The Geological Survey of India Laboratory.

Organisation.

THE headquarters office of the Geological Survey of India is a four storey building built in 1897 and is situated behind the Indian Museum in Calcutta. The general disposition of the building is as follows :—

Ground floor : godowns and clerks' offices,
First floor : senior officers' rooms ;
Second floor : Director's room, library and map room ;
Third floor : laboratory, darwing office and junior officers' room.

The headquarters staff working immediately under the Director consists of the Petrologist, Assistant Director, Palæontologist and Chemist.

The Assistant Director controls (*a*) the clerical staff under the Chief Clerk, (*b*) the Library and (*c*) the Drawing Office, which is in charge of the Artist. The Assistant Director is also in charge of the publication of the *Memoirs*, *Records* and *Palæontologia Indica* published by the Department.

The Palæontologist, assisted by a Field Collector and Museum Assistant, is repsonsible for the large and steadily increasing collections of fossils which are constantly receiving the attention of the Department. He also advises on the arrangement of the Siwalik and Invertebrate galleries in the Indian Museum.

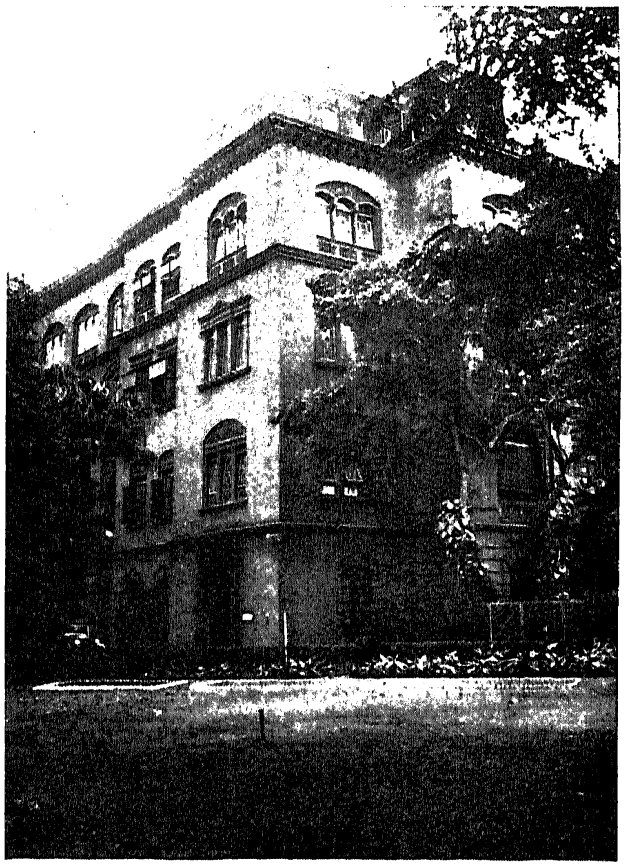
In the past the Laboratory has been in charge of the Petrologist, but it is intended shortly to divide it into two sections, the Chemist to have control of his own section. Working under the Petrologist is the Curator, who attends to the rock, mineral, economic and meteorite galleries in the Museum, looks after the upkeep of the office building, and the general routine of the Laboratory. In addition, two Field Collectors and three Museum Assistants attend to the varied work going through the Laboratory.

The Laboratory.

The work of the Laboratory is divided into two sections, petrological and chemical.

Petrological Laboratory.—In the Petrologist's room are stored the majority of the petrological and field instruments. These include about 40 microscopes with innumerable accessories, various types of refractometers and goniometers, some 20 cameras both for microscope and field use, aneroids, clinometers, etc. In addition, there are other instruments such as electrometers, spectroscopes, etc. The equipment is very complete, the only serious shortage being a photographic spectrometer and an X-ray equipment.

The Geological Survey makes no charge for the determination of specimens, which are constantly being submitted from all over India, but merely stipulates that the locality from which the specimen was obtained should be given. This is for the



Departmental records and is kept confidential, if so desired. As a rule, specimens from outsiders are only determined qualitatively, most of the quantitative analytical work being reserved for Departmental specimens. Between 500 and 800 extra departmental specimens are examined annually. Nearly all specimens are determined by a Museum Assistant and checked by the Petrologist. Most of the Petrologist's time is devoted to special petrological work and to advising on economic questions, on which a large number of enquiries are received, and are

constantly increasing in pace with expanding interest in the mineral industry of India.

Besides the usual thin-section determination, opaque minerals are also examined under reflected light, for which there is an excellent equipment. The making of thin-sections and polished sections is done mechanically on revolving laps. The polished section technique is up-to-date.

The microphotographic apparatus is in the Petrologist's room. Here also there is a collection of some 25,000 thin-sections of rocks from all over India and from other countries. In addition, stored in the Museum, are some 50,000 rock specimens, the collections of Officers of the Department over the course of eighty years.

Chemical Laboratory.—The staff of this laboratory consists of the Chemist in charge, Assistant Chemist and Laboratory Attendant, with menials shared with the Petrological side. The equipment is more or less complete. In addition to the usual analyses, dry assays are done when necessary, using gas-fired and electric furnaces. A large stock of apparatus and reagents has to be kept on hand. The apparatus includes a calorimeter for coal determination, small electromagnetic separator, electric ovens and all the usual accompaniments of a chemical laboratory.

The Drawing Office.

The Drawing Office is equipped for the production of the following classes of work:

(1) *Photography.*—The development and printing of Officers' negatives, photo-copying of specimens (rocks, fossils, meteorites, minerals, etc.), micro-photography of rock sections and minerals, map-copying by photography, etc., are undertaken. There are arrangements for direct photo-micrography with a vertical camera and enlarging lens (by daylight or artificial light), as well as with vertical and horizontal photographing apparatus with artificial lighting.

(2) *Map Drawing, Copying and Colouring.*—Hand drawing, copying and colouring of geological maps, sections and diagrams, pantograph reductions and tracing (on glass tracing tables illuminated from below) of maps, preparation of original maps for reproduction, drawing text-figures and line plates for publications, and fossil drawings (in wash and line) are executed. All the original geological maps of the department and the topographic sheets that are used in the field and for fair-copying, as well as the maps published for sale by the Department, are classified and stored in the map-room in the Drawing Office.

(3) *Reproduction.*—The reproduction of text-figures and plates for the publications of the Department (*Records*, *Memoirs* and *Palæontologia Indica*) by halftone, line and lithographic processes, in monochrome and in colours, and the printing of these plates, is carried out. There is a fully equipped process-engraving and lithographic plant with camera, screens, stands, copying lamps, etching, finishing and mounting apparatus and machinery; also a platen printing press with cylindrical inking, with type and accessories for printing halftone and line plates and type jobs of the Department. There are also three hand presses (two being transfer presses) for litho printing. Fine-screen (175-line and 200-line) halftone work is done for the reproduction of photographs for plates for publications.

The Library.

Almost the whole of the third floor is occupied by the extremely fine library of which Officers of the Department feel justly proud. It contains approximately 80,000 books and papers, and is now being re-catalogued according to a more modern system.

The Godown.

Nearly 200 tents are stored in the godown, and are in the charge of the Petrologist's Department. A carpenter and a polish mistri, under the Curator, are also located here.