The University of Bristol.

NEW PHYSICS LABORATORY.

THE University of Bristol owes not only its foundation to a member of the family of Wills, but also has since received a series of princely gifts from his two sons, Sir George and the late Mr. Henry Herbert Wills. Of these none is more striking than the Henry Herbert Wills Physics Laboratory, formally opened on Oct. 21 by Sir Ernest Rutherford before a distinguished company of physicists and of supporters of the University in Bristol and the surrounding counties. The laboratory through which Bristol may be expected to become increasingly important as a centre of physical research and teaching has arisen as the result of a gift of £200,000 presented in the years

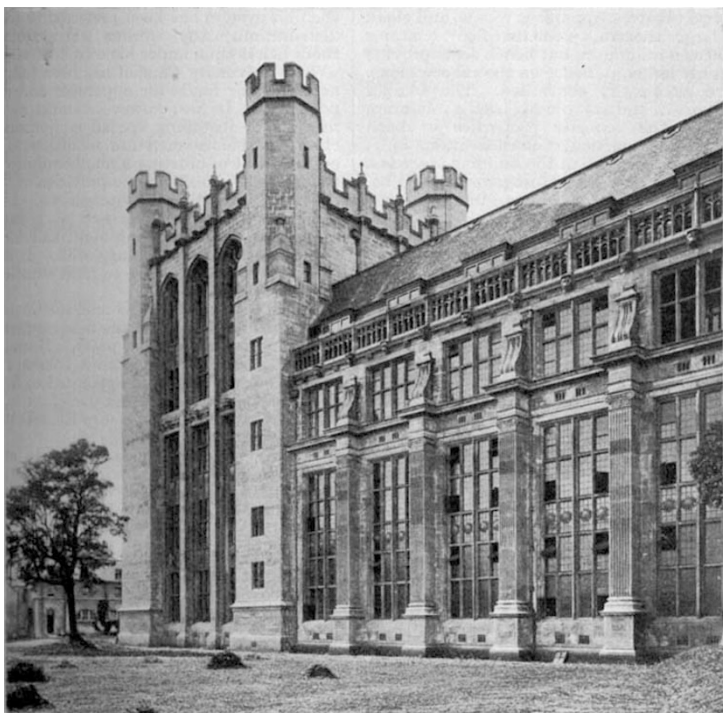

FIG. 1.—Henry Herbert Wills Physics Laboratory, University of Bristol.

1919–20. Mr. Wills desired that this gift should be used mainly in the erection of the building and that the interest accruing in the meantime should provide for its scientific equipment and go towards the establishment of an endowment fund for its maintenance.

The building as designed is the first instalment of an extensive scheme of University buildings intended by the donor to crown the top of a hill overlooking the city, and to be a distinctive feature in distant views of the city. Until the whole scheme has been developed, either as Mr. Wills intended or on somewhat similar lines, the meaning of the design of this first unit, with its tower and reversed "L" shaped plan, cannot be fully grasped.

The long arm of the "L" is arranged with the view of future extension; pending this, an external iron staircase is provided at its end. It contains four floors, together with one large and one small cellar completely underground. In general the rooms are arranged in units or multiples of units, in width 17 feet between centres. On the north side of the corridors most of the rooms are 26 feet deep, and on the south side 16½ feet deep. The ferro-concrete floors have intermediate support on a single row of concrete pillars axially central in the building. The building is designed more or less as a shell, and internal divisions may be removed or rearranged as required.

The general scheme of this portion of the building is subject to alteration in later years as the work of the laboratory develops. At present it is as follows:

Ground Floor	... Research Rooms, Power Rooms, and Workshop.
First Floor	... Research Rooms and Senior Teaching Laboratories.
Second Floor	... Senior Optics and Junior Teaching Laboratories.
Third Floor	... Library, a suite of Class Rooms, Seminars, and Private Rooms.

On each floor one or more rooms are allotted for future extension and fittings are not yet provided; the necessary supplies are, however, brought to the rooms ready for distribution later as required. In particular, on the third floor advantage is being taken of space

set aside in this way to maintain a close liaison with the Department of Mathematics, which, it is anticipated, will occupy the greater part of this floor for some years to the mutual benefit of both subjects. On this floor a room 53½ by 26 feet, with a gallery, is allotted to the library, and will provide accommodation for many years for the growing needs of the two departments in this direction.

An important bequest by Mr. John Exley to the University College of Bristol in 1900 has provided the library with valuable sets of back numbers of leading scientific periodicals. The supply of these has since been maintained by annual grants which will be supplemented, owing to Council's decision to allocate to the Physics Library the income from a capital sum of about £1800 bequeathed to the University by Miss Maria Mercer.

