

THE PLYMOUTH LABORATORY OF THE MARINE BIOLOGICAL ASSOCIATION OF THE UNITED KINGDOM, 1963

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The Plymouth Laboratory

(Plates I, II and Text-figs 1-5)

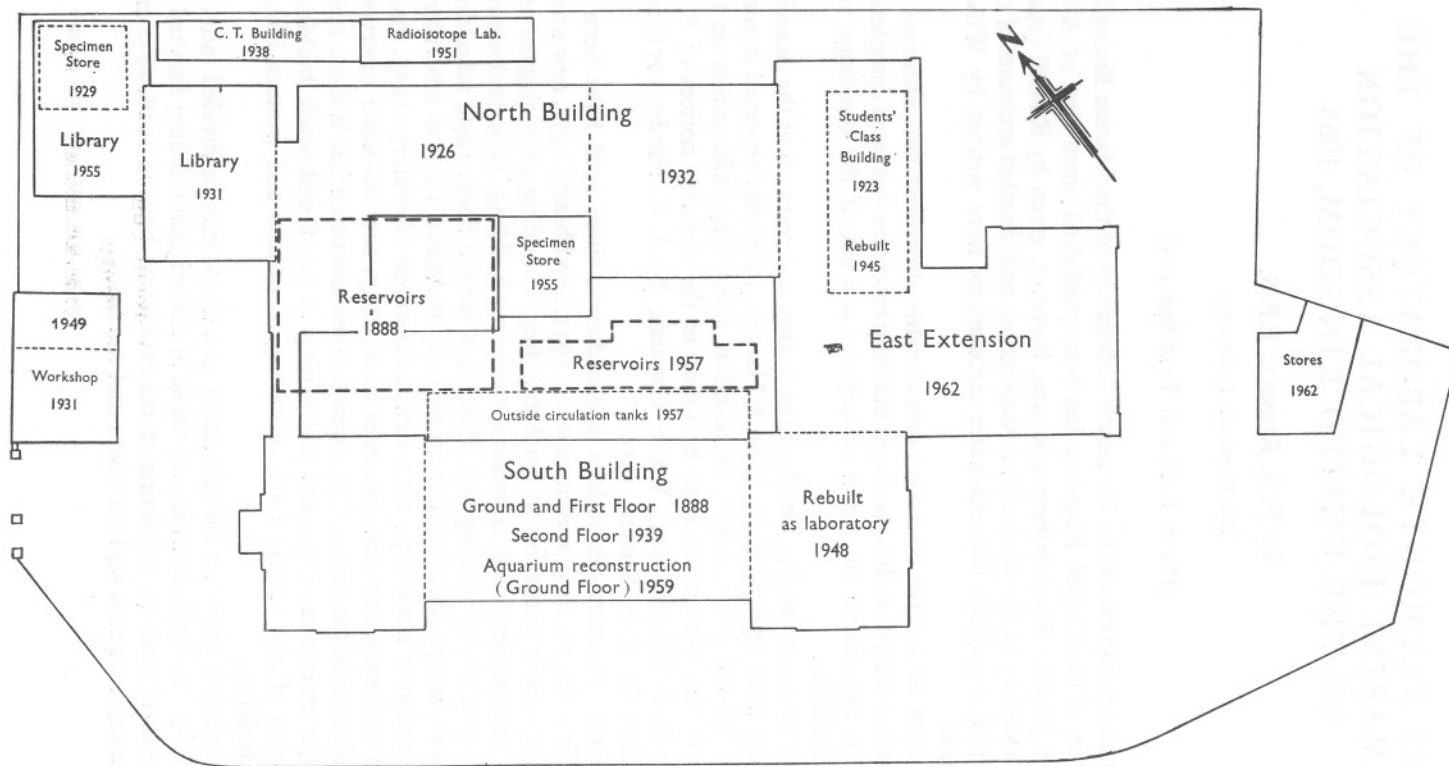
No general description of the Plymouth Laboratory of the Marine Biological Association of the United Kingdom has been published since that of Allen & Harvey (1928). Some information was, however, given by Russell (1947, 1948) in a survey of the work of the Association, and detailed accounts of the old and new aquarium and sea-water circulations were written by Wilson (1952, 1960).

