engineering in importance in the Sibley College organization. The expenditure of all that may be needed to make its material part complete, aided as it is so effectively by its friends outside the university, will be more than justified.

Professor Thurston estimates that about $100,000 should be expended in its permanent establishment: $60,000 on building, including $15,000 on water and steam power, each of which should give 150 horse-power, the one for use in ordinary work, the other whenever experimental work compels the utmost possible regularity of speed; and the balance, $40,000, in supplying needed additions to the equipment of apparatus of exact measurement for heavy currents, and to furnish the income needed for running expenses, including fuel, one workman, and an assistant to the professor of physics, who should be placed in charge of this valuable property; which, although a part of the Sibley College establishment, is really managed by the department of physics in all except its power-supply. It is not impossible, that, as Mr. Cornell used to say, "there is some one walking around who wants to provide this" now greatly needed laboratory. It is certainly an opportunity for some wealthy and public-spirited friend of the university and of this side of its work to immortalize himself, while doing a noble work for his fellows.

THE STUDY OF MODERN EUROPEAN LITERATURE IN AMERICA.

THERE has been a marked change in the subjects of instruction and study in American colleges within the last few years. In literature, the study of French and German and early English has been substituted for Latin and Greek: physical science has won larger recognition, and political economy, history, and the science of government, have become prominent subjects of instruction. The change which has effected this result in the leading universities has been gradual, but many institutions are as yet untouched by its influence.

A comparison of the curriculum of any college now and that of fifty years ago would show that modern subjects now share the time formerly devoted exclusively to the classics, mathematics, and philosophy. The value of the old is not less, but new discoveries in science, and the recognition of the value of modern European literature, have displaced in part the former subjects of education. The pressing demands of modern life and modern culture have modified views, and the practical claim has been felt that the years of study should contribute to getting on in the world. These views have changed the direction of instruction, while the end of all education, intellectual discipline and the training of all the powers, has not been forgotten. What results have been attained, and what further changes are necessary that the new education may bear the choicest fruit?

The results of the study of the modern languages can be characterized as only in part successful. One American university still announces in its catalogue that the "modern languages are taught like the classical tongues." Until recently the instruction in French and German followed strictly the old method of teaching Latin and Greek. The fact that the language was still a living speech was ignored, and the pupil went forth as powerless in the presence of the language itself as a classical student would have been if he stood before an ancient Greek or Roman. Much time is undoubtedly still wasted by confused, illogical, and misdirected efforts on the part of teachers. The learning of a foreign tongue embodies the training of the eye to distinguish the printed words, the tongue to utter them, and the ear to recognize them when spoken. Linguistic training is not simple in the sense that one method will accomplish all these aims. There is beyond this the higher discipline of the study of language as the expression of thought, and its critical and philological study. The student who learns a living language as he learns a dead language will know no more of the one than of the other. Experience verified in the lives of all scholars shows how an ability to read a given language carries with it no practical mastery of the language: the ability to speak or write the language, and to understand it when spoken, is apart from a mere reading ability. Even the familiar sentences of the New Testament will not call up their Greek or Latin or German equivalent without special study. Instruction hitherto in modern languages has been directed to impart a knowledge of the literature. The key to the literature has been found in the grammar and the lexicon. After a mastery of grammatical forms, reading has been begun.

The defects of this method are the same that have characterized all classical study, — the laborious acquisition of words, the perplexing idioms, the search after the true translation, now successful and now futile, a correct knowledge of which is only possible to one familiar with the genius and spirit of the language, and its idiomatic, provincial, or possibly archaic use.

The subtle flavor of a foreign expression cannot be distilled by the aid of the dictionary alone: it must come from a knowledge of the distinctive meaning and uses of words, and an intelligent apprehension of delicate shades of expression.

Only an exhaustive knowledge of literature and of the multiform usages of popular speech can give an inner insight into the spirit of a foreign language. Such knowledge is impossible to ordinary scholars; and even advanced study, unless covering the works of different authors and periods, cannot guide the student at a distance to a critical acquaintance with the language. The method is in itself inadequate, and the results unsatisfactory. Mental discipline of a high order may be associated with this method of study; and a language is often valuable as an instrument of culture from the fact that it transplants the scholar into a new world of thought, presenting sharp features of contrast with one's native speech, exhibiting new grammatical forms and new words as the images of things.

