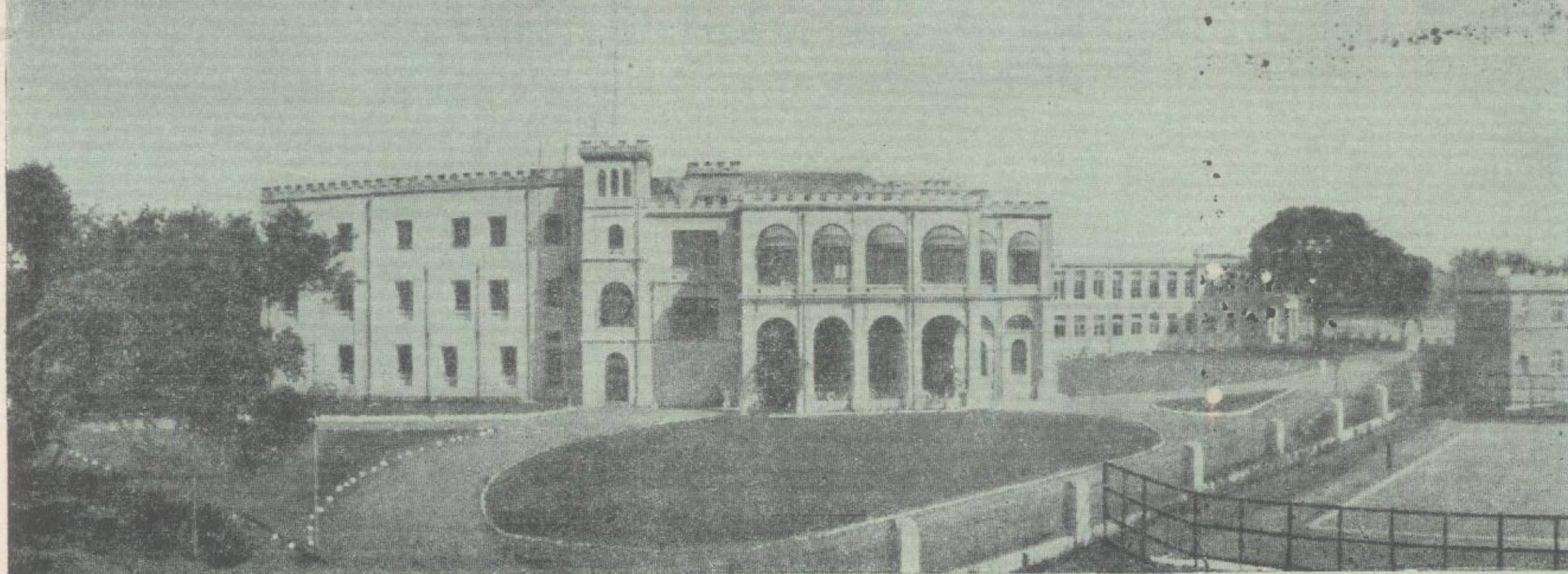


**HAFFKINE
INSTITUTE**



HAFFKINE INSTITUTE

HAFFKINE Institute is one of the biggest research cum production institution of its kind, not only in India, but also in the East. In 1896, when plague broke out in an epidemic form in Bombay a young Russian Scientist, Waldemar Mordecai Wolff Haffkine who had come to India to try his anti-cholera vaccine was invited by the Government to investigate into the cause of plague epidemic and, if possible, to combat it by preparing a prophylactic vaccine against it. This brilliant student of Louis Pasteur, with years of experience in the preparation of cholera vaccine laid the foundation of the "Plague Research Laboratory" in Bombay in which some of the most fundamental researches in plague epidemiology and plague prophylaxis were conducted.

With the growing importance of bacteriological work in the diagnosis and treatment of tropical diseases, the "Plague Research Laboratory" was further expanded. It undertook investigation of other infectious diseases besides plague. To indicate this significant expansion of its activities, the laboratory was renamed in 1906 as the "Bombay Bacteriological Laboratory". In 1925, the laboratory was rightly named as "the Haffkine Institute" to celebrate the name of its Founder and first Director Dr. D. M. Haffkine whose inspiration and work resulted in enormous benefits to the mankind and to the people of this country in particular.

The Institute has, on its technical staff, more than 200 scientists and over 720 persons as subordinate staff. The Director is assisted by eight Assistant Directors.

The Institute comprises of the following departments & sections: 1. Department of Bacteriology. 2. Department of Immunology. 3. Department of Virology. 4. Department of Pharmacology. 5. Department of/Clinical Pathology/and Diagnostic Reagents. 6. Department of Biochemistry. 7. Department of Entomology. 8. Department of Chemotherapy. 9. Blood Bank. 10. Department of Nutrition. 11. Animal House.

DEPARTMENT OF BACTERIOLOGY

Dr. Haffkine, arrived in Bombay in 1896 in the midst of severe plague epidemic then raging in the City and immediately started work to investigate the causes of the outbreak and to devise a prophylactic. Thus the Department was initially started on 8th October 1896, a fortnight after plague was officially declared to exist in Bombay.

Plague vaccine was prepared and tested successfully on rabbits in December 1896. The subsequent success and the world-wide demand for this vaccine led to the choice of the present location of the Institute in 1899 for the expansion of the production work of the plague vaccine. On 10th August 1899 Lord Sandhurst, the then Governor of Bombay, performed the

opening ceremony of the "Plague Research Laboratory" as it was initially named under the stewardship of Haffkine. This was the beginning of the present Department of Vaccines.

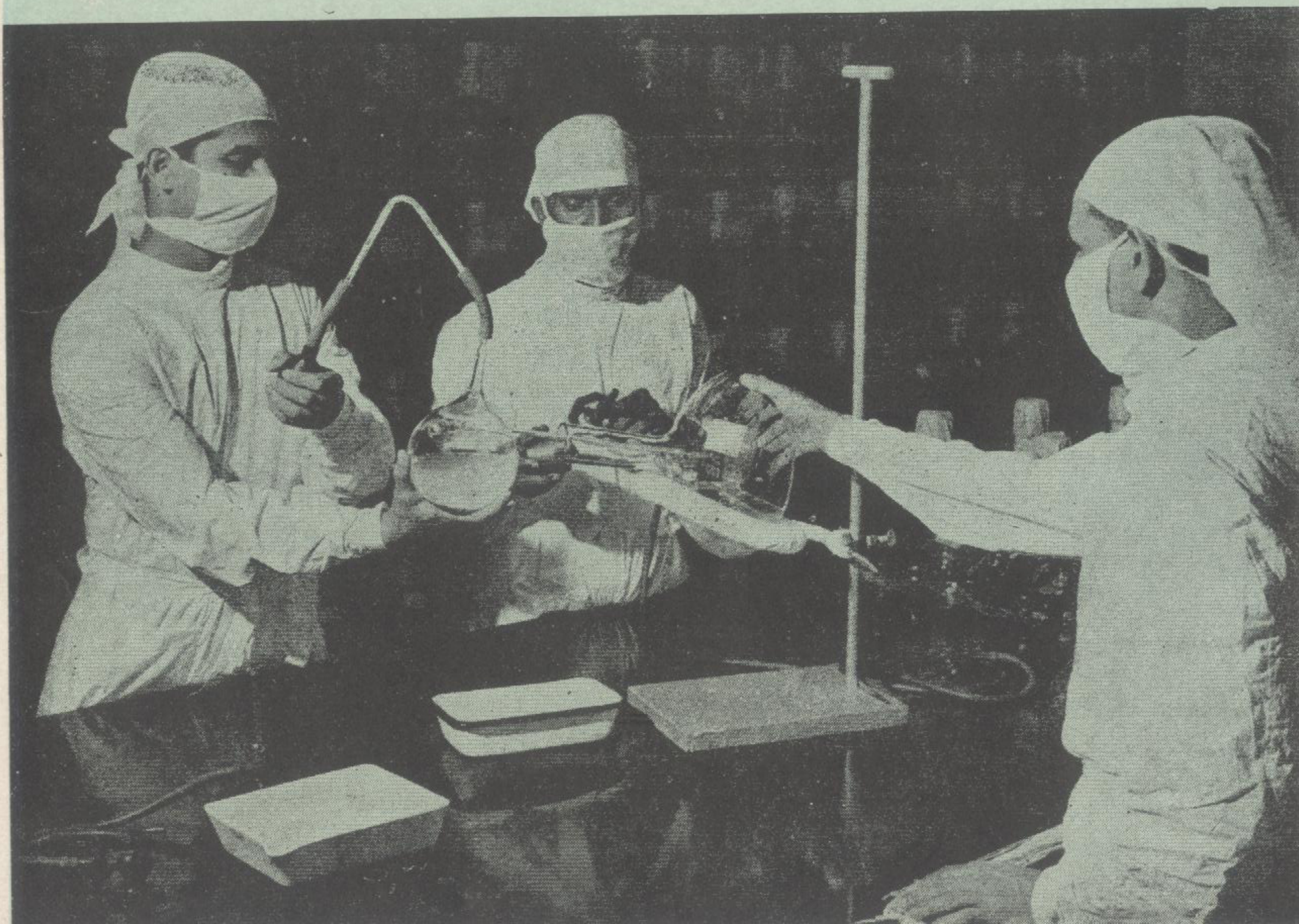
Subsequent to the initial commission to produce and supply plague vaccine to the world, the Department gradually undertook to produce and supply cholera and T.A.B. Vaccines. The department caters to the needs of the whole country and some foreign countries, for plague vaccine. It also successfully meets the requirements of the Maharashtra State for cholera and T.A.B. vaccines and in addition supplies large quantities to other States which have no facilities for production of these prophylactics.

The demand for plague vaccine has continuously been on the increase since the inception of the Department and peak supply of 23,478 litres was reached in 1947. The total quantity of plague vaccine supplied till the end of 1957 amounts to 2,63,407 litres. However, owing to intensive measures undertaken to prevent plague,

the demand for plague vaccine has shown a downward trend and at present stands at about one thousand litres per year.

The production of cholera and T.A.B. vaccines was stepped up in 1934 and increasing demands for both these vaccines led to complete reorgani-

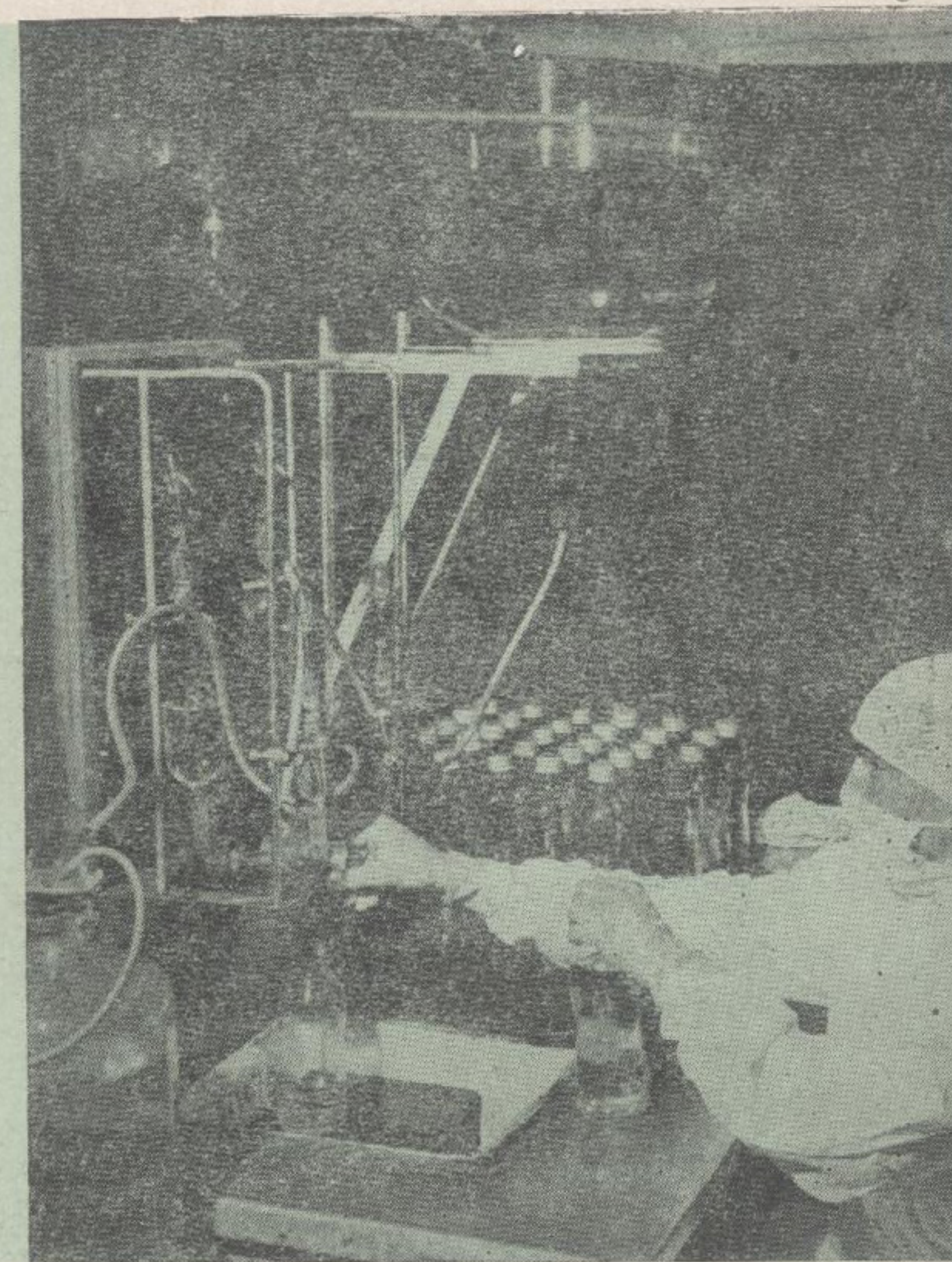
*Inoculation of media with
cholera culture*



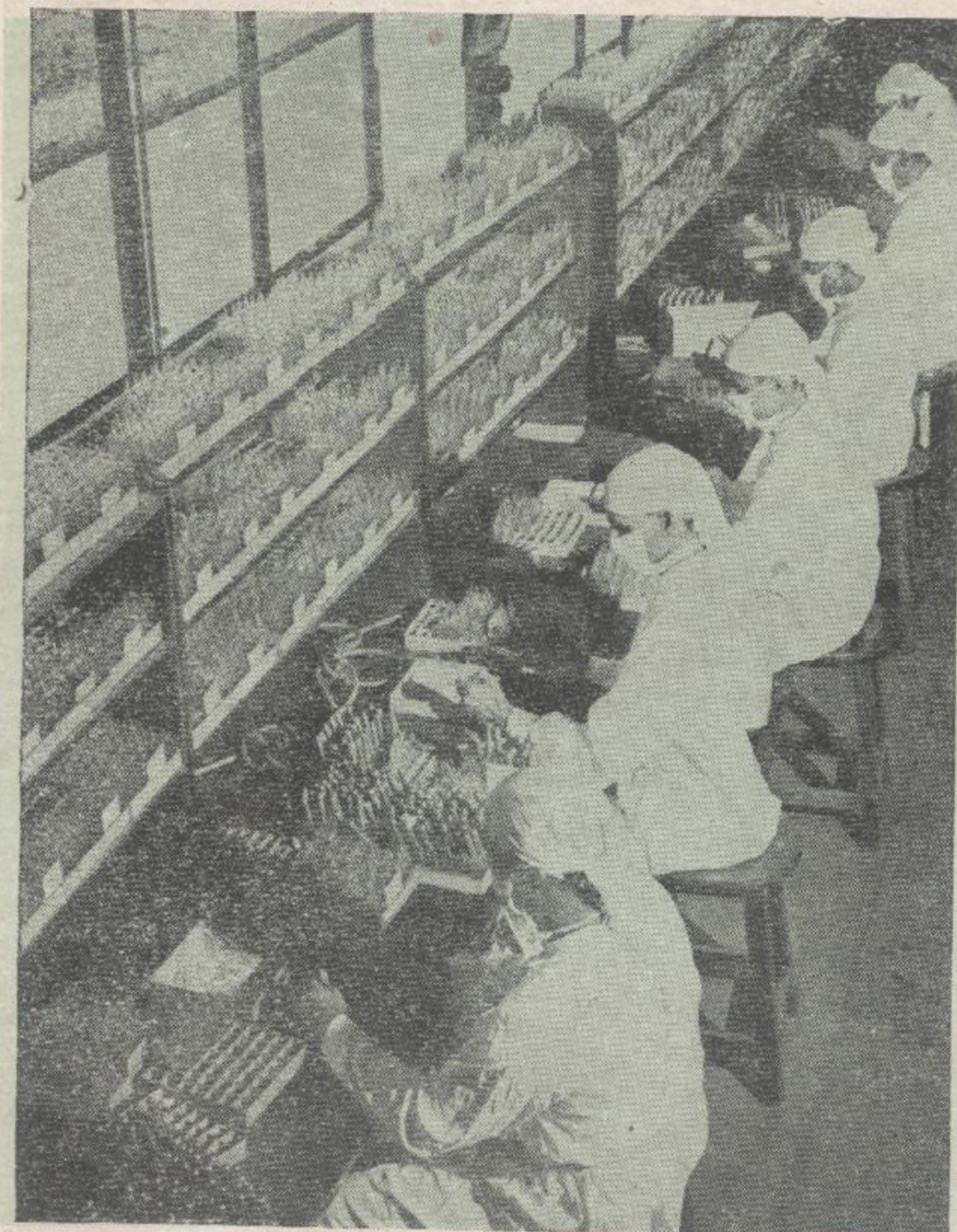
sation of the department in 1947. With the production capacity of 30,000 litres per year, the department is at present in a position to meet all the demands for these vaccines.