Since 1928 there have been very considerable alterations and additions to the laboratory and, now that the major building extension has been completed, the time is opportune for a new descriptive account of the buildings and research facilities.

It is not necessary to give details of the history and research of the Association. These were referred to by Allen & Harvey (1928) and reported at some length by Russell (1947, 1948). In addition, interesting information on the early life of the Association is to be found in the obituary notices of E. J. Allen (by G. P. Bidder, 1943), Walter Garstang (by A. C. Hardy, 1951) and G. P. Bidder (by F. S. Russell, 1955).

The major structural alterations and additions since 1928 have been as follows (Text-fig. 1): 1929, specimen store; 1931, new library; 1931, new workshop; 1932, major extension to north building, including physiological and chemical laboratories; 1938, constant temperature building; 1939, redesigning of first floor of south building and addition of second floor; 1948, rebuilding of Director's house (destroyed in an air-raid, 20 March 1941) as laboratory; 1949, extension of workshop; 1951, new radioisotope laboratory; 1955, major extension to library, and new specimen store; 1957, new sea-water reservoirs and outside circulation tanks; 1959, aquarium reconstructed (see Wilson, 1960); 1962, major extension at east end and joining of north and south buildings and addition of new stores; 1962, re-roofing of eastern and western blocks of south building.

For descriptive purposes the laboratory as a whole may be divided into the *south building*, the walls of which are those of the original building finished in 1888; the *north building*, consisting of the extensions built in 1926, 1932 and 1962; the *east extension* built in 1962; and the *library*.



Text-fig. 1. General plan showing years of completion of buildings.

The south building

The south building originally comprised an eastern block of three storeys, most of which was the Director's private residence; a western block of three storeys with a basement for engine and boiler rooms, and stores; and a central portion joining the two end blocks of two storeys of which the ground floor was the tank-room which later became the public aquarium, and the first floor was the main laboratory with sea-water circulating tanks down the centre with wooden partitioned and curtained research cubicles along the walls.

In 1938 the first floor of the central portion was dismantled and rebuilt with a central tank-room with sea-water circulation and self-contained research rooms. At the same time the original pent roof was taken down and a Mansard roof built in its place to provide an additional floor with research rooms and a central museum for a collection of local marine organisms. These two floors provide research rooms and working spaces for twenty-four persons.

During the Second World War the Director's house was destroyed during the bombing of Plymouth (for a description see Hardy, 1946). This was rebuilt in 1948 on a steel girder framework within the original limestone walls, which were badly calcined by fire in places, to provide additional laboratory accommodation. The ground floor of this eastern block has two research rooms (6 and 8),* an office (7) and stores (9 and 10), and a large wet room with asphalt floor and a refrigerating unit for work with fish and other large marine animals.

On the first floor is the Director's room (1) and secretarial office (14), two research rooms (2 and 3), a histological laboratory (12), and a biological store (13). The second floor, which for an interim period was partitioned, now forms one large common room for all members of staff and visiting workers which is used for morning coffee, afternoon tea and other social occasions.

The western block of the south building now has in the basement the engine room with sea-water circulating pumps, an oil-fired boiler house, an engineers' workshop and three stores. The boiler house communicates with a tunnel under the road giving access to the pump-house on the sea front. The ground floor is taken up with the entrance to the aquarium and adjoining wet room, around which the caretaker's living quarters are disposed.

On the first floor are a general preparation room (26) and senior technician's office (28), finance office (25) and messenger and telephone operator's room (27). The second floor has a drawing office (43) and offices at present rented to the District Fisheries Inspector of the Ministry of Agriculture, Fisheries and Food (44).

Apart from office accommodation the south building can thus accommodate some thirty or so workers.

* Numbers in brackets refer to the room numbers in the accompanying plans, Text-figs. 2-5.

In 1962 serious deterioration was appearing in the walls of the south building and the parapets were taken down and rebuilt with lead damp courses and the roofs were renewed. At the same time the old, and by then functionless, chimney stacks were removed.

The north building

In the north building there are now two basement areas in which quiet, dark research rooms are available. In the older portion of the building there are two such cellars (53 and 54) and a store. The larger cellar (54) has a pedestal insulated from the floor and built on the rock foundation. In that portion of the building which has been recently extended to the east there is a much larger semi-basement floor. This has a large room suitable for electrophysiological research (65), a constant temperature room, and two photographic dark rooms (66 and 67) with adjoining ante-room. A sea-water supply is available.