But science has brought the nations of the world nearer; and the intellectual, political, and social life of one affects all others. Every day new discoveries in art and science and in the relations of States are flashed across the sea. Other literatures are filled with the thought, the poetry, and the throbbing life of the century. The ancient world no longer fills the domain of knowledge, and new subjects of study demand recognition.

We pass from the classical method of study to the conversational method of acquiring language, not in all cases a real advance, but in the main a positive progress. Language was studied in its common forms: familiar expressions interpreted the formal grammatical rules, and impressed them upon the mind. But multitudinous exercises often meant perpetual revolution without progress. The entire time available for the student was spent in the exhausting study of exercises: little of the literature was read, and the new tongue became a confused and endless mass of idioms. Exercises were not merely used to illustrate grammatical principles, but became an end in themselves. Few students sought an acquaintance with German or French in order to speak these languages, and yet the entire time of the student was consumed in these exercises.

A *via media* was then attained by the production of grammars, scientific in arrangement, brief and clear in statement, with exercises sufficient to illustrate the rules: idioms were simply studied to facilitate translation.

The 'natural' method, or method of oral instruction, followed. The popularity of this system has been increased by its use in the various summer schools of languages. As an accompaniment of any course of study, this method possesses real merits. Its motto is, "Learn a foreign language as a child learns its mother-tongue." This system has also been applied to teaching the classics. It requires from the first the use of the language itself by the pupil. Brief sentences are learned, and then translated so as to assert, to ask, to command, and to express conditionality: the subject becomes in turn object, and the object subject. By continuing the process, the forms of the article, adjective, and the indirect cases of nouns and pronouns, are learned. Later the forms of tenses and modes are learned. This method trains pre-eminently the memory: as a phase of instruction, it is important and valuable, but when it claims exclusive possession of the field of languages, and seeks to dominate the entire system of instruction, it is not justified in supplanting established methods.

A noteworthy application of this method has been made in teaching Hebrew, and a modified form of it has been used in instruction by correspondence.

From the Hebrew text of the Bible a living language has been constructed, and made the vehicle for the expression of familiar

thought. In many cases the English text has been retranslated orally into Hebrew. A thousand students in a single year have been engaged in this study, and the Semitic languages are now subjects of study in this country to an extent unknown before.

