

est value for producing the strongest acid, and avoids especially any necessity for concentrating plants. For weaker acid, such as chamber acid, it is probable the old process will always be more economical. The new process has, however, the further advantage of giving an acid exceptionally pure and especially free from arsenic. This would seem at the present outlook to be the most important advance in technical chemistry in the last few years.

J. L. H.

#### CAMBRIDGE UNIVERSITY\*

A COMMENCEMENT has already been made with the new Geological Museum which will cost about £44,000, of which sum the fund raised as a memorial to Professor Sedgwick will supply £27,000. The contributions to the Benefaction Fund have made it possible to consider the erection of new buildings for Law, part of the funds for which will, it is understood, be contributed by the trustees of Miss Squire's will, for Medicine, Botany, Archæology and rooms for business purposes and examinations; but it is impossible to say until plans have been drawn and estimates made whether the resources of the University will allow of the erection of all these buildings at the present time.

Although the extreme pressure upon the funds of the University is thus removed and some of the most urgent of long-standing claims can be satisfied, the response made as yet to the Chancellor's appeal will not allow of any of the new developments of University work which many friends of the University consider opportune. In the interests of national progress it is greatly to be desired that laboratories of applied science should not be isolated, but should be established in connection with schools which are already strong in pure science. Technical training in any limited sense of the expression is impossible. In every subject of practical application, whether it be a learned profession or an industrial art, success depends upon breadth of knowledge of the sciences upon which the profession or art is based. Advances in technology are almost invariably due to the application by practical men of principles dis-

covered by those who carry out investigations in pure science. Conversely the strength and vitality of the school of pure science is largely increased when opportunities are afforded to students of passing on to its applications.

The remarkable progress of Natural Science in Cambridge is closely associated with the growth of the Medical School. During the past twelve years a larger number of students have entered for the Natural Sciences Tripos than for any other examination for honors, notwithstanding the fact that but few students are in a position to allow their prospects in life to depend upon the discovery in themselves of a special aptitude for pure science. Almost all those who have since distinguished themselves in various branches of science have commenced their career by preparing to qualify for a profession. The majority of the graduates, for example, who are at present prosecuting researches in the physical, chemical, botanical, zoological, physiological, anatomical and pathological laboratories, making, to the great credit of the University, additions to knowledge which are not exceeded, if they are equalled in amount, by any other university in the world, entered as medical students. The phenomenal growth of the Engineering Department under Professor Ewing is also beginning to produce similar results; students who entered with the intention of becoming engineers have discovered in themselves a special aptitude for pure mathematics or for physics in one of its various branches. Thus experience shows that whereas there can be no doubt as to the advantages which a professional or technical department reaps from the support of a school strong in pure science, the advantages which pure science reaps from the proximity of departments of applied science are not less substantial. An examination of the class-lists, as well as the records of work done after graduation, shows with equal clearness that the older subjects of university culture do not suffer from the rivalry of new departments.

#### GRADUATE STUDY AND THE SMITHSONIAN INSTITUTION.

It will be remembered that a committee representing the American Association of Agricul-

\*From the report of the retiring Vice-Chancellor, Dr. Alexander Hill, Master of Downing College.

tural Colleges and Experiment Stations requested the Smithsonian Institution to consider the organization of post-graduate study in Washington. The matter has been considered by a committee of the regents, consisting of ex-Senator Henderson, President W. L. Wilson, Professor A. Graham Bell, President James B. Angell and Representative Hill, which has drawn up a report that concludes as follows:

"The committee does not hesitate to express its warm and decided sympathy with the general purpose of the movement thus made by the associated colleges. The object sought commends itself to us all, and the zeal and ability with which it has been pressed upon our consideration by the very able and distinguished educators and scientists connected with these colleges furnish ample assurance that the consummation of the great and leading object sought by them is only a question of time. The material already collected in the bureaus and departments of the government furnishes a rich mine of the educational wealth that will not be permitted to remain forever undeveloped. This material is now being constantly enriched by the most valuable additions to its present enormous wealth. Already it has invited to the national capital many distinguished scientists, anxious to avail themselves of the superior advantages thus offered for investigation and research.

"Your committee, however, is painfully impressed with the fact that the powers of the Smithsonian Institution as at present organized are scarcely broad enough to embrace the work proposed. And the committee is equally impressed with the fact that even with enlarged authority its present financial condition would absolutely prevent anything like efficient and creditable performance of the work contemplated.

"It is well known to the members of this board that a great wealth of material—material which would be of immense utility in the successful accomplishment of the purposes indicated by the associated colleges—lies buried in the crypts and cellars of the National Museum.

"If our institution is unable for want of room, as it undoubtedly is, even to place this valuable material on exhibition for the public

eyes, and as little to arrange it for scientific uses, the problem of providing halls for lectures and meeting the necessary expenditures incident to the work proposed becomes serious and formidable in the extreme. Your committee is not prepared to make definite recommendations to the board for its final or ultimate action. That which is clearly inexpedient to-day may become not only expedient but eminently desirable to-morrow."

#### THE MISSOURI BOTANICAL GARDEN.

FROM advance sheets of the administrative reports for 1899 of the Missouri Botanical Garden, it appears that as contrasted with the preceding year there was a slight increase in revenue, and that by a decree of the Supreme Court of the State of Missouri, affirming a decision of the lower court, handed down some years since, the Trustees of the Garden are now empowered to sell real estate originally inalienable, which, when improved, should sell for at least \$1,500,000. The Garden expenses for the year were \$32,174.36, in addition to which a small sum was spent on special improvements.

The Director's report shows that 71,021 visitors to the Garden were counted during the year, and that the collection of living plants, which included 8009 species and varieties at the beginning of the year, made a net gain of 1118, bringing the total at the end of the year up to 9127.

There were 32,890 sheets of specimens incorporated in the herbarium, which now comprises 340,350 sheets. The additions to the library comprise 642 books, 172 pamphlets, and 9042 cards, bringing the contents of the library at the end of the year up to 33,462 parts, of which 14,287 are books, and 19,175 pamphlets. The total value of the herbarium is now stated to be \$51,052.52, and of the library \$54,683.24.

It is stated that as a result of the recent decision of the Supreme Court touching the unimproved real estate constituting a part of the endowment of the Garden, the Trustees are now able to look forward to the gradual conversion of a large amount of unproductive, heavily taxed property into an income-produc-