A Section of Public Health Chemistry and Bacteriology is attached to this Department since the early days of the Institute and has proved to be of great value in testing samples of water, milk, food, etc. for the control of their quality.

The Department has developed a method for measuring the virulence of plague organism. A method of bio-assay for the standardisation of plague, cholera and T.A.B. vaccines and a method for the production of a potent anti-plague serum have also been worked out. The old methods of preparing plague and cholera vaccines have been replaced by new ones. With the advent of anti-bacterial chemotherapy and the antibiotics, the chemo-



Filling of Glucose Saline



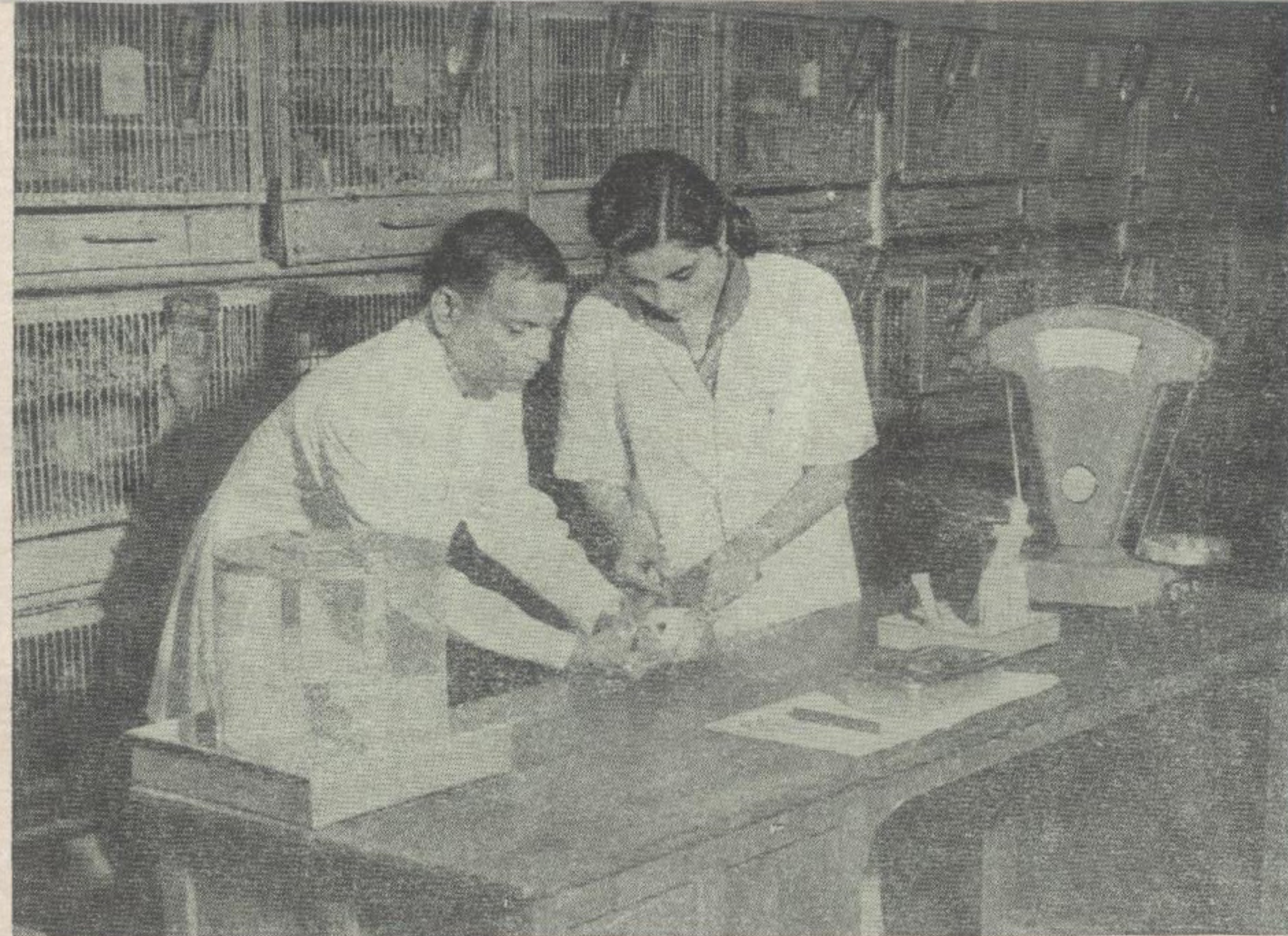
Sealing of ampoules

therapeutic, sulphadiazine, and the antibiotics streptomycin and tetracyclines have been tested for their efficacy against plague both in the laboratory as well as in field trials.

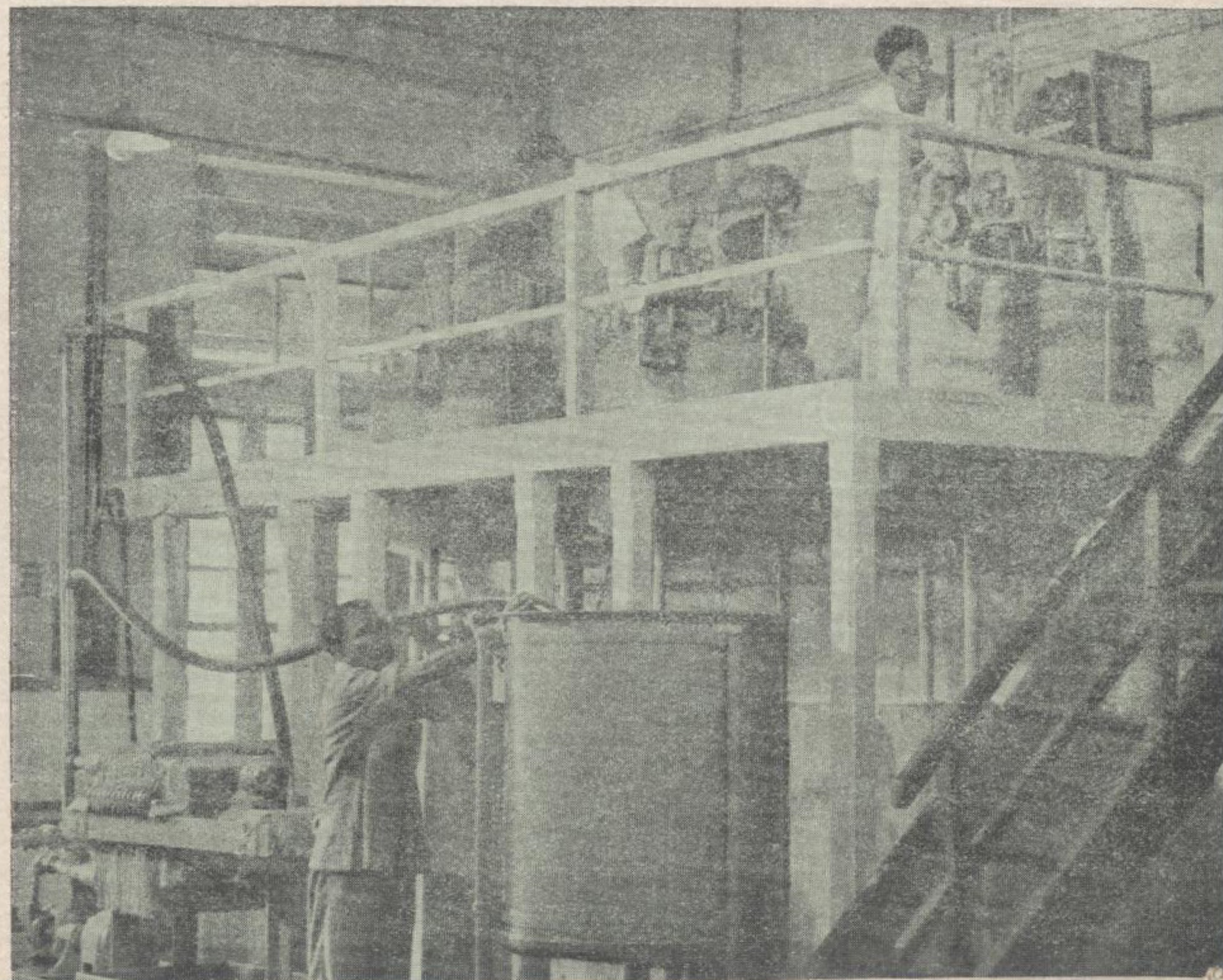
The Department in collaboration with Department of Antitoxins and Sera has prepared the triple vaccine for the combined prophylaxis against diphtheria, tetanus and whooping cough.

The Department collaborates with Plague Advisory Committee of the Indian Council of Medical Research, in researches on plague, and with the World Health Organisation in the standardisation of cholera vaccine. Facilities are available for post-graduate research in the field of bacteriology and immunology.

The Department also imparts training to technical and Public Health personnel especially in the field of plague preventive measures.



Biological testing of vaccines



Manufacture of protein hydrolysate

DEPARTMENT OF IMMUNOLOGY

India had to depend solely on foreign imports for all her requirements of antitoxins and sera till about 30 years ago. The outbreak of World War II and the consequent restrictions on imports led to the establishment of the Department of Antitoxins and Sera in the year 1940 with the object of producing the sera on a large scale. The Department first supplied the antitoxins prepared at the Institute in the year 1941, the total quantity being 42,000 millilitres. Subsequent progress has been quite phenomenal as is evident from the quantity of sera issued in the year 1960 which amounted to 1.7 million millilitres.

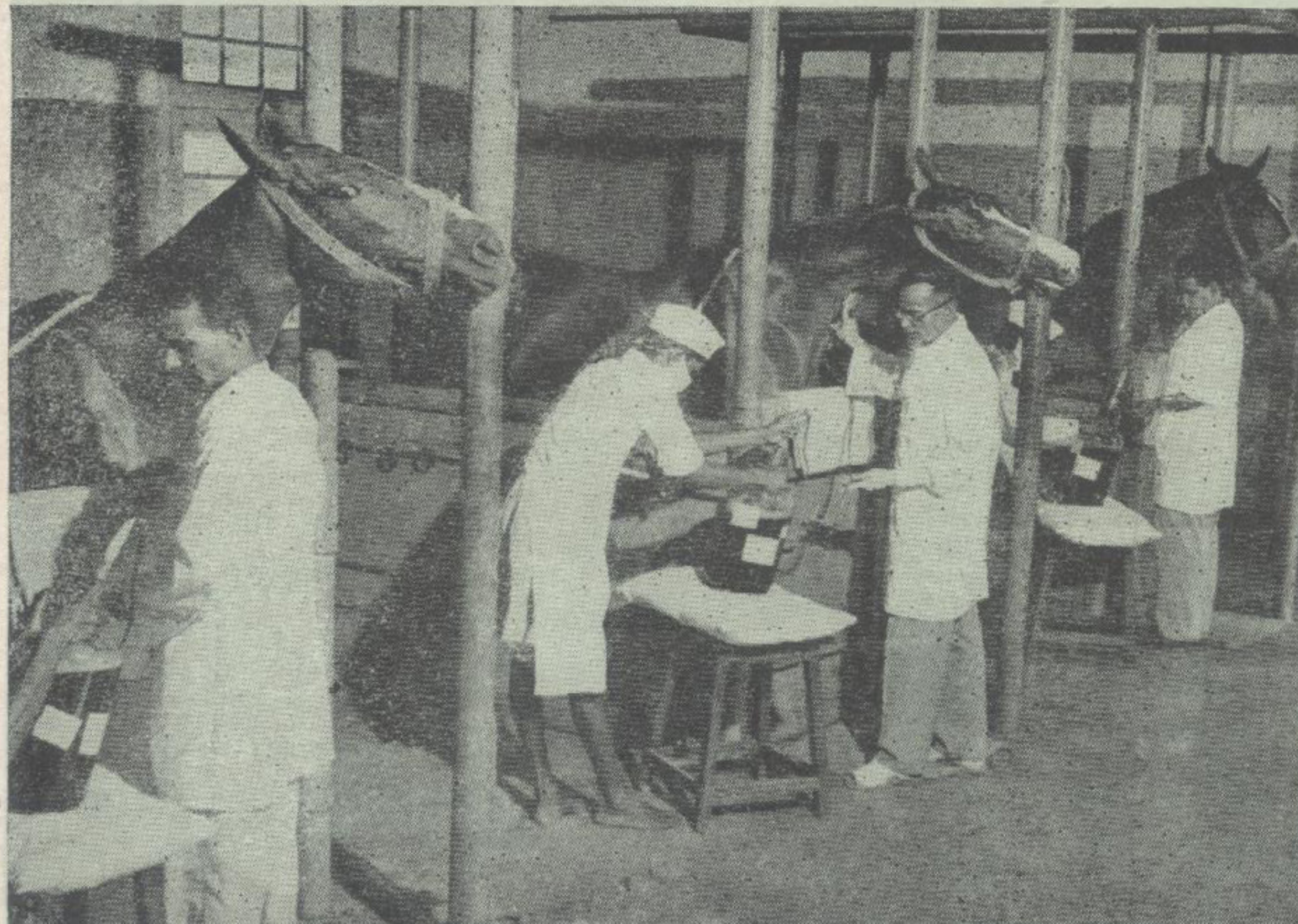
A great stride was made when the Department successfully produced a polyvalent anti-snake venom serum (antivenin) effective against the venoms of the four common poisonous snakes normally found in India, namely, Cobra, Krait, Russell's Viper and Saw-scaled Viper. Methods were developed to lyophilize sera and supply them as a sterile dry powder, which retains its potency under ordinary storage conditions for over 10 years. This has been of immense benefit

in the case of antivenin which can be kept in any kit handy for immediate use in the event of an accident necessitating its use.

In spite of the utilization to the fullest extent of all the available resources for the production of antitoxins, the production has been far below the requirements of country. In the year 1953, Government acquired a farm at Pimpri near Poona with an area of about 45 acres with

the object of developing there a full-fledged Serum Laboratory. Another 40 acres of land adjacent to the present farm at Pimpri have been acquired at Pimpri in 1961 for expansion of laboratory facilities and to house more horses necessary for the contemplated increase in production.