The modern languages are far from full recognition in the courses of study in the greater number of colleges. The demand for their study as part of a liberal education is not emphasized by their position and the amount of time devoted to them. They are tolerated rather than regarded as essential. Out of sixty-four representative colleges, fifty-eight require neither French nor German for admission to the course in arts, four require French, and two either French or German. The colleges are thus reduced to the necessity of giving elementary instruction in the modern languages; and the college does not to this extent imply advanced instruction, but simply the teaching of the rudiments. A knowledge of French and German is necessary for the highest scientific as well as classical study. The use of French and German works, the consultation of authorities found only in these languages, is impossible if their study is postponed until late in the academic course. The colleges do not reap the fruits of a knowledge of the modern languages in their subsequent instruction. The philological study of Latin embraces law Latin and the forms that have survived in French and the other Romance languages. A critical knowledge of early English is not possible without a study of the French element in English derived from the Latin. Thus the advanced study of the classics, as well as our heritage of the English tongue, is dependent upon an acquaintance with French. The study of Anglo-Saxon is promoted by a preliminary knowledge of German. Our colleges are thus fettered in their work by the lack of the elementary knowledge on the part of pupils essential to its successful prosecution. An intelligent acquaintance with modern European literature is not possible when the time which should be devoted to it is occupied with elementary study. The time which is devoted to the modern languages forms in most institutions but a small part of the regular college course, necessitating imperfect and hasty study. In sixty-four colleges conferring the degree of bachelor of arts, the amount of time required to be spent in the study of French and German is seven and three-tenths per cent of the entire four years' course. It is required that less than four per cent of the entire time of the student shall be devoted to one of these languages. It is not to be assumed that this low amount adequately represents the entire time devoted to the modern languages, for through electives in the best colleges the study can be greatly extended; but it represents the current estimate of college faculties of the value of these studies, and the amount required to enable the student to prosecute his later work. During the same period, at least twenty-five per cent of the student's time is consumed, by compulsion, in classical study, in addition to the preliminary knowledge required before entering college. The revised curriculum which has been adopted at Yale, and other colleges where the strict classical requirement has not been retained in full force, is very encouraging. Several Western and Southern institutions, as the Universities of Michigan, Indiana, and Virginia, exhibit a thorough and extended course in the modern languages. The scientific and technical schools recognize the indispensable character of a knowledge of French and German for purposes of all advanced investigation in science and engineering. The most recent discoveries in these and allied branches are published in monographs and reviews, and it is safe to say that the highest expert testimony on a question of engineering cannot be secured except from one familiar with the constantly increasing results of foreign investigation. Such results are not immediately attainable except in the language itself; and the final word which has been uttered in discovery is often of priceless value in all industrial enterprises. There is a loss in the equipment of every scientist or engineer who cannot at once obtain from original sources the knowledge which he needs. There is an additional reason why the instruction in modern languages in our scientific courses should be increased rather than diminished. The requirements for admission to these courses are less than to the classical. An exclusively professional or technical course, unless conceived in a broad spirit, fails to give a view of the connection and relation of the physical sciences. No branch of study stands alone, and can be built up from itself. Geology embraces paleontology, and paleontology demands a knowledge of animal and plant forms, hence of zoölogy and botany. Chemistry touches, on the one hand, organic forms, and, on the other, inorganic, and involves the laws of physics. The highest results in every field of learning demand the highest preparation for them, and the student going out into life will find a sphere corresponding with his highest fitness. It is a misfortune to educate men out of sympathy with other fields of knowledge. The scholar whose work will be confined to a single branch needs the broadest attainable culture, which would be impossible for him later. Knowledge loses half its value when it cannot be communicated clearly, forcibly, and persuasively. Thus the student with an exclusively practical life before him cannot dispense, even for success in his own department, with the culture which springs from a linguistic training. The scholar with a clear insight into the meaning of words, and the power to marshal his thoughts effectively, can make his knowledge useful to himself and the world. Any course, whether technical or scientific, which sends out graduates without that literary training which will give a commanding weight to their views in any community, is to that extent defective, and fails to prepare them for the widest usefulness. Minor defects in subordinate, technical matters can be more readily repaired by experience than a lack of linguistic training, which will give clearness and definiteness to their thinking, and make the publication of the results of their experience a contribution to the world's knowledge.

The experiment by which in certain courses the modern languages are substituted for the classical, is one of extended application in the colleges of this country. In many institutions the students in courses in philosophy and literature are more numerous than the classical students.

We conclude that the elementary study of French and German should be begun in the public schools; that there are years in youth in which languages are acquired with unusual facility, which should be improved in any system of education.

This would enable the instruction in the modern languages in colleges to be advanced in character, so that by their use the full value of a literary, scientific, or historical course could be realized.

By requiring French or German for admission to technical courses, the benefits of a thorough knowledge of these languages would be attained without crowding the strictly professional studies, and some literary study should accompany the whole four years' course in such schools.

W. T. HEWETT.

BRITISH UNIVERSITIES AND THE TRAINING OF TEACHERS.

THERE is no professorship of education at any university of England, Wales, or Ireland. At the universities of Cambridge and London there are special examinations for teachers, on the results of which certificates or diplomas are granted; but there are no educational degrees. Technically speaking, therefore, education is not a university subject in these countries. At Cambridge, under the auspices of a teachers' training syndicate appointed by the university early in 1879, lectures on teaching have been given for eight years past; but they are not permanently established, and may come to an end at any time. They are, as a rule, fitfully and poorly attended, and cannot as yet be pronounced a decided success. Except in the training-colleges and at the College of Preceptors, there is no other systematic course of lectures for teachers outside Scotland. In Scotland there are two chairs of education, established in 1876 out of funds left by the well-known Dr. Bell, — one at Edinburgh, and the other at St. Andrew's. Both these chairs are very ill endowed. In 1886 a school-masters' diploma was established at the University of Edinburgh.

I shall not attempt to criticise this state of things, — looked at from any point of view, it is far indeed from satisfactory, — but I shall endeavor in the space at my disposal to describe what is actually being done for the training of teachers by these various agencies.

I will begin with Cambridge, and first as to its courses of lectures. They usually consist of one set on psychology in its bearing on teaching, delivered as a rule by Mr. James Ward of Trinity College; another set on the history of education; and a series of dis-