.

Of interest was one case involving a fake brand of eye lotion. Analysis and comparison with genuine sample revealed that in the spurious sample one ingredient was absent and the amounts of two ingredients were far out of the amounts present in the genuine sample.

There was one sample of tablets submitted by the Inspector of Poisons, the formulation of which was not declared. On analysis this was found to contain amphetamine which is a listed poison under the Poisons Ordinance.

Other Samples

Of the 23 official samples submitted, 11 samples were formal. These official samples consisted of hair dyes, cosmetics and colouring matter. Two samples of hair dyes were found to contain 1.1 per cent and 2.1 per cent of lead respectively, an offence under the Food and Drugs Ordinance. Two samples of hair spray were found to contain approximately 30 per cent and 40 per cent of methyl alcohol respectively. However no restriction on their sale could be enforced under the Food and Drugs Ordinance.

OTHER MEDICINES AND DRUGS

The Government Pharmaceutical Laboratory and Store submitted 831 samples for assay and/or compliance with British Pharmacopoeia specifications. Those analysed for compliance were mainly the raw materials supplied by tenderers. Those for assay were routine samples for checking as a control on their own preparations, e.g. tablets, injections, syrups, tinctures, etc. The majority of these samples were confirmed to be within specifications.

Dispensaries at the General Hospital and other hospitals also submitted for analysis samples of drugs which had been kept for sometime as a precaution against deterioration.

For the Customs and Excise Department 45 samples of raw opium were assayed for their moisture and morphine contents with a view to their ultimate sale.

Metallic Contamination

From the routine samples of liquor submitted by the Customs and Excise Department for spirit strength and other determinations, 104 samples were checked for lead and copper contents. Four samples submitted by commercial firms were also similarly checked. The samples which were checked included new brands of liquor and those brands previously found to contain high lead or copper.

One sample of brandy was found to contain 1.2 parts per million of lead which was in excess of the permitted limit of 0.5 parts per million. One sample of liquor was found to contain 8 parts per million of copper which was in excess of the permitted limit of 2 parts per million. Prohibition of importation of these samples were recommended.

The limits for copper and lead in liquors are laid down in the Food and Drugs Regulations and in the Customs (Prohibition of Imports) Notification 1963.

HEALTH SECTION

DISTRIBUTION OF WORK 1964

| Class of Work | SOURCE | | | | | Total Samples | Total Cases |
|------------------------------|---------|---------|-------------------|--------------|-------|---------------|-------------|
| | Customs | Medical | Other Departments | Non-Official | | | |
| Food and Drugs Ordinance: | | | | | | | |
| (a) Foodstuffs: | | | | | | | |
| Formal | .. | 809 | .. | .. | 809 | 809 | |
| Informal | .. | 423 | .. | 46 | 479 | .. | |
| (b) Medicine and Drugs: | | | | | | | |
| Formal | .. | 131 | .. | .. | 131 | 131 | |
| Informal | .. | 27 | .. | .. | 27 | .. | |
| (c) Other Samples | .. | 23 | .. | 2 | 25 | 12 | |
| Foods: | | | | | | | |
| Other | .. | .. | 1 | .. | 1 | .. | |
| Medicine and Drugs | | | | | | | |
| Other | 45 | 831 | 1 | 14 | 891 | .. | |
| Metallic Contamination | 104 | .. | .. | 4 | 108 | .. | |
| Total | 149 | 2,253 | 2 | 66 | 2,471 | 952 | |

Table 152

FORMAL AND INFORMAL FOOD SAMPLES ADULTERATED
OR OTHERWISE IRREGULAR

| No | Sample | Nature of Irregularity |
|----|-------------------------------------|---|
| 18 | Aerated Water and still drink | Contained saccharin. |
| 5 | Aerated Water and still drink | Contained excessive permitted preservative. |
| 1 | Aerated Water and still drink | Contained saccharin and excessive permitted preservative. |
| 2 | Aerated Water and still drink | Contained non-permitted dye. |
| 4 | Cakes | Contained non-permitted dye. |
| 12 | "Char-Siew" (Roasted Sweet Meat) | Contained non-permitted dye. |
| 1 | Chilly Powder | Contained non-permitted dye. |
| 1 | Chilly Powder | Adulterated with starch. |
| 2 | Chilly Sauce | Contained saccharin. |
| 3 | Chilly Sauce | Contained saccharin and excessive permitted preservative. |
| 26 | Coffee and Coffee Mixture | Deficient in coffee. |
| 3 | Coriander Power | Adulterated with starch. |
| 1 | Essence of Chicken | Not genuine. |
| 3 | Fruit | Contained excessive arsenic. |
| 9 | Ghee | Not genuine deficient in butter fat. |
| 17 | Groundnut Oil | Not genuine groundnut oil. |
| 3 | Honey | Contained sucrose (cane sugar). |
| 4 | Iced drinks | Contained non-permitted dye. |
| 7 | Iced drinks | Contained saccharin. |
| 1 | Iced drink | Contained saccharin and non-permitted dye. |
| 1 | Iced drink | Contained saccharin and excessive permitted preservative. |
| 8 | Margarine | Contained excessive water. |
| 6 | Milk | Deficient in solids-not-fat. |
| 1 | Milk | Deficient in solids-not-fat and fat. |
| 1 | Popsicle | Contained saccharin. |
| 7 | Sauce (other) | Contained excessive permitted preservative. |
| 1 | Sauce (other) | Contained saccharin. |
| 4 | Sugar (coloured) | Contained non-permitted dye. |
| 1 | Syrup | Contained saccharin. |
| 1 | Syrup | Contained saccharin and non-permitted dye. |
| 1 | Syrup | Contained saccharin and excessive permitted preservative. |
| 1 | Syrup | Contained excessive permitted preservative. |
| 1 | Syrup | Contained non-permitted dye. |
| 1 | Syrup | Label infringed Regulation 5 (1) (d). |
| 9 | Syrup | Deficient in Vit. C/Ascorbic Acid. |
| 66 | Tow Kuah (bean cake) | Contained non-permitted dye. |
| 2 | Tea | Label infringed Regulation 5 (1) (d). |
| 2 | Tea | Contained dyes. |

Table 153

DRUGS SAMPLES ADULTERATION OR OTHERWISE IRREGULAR

| No. | Sample | Nature of Irregularity |
|-------|---|---|
| 3 | Tincture of Iodine B.P. | Deficient in iodine. |
| 1 | Tincture of Iodine B.P. | Excessive iodine. |
| 1 | Zinc Ointment | Deficient in zinc. |
| 1 | Vitamin A capsule | Deficient in vitamin A. |
| 1 | Halibut liver oil capsule | Deficient in vitamin A. |
| 1 | Cod liver oil | Deficient in vitamin A. |
| 1 | Fever Powder | Deficient in weight. |
| 1 | Fever Powder | Excessive caffeine. |
| 3 | Medicated Oil | Deficient in methyl salicylate. |
| 4 | Medicated Oil | Excessive methyl salicylate. |
| 1 | Eye Lotion | No berberine. Deficient in boric acid. Excessive zinc sulphate. |
| <hr/> | | |
| 18 | | |
| <hr/> | | |
| | Total number of formal samples received | 131 |
| | Number of unsatisfactory samples for which Certificates were issued | 18 |
| | Percentage of unsatisfactory samples | 13.8% |

WATER AND SEWAGE SECTION

Water

The total number of samples received and analysed during the year amounted to 23,608. Of these 18,901 samples (approximately 80 per cent) were submitted by the Water Department of the Public Utilities Board and 3,953 samples of swimming pool water (approximately 16.7 per cent) by the Parks and Recreation Division of the Ministry of Labour. The remaining 3.3 per cent of water samples received from various sources were of diversity in nature.