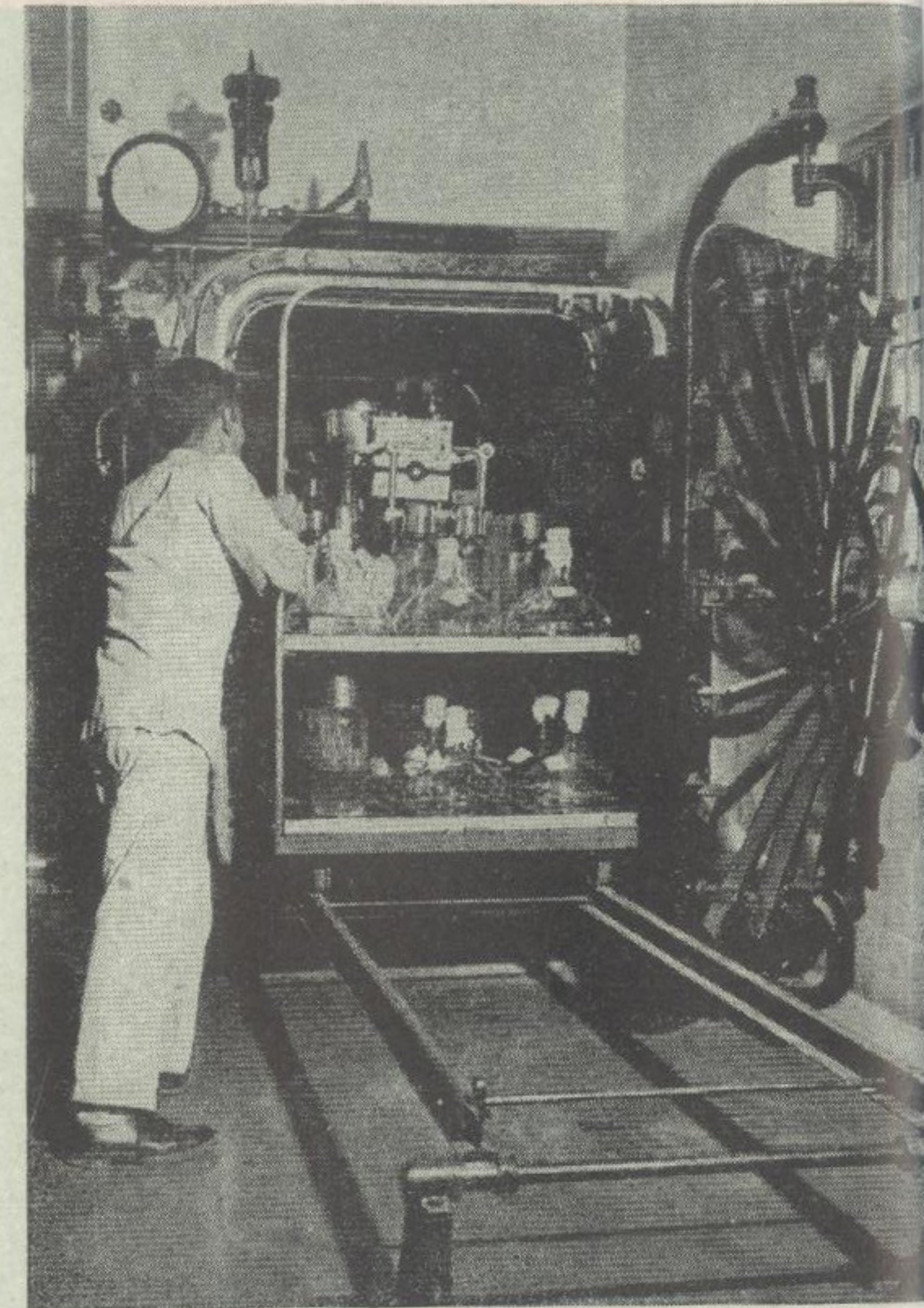
In addition to the production of antitoxins and sera, the Department also produces prophylactics



Bleeding of horses for manufacture of antitoxin

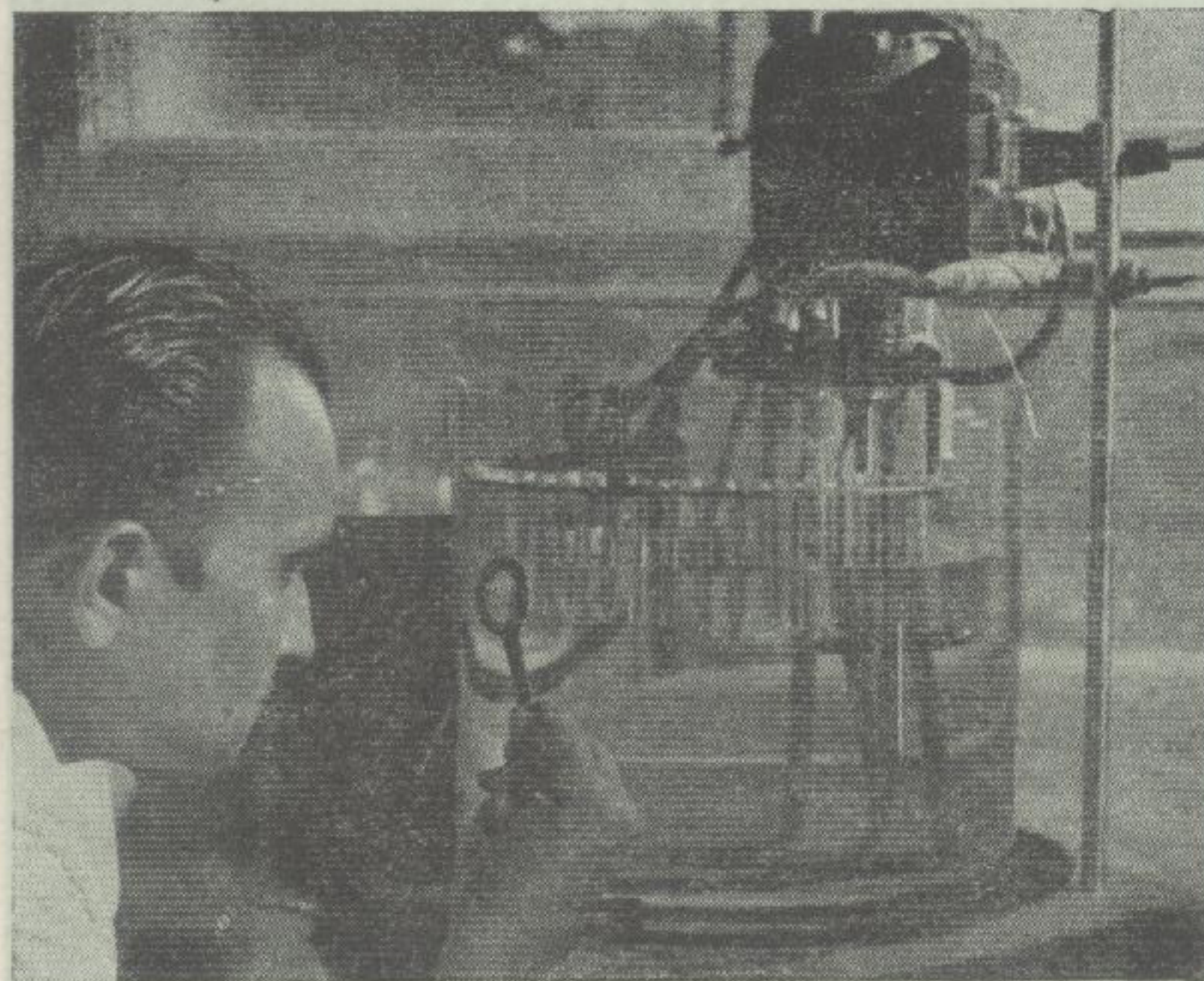
(toxoids) such as tetanus and diphtheria toxoids, the demands for which have gone up considerably. The Department has also successfully developed a combined prophylactic against tetanus, diphtheria and whooping cough, which is also in great demand, in the country.

Apart from the production of these life-saving biologicals, the Department has fully engaged itself in research work on problems relating to production of biologicals with special reference to the biochemical and immunological aspects. The important contributions of the Department in the field of research are the development and standardisation of the polyvalent anti-snake venom serum (antivenin), deve-



Sterilisation of media

lopment of a method for purification of anti-toxins and a method for the large-scale production of diphtheria toxin, giving higher and consistent yields. The antigenic and electrophoretic analysis of the venoms of the four poisonous snakes of India have been studied along with their enzyme activities. The Department admits students for post-graduate research.



*Estimation of titre of diphtheria
antitoxin*

DEPARTMENT OF VIROLOGY

The Department of Virology was established in the year 1922. Its function was limited at first to the manufacture of Antirabic Vaccine. Shortly thereafter, a treatment centre for rabies was established at the Institute which catered to the needs of the people of the then Bombay State and the surrounding regions. The Yellow Fever Unit was added in 1942 to provide an inoculation service to passengers travelling to Yellow Fever endemic areas.

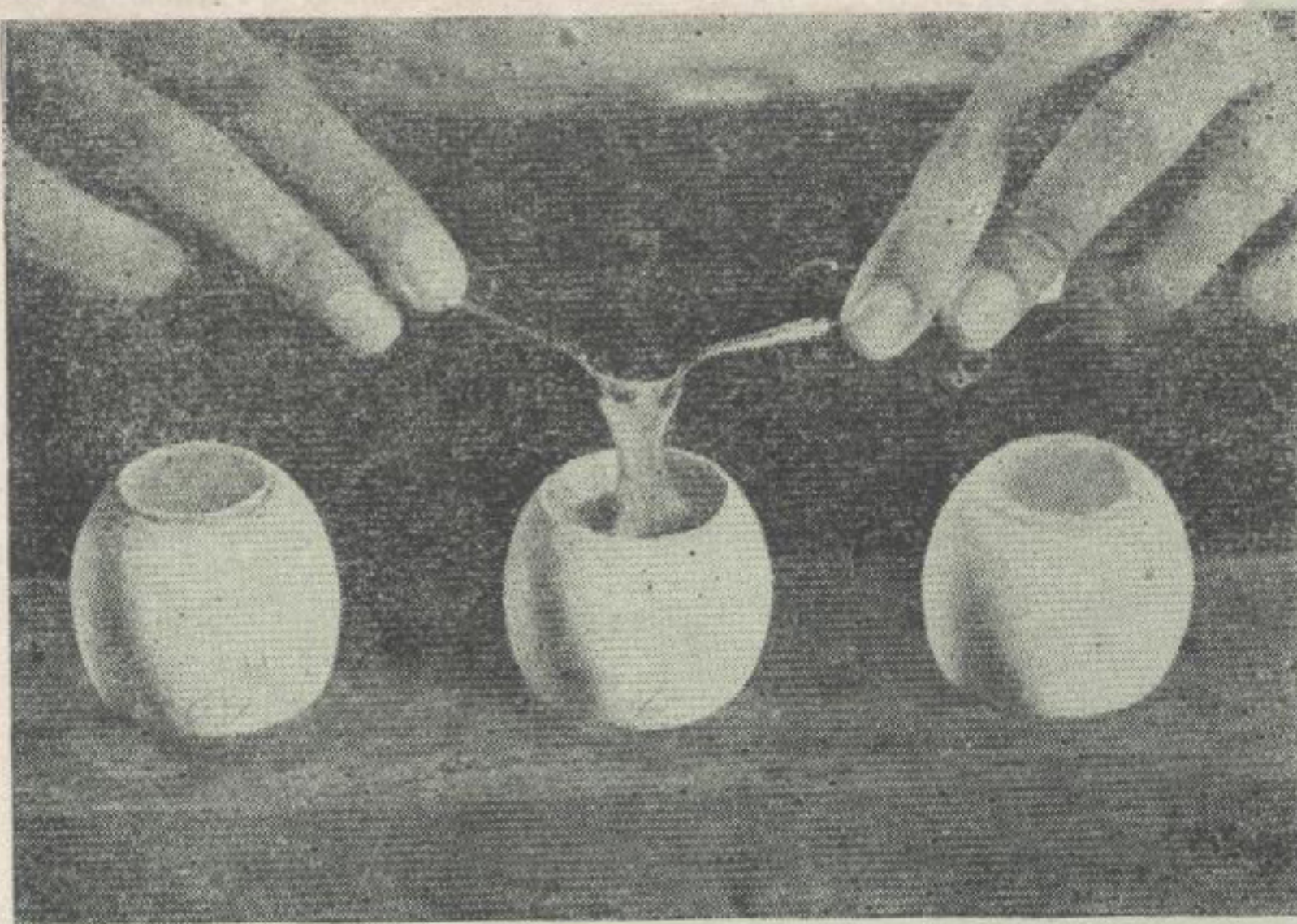
The Department prepares Antirabic Vaccine for the treatment of dog-bite cases both for medical and veterinary purpose and meets the entire needs of Maharashtra, Gujarat and other neighbouring States by supplying the vaccine to about 300 centres. The vaccine has been improved in quality from year to year and a considerable amount of study is going on to find better and more effective antirabic vaccines. Flury Vaccine for canine and veterinary use is being produced by this department. Hyperimmune antirabic serum of high titre is produced, and made available in lyophilized form to treatment centres which require it.

Vaccine was produced against Asian Influenza during the pandemic of 1958. Studies on techniques of preparation and standardization of egg line vaccines were also undertaken. The Department can undertake the preparation of influenza vaccine again, should such a need arise.

Every year, about 60 specimens (brain with salivary glands) are referred to this Department for diagnosis of rabies and for advice on treatment. Cases of undiagnosed fevers, suspected viral infections, etc. are frequently referred to this department by hospitals in the city (and also, on rare occasions from outside Bombay), to carry out isolation and serological confirmation of the responsible viral agents from these cases. Researches on rabies include studies on egg adaptation of rabies street virus strains, the adaptation of rabies virus to tissue culture, devising quick diagnostic tests for rabies which would obviate the long delay involved in biological tests and the purification of rabies virus by various methods including the extraction of infective nucleic acids from this virus.



Candling of eggs



Harvesting of yolk-membranes in the manufacture of vaccines

Other research work includes the production of a polyvalent influenza vaccine, studies on adenovirus infection in Bombay, studies on encephalitis in infants and children, studies in polio, coxsackie ECHO, and other enterovirus infections, pilot studies on polio vaccine and studies on preparation of a vaccine against the Kyasanur Forest Disease of Mysore.

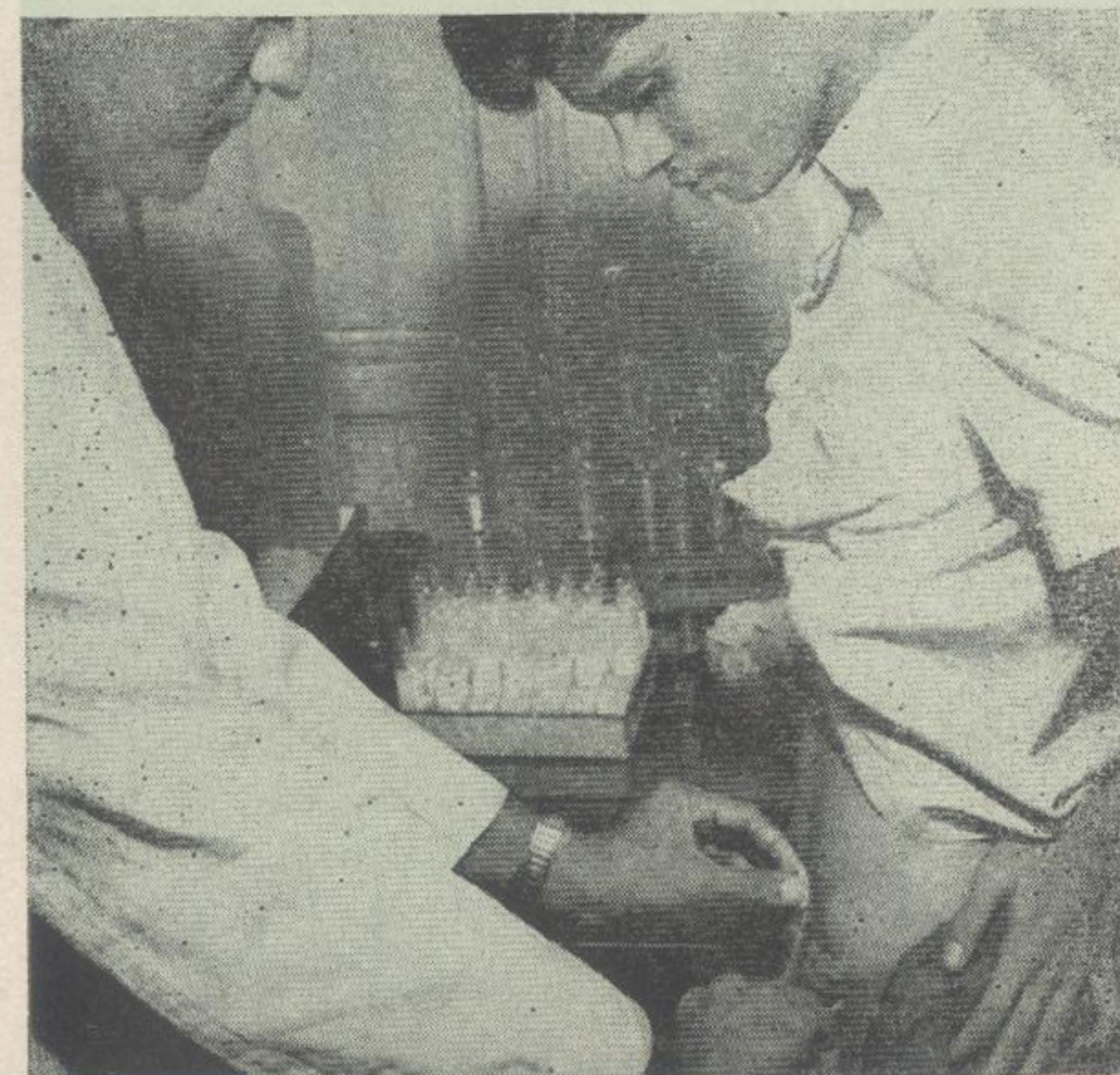
As a corresponding laboratory of the World Influenza Centre, the Department undertakes routinely, the isolation, identification and typing of viruses from sporadic or epidemic cases of respiratory tract infections. Influenza strains isolated are sent to the World Influenza Centre, London, for confirmation.

