Third Year.

Biology	9
Philosophy	5
History and Economics	4
Elective Course	2

English composition and reading, French and German, as well as economics, are included in all the complete engineering and science courses at the Case School of Applied Science, Cleveland, Ohio. The same practise is followed at the Massachusetts Institute of Technology, where, in addition, history (American and European) figures in the program. In these institutions the course lasts four years. The course of reading prescribed in the Case School is an instructive one.

I inquired specially into the teaching of English composition. At the Massachusetts Institute the instructor was taking the utmost pains to select themes likely to interest engineering students; but the possibility of directly correlating the laboratory work with the literary work had not been contemplated.

It appears to me that we may well take a leaf out of the American book and introduce an element of literary study into our engineering courses; but when the question is considered, I trust we shall endeavor to correlate the literary work very closely with the practical work. I did not discover that American students are any more willing to read studiously than ours are.

HENRY E. ARMSTRONG.

LONDON.

(To be continued.)

JOHN BELL HATCHER.

AMERICAN paleontology has suffered an irreparable loss in the untimely death of Mr. Hatcher, which took place, after a short illness, at Pittsburg on July 3.

John Bell Hatcher, the son of John and Margaret Hatcher, was born at Cooperstown, Illinois, October 11, 1861, but at an early age was taken by his parents to Greene County, Iowa, where they settled permanently, and where he received his early education. As a boy, he provided for future college expenses by working as a coal-miner and what he observed in the mines directed his attention and interest to the problems of geology. In 1881 he entered Grinnell College, Iowa, and, after remaining there for three months, he became a member of Yale University, graduating in 1884. His undergraduate years were devoted to the study of the natural sciences, and especially to geology and botany. Some collections that he had brought with him from Iowa attracted the attention of the late Professor Marsh, who appointed Hatcher, immediately on his graduation, as his assistant and at once sent him to the western field to collect fossil vertebrates.

Thus began a career which was unrivalled of its kind, for Hatcher had a positive genius for that particular work, as is well known to all who have had the privilege of accompanying him in the field. Marvelous powers of vision, at once telescopic and microscopic, a dauntless energy and fertility of resource that laughed all obstacles to scorn, and an enthusiastic devotion to his work, combined to secure for him a thoroughly well-earned success and a high reputation. He may be said to have fairly revolutionized the methods of collecting vertebrate fossils, a work which before his time had been almost wholly in the hands of untrained and unskilled men, but which he converted into a fine art. The exquisitely preserved fossils in American museums, which awaken the admiring envy of European paleontologists, are, to a large extent, directly or indirectly due to Hatcher's energy and skill and to the large-minded help and advice as to methods and localities which were always at the service of any one who chose to ask for them.

Hatcher's uprightness and sincerity of

character, no less than his remarkable energy and persistence, attracted to him the admiration of many western men, by whom frequent tempting offers were made him to leave the unremunerative paths of science for the material rewards of business, but in vain. He would not seriously consider the abandonment of his chosen work for any reward whatever and he died in harness.

In 1887 he married Miss Anna M. Peterson, who, with four children, survives him.

Hatcher's work for Professor Marsh and the U. S. Geological Survey continued for nine years and though, in 1890, he was appointed an assistant in geology in Yale University, he kept up his field-work with unbroken success, amassing a very large part of the enormous and invaluable collections which are stored at New Haven and Washington.

He accepted, in the spring of 1893, a call to Princeton University as curator of vertebrate paleontology and assistant in geology and at once threw himself into his new duties with characteristic ardor. For the three summers of 1893–5 he conducted field-parties of students through large parts of Utah, Wyoming and South Dakota and, with all of his old interest and skill, gathered priceless collections of mammals from the Uinta, White River, Loup Fork and Sheridan beds, accomplishing wonders, in spite of the scanty resources which sadly hampered his plans. His students became his enthusiastic friends and admirers, glorying in the courage and devotion which overcame every obstacle, material or moral. In return, Hatcher took the warmest interest in his students, especially in those who were struggling against difficulties to secure an education; in the quietest and most unostentatious way he was continually devising effective means to help such students to help themselves and thus enabled them to continue their studies without any impairment of their self-respect.

The most important work which Hatcher undertook during his connection with Princeton was his exploration of Patagonia in the years 1896 to 1899. The plan was all his own and was not proposed to the geological department until everything was nearly ripe for action; he secured the greater part of the necessary funds and, with characteristic generosity, was himself a liberal contributor. How successful this great undertaking was is very generally known and needs not to be repeated here. Great credit for this success is due to Messrs. Peterson and Colburn, who were associated with Hatcher in the work, but the soul of the enterprise was Hatcher himself. In his 'Narrative of the Expeditions' he has left an extremely well-written and interesting account of these explorations, which, however, gives the reader but an inadequate conception of the difficulties and perils which beset him, and of the boundless energy and courage with which those difficulties were met and overcome. Painful wounds, dangerous sickness, indescribable suffering, the hardships due to a severe climate and a savage wilderness and to inadequate equipment, in vain combined to turn him back, though he was twice compelled to return home for short periods of rest and recuperation. In the history of scientific exploration there are few chapters recording truer heroism and achievement than Hatcher's journeys through Patagonia.