Drinking Water

The samples from the Water Department of the Public Utilities Board were for routine examination and for special investigation purposes.

The daily routine tests were essential for the determination of the efficiency of purification process at the various treatment works and for ensuring that there was no deterioration of the treated water in the distribution system. The table below shows the various samples received from the Water Department:

| | |
|--|--------|
| Routine daily water samples | |
| From treatment works and distribution system | 12,132 |
| From Camp supplies | 1,443 |
| For Fluorine Test | 5,151 |
| Monthly samples from Clear Water Tank | 67 |
| Quarterly samples of raw water | 36 |
| Water for Special Investigations | 72 |
| | <hr/> |
| | 18,901 |

In the second half of the year, the sources of water supply of Singapore was augmented by the completion of the Scudai Water Works. The treatment employed at this new works was similar to that used at Tebrau Water Works, namely employing activated silica in conjunction with small doses of lime and alum. In spite of the new source of water supply, the total number of samples of drinking water submitted was about the same as that for last year (18,901 as compared with 18,853). Since July, samples of raw water from the reservoirs or rivers were submitted quarterly instead of monthly as was with previous practices. Tables 154 and 155 show the average figures of quarterly tests on raw water and the monthly tests on treated water.

The Singapore water continued to received fluoridation throughout the year to the extent of about 0.7 parts per million of fluorine. This year is the eighth year of the fluoridation of the Singapore water supply and the effect of this addition is being surveyed by the Chief Dental Officer.

Routine chemical and bacteriological tests were performed on well water from rural areas sampled by the Public Health Inspectors. The bacteriological results indicated that by the usually accepted standards, the water from these wells were unfit for human consumption. It is fortunate that the use of this type of water supply for consumption is on the wane with the ever increasing spread of stand-pipe water.

The Port of Singapore Authority continued to submit, once a month, water samples from its storage reservoir for chemical and bacteriological tests. These water samples were found to be satisfactory. A sample of drinking water from the storage tank of a Royal Malaysian vessel was examined for sea water and other contaminations.

Four samples of tap water coming from a storage tank in a private premises were submitted by the Public Health Inspector. The storage tank was said to have been recently painted with coal tar. Phenol was detected in all the four samples and advice was given not to use this water for drinking purposes. Of two samples of water from storage tanks in the Jurong area, one sample was found to be bacteriologically unsatisfactory.

Four samples of rain water collected in petrol drums were received from a hospital in Tawau. These samples were tested for content of lead and were found to comply with the British Pharmacopoeia limit test for lead in purified water.

Swimming Pool Water

A total of 3,861 samples of pool water were submitted by the Parks and Recreation Division of the Ministry of Labour. Daily tests were done on the water from the following public pools:

| | | |
|-------------------|-----|-------|
| Mount Emily Pool | ... | 565 |
| Yan Kit Pool | ... | 1,072 |
| River Valley Pool | ... | 1,136 |
| Farrer Park Pool | ... | 1,088 |
| | | <hr/> |
| | | 3,861 |

Commercial samples from four social clubs, one seamen's club, three Royal Air Forces Stations and a hotel amounted to 407 samples.

River Water

The river water samples amounting to 171, submitted by the Public Works Department, were taken from Singapore River, Geylang River, Kallang River, Serangoon River, Sungei Whampoa, Jurong River, Katong Canal, Siglap Canal, Stamford Canal and Rochore Canal. They were analysed with a view to determine the extent of pollution and to detect any new source of pollution as for instance the discharge of untreated trade effluents. Except for Jurong River, the others were far from satisfactory.

The 36 samples from a dam in Jurong were submitted by the Public Health Engineer for the purpose of mosquito control. They were analysed for the chloride content since anopheles mosquitoes breed on brackish water having a chloride content lying within a certain range.

Aquarium Water

Routine analysis were done regularly on both fresh and salt water from the Van Kleef Aquarium.

Other Water

All the samples were from commercial sources. The majority of the samples were for conductivity. One sample submitted by the Chief Gas Engineer was tested for chloride content in order to ascertain the extend of tidal contamination of the cooling water used at the Kallang Gas Works. This water was found to contain approximately 7 per cent of sea water.

Sewage

The following samples were analysed for the Public Works Department:

| | | |
|--|-----|-------|
| Sewage, sludges, top-water and effluents from sewage disposal works | ... | 1,171 |
| Septic Tanks | ... | 1,767 |
| | | 2,938 |

The sewage samples from sewage disposal works at Kim Chuan Road and Serangoon were regularly examined throughout the year. The average results for the effluents from Kim Chuan Road works are shown in the Table below:

AVERAGE ANALYSIS OF SEWAGE WORKS EFFLUENTS
(in parts per million)

| | Kim Chuan Road Works | | |
|----------------------------|----------------------|----------|-----------|
| | Phase I | Phase II | Phase III |
| Free and Saline Ammonia | 40.0 | 37.3 | 39.1 |
| Albuminoid Ammonia | 1.1 | 1.2 | 1.1 |
| Oxygen Absorbed in 4 hours | 26.1 | 21.7 | 21.6 |
| Biochemical Oxygen Demand | 87.3 | 38.4 | 34.6 |
| Total Solids | 593 | 592 | 614 |
| Suspended Solids | 49.4 | 50.6 | 54.4 |
| Nitrates | absent | absent | absent |
| Chlorides (as Cl) | 182 | 183 | 186 |
| pH | 7.1 | 7.2 | 7.2 |

For septic tank effluents, it was agreed with the Public Works Department that for assessing the quality of the effluents the standards of 10 parts per million for oxygen absorbed in 4 hours by potassium permanganate and 30 parts per million for suspended solids be adopted.