A small tissue culture section is maintained for preparing, maintaining and supplying cultures of different cell lines for the requirements of the various sections.

Viral antigens and antisera are supplied to such workers and to those institutions which require them for diagnostic or research purposes.

Short term training is given to workers and medical officers from other institutions, who wish to gain familiarity with some aspect of virological work.

Treatment for dog-bite



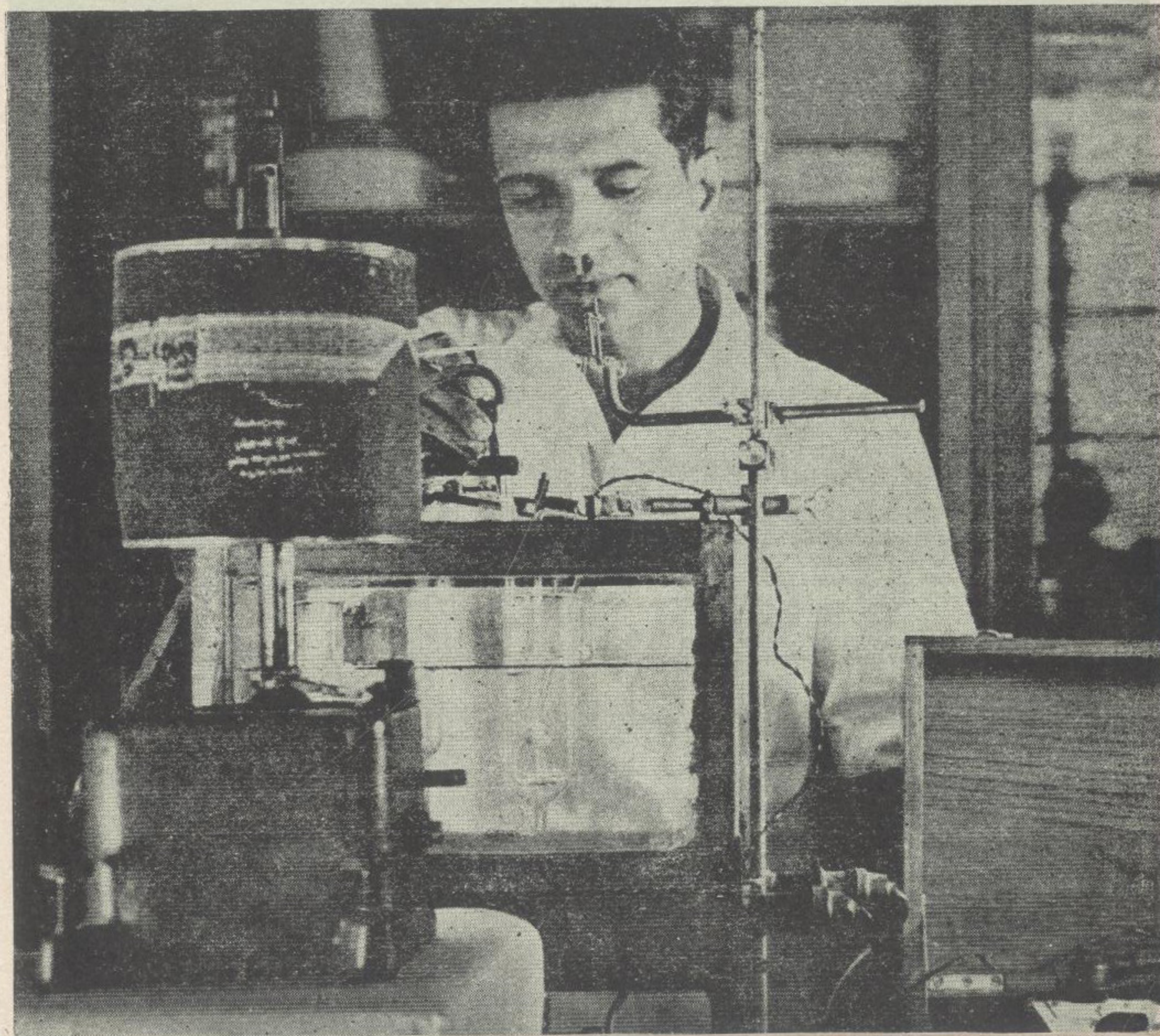
The history of the establishment of the Department of Pharmacology dates back to the year 1924, when a small unit was added to this Institute, financed by the Indian Research Fund Association. The unit has since been developed by the Government of Bombay into a full-fledged department.

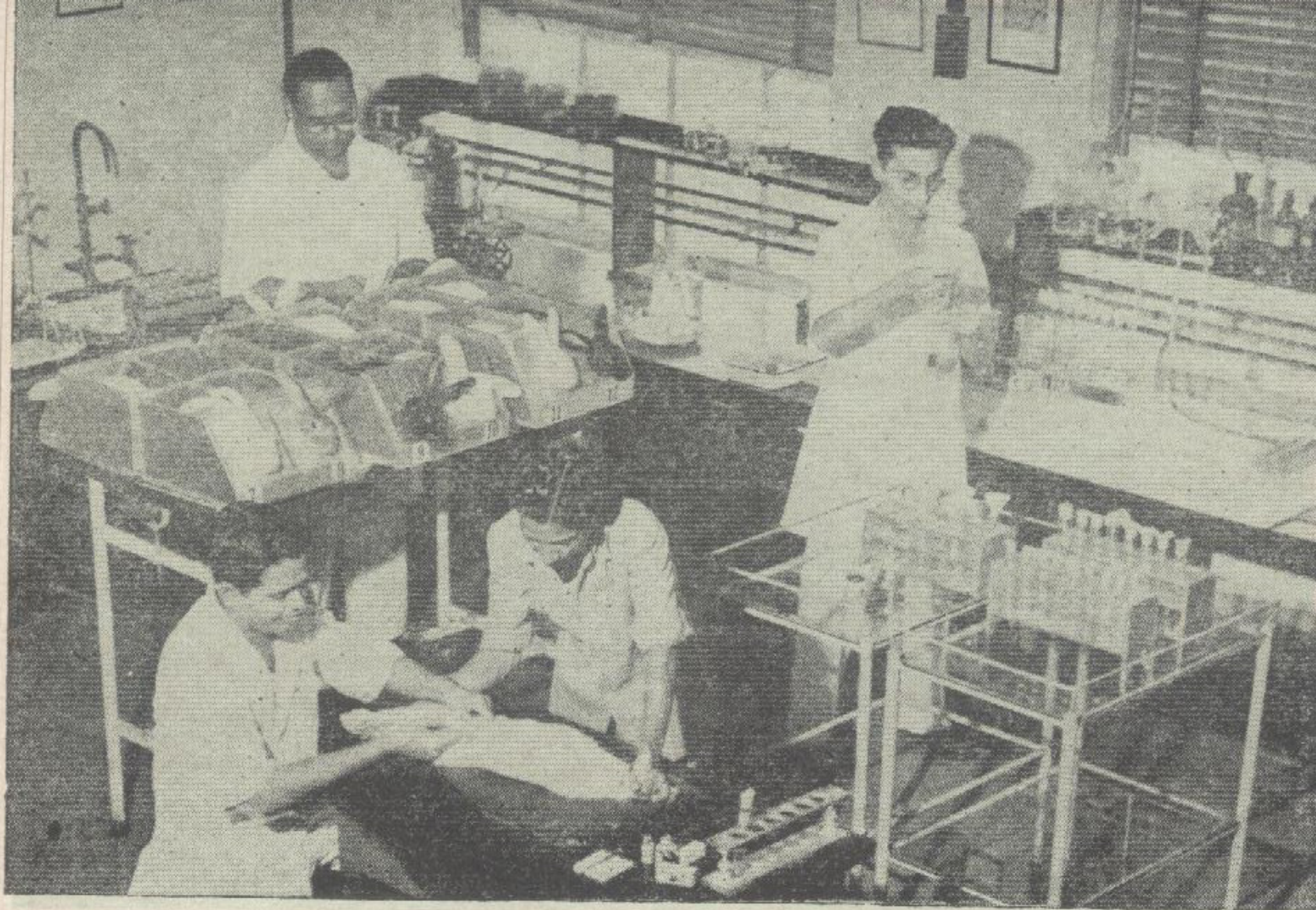
The Department has also been functioning as the Drugs Testing Laboratory where the drugs are tested for quality for the Directorates, of Drugs Control Administration for the States of Maharashtra and Gujarat, Prohibition, Excise and Police Departments of our State, Government Institutes and Hospitals, and private individuals. The Department is serving as an expert laboratory for testing of products that are sent here by pharmaceutical firms to ensure that the drugs, that are being manufactured, distributed or sold, are of standard quality. During the last 10 years 32,560 samples of drugs have been examined.

DEPARTMENT OF PHARMACOLOGY

*Bioassay of muscle
relaxants*

The Department has been carrying on researches to assess the therapeutic value of synthetic compounds for the development of newer drugs, in co-operation with other departments of the Institute, and to find out new methods of drug testing or to modify the existing ones. The Indian Medicinal Plants are being studied to assess their usefulness in treating cholera and to isolate the active principles. Problems of interest to the pharmaceutical industry in general are investigated.





Standardisation of Insulin on rabbits

Facilities are provided to students to take post-graduate degrees of the Bombay University. Several fellowships are also offered to undertake research in the pharmaceutical line.

The Department offers facilities for specialisation in various fields of drug testing which involve the use of pharmacological, chemical, biochemical, microbiological, serological, and pharmacognostical methods.

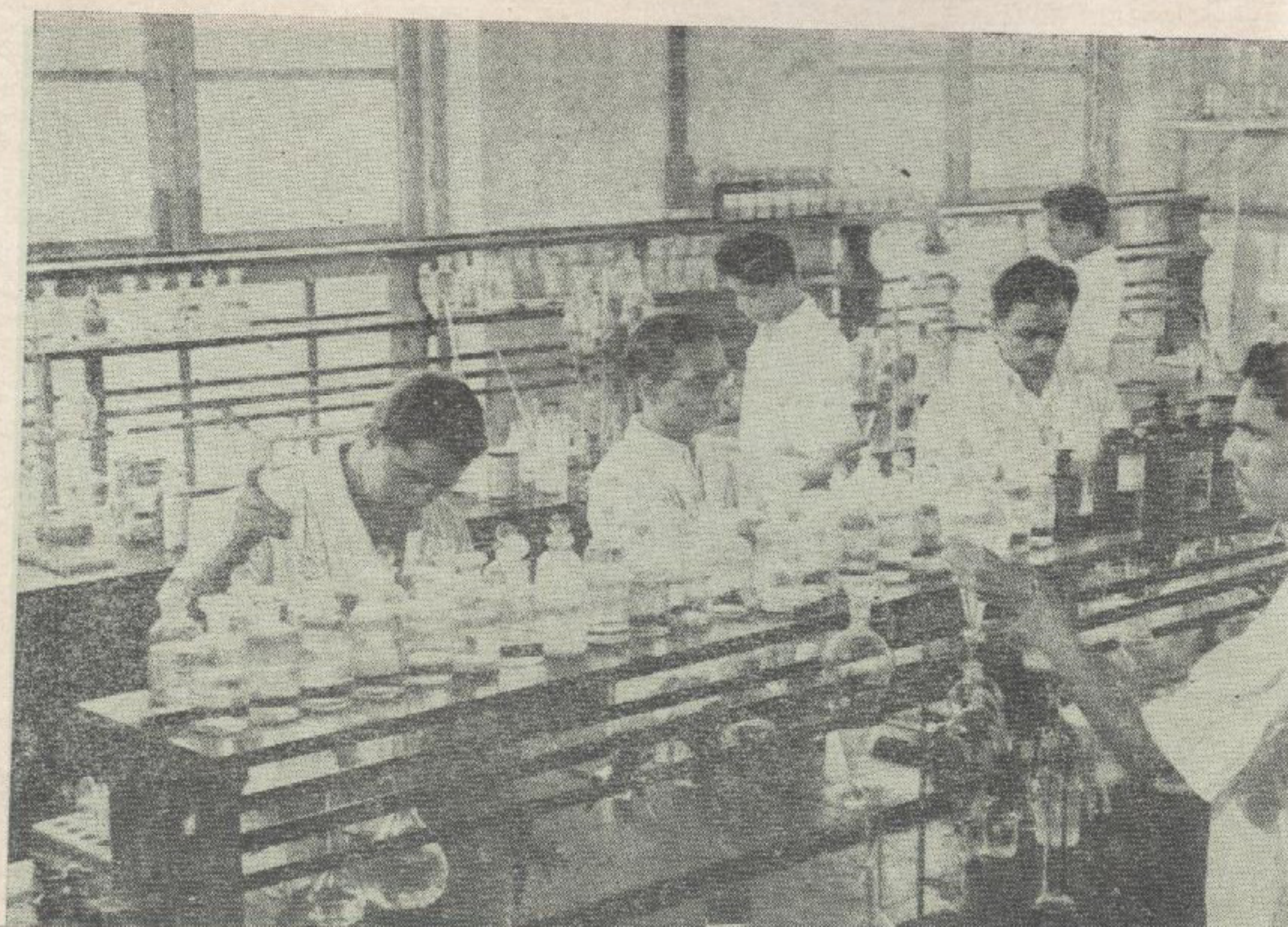
Significant contributions to research have been made in several directions. The most important species of the genus *Terminalia* which could be used in heart diseases has been discovered. The use of the Indian medicinal plant, *Sassurea lappa*, for the treatment of chronic bronchitis has been justified experimentally with the isolation of an alkaloidal fraction from the root of the plant.

A method has been developed in laboratory animals (infant rabbit) for study of fundamental problems on cholera and for testing anti-cholera drugs.

Important contribution has been made for development of oral antidiabetic drugs, with the technique of production of experimental diabetes in laboratory animals.

A new method has been developed for estimation of iodochlorohydroxyquinoline and diiodohydroxyquinoline in pharmaceutical preparations. A method for estimation of saccharine in prepared tea, was developed which is of considerable help in detection of saccharine, when substituted for sugar, in beverages and in pharmaceutical preparations.