The ground floor of the north building has at its western end the specimen sales room, outside which there is a sea-water circulation system with small tanks. The remainder of the floor is mainly used for physiological research. In addition to eight individual research rooms, there is a large physiological laboratory (63), a physiological chemistry laboratory (55), a constant temperature room, and tank rooms with sea-water circulation for experimental research (58 and 60). Besides having facilities for small tanks there is a large tank 10 ft. long, 4 ft. wide and 2 ft. 6 in. deep (305 cm \times 122 cm \times 76 cm) with a glass bottom (60). On this floor there is also a small physiological workshop (50), a battery charging space (Batt. Ch.), refrigerating unit (Refr.), a small dark room, and storage accommodation (64). All individual research rooms can be completely darkened.

The first floor is used largely for chemical research. There are eight individual research rooms and one large room suitable for two or three workers (72). There are three main chemical laboratories for oceanographical (82), inorganic (83), and organic chemistry (77), respectively. There are separate balance rooms (73) and dark instrument rooms (84), a wash-up room (76) and stores (79 and 80). There is a refrigerating unit.

Individual rooms and working spaces in the main laboratories of the north building can afford working accommodation for some twenty-six or more persons.

The east extension

The eastern portion of the building which joins the north and south buildings together has on its ground floor an entrance hall leading to a lecture hall capable of conversion into a students' class-room for biological or physiological courses. As a lecture hall it has seating accommodation for about 150 people; when used as a class-room there are facilities for twenty-two

students. Adjoining the lecture room is a small kitchen and motor room. Also on this floor, leading into the wet-room on the ground floor of the south building, there is a small tank-room with circulating sea water.

There is a passenger lift stopping at all floors from the basement upwards.

On the first floor the east extension is devoted to botany. There are four individual research rooms, and one general laboratory with space for four workers (90) and housing the herbarium. There is a temperature controlled culture room with adjoining wet and dry preparation rooms (88 and 89) and small store (94). On the main landing there is a room for a sterilizer (85), a small algal museum (11), a histological dark room (4), and a dark instrument room (86).

On the second floor are kitchen and ante-room to the common room, with access to all the roofs of the buildings.

The library

At the time of the account given by Allen & Harvey (1928) the library was housed on the top floor of the western block of the south building in the south room which is now used as office accommodation. A new library consisting of two floors and a gallery floor was built in 1931 at the western end of the north building. In 1955 this building was extended, with three floors, to give nearly double the accommodation. The library houses some 30,000 volumes, and has reading accommodation for about fifteen to twenty people at one time.

The north and south buildings are joined at their west end by a bridge over the yard at the end of which there is a small dark room and store (45).

Radioisotope laboratory

In the narrow space between the north building and the walls of the Citadel small laboratories have been erected. In 1938 a constant-temperature building with two compartments was put up as a result of a legacy from the late Florence Buchanan. In 1951 a small laboratory for the use of radioactive substances was built on to the end of the constant-temperature building and the passage to the two buildings was covered in with a glass roof. The central portion of the constant-temperature room is at present used as a scaler room for radioactive research.

Workshop

In 1931 a wood-workshop was built on the site of an old store near the main entrance to the laboratory through the generosity of the late E. T. Browne. This workshop was extended in 1949 and fitted out for metal as well as wood-work. Beneath the workshop there is a store.

Yard

The yard between the north and south buildings contains the sea-water reservoirs and outside circulation tanks fully described by Wilson (1960). In addition, there is a large specimen store, stores for aqua-lung equipment and a compressor for filling aqua-lung cylinders, and a covered car port.

Car park and stores

In front of the south building and east extension there is a car park which can accommodate fifty or more cars. At the eastern end of the car park are net and solvent stores.

Special equipment and laboratory facilities

The working accommodation provided for staff and visiting scientists thus includes some sixty or more rooms and bench spaces in the larger laboratories. Visiting workers have the use of all normal glassware, chemicals and general apparatus. Microscopes can usually be provided. As far as possible research workers are supplied with those marine plants and animals required for their investigations.