Table 155

TREATED WATER
FROM CLEAR WATER TANK
 Average results of Monthly Samples, 1964
(Results in parts Per Million)

| | Tebrau | Gunong Pulai | Wood-leigh | Bukit Timah | Bedok | Scudai |
|---|--------|--------------|------------|-------------|-------|--------|
| Ammoniacal Nitrogen .. | 0.32 | 0.25 | 0.21 | 0.14 | 1.36 | 0.01 |
| Albuminoid Nitrogen .. | 0.03 | 0.06 | 0.05 | 0.05 | 0.12 | 0.01 |
| Nitrite Nitrogen .. | absent | absent | absent | 0.01 | trace | absent |
| Nitrate Nitrogen .. | 0.06 | 0.03 | 0.03 | 0.07 | 0.10 | 0.24 |
| Carbon Dioxide .. | 0.1 | 0.1 | 0.2 | 0.2 | 1.8 | 0.3 |
| Total Alkalinity (as CaCO ₃) .. | 11 | 9.6 | 8 | 8.5 | 108 | 10 |
| Total Hardness (as CaCO ₃) .. | 25 | 24 | 29 | 31 | 168 | 27 |
| Carbonate Hardness (as CaCO ₃) .. | 11 | 9.6 | 8 | 8.5 | 108 | 10 |
| Chlorides (as Cl) .. | 4 | 4 | 3.3 | 4.5 | 74 | 5 |
| Iron (as Fe) .. | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.15 |
| Soluble Alum (as Al) .. | 0.25 | 0.30 | 0.40 | 0.35 | 0.05 | 0.05 |
| Total Residual Chlorine .. | 1.15 | 1.22 | 0.90 | 0.79 | 1.15 | 0.32 |
| Oxygen Absorbed from Permanganate in 4 hours .. | 0.3 | 0.5 | 0.7 | 0.4 | 0.8 | 0.1 |
| B.O.D. in 3 days .. | 0.5 | 0.6 | 0.7 | 0.7 | 0.6 | 0.1 |
| Total Solids .. | 40 | 52.5 | 45 | 49 | 395 | 54 |
| Suspended Solids .. | 2 | 1.1 | 0.6 | 1.5 | 3.8 | 1 |
| Colour (Hazen Units) .. | 5 | 5 | 5 | 5 | 5 | 5 |
| Turbidity (Silica Units) .. | 0.57 | 0.65 | 0.88 | 0.90 | 1.30 | 1.90 |
| pH Value .. | 7.5 | 7.5 | 7.3 | 7.3 | 7.8 | 7.9 |

MISCELLANEOUS SECTION

General

Three hydrometers from the Customs and Excise Department and three from a commercial firm were calibrated, and a correction table was supplied for each hydrometer.

Two samples of khaki cloth from the Police were tested for fastness of colour and shrinkage. The Public Works Department submitted 36 sheets of blotting paper for impregnation with lead acetate to be used for testing of hydrogen sulphide gas, and seven samples of soil for pH and concentration of sulphate.

The Chief Fire Officer submitted one sample of a blue granular material for detection of celluloid. The Primary Production Department submitted 75 samples comprising 30 samples of feedstuffs being pig or poultry rations, one sample of prawn dust, 10 samples of vegetable, one sample of mushroom grown from padi straw and 33 samples of soil for analysis mainly for the contents of nitrogen, phosphorus, potassium, moisture, calcium, magnesium, salt or organic matter and also for pH value in the case of soils. Samples of soil for analysis were also received from the Public Works Department.

Metals, Minerals and Chemicals

The Senior Radiologist submitted four samples of used fixer solution for their silver content to determine whether it was economically worthwhile to recover the silver from the solution.

The Water Department, Public Utilities Board, submitted for analysis 74 samples of water treatment chemicals comprising hydrated lime, aluminium sulphate, sodium bicarbonate, sodium silicofluoride, chlorinated lime and sodium aluminate for compliance with their specifications. Also submitted were seven samples of filter sand for sieve grading, and one sample of fertiliser for arsenic content to determine its suitability for use on turf in the catchment area. Request was received for the preparation of 11 samples of orthotolidine and phenol red reagents.

One sample of wire mesh netting from the Public Works Department was tested for its galvanised coating in accordance with British Standard Specifications. Twelve samples of quarry sand were tested for their salt content, and two samples of clay taken from the proposed Toa Payoh Sewerage Scheme site for sulphate content.

Several commercial firms submitted 41 samples of sodium arsenite for compliance with statutory colour requirements of the Federation Poisons (Sodium Arsenite) Ordinance, 1949, all of which were found to comply. Three cylinders of carbon dioxide were received from commercial firms for purity test. The Primary Production Department submitted one sample of fertiliser for contents of nitrogen, phosphorus and potassium.

Twenty-five samples of soap submitted by the Central Supplies Office were analysed for compliance with their specifications. In connection with preparation of reagents, four lots of solution for testing residual hypo in films were made for the Chief Surveyor, six lots of photographic developer for the General Manager's Office, Public Utilities Board, four bottles of standard alkali and two bottles of solution for testing of hardness for commercial firms.

Microfilm

810 samples of microfilms were tested for residual hypo for the Microfilm Unit.

Oils

Sixteen samples of anti-malarial oil were tested for the Public Health Division for conformity with specifications. One sample of diesel oil for salt content was carried out for the Senior Mechanical Engineer, Public Works Department.

The Broadcasting Division, Ministry of Culture, submitted 173 samples of transformer oil for acidity tests. Two samples of patchouli oil were received from a commercial firm for solubility tests in 90 per cent alcohol.

MISCELLANEOUS SECTION
DISTRIBUTION OF WORK 1964

| Class of Work | SOURCE | | | | | | | | Total Samples |
|--------------------------------------|---------|---------|--------|------------------|-------------------------|----------------------|-------------------|--------------|---------------|
| | Customs | Medical | Police | Water Department | Public Works Department | Parks and Recreation | Other Departments | Non-Official | |
| General | 3 | .. | 2 | .. | 43 | .. | 76 | 16 | 140 |
| Metals, Minerals and Chemicals | .. | 4 | .. | 93 | 15 | .. | 36 | 50 | 198 |
| Microfilm | .. | .. | .. | .. | .. | .. | 810 | .. | 810 |
| Oil | .. | 16 | .. | .. | 1 | .. | 173 | 2 | 192 |
| Total .. | 3 | 20 | 2 | 93 | 59 | .. | 1,095 | 68 | 1,340 |

The Singapore Fire Brigade submitted 40 samples of liquid for classification as to whether or not they were "Petroleum" as defined in the Petroleum Ordinance or "Cellulose Solution" under the Cellulose Solution By-Laws. Eight samples were found to be not classifiable as either "Petroleum" or "Cellulose Solution".

REVENUE SECTION

The account given here covers all the work done for the Customs and Excise Department except work in connection with offences under The Customs Ordinance or preventive aspects. Work of the latter nature is described in the Forensic Section.

As in previous years the bulk of the samples comprised liquors, the rate of duty on which depends on their alcohol contents, volumes and classification. During the year 5,003 liquor samples (excluding toddy samples) were submitted by the Customs and Excise Department for classification and determination of spirit strengths and volumes. The figure for last year was 6,928. Labels of liquor samples were also checked for compliance with the Food and Drugs Regulations. Importers were advised by letter whenever the examinations revealed any contravention of the above regulations.

Although there was a reduction in the number of liquor samples and toddy samples (305 as compared with 417 for last year), the total number of samples under the Revenue Section for this year has increased (7,457 as compared with 7,096 for last year). The increase was due to the increase of the variety of samples classed under Duty Category Investigations.