Drug testing laboratory



DEPARTMENT OF CLINICAL PATHOLOGY AND DIAGNOSTIC REAGENTS

The activities of this Department can be said to have commenced with the starting of this Institute as a Plague Research Laboratory in 1896. Besides studies of plague, this laboratory was called upon to carry out additional diagnostic and investigational work on cholera, Malta fever (brucellosis), typhoid, diphtheria, malaria, relapsing fever and on different pathological tissues. This work grew up so much that a separate department of Clinical Pathology was established in the year 1905. This again was reorganised in 1938 into the Department of Clinical Pathology and Diagnostic Reagents.

Researches, both fundamental and applied, on the various infectious diseases of public health importance, and on improving the existing laboratory techniques, are carried out. Studies on cholera, tuberculosis, diphtheria, typhoid, syphilis, etc. have provided valuable information. Several improved methods have been evolved for the isolation of enteric pathogens, diphtheria organisms, and for carrying out pregnancy tests and preparation of stable and specific antigens.

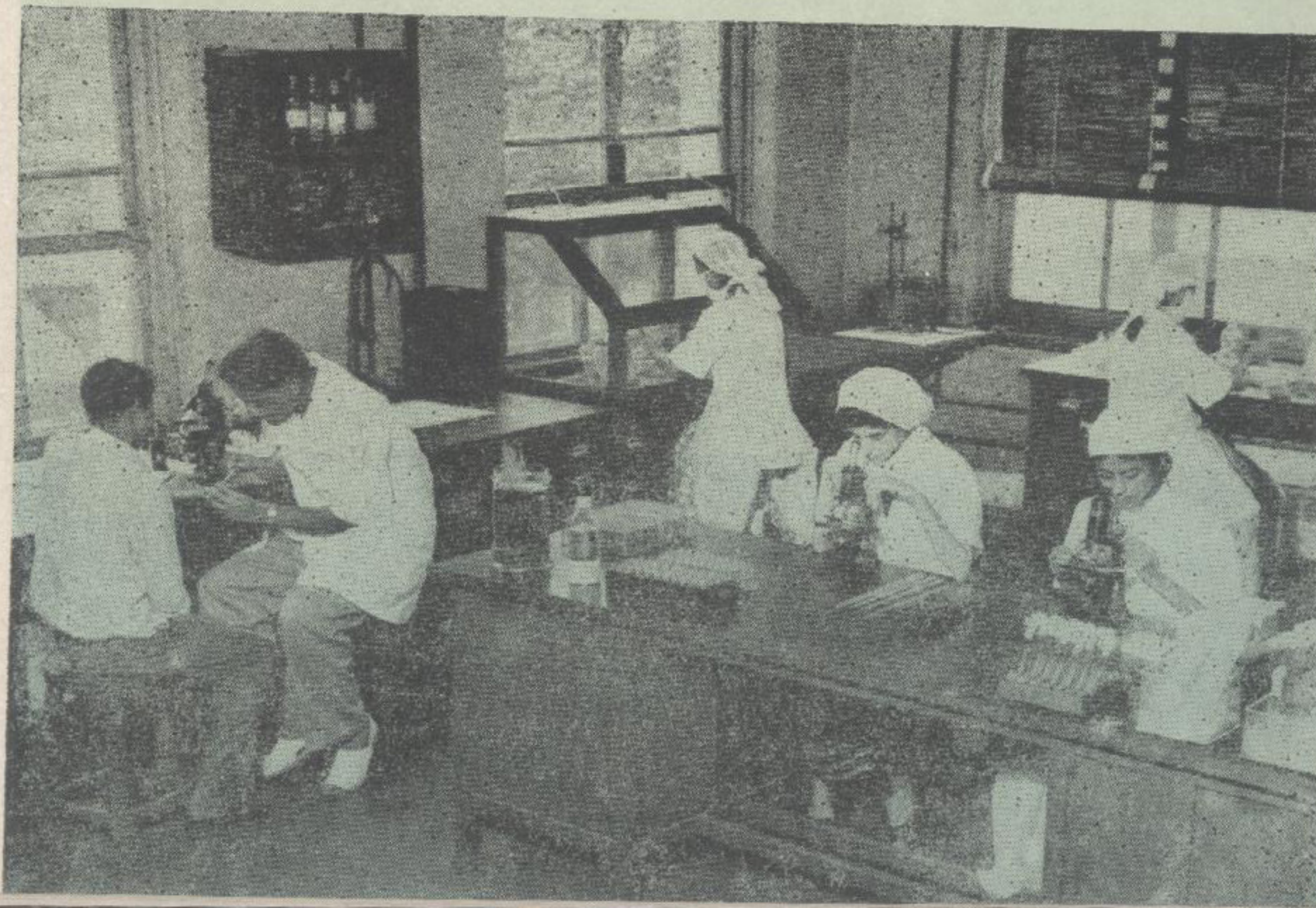
The department also functions as a Standard Reference laboratory to help smaller units in evolving out standard techniques, reagents, and apparatus. It also serves as a centre for investigations in Salmonella and Shigella infectious serology of syphilis, at the State level.

More than seventy different standard diagnostic reagents are prepared and supplied. To meet the increasing demands for these reagents, further expansion of this section is underway, which will help to make the country self-sufficient in these requirements.

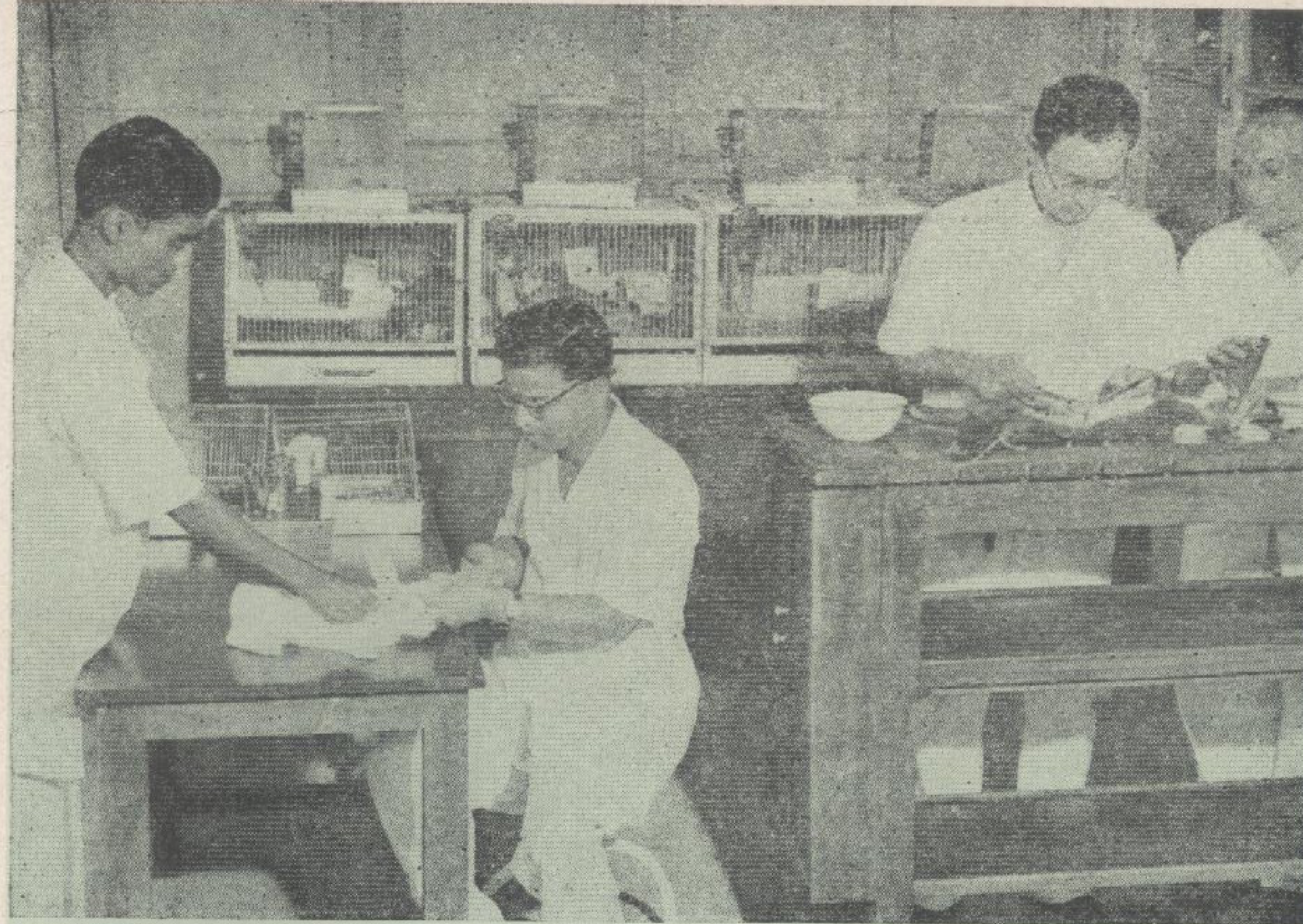
All types of pathological and bacteriological work, comprising of more than forty different tests are carried out by the Department. These include routine tests like

blood-counts, microscopic and bacteriological examination of stool, sputum, urine, serological tests for enteric infection, syphilis, and special tests like pregnancy tests, histopathological examinations, Rideal-Walker tests, antibiotic sensitivity tests, etc. Further tests for which facilities are not available elsewhere are also being added.

All laboratory investigations for infectious diseases such as typhoid, plague, cholera, dysentery, diphthe-



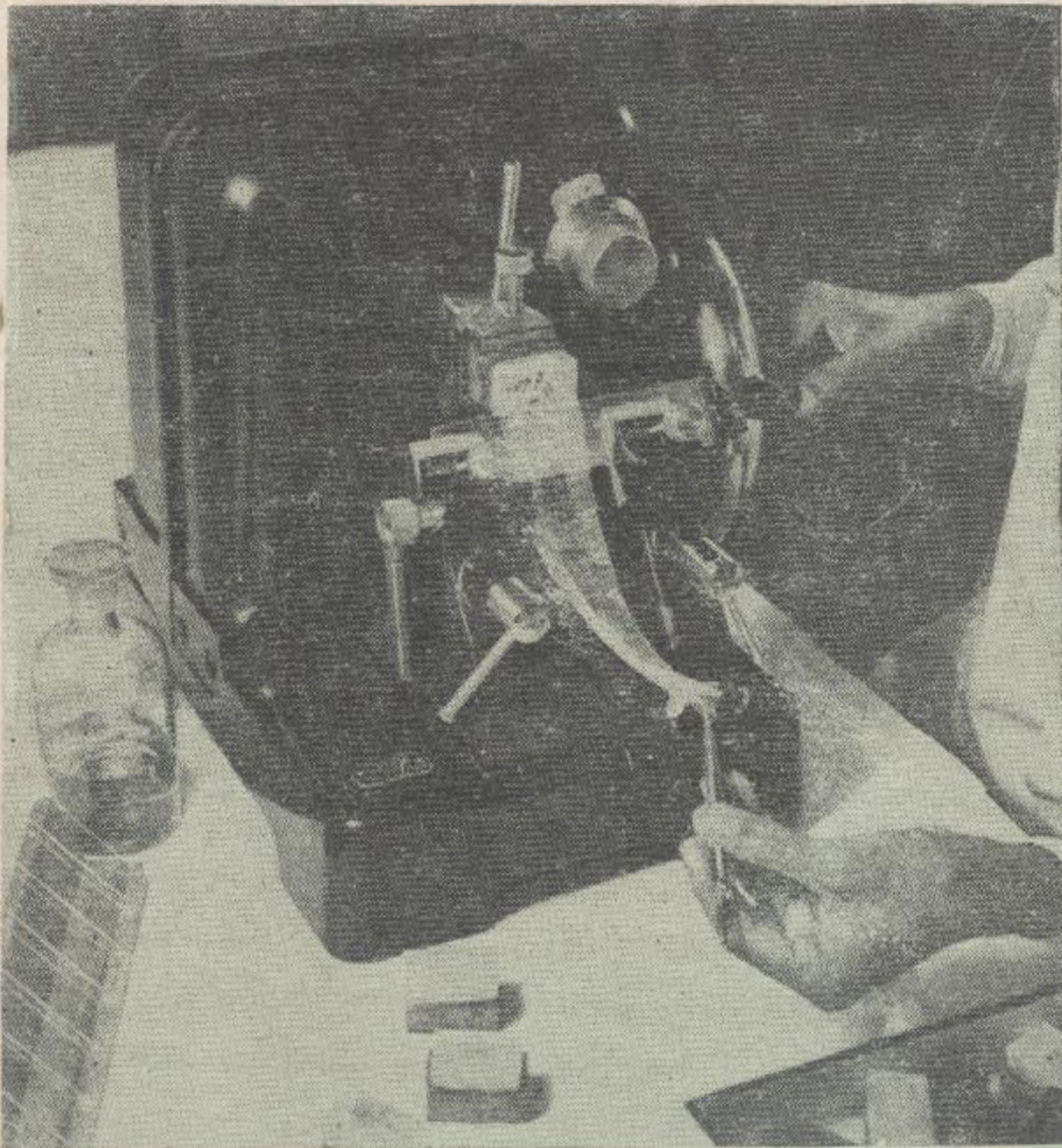
Examination of blood, urine and sputum



*Pregnancy Tests
on rabbits*

ria, tuberculosis, etc. are carried out free of charges. For other tests only nominal charges are levied.

Owing to repeated outbreaks of typhoid fever in the city of Bombay for several years, a separate unit called "Typhoid Unit" was sanctioned by the Government in 1948, to help the public and medical practitioners alike in the quick diagnosis, treatment, and segregation of patients with typhoid fever. On request from a medical practitioner anywhere from the city limits of Bombay, a doctor of this Unit visits the patient's residence to collect blood, urine, or stool samples for the specific tests and the results are intimated to the practitioner concerned, free of any charge. In the case of all positive cases, the executive Health Officer of the Bombay Municipal Corporation is also informed as typhoid is a notifiable disease.



*Micro-sections in the diagnosis
of cancer.*

This information helps him in taking precautionary measures to check the spread of the disease. This scheme has become very popular and is of great public health importance both to the Public and Health authorities.

This Department actively collaborates with the Public Health and Medical Departments of the State in investigating diseases of unknown origin. Experts from the Department are often sent to the field to investigate, collect clinical materials, and suggest remedies. For this a Mobile Unit has been separately formed, since 1960. The function of this unit is to proceed at short notice to any place or locality in the state of Maharashtra, to carry out on-the-spot investigations on outbreaks of peculiar diseases the causes of which may not be clear.

A large number of medical and non-medical personnel are trained up in the department in clinical diagnostic work every year. This department is also a recognised laboratory for post-graduate work for M.Sc., F.C.P.S., and D.P.B. degrees of the University of Bombay and on an average four post-graduate students work every year.

DEPARTMENT OF BIOCHEMISTRY

The department of Biochemistry was started in 1924 to undertake all Biochemical work connected with the production of vaccines and sera. There was also a growing awareness to introduce chemical and biochemical tests for clinical diagnosis and to render all possible services to the hospitals and to the medical profession.

In the early years, work was concentrated on establishing liquid media for the production of plague and cholera vaccines. Eventually this resulted in the introduction of casein hydrolysate medium which is now used for the large scale production of these vaccines. Chemical work, connected with the preparation of therapeutic sera and antitoxins was initially taken up by this department until a separate department was established later on. Researches on the nutrition and respirations of the various strains of plague organism were carried out in order to study the optimum conditions for the growth of

the organism for vaccine production.

On the clinical side, this was one of the first laboratories to introduce biochemical tests for clinical diagnosis. In this connection, investigations were carried out on the biochemistry of sprue, basal metabolic rate, kidney function, various types of anaemias and the establishment of normal standards wherever necessary.

At present, a wide variety of about 50-60 biochemical tests are carried out in this department for the benefit of the local hospitals and the public. These include some of the simple routine estimations and other special tests such as functional tests, hormone and enzyme assays, chromatographic and electrophoretic analysis.

The department has a programme to set up control and reference laboratory services and to help in introducing simpler and standard procedures for clinical work. Special emphasis is given to study and

Studies on cell respiration



adopt micro methods using modern techniques.