Intending visitors are advised to write to the Director, stating the nature of the research they wish to do, and any special apparatus they may require. The laboratories are, however, well equipped with much modern apparatus.

The following information about the equipment of the laboratory may be useful in helping visitors to decide about their work.

All rooms are fitted with gas, air (10 lb./sq. in.) and fresh water. Circulating sea water is available in various parts of the building as detailed above, and in the yard, but not generally in the research rooms. All have mains electric light and power plugs. The voltage is 240 V 50 cycles. Most physiological research rooms are fitted with copper earthing strips and a constant voltage supply is available in the electrophysiology cellar.

Educational and other services

Courses in marine biology for university graduates are held during the Easter vacation under the supervision of members of the laboratory staff. In some years courses on the physiology of marine organisms are similarly given in the autumn; courses for university students and school students are given from time to time under outside supervision.

The Association supplies schools and universities with marine specimens, living and preserved, for teaching purposes, and can make to order a variety of plankton and other nets for collecting purposes.

Sea-going and collecting facilities

The Association owns three vessels: R.V. 'Sarsia', R.V. 'Sula' and M.L. 'Gammarus'.

R.V. *Sarsia* was built in 1953, is 130 ft. long, and capable of making extensive cruises of up to 3 weeks' duration into deep water. The area in which she makes her investigations extends from the Strait of Dover, throughout the English Channel to the south-west of Ireland and the Bay of Biscay. A full account of this vessel has been given by Steven, Hoodless, Harrison & Warren (1955).

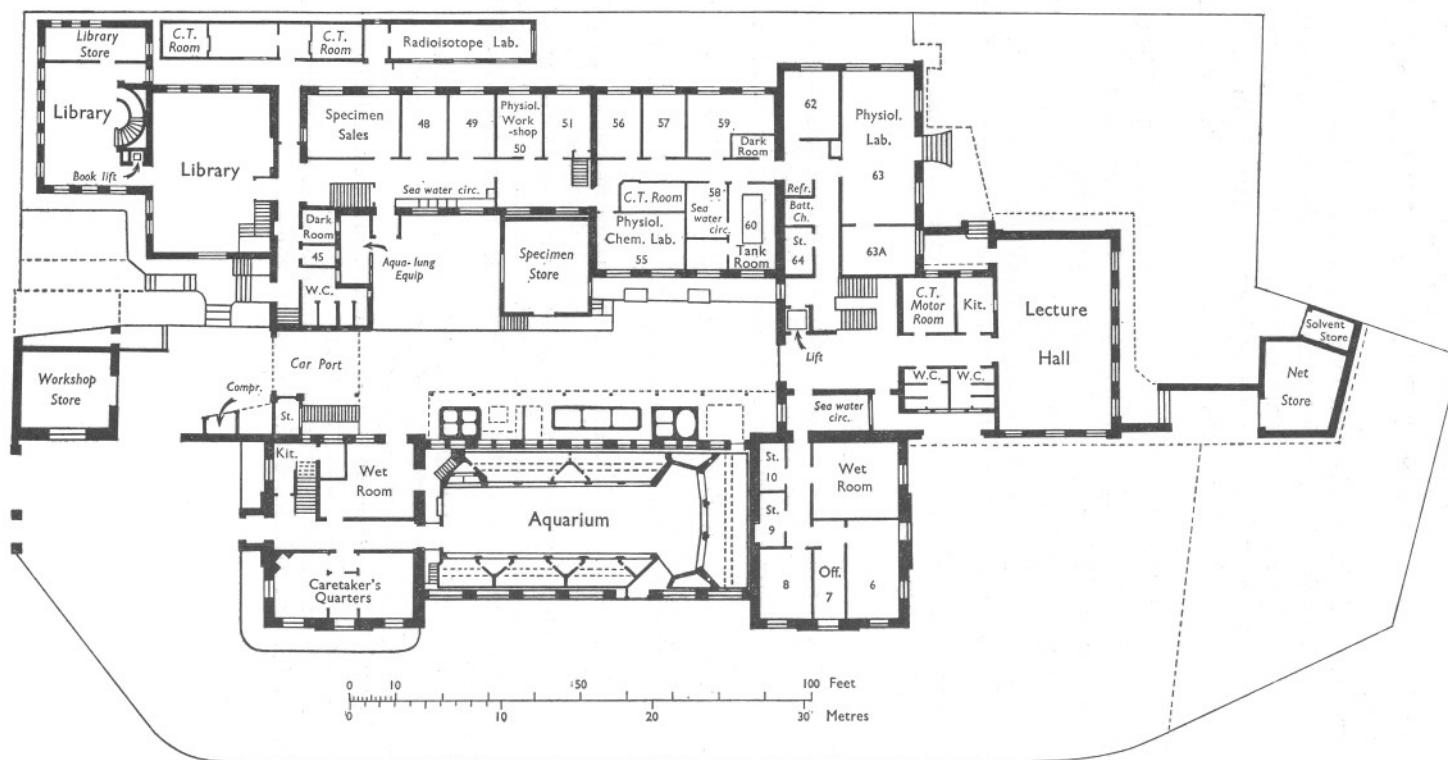
R.V. *Sula* was completed in 1948 and slightly modified in 1956 (Russell, 1948, Pl. XXV). She is 61½ ft. long with a 105 H.P. Lister engine, and is used for collecting usually within a radius of about 20 miles from Plymouth.