European-Type Liquors

The total number of the above type of liquors submitted by the Customs and Excise Department was 2,547. Five samples were received from commercial firms. Apart from the need to comply with limits for lead and copper prescribed by the Food and Drugs Regulations, whisky, rum, gin and brandy have also to conform to standards for spirit strength and also ester content in the case of brandy only.

Eight samples of brandy, six samples of rum and one sample each of whisky and gin were classified as "Intoxicating liquor not elsewhere specified" because of failure to conform to either spirit strength or ester content. One sample of rum was found to contain excessive copper and hence prohibition of importation of this was recommended. Two samples of brandy were also found to contain the maximum permitted amount of copper and the importers were notified by letter.

Samsoo

The number of samsoo samples received was slightly less than that of the previous year (2,761 as compared with 2,950 for last year). Approximately 29 per cent were from local distilleries.

Accuracy in analysis was particularly vital as very often the duty on gallons of liquor was based on the results of analysis of a single sample. The accuracy of analysis was reflected in the results of analysis of check samples submitted monthly.

Denaturation

The number of samples of alcohol denatured during the year on behalf of commercial firms was almost the same as that for previous year (245 as compared with 244 for the previous year). Apart from five drums which were denatured with one per cent kerosene and 1/6 per cent pyridine all the other samples were denatured with denaturants such as essential oil, dimethylphthallate, tobacco dust, and methyl alcohol.

Twelve samples were denatured in accordance with Federation of Malaya requirements, i.e. two per cent essential oil, one per cent dimethylphthallate, and five per cent methyl alcohol.

Methylated Spirits and Other Denatured Alcohol

A total of 729 samples of methylated spirits and denatured alcohols were analysed during the year. These samples were all denatured before being imported into Singapore. Samples were taken from every consignment on arrival to ensure that they were adequately methylated or denatured in accordance with local regulations.

All the samples were accepted as adequately denatured since they were found to contain either one per cent kerosene together with one-sixth per cent pyridine, or five per cent methyl alcohol, or one per cent dimethylphthallate.

Toddy

The number of toddy samples received this year showed a decrease of 112 (417 as compared with 305 for last year). These routine samples were submitted for the purpose of checking on the quality of toddy sold in the toddy shops of Singapore. The standard of the samples remained high, 81 per cent of them being classified as good and only less than one per cent of them being classified as bad due to added water or overfermentation or both.

Duty Category Investigations

There was a very marked increase in the number of samples received for the year under the above heading. A total of 865 samples were reported on as compared with 168 for the previous year. The large increase was due greatly to the extension of the Customs Duties Order to include many items which had previously been non-dutiable.

The samples in this section could be divided into three groups. Detergents and cleansing preparations were analysed in relation to the Customs (Protective Duties) Order, 1960, which levies duties on soap (except toilet and abrasive soaps) and preparations containing soap. Paints and paint materials were examined in relation to The Customs (Protective Duties) Order, 1962 which levies duties on prepared paints, varnishes other than nitrocellulose varnishes and insulating varnishes, distempers and water paints other than cement based paints. In addition raw materials for paint manufacture were analysed and classified either as dutiable or non-dutiable items in accordance with the recommendations of the *ad hoc* Committee on paints. The third and relatively new group of samples comprised the new items introduced into The Customs Duties Order, 1964. As a result of this order sugar and sugar-containing products, flavouring concentrates, cocoa-containing products, marble chips, greases and waxes, etc. which had hitherto been non-dutiable were now sent in for analyses and classification and ultimate assessment of duty by the Customs Department.

The number of samples of detergents and cleansing preparations, namely 214, received was slightly more than double that for the previous year, namely 96. Fifty-five of the samples analysed were found to contain soap.

Samples of paints and paint materials totalled 215 as compared with 53 for the previous year. Of this number 60 samples were resins, tested for viscosity, and 85 were thinners, analysed to determine whether they were petroleum products or not. Other samples included driers, pigments, solvents, paint removers and drying oils.

Sugars, tested for degree of polarisation, and flavouring essences were the two major items analysed.

Among the samples under "Duty Category Investigation" were 159 samples of beverages, which were found to contain less than two per cent Proof Spirit and therefore classified as "Not Intoxicating Liquor". There was one sample which was found to contain 17.1 per cent Proof Spirit, but recommendation for exemption from duty was made as it was used for medicinal purposes.

REVENUE SECTION
DISTRIBUTION OF WORK 1964

| Class of Work | SOURCE | | |
|--------------------------------------|---------|--------------|---------------|
| | Customs | Non-Official | Total Samples |
| Denaturation of Spirit | .. | 245 | 245 |
| Liquors: | | | |
| Beer, Cider and Stout | 717 | .. | 717 |
| Brandy | 271 | 2 | 273 |
| Whisky, Rum and Gin | 362 | 1 | 363 |
| Wine, Bitters and Liquers | 892 | .. | 892 |
| Miscellaneous | 305 | 2 | 307 |
| Samsoo | 2,761 | .. | 2,761 |
| Toddy | 305 | .. | 305 |
| Methylated Spirit, etc. | 729 | .. | 729 |
| Duty Category Investigations | 865 | .. | 865 |
| Total .. | 7,207 | 250 | 7,457 |

TOXICOLOGY SECTION

The table below indicates the number of cases and samples for this year and last year.

NUMBER OF CASES AND SAMPLES

| Type of Cases | No. of Cases | | No. of Samples | |
|--|--------------|------|----------------|-------|
| | 1963 | 1964 | 1963 | 1964 |
| Poisoning ... | 693 | 596 | 1,128 | 981 |
| Clinical (for opium, metals, etc.) ... | — | — | 575 | 488 |
| Alcohol (in urine, blood, etc.) ... | 289 | 241 | 469 | 395 |
| | 982 | 837 | 2,172 | 1,864 |

Poisoning Cases

There was a decrease in the number of cases and samples when compared with those for 1963. Autopsy cases amounted to nearly 15 per cent of the total number of cases.

Table 156 shows the diversity of substances found and the number of cases of each.

There were some food poisoning cases, most of which were probably due to bacteria rather than chemical poisons. On three occasions, exhibits such as cooked ham, bread, coffee powder, grapes and ice water were also submitted for metallic contamination but no significant quantity of the common heavy metals were detected in any of them.

An interesting case of food poisoning was in connection with a number of persons who vomitted after eating *nasi lemak*. The police seized the goods from the vendor and also submitted samples of the *nasi lemak* together with ingredients used in the preparation such as coconut milk and fried fish. On analysis the presence of arsenic in the *nasi lemak* and coconut milk was established. The contents of one of the packets of the *nasi lemak* weighing about 255 grammes was found to contain about 10 milligrammes of arsenic. Specimens of stomach washout and urine of the affected people, submitted by the hospitals, were also analysed and all of them were found to contain arsenic. The urine of one patient was found to contain as high as 5 milligrammes of arsenic per litre. Fortunately there was no fatal case.