Training of medical technologists and other students is also part of the activity of the department. A few students are admitted to work for their postgraduate degrees and laboratory facilities are offered to research fellows sponsored by the C.S.I.R., Government of India, and Bombay and Haffkine Institute Diamond Jubilee Unit.

Research work is carried out on (1) studies of biochemical disorders in children, (2) study of carbohydrates-protein complexes in clinical materials, (3) chemical and biochemical studies on meconium, (4) studies on the biochemistry of the plague organism and (5) studies of co-factors in protein biosynthesis.

Media Section

This section supplies various media required for the manufacture of vaccine and other media used for diagnostic work and sterility tests. Many reagents and stains are also prepared in bulk and made available to the hospitals and other laboratories. The preparation of any other special media is also undertaken on request from parties.

The Department also meets a heavy demand from Government Hospitals from Maharashtra and other outside States for parenteral preparations such as normal, hypertonic and glucose salines, glucose solutions, protein hydrolysate and distilled water.

In 1938, the Department of Entomology was established to study arthropod (insect) borne diseases, and particularly plague epidemiology with reference to fleas and rats. Identification of snakes, fleas, mosquitoes and a number of insects of medical importance is undertaken on behalf of local bodies and Government agencies. The Department also undertakes the testing of insecticides and rodenticides.

A Rat Unit has been set up for studying rat population and the state of their immunity. This unit works in collaboration with the Bombay Municipal Corporation. On an average 2,800 rats are received every day at the Institute from the different wards of the city. All rats are classified according to species and the dead rats are examined for signs of plague infection. Besides providing valuable information on the subject of epidemiology, this work helps the Corporation in the detection of plague infection if any in any part of the city. The Department has developed a rat-trap which is widely used.

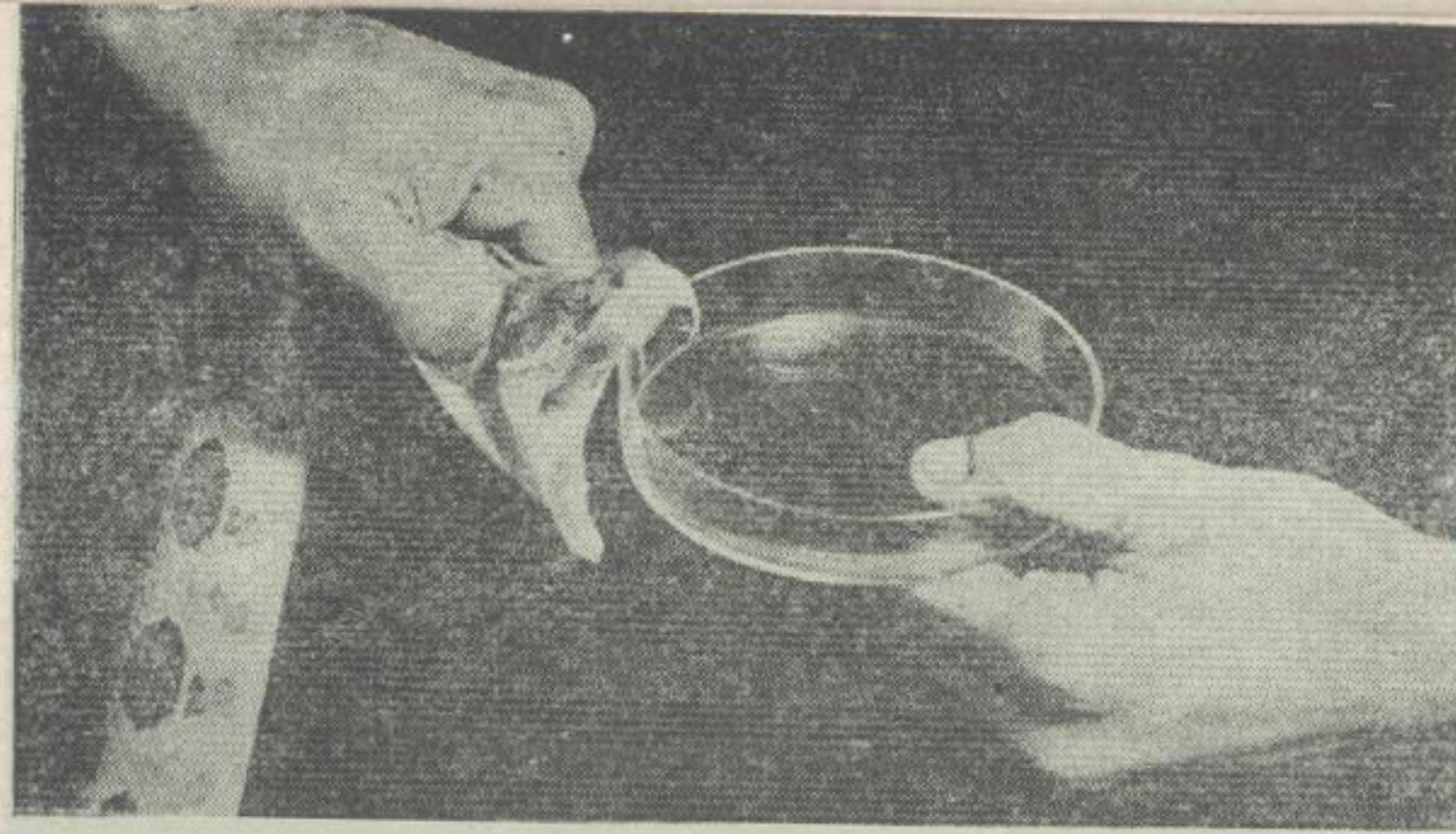
DEPARTMENT OF ENTOMOLOGY

The Department maintains a large number of each of the four types of poisonous snakes for the collection of venom. These venoms are supplied to Serum Department and other laboratories for manufacture of anti-venin, for biochemical research, and therapeutic use. An open-air snake farm has been constructed for rearing snakes in their natural surroundings.

The ecological studies of parasites living on the body of rats show significant specificity of fleas to specific rats. Breeding of fleas is undertaken with



Snake farm



Milking of snake (Russell's viper)

a view to studying the food requirements of the larvae and its effect on the sex ratio in adult fleas. These studies give very valuable information about the role of fleas in the transmission of plague. Fleas are becoming resistant to inorganic insecticides and therefore studies were undertaken to determine the pulicidal value of pyrethrum.

Biometrical studies of rats have enabled the proper classification of Bombay rats. The study of their burrowing and food habits is expected to help in rat control. Experiments on the susceptibility of rats, in Bombay City, to plague infection have revealed that two species of rats, namely, *Rattus rattus* and *Rattus norvegicus*, have almost become immune to plague. Physiological studies on the development of the houseflies with reference to the influence of endocrine glands are in progress.

The ecological studies of the common poisonous snakes have given very valuable data which will help in the breeding of snakes and increasing the output of venom.

Facilities are available in the Department for post-graduate research in Entomology and allied subjects. Classes are conducted for training of epidemiological workers in plague control measures.

DEPARTMENT OF CHEMOTHERAPY

The shortage of quinine during World War II prompted the Institute to explore the possibilities of manufacturing synthetic antimalarials. The importance of chemotherapy as a valuable tool to conquer bacterial infections was clearly emphasised with the discovery of sulpha drugs. The Department of Chemotherapy was established in 1940 for the discovery of newer drugs. The Department, in close co-operation with other departments, soon proved the efficacy of sulphathiazole in the treatment of plague, in some bacterial infections, and in the treatment of experimental malaria in monkeys. With the assistance of Indian Council of Medical Research a unit was set up for the study in chemotherapy of malaria using *Plasmodium gallinaceum* in chicks and *P-berghii* in mice.

The optimum conditions for the laboratory preparation of important antimalarials like atebrine, chloroquin and paludrine, antitubercular compounds such as para-aminosalicylic acid, isoniazide, and anti-

leprosy drugs such as diamino-diphenylsulphone, were worked out. Processes for the preparation of intermediates in the manufacture of chloramphenicol were worked out and patented.

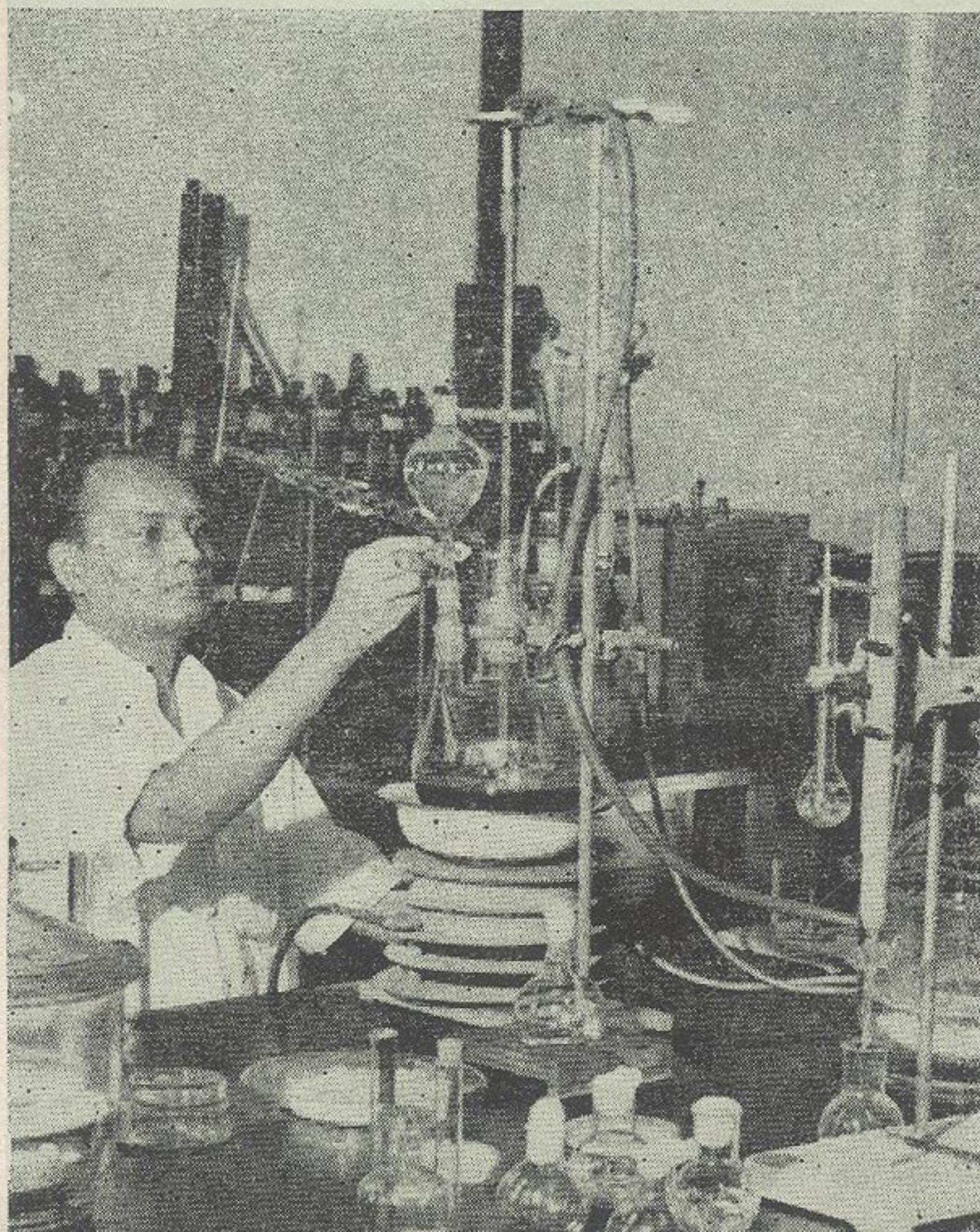
When the new process for the manufacture of sulphathiazole was worked out and patented, a pilot-plant was set up to study the large scale manufacturing conditions. The optimum conditions for the large-scale preparation of other valuable synthetic drugs and intermediates have also been worked out.

In recent years, the work has been extended in search of drugs, for the cure of hypertcutin, hypoglycaemia, analgesia, diuresis, and of stimulants of the central nervous system. The department has worked out processes for the manufacture of oral antidiabetic drugs and patented them.

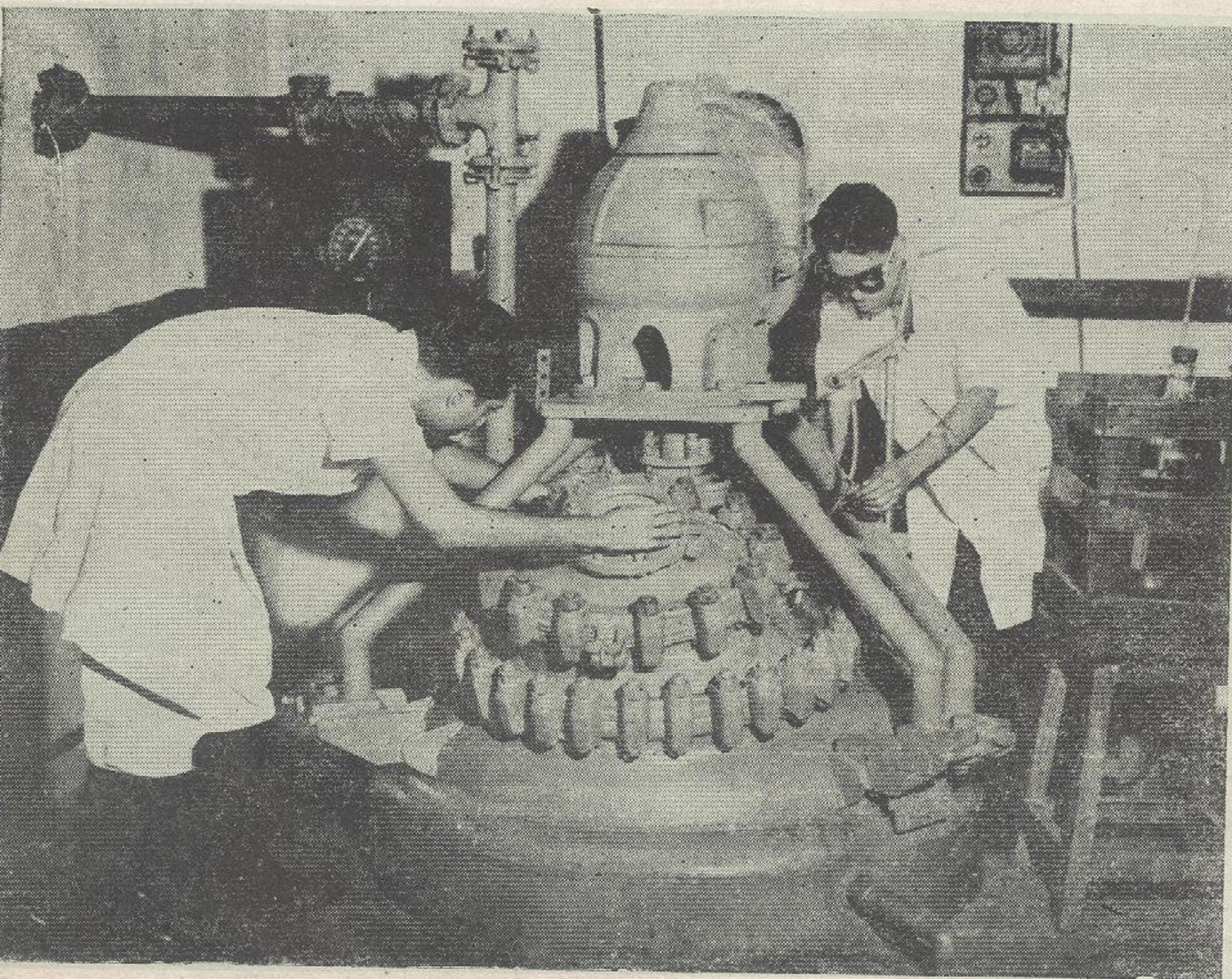
To meet the shortage of imported antiseptic fluids during the war, the Department undertook the manufacture of an antiseptic known as "Pemon" for supply to State Hospitals and dispensaries. The

manufacture of organic mercurial compounds for use as preservatives in vaccines was also undertaken. Since then, the requirements of the Department of Vaccines and of other Institute are being regularly met with by the Department.