M.L. *Gammarus*, built in 1921, is a 26 ft. launch, now modified and provided with two 7 H.P. engines (see Russell, 1948, Pl. XXIV, fig. 2). She is used for collecting in Plymouth Sound, the Tamar estuary and the surrounding shores.

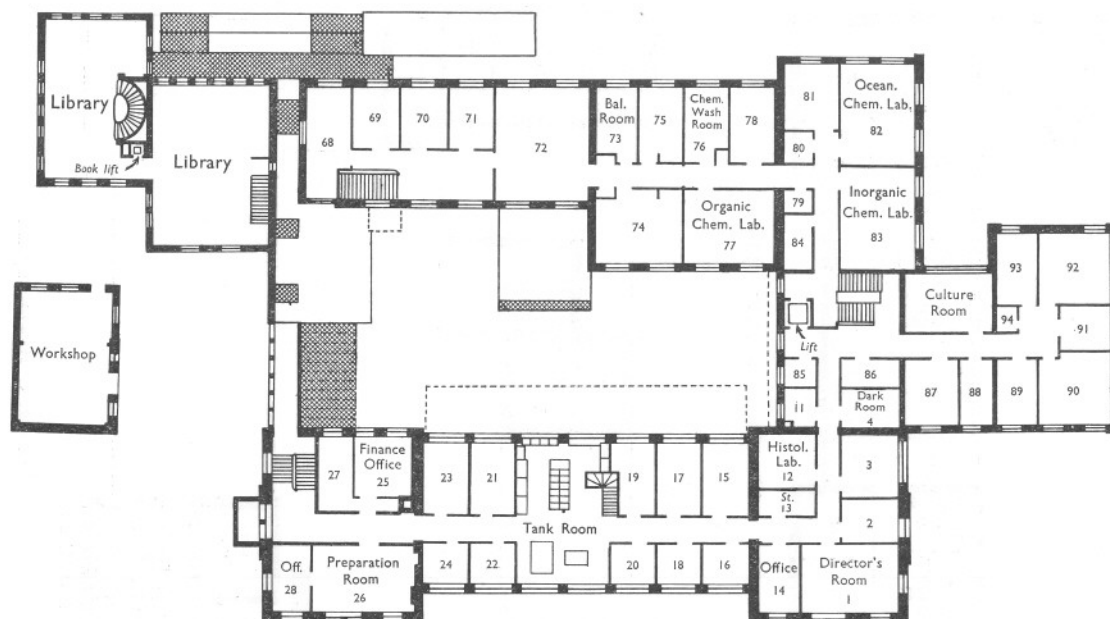
My thanks are due to Mr G. A. W. Battin for his care in drawing the plans reproduced in Text-figs. 1-5.