The number of sodium hydroxide poisoning cases remained about the same as that for last year (28 as compared with 26 for last year). Almost invariably the taking of caustic soda was with suicidal intent and of the 28 cases encountered, there were 11 deaths. Those who survived presumably had no idea of the damage and agony that were to follow after the ingestion of such corrosive alkali.

As might be expected, household commodities were frequently met with in suicide or accidental poisoning cases. These included synthetic detergents, soap, calamine lotions, lime, bleaching solutions, essential oils, etc., with detergent and kerosene topping the list. In some instances, the accidental ingestions were by small children. However the majority of the cases were not fatal. In a few cases, ingestions of methyl salicylate have resulted in deaths.

On such mishap concerned a three year old girl who was given a table-spoon full of cinnamon oil instead of cough mixture by her mother. On realising the error the child was immediately sent to hospital where she died the following day. Oil of winter-green (methyl salicylate) was detected in the specimen of stomach washout. The bottle labelled "Pure Cinnamon Oil", which was submitted by the Police, was found to contain approximately 89 per cent of methyl salicylate.

The number of exhibits (as opposed to specimens) submitted by the Police and the Hospital was about the same as that for last year. These exhibits very often gave valuable clues to the Chemist as to what to look for in

the hospital specimens. The labels on the exhibits were extremely helpful and the poisons, if any, present in them were purer and easier to manipulate than the poisons present in the specimens from the victims. The exhibits included pills, tablets, or mixtures. Among the substances encountered were chloramphenicol, digoxin, marplan, probanthine, warfarin etc. Many of the exhibits were mixtures and in one particular type of tablets, five substances were detected, namely amidopyrine, dipyrone, phenobarbitone, papaverine and homatropine.

Among the Chinese, the use of Chinese medicines for various ailments is a traditional practice. On occasions excessive lead and arsenic were found in the medicines. In one case a baby developed cyanosis of the extremities after taking a brown powder containing 1,000 parts per million of lead and 80 parts per million of arsenic. In another case a brown powder for use externally was found to contain 12,000 parts per million of lead.

Insecticides such as DDT, gammaxene, diazinon and malathion were frequently encountered. Among the six fatal cases, four were due to malathion, one was due to DDT and gammaxene and the other gammaxene alone. Two of the fatal cases due to malathion were from Kuching while the one due to gammaxene was from Jesselton. In most of the cases, large quantities of the insecticides were isolated from the stomachs.

Cases due to overdose of depressant drugs such as the hypnotics and sedative were many with the barbiturates heading the list.

In a fatal suicide attempt by a teenage girl, fragments of amytal tablet were recovered from the stomach. The stomach and contents was also found to contain four grammes of amytal.

Among the non-barbiturate sedative class, there were three cases of gluthethimide (doriden) and three cases of methaqualone (melsedin), but only one was fatal. There was also one death arising from ingestion of tranquilizer meprobamate. Slightly more than two grammes of meprobamate were found in the stomach and contents.

Cases of poisoning due to narcotics included opium, morphine and codeine. In one case a seaman, a drug addict, was found dead in his cabin and beside him was a hypodermic needle and a few packets of white powder suspected to be morphine. Analysis of the exhibits as well as the organs of the deceased revealed the presence of morphine and the amount found in the liver was 0.14 milligrammes morphine per 100 grammes liver.

Cases from Sabah, Sarawak and Brunei numbered 19 as compared with 12 for last year. Of these, four were veterinary cases involving two racing ponies, a dog and a goat.

In one case from Kuching, a housewife admitted having placed in a cup of tea meant for her husband some ash from the web of a gas-lamp. The keen-eyed husband, on observing what took place, refused to drink the tea but instead brought it to the local Police. The tea was found to contain traces of thorium, which is used in the manufacture of gas mantles.

Blood, Urine, etc. for Alcohol

The number of cases and specimens this year showed a decrease (241 cases involving 395 specimens as compared with 289 cases involving 469 specimens. Among the specimens were 220 blood, 150 urine and 25 other specimens such as vomits or stomach washout. Of the 241 cases, no alcohol was detected in slightly over a quarter of the cases while post-mortem cases accounted for about one-third. The majority of the cases were in connection with simple drunkenness of traffic accidents.

In 13 cases the blood specimens were found to be clotted and thus no quantitative analysis was done as no reliable result could be expected from a clotted specimen. This was regrettable since the amount of alcohol in the blood in such cases might be of value in court proceedings.

Besides the specimens from the local hospital, eight specimens were also received from Sabah, three specimens from the British Forces and two from a local private dispensary. In the latter case the person affected wanted his own doctor to take samples of his blood and urine.

Clinical Specimens

The 488 specimens analysed under this heading were made up of the following:

| | | |
|------------------|-----|-------|
| Opium alkaloids | ... | 57 |
| Lead | ... | 55 |
| Lead and Arsenic | ... | 5 |
| Arsenic | ... | 7 |
| Fluorine | ... | 364 |
| | | <hr/> |
| | | 488 |
| | | <hr/> |

The majority of the specimens were urine specimens. Those for fluorine content were check samples taken from workers engaged in the treatment works of the Water Department, Public Utilities Board.

The number of samples submitted by the Opium Treatment Centre and the General Hospital for opium alkaloids was approximately half of that for previous year. Over the past few years, the number of these samples has been steadily decreasing and could possibly indicate the decreasing number of opium addicts. Approximately 61 per cent of the 57 specimens were found to contain both morphine and codeine. In six instances morphine only was detected.

In one case, a patient, a former morphine addict, was suspected of taking opium although he claimed to have not taken any. Analysis of his urine revealed the presence of codeine only thus supporting his claim. The patient had in all probability, taken compounds containing codeine.

Specimens for suspected arsenic poisoning included urine, hair and nail clippings. In one case, although no arsenic was detected in the nail clippings, 4.2 per cent arsenic was found in the Chinese medicinal pills.