In the wake of famine at the end of World War II and of malnutrition in the Province, the Government felt the need of distributing vitamin tablets in scarcity areas. The Department



Synthesis of new drugs



Manufacture of sulphathiazole

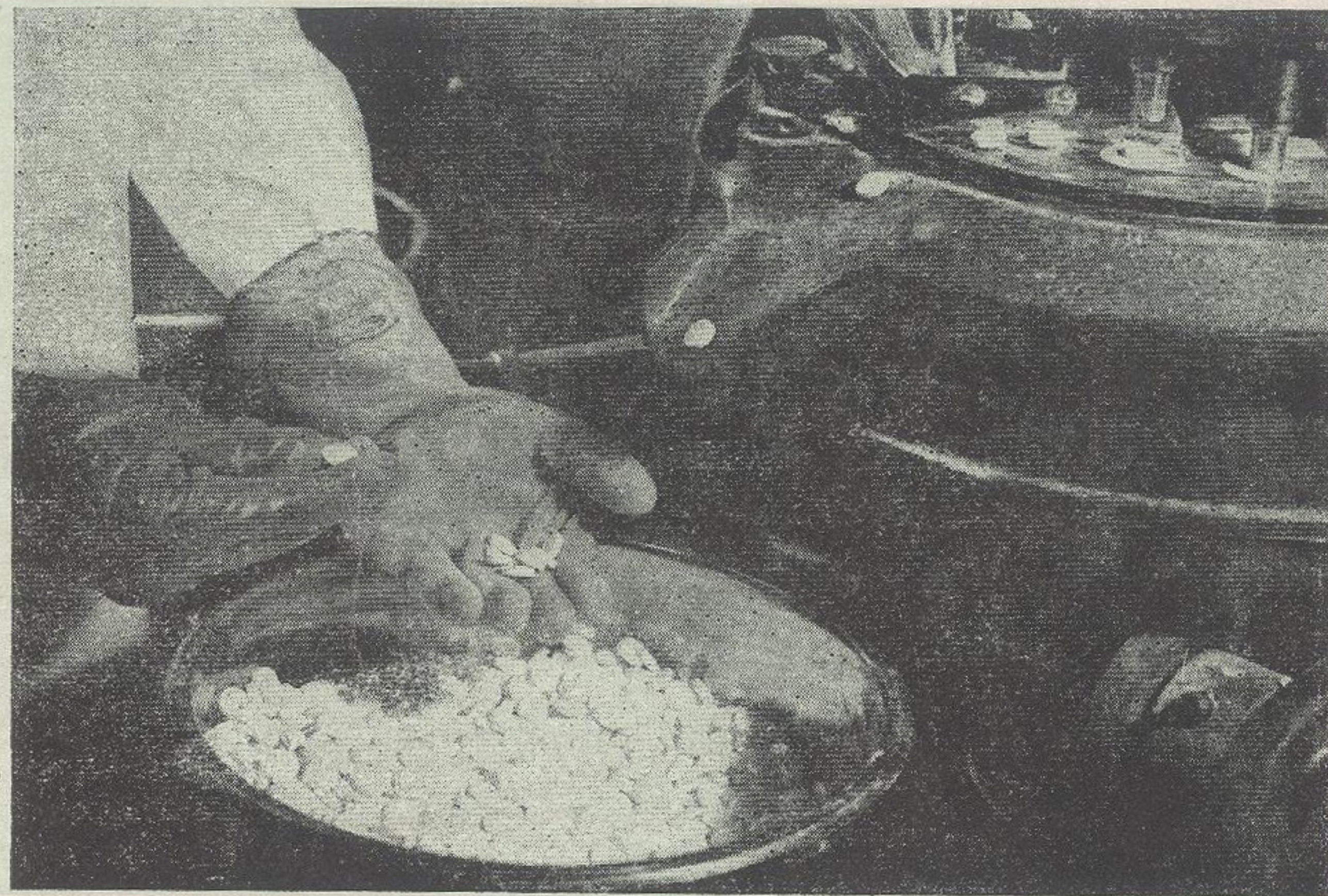
soon developed a process for the manufacture of a cheap and odourless vitamin A concentrate from the shark liver oil produced by the fisheries department. The equipment for the same was designed in the Department and was fabricated locally. The concentrate thus obtained was incorporated with milk powder and cocoa and made into very palatable vitamin A-D tablets. Similarly, multivitamin tablets were also prepared for distribution in scarcity areas. The Tablet Department set up at that time is now used for preparing vitamin products, sulpha drugs, and other products for the use of State Hospitals, dispensaries and Employees State Insurance Scheme.

As a result of large scale laboratory work done in the Department, a scheme for the large-scale production of Penicillin was proposed and because of the initiative then shown by

Maj. Gen. Sokhey, the Penicillin factory at Pimpri has now become a reality.

A few years ago, on receiving complaints from Leprosy Clinics that hydnocarpus oil injections available in the market were producing severe reactions and abscesses, the Department undertook the manufacture and supply of this product. Even now, the Department has been preparing and supplying injections of Solapsone for the treatment of leprosy.

Facilities are available in the Department for post-graduate research work in organic chemistry and chemotherapy. The training in manufacture of drugs and their quality control is also imparted to the students of Pharmacy Colleges.

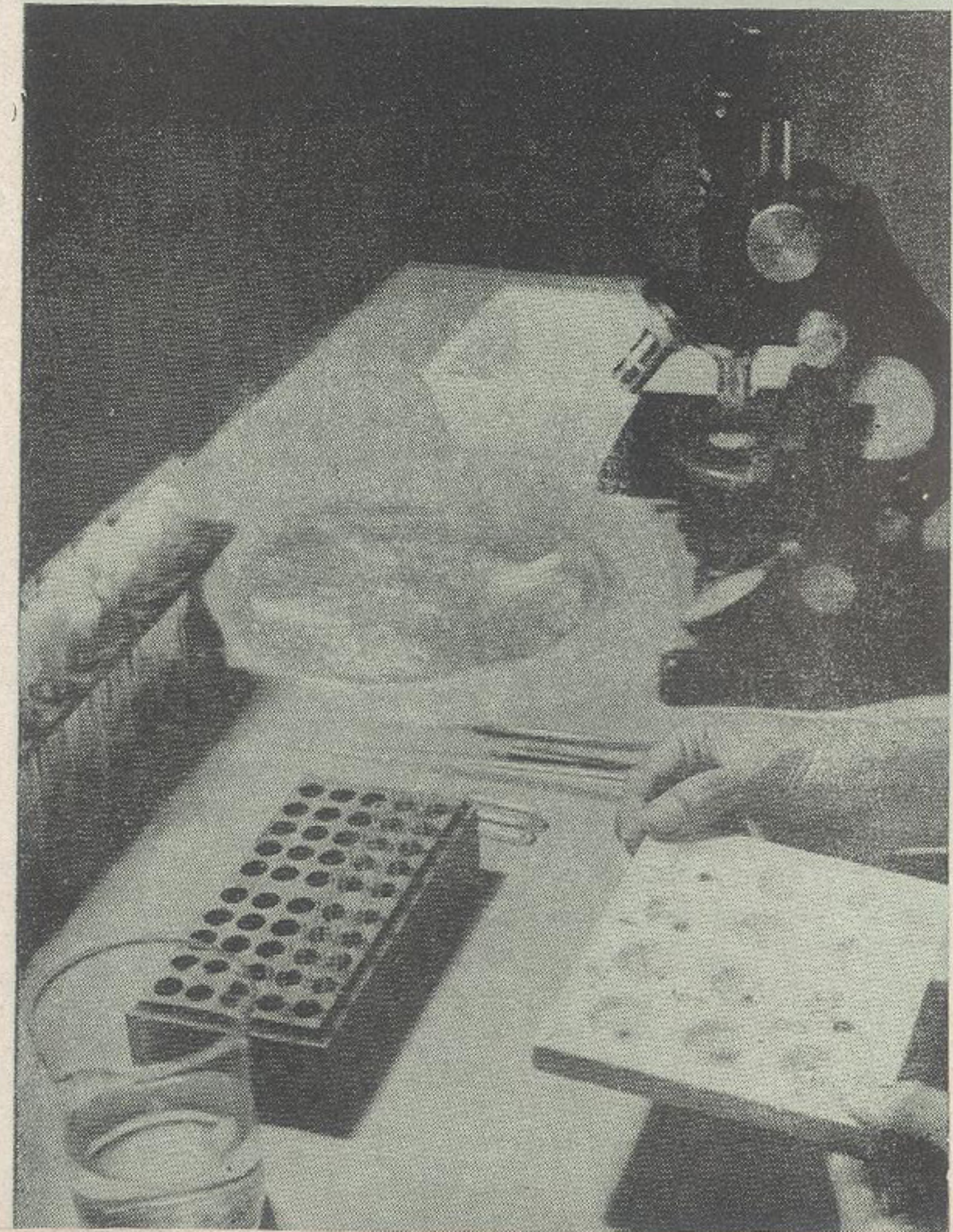


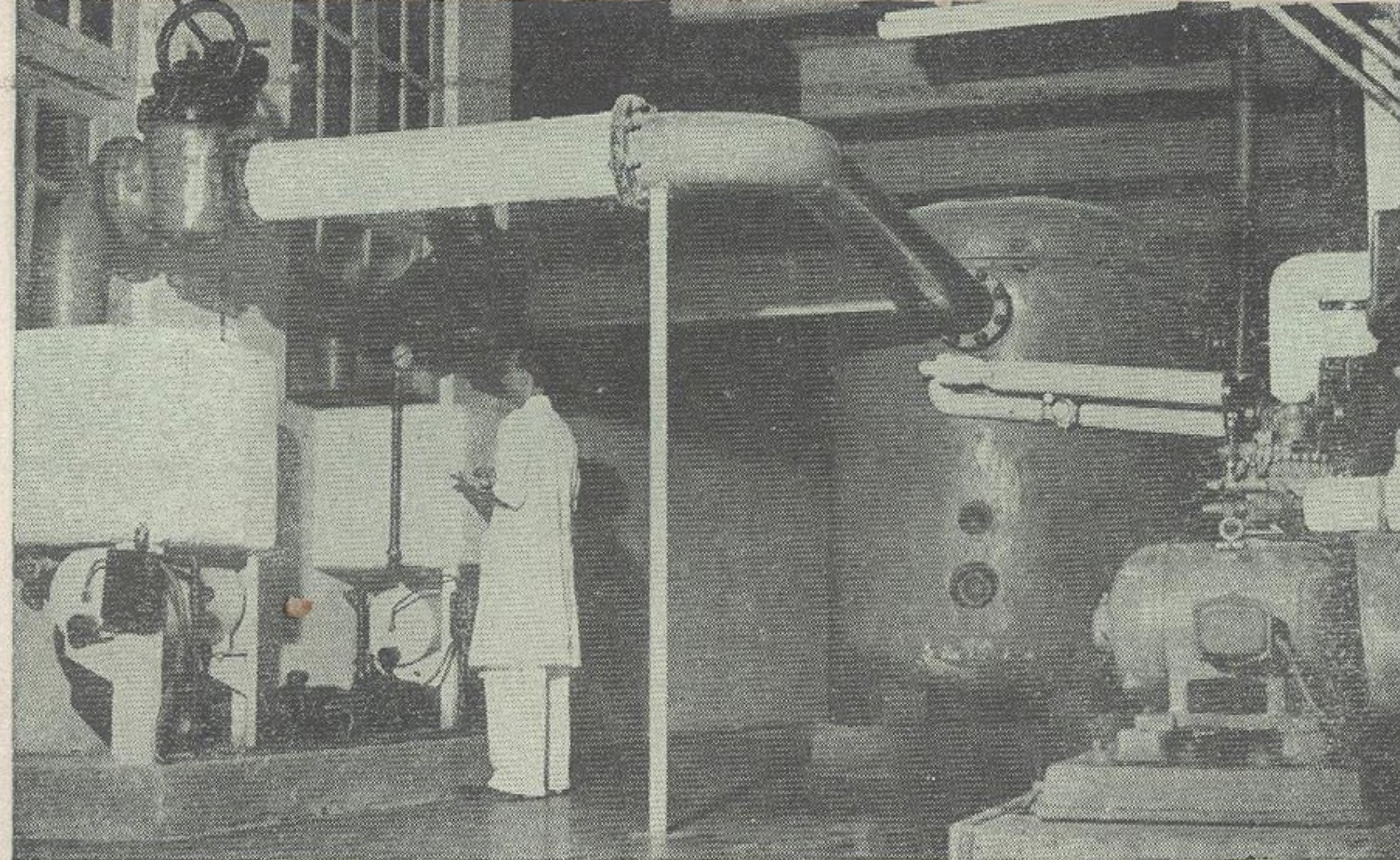
Checking of quality of tablet

This Section was organised in 1942. With the imminent threat of air raids on the city, the problem of preservation of blood in large quantities so as to be available for use in emergencies assumed great importance and this led to the starting of the Blood Bank. The whole blood as such cannot be preserved for any length of time, and hence the possibilities of preparing freeze-dried blood plasma were explored. A plant for freeze-drying of blood plasma designed by the department was fabricated locally and put into operation in 1943.

BLOOD BANK

Blood grouping





*Desivac plant for
freeze-drug drying*

Later, in 1950, a new and much bigger (Desivac) plant with a capacity of 75 litres, the first of its kind in India, was installed in 1950. The plasma produced at the department is partly distributed free to the charitable hospitals and the rest sold throughout the country. Blood collecting units are organised and a mobile unit for the collection of blood from out-stations is also established. The demand for plasma is far greater than what can be produced from the blood received from the donors. The supply can be increased only if more healthy persons volunteer to donate their blood which would be

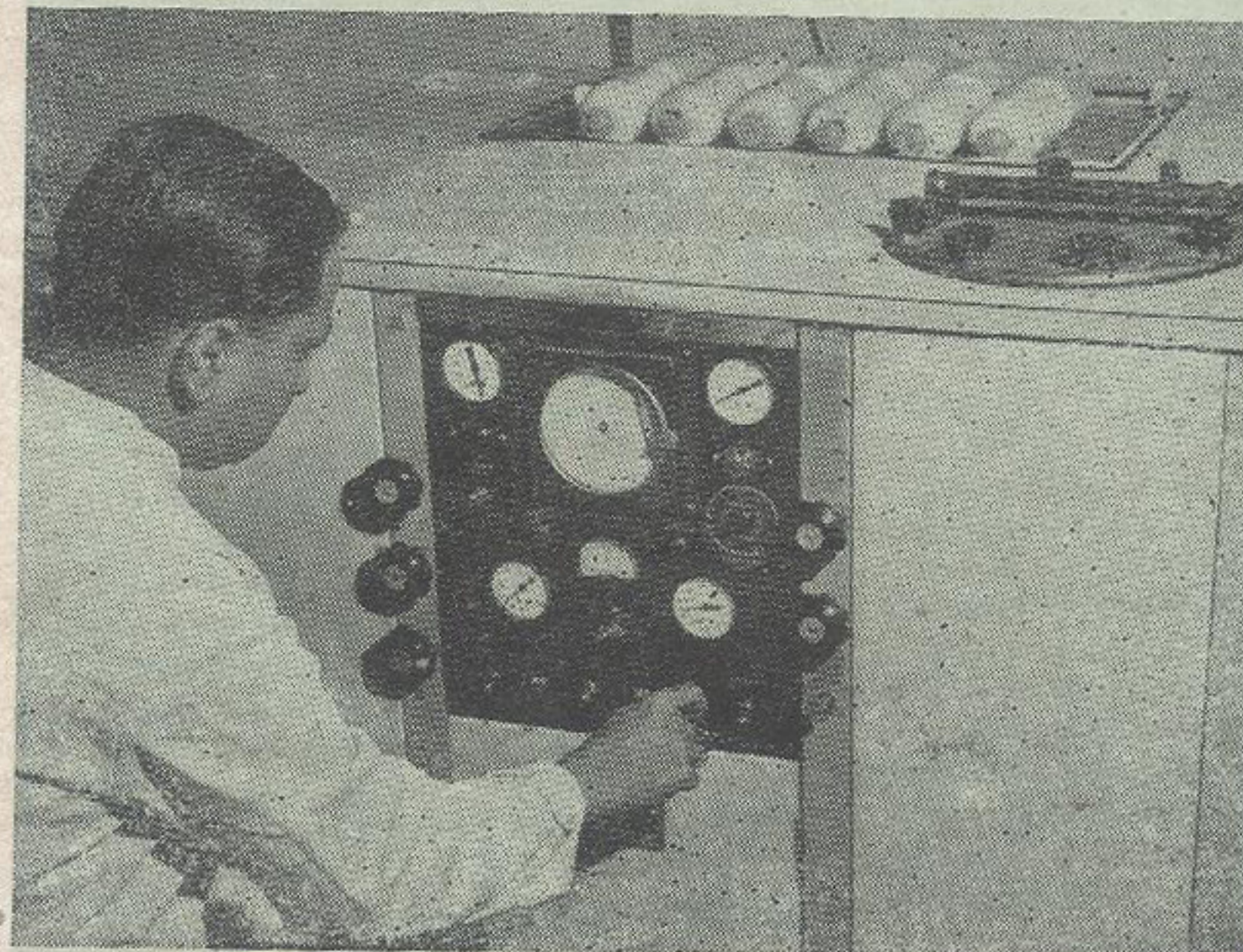
very usefully utilized for saving precious lives. The lyophilization (freeze-drying) of other products manufactured in the Institute such as antivenin, hyperimmune serum, Schick toxin, is also undertaken in this Section.