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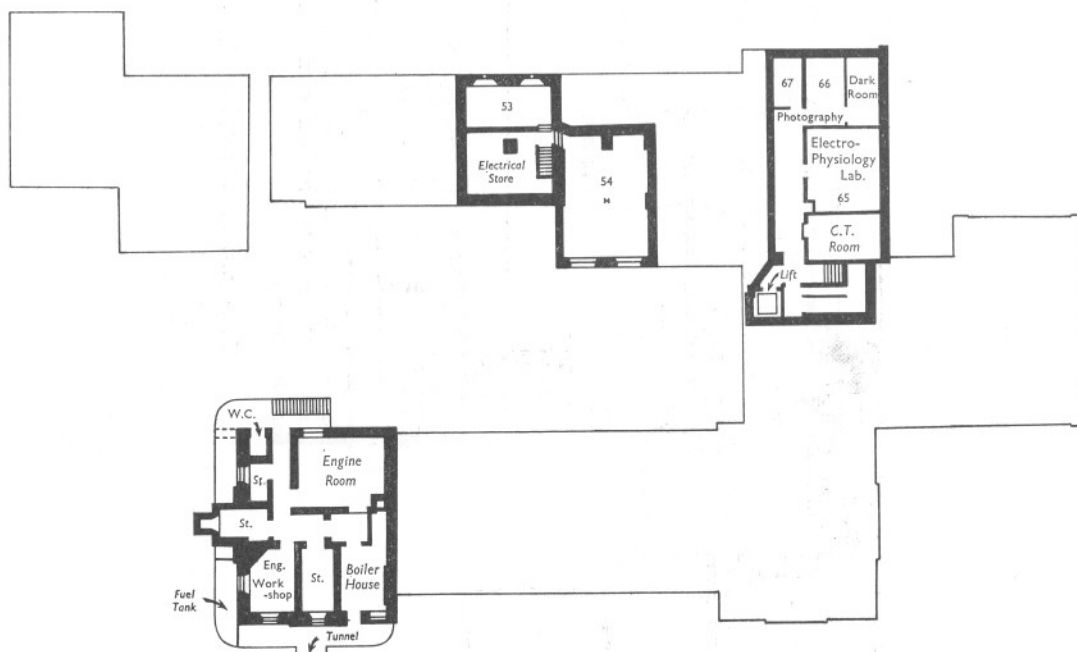
Text-fig. 2. Ground floor plan.



Text-fig. 3. First floor plan: stippled areas are glass roofs and lights.



Text-fig. 4. Second floor plan.



Text-fig. 5. Basement plan.

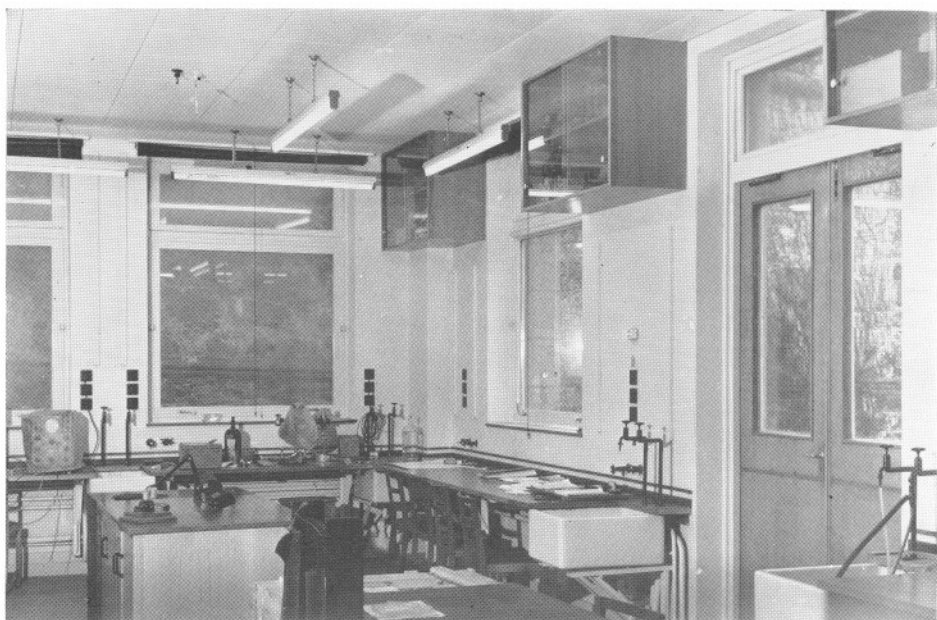


The Plymouth laboratory.



The East extension.

(Facing p. 290)



Part of Physiology laboratory.



Part of lecture hall, arranged for a course.