Table 156

SUBSTANCES FOUND AND THE NUMBER OF CASES

| | | | |
|-------------------------------|---------|--------------------------------|--------|
| A.P.C. | ... 10 | Melsedin | ... 2 |
| Acriflavine, Codeine | ... 1 | Melsedin, Morphine, Codeine | 1 |
| Amytal | ... 12 | Meprobamate | ... 1 |
| Amytal, Alcohol | ... 1 | Meprobamate, Soneryl | ... 1 |
| Amytal, Phenobarbitone | ... | Mepyramine | ... 1 |
| Codeine | ... 1 | Mercuric Sulphide | ... 1 |
| Amytal, Phenothiazine | ... | Methyl Salicylate | ... 7 |
| Compound | ... 1 | Methyl Salicylate, Turpentine | 1 |
| Amytal, Soneryl | ... 1 | Methylene Blue, Azine Dyestuff | 1 |
| Amphetamine | ... 1 | Morphine | 2 |
| Antihistamine | ... 2 | Morphine, Codeine | ... 3 |
| Antipyrine | ... 1 | Morphine, Codeine, Alcohol | ... 1 |
| Arsenic | ... 12 | Napththalene | ... 1 |
| Arsenic, Lead | ... 1 | Opium | ... 19 |
| Aspirin | ... 1 | Opium, Alcohol | ... 1 |
| Barbiturates | ... 36 | Paracetamol | ... 1 |
| Barbiturates, Phenothiazine | ... | Peppermint | ... 1 |
| Compound | ... 2 | Phenacetin | ... 3 |
| Bleaching Solutions | ... 4 | Phenacetin, Barbiturate | ... 2 |
| Calamine | ... 3 | Phenacetin, Barbiturate, | ... |
| Calcium Carbonate | ... 3 | Codeine | ... 1 |
| Camphor | ... 1 | Phenergan | ... 2 |
| Carbon Monoxide | ... 1 | Phenobarbitone | ... 4 |
| Carbutamide | ... 1 | Phenolphthalein | ... 1 |
| Chloramphenicol Palmitate, | ... | Phenothiazine Compound | ... 8 |
| Aspirin, Tetracycline | ... 1 | Phenytoin, Phenobarbitone | ... 1 |
| Codeine | ... 3 | Potassium Permanganate | ... 1 |
| Codeine, Phenacetin | ... 1 | Quinine | ... 2 |
| Codeine, Salicylic Acid | ... 1 | Quinalbarbitone | ... 1 |
| Copper | ... 1 | Quinalbarbitone, Soneryl, | ... |
| Cresols | ... 1 | Phenergan | ... 1 |
| D.D.T. | ... 5 | Reserpine, Sparine | ... 1 |
| D.D.T., Gammexane | ... 2 | Salicylic Acid | ... 12 |
| Dapsone | ... 1 | Salicylic Acid, | ... |
| Dettol | ... 4 | Alcohol Methanol | ... 1 |
| Dettol, Methyl Salicylate | ... 1 | Salicylic Acid, Phenacetin, | ... |
| Detergent | ... 19 | Codeine | ... 1 |
| Diazinon | ... 1 | Salicylate, Barbiturate | ... 1 |
| Dipyrene, Amidopyrine, | ... | Saridon | ... 2 |
| Phenobarbitone, Papaverine, | ... | Soap | ... 2 |
| Homatropine | ... 1 | Sodium Carbonate | ... 3 |
| Doriden | ... 3 | Sodium Chloride | ... 1 |
| Dormwell (Dichloralphenazone) | 2 | Sodium Hydroxide | ... 28 |
| Ephedrine | ... 2 | Sodium Hydroxide, Detergent | 1 |
| Ethyl Alcohol | ... 14 | Soneryl | ... 4 |
| Eucalyptus Oil | ... 3 | Soneryl, Alcohol | ... 1 |
| Flavines | ... 3 | Soneryl, Phenobarbitone | ... 1 |
| Gammexane | ... 1 | Sulphadiazine | ... 1 |
| Hair Lotion | ... 1 | Sulphanilamide | ... 1 |
| Hyoscine | ... 1 | Sulphapyridine | ... 2 |
| Isoprenaline | ... 1 | Sulphathiazole | ... 1 |
| Kerosene | ... 14 | Sulphuric Acid | ... 3 |
| Largactil | ... 6 | Tetracycline | ... 1 |
| Lead | ... 2 | Theophylline, Phenobarbitone, | ... |
| Lead, Aluminium, | ... | Ephedrine | ... 1 |
| Methylene Blue | ... 1 | Thorium | ... 1 |
| Lead, Camphor | ... 1 | Trisulphonamide, Largactil, | ... |
| Lysol | ... 2 | A.P.C. | ... 1 |
| Malathion | ... 6 | Tuba Root Resins | ... 1 |
| Marplan, Amytal, | ... | Turpentine | ... 4 |
| Prochlorperazine | ... 1 | Zinc, Silica | ... 1 |
| Nil | ... 246 | | |

DISTRIBUTION OF WORK 1964

| Class of Work | SOURCE | | | | | Total Samples | Total Cases |
|----------------------------------|---------|--------|------------------|-------------------|--------------|---------------|-------------|
| | Medical | Police | Water Department | Other Departments | Non-Official | | |
| Clinical Specimens .. | 120 | .. | 364 | .. | 4 | 488 | .. |
| Blood, Urine etc. for Alcohol .. | 382 | .. | .. | .. | 13 | 395 | 241 |
| Poison Cases: | | | | | | | |
| Exhibits .. | 74 | 58 | .. | 4 | 19 | 155 | } 596 |
| Specimens .. | 762 | .. | .. | 3 | 61 | 826 | |
| Total .. | 1,338 | 58 | 364 | 7 | 97 | 1,264 | 837 |

DANGEROUS AND HAZARDOUS MATERIALS SECTION

This section continued to give advice to the Port of Singapore Authority (previously called the Singapore Harbour Board) regarding classification of dangerous goods and answer various queries concerning chemicals.

Early this year a long list of dangerous goods was submitted by the Port of Singapore Authority for amendments and our advice on the classification. Many of the items in the list required a lot of searching of reference books in order to ascertain their properties including flash points. This was time consuming. For a number of items because of insufficient information or no reference in the literature available in the Department classification was not possible. Many items in the list appeared to be non-dangerous from the point of view of the Regulation of the Port of Singapore Authority. As it would be inappropriate to include these items in the list of dangerous goods, it was suggested that these items be placed in a separate informal list for their reference.

Explosives

Three inspections of blasting explosives, detonators and fuses to be landed in Singapore were carried out on board the ships. Where no inspection was made samples of explosives were forwarded to the Department for testing. Seventy-one samples of industrial explosives were tested in the laboratory for stability and freedom from exudation of liquid nitroglycerine. Sixteen of these samples were from consignments for Port Swettenham and were tested on behalf of the Department of Chemistry, Kuala Lumpur. All were found fit for importation.

A total of 145 "Form H" certificates were issued to the Police Licensing Officer. The Licensing Officer would then permit the landing of explosives into Singapore or in the case of transit cargoes the off-loading of the explosives into lighters at the Eastern Explosives Anchorage pending re-loading onto the same vessel or other vessels.

The total number of samples of fireworks examined for the Police was 46 as compared with 86 for last year. The decrease in samples was because only samples from actual consignments were submitted by the Police. Previously trade samples were also submitted by the Police to see whether they were of the prohibited type. For such trade samples, the firms should be able to obtain a confirmation either from the manufacturer or seller that they did not contain prohibited ingredients. These samples were now to be treated as commercial samples and if the firms wished to ascertain that they were not of the prohibited type, the samples could be sent for analysis by the firms for which fees would be charged.

Under the Arms and Explosives Ordinance the importation, manufacture or possession of any firework composition or manufactured fireworks containing a chlorate or phosphorus or picric acid or any picrate, or of any manufactured firework containing more than one-fifth of an ounce of explosives composition is prohibited. The prohibition, however, does not apply to amorces (caps or igniting tapes for toy pistols) or signals for use by ships or aircraft or to Christmas crackers or bob-bon crackers or the snaps therefor or where used solely as a friction primer composition. Of the 46 samples examined only one was found to be of the prohibited type.