The short arm of the "L" contains two storeys, and includes two theatres, apparatus rooms, and cloak rooms. The larger theatre, on the first floor, contains seating for 300 as a minimum, but bench seats provide for a considerably larger audience on special occasions. Its blinds are electrically controlled. The smaller theatre is beneath it, and is provided with a minimum seating of 130. The acoustic properties of both theatres have received particular consideration.

Under the roof of each arm of the building there is a large loft suitable for extensive storage or, if need be, for any special experiment requiring an uninterrupted length of space.

The junction of the two arms of the building is surmounted by a tower 64 feet square. In this there is a fourth floor containing two large rooms available for research. It is flanked by four turrets, one of which contains a vertical shaft, 4 feet by 3 feet, which goes to the bottom of the building, 90 feet below.

In the general equipment of the rooms special regard has been paid to the wishes of the donor that the furniture and fittings should be of such a high quality as would relieve the University from expenses of repairs for many years to come. The changing needs of any scientific laboratory in these days of rapid advance have, however, been constantly kept in mind, and nothing has been done to diminish the flexibility of the equipment essential to meet new conditions as required. In the provision of gas, water, and electricity in the various rooms the rival claims of the overhead system and the floorduct system have been carefully considered. It was felt that in the main teaching laboratories, where the presence of a few fixed tables distributed over the floor has no inconvenience, the floorduct system has fewer disadvantages, and for this reason it has been adopted. In the research rooms, many of which are relatively small, the supplies of gas, water, and alternating current are conveyed through the rooms in floorducts, and those of direct current of various voltages by bare wires overhead. At the same time, a horizontal duct with creeping way is provided in the roof of the main corridors. This not only serves the purpose of a vitiated air duct in the ventilation system, but also gives means for rapidly laying any temporary cable or piping as required to any room.

For the supply of compressed air and of vacuum, the unit system has been preferred to that of general distribution. Any worker who requires either of them has it thus under his own control.

The University Council has been fully alive to the necessity for funds for apparatus and for additional personnel. It has, however, aimed at avoiding the mistake of installing special equipment of a costly character before men are available to use it, and equally that of creating a number of new posts before funds are available for the provision of the apparatus necessary for their investigations. In apparatus, therefore, immediate provision has been made for the researches of the existing staff, and for the present requirements in teaching, while a small reserve fund has been set aside to form a nucleus for future needs.

In the provision of personnel the Council has found its way to meet some of the new requirements by the creation of certain new posts. Thus, as has been already announced in these columns, Dr. J. E. Lennard-Jones has been appointed to a professorship in theoretical physics and Dr. L. C. Jackson and Dr. H. W. B. Skinner to Henry Herbert Wills' research fellowships.

If, however, the laboratory is to be put to the full uses that its donor desired, further additions to the personnel and equipment will be necessary, and it is hoped that both will soon be forthcoming.

The Velocity of Light.

By M. E. J. CHEURY DE BRAY.

MOST tables of determinations of the velocity of light contain misstatements which seriously detract from their utility. Moreover, there seems to be no table available giving a fairly complete summary of the work which has been done to ascertain the exact value of this most important constant.

The following table has been compiled, from the original communications contributed by the investigators themselves, for the purpose of meeting this want. It contains every value which has been deemed by the author of the observations to be worthy of being stated as the result of a completed series of experiments, in the course of the work which ultimately led to a final value adopted as representing best the result of this work.

The history of the quest for the value of the velocity of light is conveniently divided into three periods, and the table has been accordingly divided into three sections, in a manner which the headings render self-explanatory.

The letters *TW* refer to the toothed wheel (or 'eclipse') method and *RM* to the revolving mirror method. These two methods which, although both of French origin, have become characteristic of European and American practice respectively, are classical and need no further explanation here. References to the original papers, etc., are given after the table, with brief remarks where necessary. In most cases the data have been left in the form in which they were given by the investigator or by the author of the paper, etc., himself (except that all the values of the velocity have been expressed in the same unit: kilometres per second), even when a modification suggested itself, such as when the velocity in air only was given, or when the velocity was stated with a degree of accuracy which is evidently unwarranted owing to the residual uncertainty attaching to the determination.

Not infrequently it has been impossible to ascertain the average date of a series of experiments, and in such cases, after careful consideration of the available evidence, a date has been adopted which appears to represent fairly the most probable position of the observations on the chronological scale. The values being tabulated in chronological order, it follows that mean values (to which a mean date has been assigned)