With the increase in the blood transfusion facilities in the country, the demand for blood grouping sera is continuously increasing. These sera are required for finding out whether the blood of the donor will match with the blood of the recipient. To meet this demand, human blood donors are immunised to yield high titre grouping sera.

The Department works in close co-operation with the Blood Group Reference Centre of the Indian Council of Medical Research, in the production and standardisation of Blood Grouping and Typing Sera, and other Blood Group diagnostic reagents.

Training facilities are provided in the Department for medical officers and laboratory technicians in Blood Bank Technology with a view to help the organisation and expansion of the blood transfusion services in the State. Advantage of this facility has also been taken by persons from the Medical Departments of other States.

The Section carries out various blood groupings and paternity tests and other investigations on cases of blood group isoimmunisation and haemolytic relations which are referred to by the various hospitals and the medical personnel. Studies have been undertaken for the production of various plasma fractions which are being utilized in therapeutics.



Freeze-drying of plasma

DEPARTMENT OF NUTRITION

The Department of Nutrition was established by amalgamating the Department of Nutrition and Experimental Pathology at the Haffkine Institute with the former Nutrition Unit of the Civil Supplies Department. The Department is located in the Haffkine Institute as a separate administrative unit with a staff of 35 members—medical, scientific and technical.

The Department possesses a well-equipped laboratory where adequate facilities are provided by the Haffkine In-

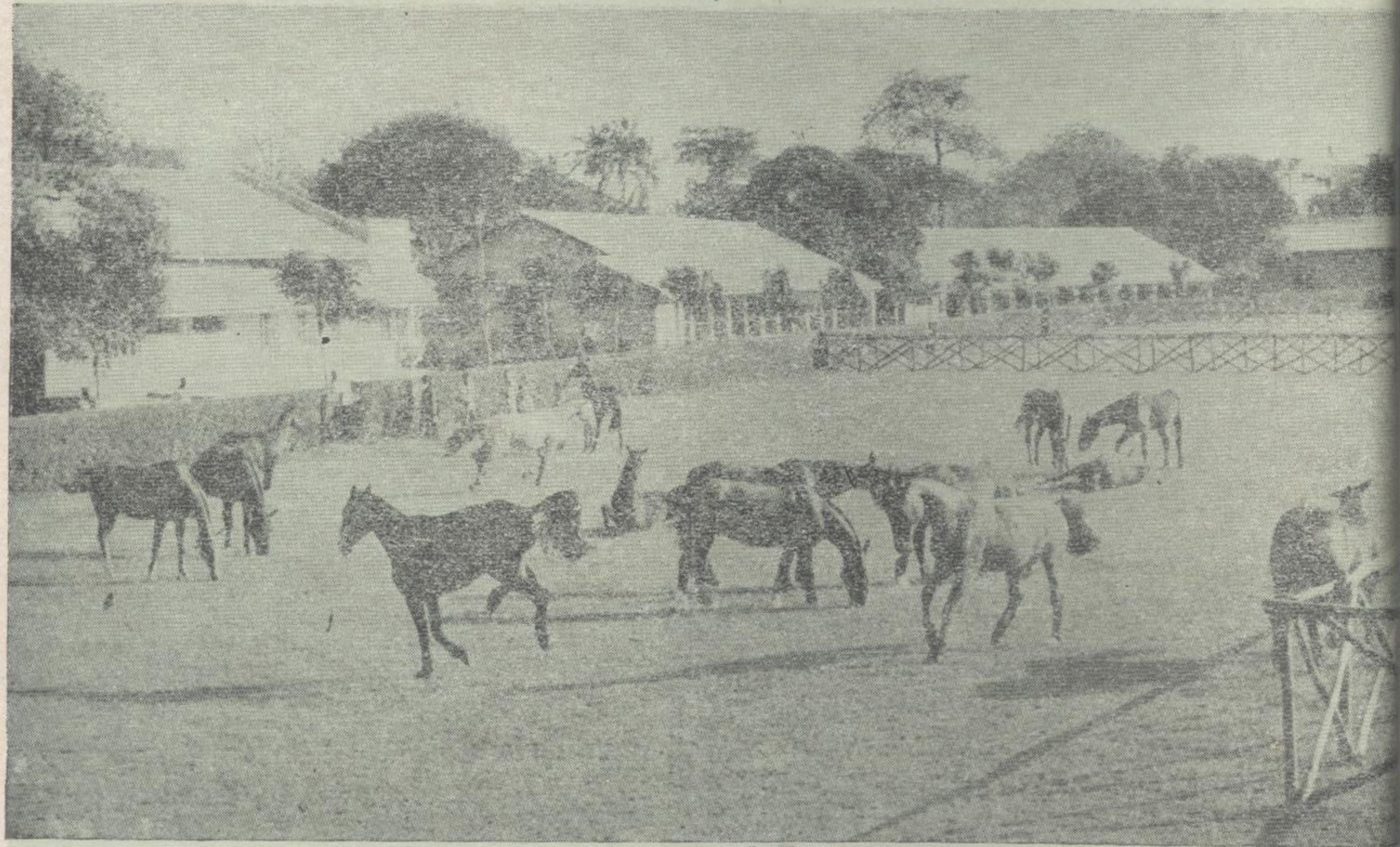
stitute, a Nutrition Clinic at the J.J. Group of Hospitals and a Field Unit, with jurisdiction all over the State.

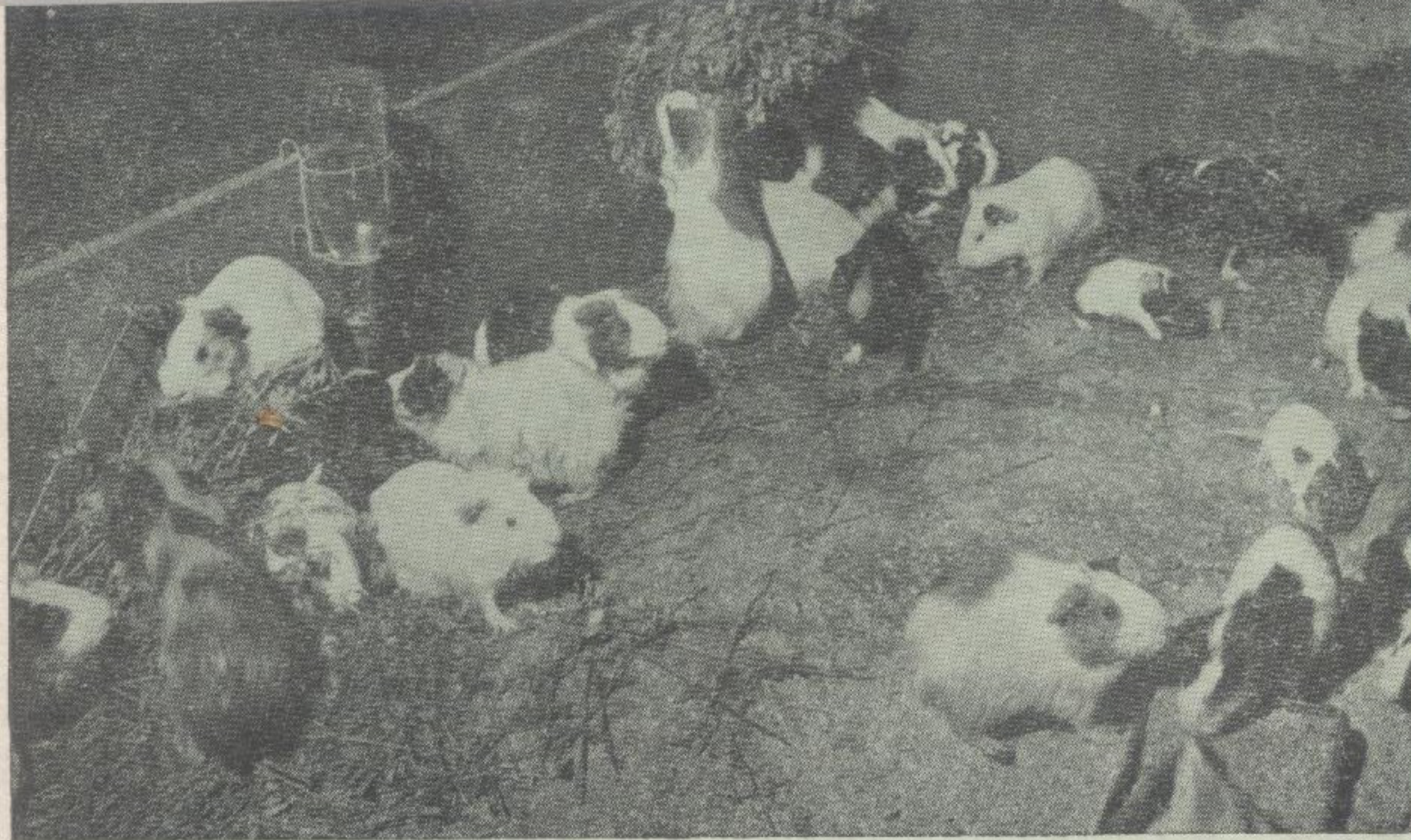
The main activities of the Department are to carry out research into various problems of human nutrition and dietetics, to assess the state of nutrition of different population groups, to improve community nutrition and to advise the Government in matters relating to the subject.

Examination of samples for food bacteriology is also undertaken.

ANIMAL HOUSE

Horses taking their morning constitutional





Guinea-pigs—useful experimental animal

The Institute needs animals for various biological tests for standardisation of some of its products, to comply with the requirements of the Drugs Act and Rules thereunder, and also for research. The Institute, therefore, maintains an animal house and also supplies animals to other research Institutions whenever possible.

About 145 horses are maintained at the stables in the Institute compound for the production of anti-

toxins and sera. The Institute also maintains a farm at Pimpri near Poona accommodating 98 horses. A full fledged serum Laboratory is contemplated at Pimpri in third five year plan. The horses at Pimpri are undergoing preliminary immunization before they are brought to the Institute for hyperimmunization.

Training in animal keeping and breeding is also given at the Animal House.

The Library attached to the Institute containing a collection of more than 20,000 publications and 250 medical and scientific periodicals, received annually.

The Institute Library caters to the needs of not only the staff and research workers of the Institute, but also to a number of other Institutes and Laboratories in Bombay City.

The Library has a special collection

of about 1,000 references on plague and cholera. It also has a complete collection of all the publications of the League of Nations and the World Health Organisation. The Library also possesses U.S. Army Surgeon General's Index to Medical literature. It has all the indexes, such as Quarterly Cumulative Index Medicus, Current List of Medical Literature, Biological Abstracts and Chemical Abstracts.

LIBRARY

*Library in former
Durbar Hall*



GENERAL

The Institute is affiliated to the University of Bombay for the M.Sc. and Ph.D. degree courses in Microbiology, Biochemistry, Organic Chemistry, Pharmacology, Pathology, Bacteriology, and Zoology.

There are several research fellowships awarded at this Institute by national agencies, such as the Indian Council of Medical Research, Council of Scientific and Industrial Research, State and Industrial Research, State and Central Governments. The Institute also takes up research fellows who may be recipients of fellowships of the National Institute of Sciences of India or any other research endowment. These fellowships are open to science and medical graduates. The Institute takes the advantage of sponsoring research schemes through the Indian Council of Medical Research on specific projects. The laboratories of the Institute are exceptionally well-equipped and attract international visitors, and trainees from Organisations like the World Health Organisation, UNICEF, Colombo Plan, and Rockefeller and other International Foundations. The Institute has contributed substantially in several fields of medical research. The Institute also educates the public by placing before them the scientific activities. The Institute welcomes visitors and the Public Relations Officer takes them round the Institute.

All the labour welfare legislations with regard to manufacturing activities are applied to the Institute.

HAFFKINE INSTITUTE PRODUCTS

VACCINES

- (1) Plague Vaccine : Prophylactic against plague.
- (2) Cholera Vaccine : Prophylactic against cholera.
- (3) T.A.B. Vaccine : Prophylactic against Para-Typhoid A & B.
- (4) Antirabic Vaccine : For treatment in dogbite cases.
- (5) Influenza Vaccine : Prophylactic against Asian Virus Influenza.
Influenza (at present available for key personnel only, against sanction of Central Government but may be available to public in the near future).

ANTITOXINS AND SERA

- (1) Anti-venin : Lyophilised Polyvalent Anti-snake Venom Serum, effective against bites of Cobra, Krait, Russell's Viper and Sawscaled Viper.
- (2) Tetanus Antitoxin : Used in the treatment and prophylaxis of tetanus.
- (3) Diphtheria Antitoxin : Used in the treatment of Diphtheria.
- (4) Normal Horse Serum : Used as a constituent of bacteriological media.
- (5) Gas Gangrene Serum : Used in the prophylaxis and treatment of infected gangrenous wounds.
- (6) Diphtheria Toxoid : Prophylactic against diphtheria, and prevents disease for long periods, particularly useful for children.
- (7) Tetanus Toxoid : Prophylactic against tetanus and prevents disease for long periods, particularly useful for children.

BLOOD PLASMA

Lyophilised human plasma for transfusion therapy.

SNAKE VENOMS

(Cobra, Russell's Viper, Krait and Saw-scaled Viper). Used in the manufacture of Antivenin and biochemical research.

MEDIA

As Diagnostic Reagents.

DEAD EMULSIONS, HIGH-TITRE SERA, STAINS AND SOLUTIONS

As Diagnostic Reagents.

BLOOD GROUPING SERA

For typing blood groups.

PARENTERAL SOLUTIONS

In the treatment by infusion therapy.

DRUGS

- (1) Vitamin Products : In the treatment of disorders due to vitamin deficiency.
- (2) Sulpha Products : In the treatment of Bacterial infections.
- (3) Quinine Sulphate Tablets : In the treatment of Malaria.
- (4) Pemon : A liquid antiseptic and disinfectant.
- (5) Solapsone : Strong Solution. In the treatment of Leprosy.

KITS

- (1) Snake bite Kit for immediate first-aid as well as effective treatment of snake-bites.
- (2) Kit for Inoculation against Cholera : For preventive mass vaccination against Cholera.

ANALYTICAL SERVICES

The Institute renders extensive services to Government and the public in the fields of Clinical Pathology, Biochemistry and Entomology. The Institute has Pharmacological Laboratory, which also acts as a Drug Testing Laboratory for the Director Drugs Control Administration for the State of Maharashtra and for the Prohibition Department.

Additional information regarding the products and prices can be had from The Director, Haffkine Institute, Bombay - 12.

DIRECTORATE OF PUBLICITY,
GOVERNMENT OF MAHARASHTRA,
BOMBAY.