In one case from the Customs and Excise Department all three samples of fireworks were found to contain the prohibited ingredients, phosphorus and chlorate. One of the samples being firing tape does not come under the imposed prohibition. The other two samples consisted of a string with either a paper cylinder or four separate paper cylinders attached to it. When the strings were pulled the paper cylinders exploded.

Out of the five samples of fireworks examined for commercial firms, three were found to be of the prohibited type. Two samples of fireworks examined for the Chief Fire Officer were found to be of the prohibited type. One sample submitted by a technical school was found to contain the legally allowed gunpowder.

Magazines

It was agreed with the Police that annual routine inspection of existing magazines for the purpose of renewal of licences could be carried out by Police Officers except in doubtful cases when the assistance of this Department was required. However, in the case of inspection of new magazines or choice of site for a new magazine, officer of the Department of Chemistry would inspect and advise. The Police was given a copy of instructions concerning explosives magazine and so long as the magazines were maintained in accordance with the instructions, licences could be renewed.

On behalf of the Police three inspections of explosives magazines were carried out. An old existing explosives magazine unused for about 15 years was found to be unfavourably sited from the safety point of view. A new site was chosen for the construction of a new magazine to replace the old one. The new magazine was consequently erected at the chosen site.

Petroleum

The total number of samples tested for flash points was 702 showing an increase when compared with 499 samples for 1963. The 702 samples comprised 237 samples of kerosene, 425 samples of aviation turbine fuel and 40 samples of other type. The main increase in sample was from aviation turbine fuel as 271 samples were received last year.

Ship Inspections

A total of 740 ship inspections were carried out for this year as compared with 824 ship inspections for last year. Under the Petroleum Ordinance, any ship which has carried dangerous petroleum has to be inspected and certified "gas free" of inflammable vapour before coming to dock or wharfs for repairs. In 27 of these inspections, the ships were found to be not "gas free" and had to be further cleaned and re-inspected. Fifty-one of the inspections were in connection with certifying of spaces such as double bottom tanks, settling tanks, bunkers, etc. for freedom from petroleum vapour in toxic amount prior to entry by workmen at the requests of shipping firms or dockyards.

In eighteen instances, Inspectors under the Petroleum Ordinance proceeded for inspection but owing to non-arrival or late arrival of the vessels no inspection was possible.

Trade Effluent

With the setting up of more and more new industries in the State of Singapore, the number of trade effluents examined has increased as envisaged. Further increase is to be expected in the years to come.

Altogether 25 samples of trade effluent were analysed as compared with four in 1964. Ten samples of trade effluents were taken from various factories by Health Inspectors and submitted for analysis as to their suitability for discharge. Of these ten samples, only one was found to be of a fairly good standard and suitable for discharge. Analytical results of the other samples indicated the need to treat the effluents before discharge in order to obviate pollution.

In one factory the effluent was treated by filtration before discharge. However analytical results of the treated final effluent were still unsatisfactory indicating the filtration plant was not functioning properly.

Of the 15 non-official samples, 12 were submitted by the Royal Air Force, Seletar and were from a plating shop. These were analysed for pH and cyanide content. The concentration of cyanide in these samples was found to vary from 0.04 to 6.3 parts per million. The other three samples were from a commercial firm.

Inspection and Dangerous Occurrences

At the request of the Police a scene of explosion at a refrigeration company was visited. Six cylinders were found lying on the five-foot way of the above premises, one of which appeared to have exploded through its side. The atmosphere around the exploded cylinder was tested and ammonia was detected. This would indicate that the cylinder which has exploded contained ammonia.

Arising from complaints of excessively warm and humid atmosphere and poor ventilation of the second floor of the Ministry of Health building, the Deputy Director of Medical Services (Health) requested for a survey of the office. Measurements of temperature, relative humidity, cooling power and air velocity were made at five locations over a period of about a month and a report submitted.

With more and more developments and industrialisation in Singapore, high explosives were increasingly being used for blasting purposes. Before any blasting operation could be carried out permission from the Police had to be obtained. At the request of the Police, five blasting sites were inspected and advice given to the Police. When the neighbourhood of the blasting site was found to be uninhabited, there was no objection to the use of explosives for blasting if the usual conditions were imposed. In two cases, however, the boulders to be broken up were near buildings and road. In order to prevent any damage caused by flying debris, advice were given that the boulders should be covered with wire netting and sandbags and the minimum amount of explosives necessary should be used. The measures adopted proved to be effective.

DANGEROUS AND HAZARDOUS MATERIALS SECTION

DISTRIBUTION OF WORK 1964

| Class of Work | SOURCE | | | | | | | Total Samples | Total Cases |
|--|---------|---------|--------|-------------------------|-------------------|--------------|-------|---------------|-------------|
| | Customs | Medical | Police | Public Works Department | Other Departments | Non-Official | | | |
| Explosives: | | | | | | | | | |
| Inspection | .. | .. | 145 | .. | .. | .. | 145 | .. | |
| Industrial | .. | .. | .. | .. | .. | 71 | 71 | .. | |
| Fireworks | 3 | .. | 46 | .. | 3 | 5 | 57 | 2 | |
| Magazines | .. | .. | 3 | .. | .. | .. | 3 | .. | |
| Petroleum Ordinance: | | | | | | | | | |
| Flash-point Test | .. | .. | .. | .. | .. | 702 | 702 | .. | |
| Ship Inspection | .. | .. | .. | .. | .. | 740 | 740 | .. | |
| Trade Effluents | .. | 10 | .. | .. | .. | 15 | 25 | .. | |
| Inspection and Dangerous Occurrences | .. | 1 | 5 | .. | .. | .. | 6 | .. | |
| Total | 3 | 11 | 199 | .. | 3 | 1,533 | 1,749 | 2 | |

