temperature work, a research room with roof lighting, and the entrance to the indoor animal house. The second floor is entirely devoted to investigation. Besides a professor's research suite and other research rooms, there is also a sterilising room, a small bath room, an operating suite, an outdoor laboratory, and an aquarium room. This floor opens direct to a flat roof.

With regard to the fittings, gas, water, and electric power have been brought into all rooms, and a trough system has been adopted for the drainage of water. Using this in conjunction with movable tables and cupboards designed upon a unit system, it will be possible for each research worker to arrange the benches to suit the particular investigation upon which he is engaged.

Subject to any unforeseen development, the present building should satisfy in the main the needs of biochemistry in the University for the present. Smaller wants are not yet, however, adequately met. There is, for example, the question of the research library, for which separate endowment is required. The modest sum of £2000–£3000 would go far to provide what is required in this direction. The most serious want of all, however, is believed to be that of providing studentships to enable the better men to stay behind for a period of one to two years to obtain training in research work, and so obtain the fullest possible use of the scientific opportunities of the University. This is a need which the Department of Biochemistry shares with other scientific departments, and until it is properly met there is no doubt that Great Britain will not make the best possible use of the brains of the younger generation at the University.

## The University of Birmingham.

### NEW BIOLOGICAL BUILDINGS.

WITH the progress of the biological sciences, both methods and needs have changed. The laboratories and apparatus of a generation ago are no longer adequate even for teaching purposes, still less for research. At Birmingham the three cognate Departments of Botany, Zoology, Brewing and Biochemistry of Fermentation have long been inadequately housed in the older part of the University in Edmund Street. This session, however, they have moved to their new quarters at Edgbaston. The new biological block was formally opened on Oct. 20 by the Prime Minister, Mr. Stanley Baldwin.

The buildings, the site and general character of which form part of the original design of Sir Aston Webb, face University Road, being situated between the Chemical Department and the Harding Library. The total cost of buildings and equipment is upwards of £120,000, towards which Sir William Waters Butler, Bart., has generously contributed £40,000, and an anonymous donor £5000.

Zoology occupies the ground floor of the new block, brewing and biochemistry of fermentation the greater part of the first floor, and botany the second floor, with certain rooms also on the first floor. A large lecture theatre, shared by all three departments, each of which also has its own lecture room, forms a third floor.

One important development is the recognition of the principle of departmental libraries. Each of the three departments in the new block has its own separate library, in which will be housed nearly all the periodicals and books dealing with the three subjects respectively. These departmental libraries will be under the general supervision of the University Librarian and the Library Committee.

The three departments have already started work in the new buildings, although the internal equipment and furnishing is not yet complete. The following accounts deal with the new departments.

#### ZOOLOGY.

The new Zoological Department, which forms the ground floor of the biological block, has been constructed on a spacious scale. There are three teaching laboratories, for elementary, for advanced, and for post-graduate honours students respectively. The laboratories have ample accommodation, good lighting, both daylight and artificial illumination, and modern fittings. The Department possesses a small lecture theatre for advanced teaching, while the zoologists, botanists and biochemists between them share a large theatre. This lecture theatre accommodates the large elementary class, the greater proportion of whom are medical students.

Original research is as much the *raison d'être* of a university scientific department as is teaching. For the purposes of research the new department is admirably equipped. The apparatus includes not only the microscopes and microtomes of the classical zoological laboratory, but also the numerous and often elaborate apparatus used in the newer experimental developments of the science. The members of the staff have each a private room fitted out as a laboratory. There is a research laboratory for other original investigators working in the department, with a special room for entomologists, dark rooms, an animal room, a tank room, etc.

The Department has a distinguished past record. Prof. T. W. Bridge, one of the original professors at Mason College, Birmingham, carried out much valuable research work on fishes. His successor, the late Prof. F. W. Gamble, is known to zoologists all over the world for his researches on the colour changes in crustaceans and for his study of the remarkable composite organism Convoluta, a planarian worm with symbiotic algæ. The late Prof. Leonard Doncaster was a member of the staff when he did his epoch-making work on sex-inheritance in the moth *Abraxas grossulariata*. Mr. H. G. Newth, the present senior lecturer, is an embryologist who has made a number of important original investigations. Incidentally, a large share in the design of the laboratories and fittings falls to his credit. The present head of the Department is Prof. H. Munro Fox.

#### BREWING AND BIOCHEMISTRY.

The British School of Malting and Brewing and Department of Biochemistry of Fermentation was founded at an earlier date than the incorporation of the University of Birmingham. Accordingly, at first, it was a department of Mason University College. The School was formally declared open by Mr. H. Cosmo O. Bonsor, on Jan. 18, 1900. The late Prof. Adrian Brown had been appointed, and held the position until his death in 1919, the School being maintained during that interval by contributions from the brewing industry. After the death of Prof. Brown, a further appeal was made to the brewing industry, with the result that a full endowment was provided for the chair, to which the name of Adrian Brown is attached.

The Department consists of a series of sixteen rooms running from east to west. There is a spacious general laboratory, a well-appointed microscope room,

and a research laboratory. The professor and the lecturer have each a private room and a laboratory assigned to them, and there is a special laboratory for analysis, and incubator room and dark rooms for photography and polarimetric work.