TOTAL SAMPLES ANALYSED BY THE DEPARTMENT OF CHEMISTRY AND THE CITY ANALYST'S DEPARTMENT

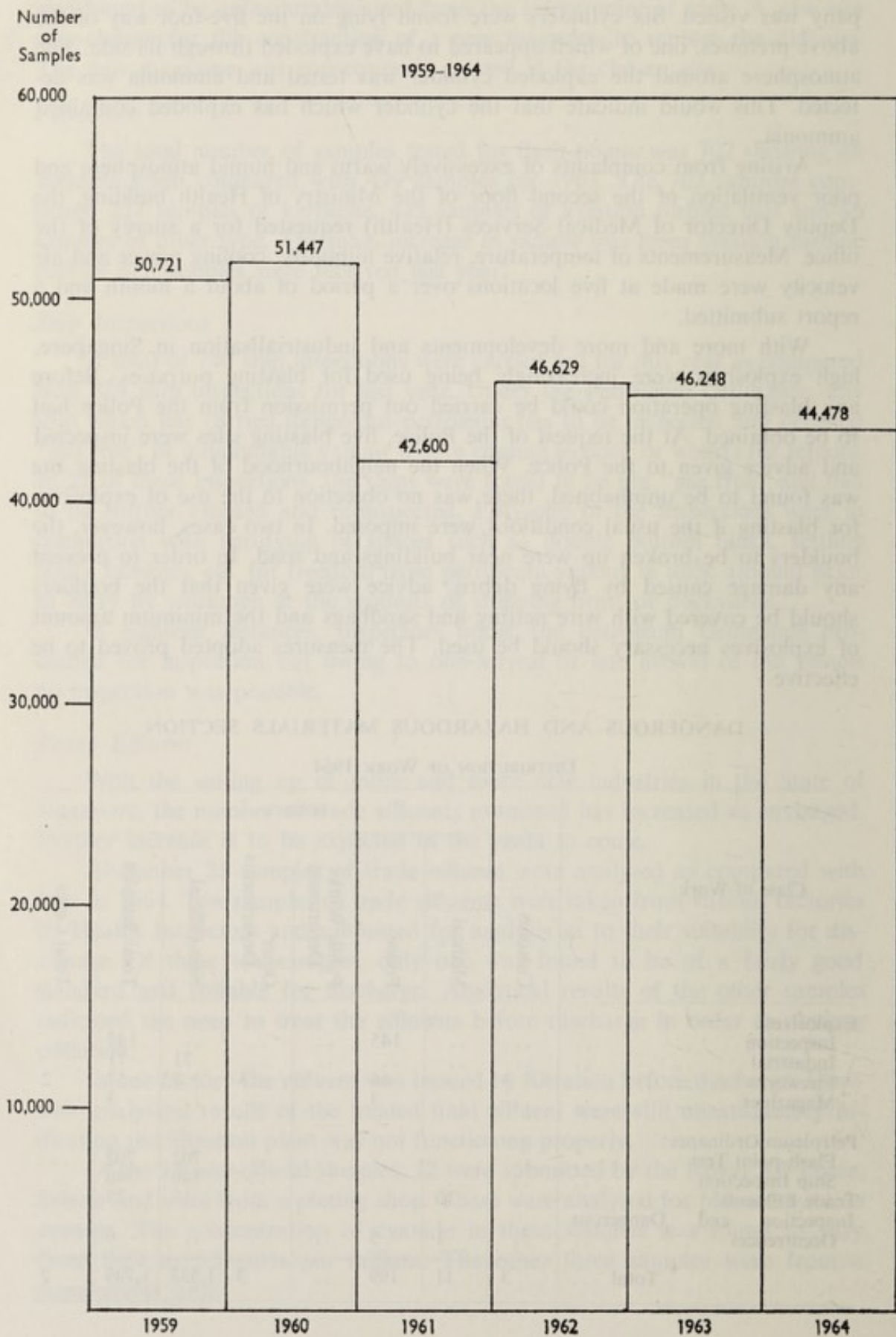


Table 157

STAFF LIST

DEPARTMENT OF CHEMISTRY AND INSPECTORATE OF
DANGEROUS MATERIALS

Chief Chemist and Chief Inspector of Dangerous Materials

Chia Chwee Leong, B.Sc. (Hons.), M.Sc., F.R.I.C.

Deputy Chief Chemist and Deputy Chief Inspector of Dangerous Materials

Chia Hong Hoe, B.Sc. (Hons.), M.Sc., D.I.C., A.R.I.C.

Senior Chemist and Senior Inspector of Dangerous Materials

Lim Chin Hua, B.Sc. (Hons.), D.I.C., A.R.I.C.

Chemists and Inspectors of Dangerous Materials

Phang Sing Eng, B.Sc. (Hons.), M.Sc., A.R.I.C.

Tan Jake Meng, B.Sc. (Hons.), Dip. Chem. Eng., A.R.I.C.

Chou Kai Chih, B.Sc. (Hons.), M.Sc., D.I.C., A.R.I.C.

M. C. Dutt, B.Sc. (Hons.), M.Sc., A.R.I.C.

Theng Chye Yam, B.A. (Mod.), M.Sc., A.R.I.C.

Lim Han Yong, B.Sc. (Hons.).

Phang Pui Yeong, B.Sc. (Hons.).

Chua Teck Hock, B.Sc. (Hons.).

Teo Teng Poh, B.Sc. (Hons.).

Ng Seng Choew, B.Sc. (Hons.).

Chia Hong Kuan, B.Sc. (Hons.).

Document Examiner

Ch'ng Beng Han, B.Sc.

Assistant Inspectors of Dangerous Materials

One Vacant (Mr. Aw Soon Cheong, B.Sc. resigned with effect from 25-12-64).

Lee Yang Hern, B.Sc. (appointed on 14-1-64).

P. C. Narendran, B.Sc. (appointed on 1-8-64).

Senior Laboratory Technicians

Chow Weng Sing.

Pwee Sye Cheow.

Laboratory Technicians — Fourteen.

Laboratory Assistants — Three.

Executive Officer

Ismail bin Ahmad.

Clerical Officers — Four.

Clerical Assistant — One.

Typists — Three.

Storeman and Packer — One.

Laboratory Attendants, Special Grade — Two.

Laboratory Attendants — Fifteen. Five Vacant.

Office Boy — One.

Watchmen — Three.

Gardener — One.

TABLE 158
DISTRIBUTION OF LABORATORY WORK

| Sections | SOURCE | | | | | | | | | | Total Cases |
|--------------------------------------|----------------------------|----------------------------|-----------------|--------------------------|------------------------------------|---|---------------------------|------------------|------------------|-------|----------------|
| | Customs Depart- ment | Medical Depart- ment | Police Force | Water Depart- ment | Public Works Depart- ment | Parks and Recrea- tion Division | Other Depart- ments | Non- Official | Total Samples | | |
| Forensic | 275 | 15 | 2,505 | .. | .. | .. | 101 | 169 | 3,065 | 660 | |
| Health | 149 | 2,253 | .. | .. | .. | .. | 2 | 66 | 2,470 | 952 | |
| Water and Sewage | .. | 107 | .. | 18,901 | 3,109 | 3,953 | .. | 479 | 26,549 | .. | |
| Miscellaneous | 3 | 20 | 2 | 93 | 59 | .. | 1,095 | 68 | 1,340 | .. | |
| Revenue | 7,207 | .. | .. | .. | .. | .. | .. | 250 | 7,457 | .. | |
| Toxicology | .. | 1,328 | 58 | 364 | .. | .. | 7 | 97 | 1,854 | 837 | |
| Dangerous and Hazardous Materials | 3 | 11 | 199 | .. | .. | .. | 3 | 1,533 | 1,749 | 2 | |
| Total | 7,637 | 3,734 | 2,764 | 19,358 | 3,168 | 3,953 | 1,208 | 2,662 | 44,484 | 2,451 | |





**MINISTRY OF HEALTH
LIBRARY**

LIBY. 15

Printed by the Government Printing Office, Singapore

To be purchased from the Government Publications Bureau
Fullerton Building (Ground Floor), Singapore

Price: \$4