One of the objects of the School is to advance research in the many fields open to investigation in connexion with the fermentation industries, and the professor possesses wide powers with regard to aiding the investigations of competent workers by finding accommodation in his laboratories, and in other ways. Applications concerning such questions should be made to the professor direct.

Prof. Adrian Brown's research work is well known. It dealt with studies on micro-organisms—bacteria and yeasts—and the products of their action on different substances. He studied specially alcoholic fermentation, and made many notable contributions to the chemistry of enzymes. The high reputation of the Department for training and research built up by the late Prof. Adrian Brown has been well maintained during the eight years which have elapsed since his death.

### BOTANY.

The new Botanical Department, comprising some thirty-three rooms, occupies the second floor of the new block, as well as the eastern portion of the first floor. On the first floor are sterilising and incubating rooms for mycological work, staff and preparation rooms, and the herbarium. The latter contains a number of important collections, being particularly rich in cryptogams.

The eastern end of the second or main floor is designed chiefly (though not exclusively) for teaching purposes, and the western end for research. Between these two parts, conveniently placed for both, are the departmental library, museum, store rooms, etc. So far as possible, laboratories and staff and other rooms in which microscope work is carried on, have been arranged on the north side of the building.

Special provision has been made for the study of plant physiology. The physiological laboratory is a large, well-lighted room at the extreme eastern end of the department. It extends across the entire width of the building, being provided with north and south windows as well as three large roof-lights. Adjacent to this laboratory are a small chemical laboratory and a physiological dark room. For experiments in which open air is necessary, a working bench of concrete and lead has been erected on the roof. This bench, like the ordinary laboratory benches, is provided with water, gas, and electric current, and communicates with the physiological laboratory below.

In addition to the building and its fittings, a considerable sum of money has been set aside for apparatus. It may therefore be claimed that the new Botanical Department is well equipped and thoroughly up-to-date. In particular, the facilities for research have been vastly improved.

### THE PRIME MINISTER'S TRIBUTE.

The new buildings were formally opened by the Prime Minister at a special congregation in which the Chancellor (Viscount Cecil of Chelwood) conferred upon Mr. Baldwin the honorary degree of LL.D. The choice of Mr. Baldwin was singularly appropriate, for not only is he a Midlander, but he was also at one time a student at Mason College, and the University of Birmingham can thus claim that it is the only provincial university which has a Prime Minister on its register of students. The function was in every way a success, and the Prime Minister, in proposing the toast of "The University" at the luncheon which followed, made an eloquent and impressive speech. He thought that few developments in Great Britain were more full of hope than the development of the modern universities, a development of modern times which would be looked on by the historians of the future as the genuine renaissance of the nineteenth and twentieth centuries—a renaissance as genuine and as pregnant in its hopes for the future as the renaissance of the fifteenth century. "You have to go back about a century to see the first roots of this movement. At that time Oxford and Cambridge were more or less monastic institutions in which learning was preserved, with some skill, in cold storage. About that time you begin to see the rise of the literary and philosophical societies, in cities like Manchester and Birmingham pre-eminently. They were societies on which (as with all good movements) much scorn was poured in their own day. The *Quarterly* and *Edinburgh Reviews*, which stood then for the highest forms of culture, used to denounce them on the ground that they encouraged the vice which has always been a favourite vice in Birmingham – they complained that they showed an exclusive fondness for speculation on the constitution of matter —no uninteresting or unimportant subject."

It was not until the last half of the nineteenth century that the university movement began to gather strength; and in Birmingham it was associated with the wonderful activity of Joseph Chamberlain and his fellow-workers, who showed what enlightened municipal government could do. When the University of Birmingham obtained its charter, mainly through the energy of Joseph Chamberlain, the magnetic personality of that statesman secured the necessary financial support. But he passed away, and, not long after, the War came; and the University went through difficult times.

Financial help was needed. Recent Governments had done what they could, the City of Birmingham gave £15,000 a year, and the surrounding district about £4000. Vast fortunes are not so common in the Midlands as in some other parts of the country, but that did not make it any more difficult for co-operative effort to raise money. "We are probably standing at the beginning of one of the periods of increasing knowledge which will mark more than ever that renaissance of which I spoke. The transformation of the world is proceeding apace; the civilisation of the west is overflowing into the east, and the dead east is giving itself up from the sandhills of the desert; and the human panorama, more vivid and more extended than ever, is rolling itself out before our eyes in a way which would have filled our parents with amazement. So in science the problems of power and space, of the atom and the electron, are being attacked and invaded with more vigour and more success than at any time in the past. This work is being done by the co-operative effort of men in a thousand colleges, such as this, all over the world. We cannot live on the sacrifices of those who have gone before. A double duty lies before us of maintaining the work which they began, and pushing forward into realms of which they had no conception. . . . I believe that in time the people of this country will learn to realise that the teachers in these universities are the helpers and servants and the friends of humanity. And when once that essential truth has been grasped, there will be no doubt then that all the help that you need in material matters will be forthcoming."

In the afternoon the Prime Minister went to Chancellor's Hall to open the new wing of the hall of residence for men students (built through the generosity of Sir Charles Hyde), where he insisted on the value of corporate life in a university education.