The principal object of the expeditions was to gather the most extensive possible series of the fossil mammals for which Patagonia has been so famous since the days of Darwin's 'Voyage of the Beagle,' and next to determine the stratigraphical succession of the beds in which these fossils occur. This involved extensive explora-

tions of regions where no white man had ever been before and brought to light much geographical information. At the same time, the plants and recent animals were collected, so far as it was possible to do so without sacrificing the principal end in view, and in these departments also an unexpected measure of success was attained, and a representative series illustrating the botany, zoology and paleontology of Patagonia was secured.

Hatcher then conceived the plan of publishing together in one uniform series of reports, by the hands of different specialists, all these results, which would otherwise necessarily appear in separate form, scattered throughout the various technical journals. This plan was submitted to Mr. J. Pierpont Morgan, and to his liberality it is due that this cherished scheme is now in process of realization and in a manner surpassing the hopes of its original proposer. In addition to the 'Narrative and Geography,' Hatcher had undertaken to write reports upon the geology and also upon the fossil Litopterna and Marsupialia. How much of this material can be put into shape for publication can not yet be told. In any event, he has raised for himself an enduring monument in these volumes, which owe their existence to him, however much or little may be his verbal contribution to their contents.

Hatcher finally returned home (little as he believed it to be a final return) in the autumn of 1899 and in the following February he accepted a position as curator of vertebrate paleontology in the Carnegie Museum at Pittsburg, a position which he occupied till his death. With undiminished interest and zeal he took up the larger and more exacting duties of his new sphere and conducted his work with distinguished success. Paleontologists all know with what remarkable rapidity the collections of the Carnegie Museum have grown within the last four years and what a wealth of noble material has been brought together there, much of it unsurpassed in the world. No less than three great collections thus owe their choicest treasures to the skill and devotion of Hatcher.

It would, however, be creating a very false impression to let the reader suppose that Hatcher was entirely or even mainly a collector. For a long time he modestly held back from bringing his own observation and inferences before the scientific world and from this comparative seclusion he was late in emerging. He had been well trained and he had enjoyed great experience in years of field-work over a vast territory in two continents; more than this, he possessed a singularly original and independent mind and the keenest powers of observation, and these gifts, combined with his wide opportunities, led him to many novel and important conclusions in dynamical and stratigraphical geology, only a very small part of which has yet been published. The paleontology of the vertebrates was the field in which he took the deepest interest and in which he has published most, his papers dealing principally with mammals and reptiles. These papers show the ability which he brought to his subject and there seemed every reason to hope that his unresting activity might continue for many years and that the harvest would correspond to the long and laborious period of preparation. But this hope has been denied; Hatcher was cut off just when his powers and opportunities had reached their fullest development and the boundless field, in which he so loved to work, lay open and unrestricted before him. When his last illness attacked him, he was engaged upon a monograph of the Ceratosauria for the U. S. Geological Survey, upon the monographs for the Patagonia

Reports above mentioned, as well as upon several papers for the publications of the Carnegie Museum.

It is a pathetic coincidence that the words which Dr. Dall applied in this journal to the late Professor Beecher should so soon find an exact application to Beecher's former colleague in the Yale Museum: 'The ranks of those capable of bringing to the study of fossils keen insight and a philosophical spirit of inquiry, guided by principles whose value can hardly be exaggerated, are diminished by one whom science could ill afford to lose, and to whom, humanly speaking, there should have remained many years of industry and fruitful research.'

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SCIENTIFIC BOOKS.

Adolescence; its Psychology and its Relations to Physiology, Anthropology, Sociology, Sex, Crime, Religion and Education. By G. Stanley Hall. New York, D. Appleton and Company. 1904.

The range of President Hall's two volumes is even wider than the title announces. Besides the topics there indicated, the book contains an outline of the author's general psychological system, a philosophical *credo,* and multitudinous comments on the psychology of early childhood and adult life. The thirteen hundred and more pages are somewhat evenly divided among physical, psychological, social and miscellaneous phenomena. The author's division is as follows:

Volume I.—Growth in height and weight, 50 pages; growth of parts and organs during adolescence, 78 pages; growth of motor power and function, 108 pages; diseases of body and mind, 88 pages; juvenile faults, immoralities and crimes, 86 pages; sexual development: its dangers and hygiene in boys, 61 pages; periodicity, 41 pages; adolescence in literature, biography and history, 77 pages.

Volume II.—Changes in the senses and the voice, 39 pages; evolution of the feelings and instincts characteristic of normal adolescence, 55 pages; adolescent love, 49 pages; adolescent feelings toward nature and a new education in science, 88 pages; savage pubic initiations, classical ideals and customs and church confirmation, 49 pages; the adolescent psychology of conversion, 82 pages; social instincts and institutions, 86 pages; intellectual development and education, 112 pages; adolescent girls and their education, 87 pages; ethnic psychology and pedagogy, or adolescent races and their treatment, 101 pages.

The student will naturally divide the book as a whole into: (1) An array of facts bearing upon its topics, (2) an attempt to establish a parallelism between the mental development of human individuals and that of the whole phylum at one extreme of which they stand and (3) the author's educational recommendations. The reviewer will follow this division.

The array of facts presented implies an astonishing labor in reading, selecting and condensing. Over two thousand writers are quoted or referred to. Whoever has made any pretense of saying a scientific word about the rich life of concrete human nature, we may expect to find summarized. Be it the love of children for cats or growth of thoracic capacity or the lives of the saints, President Hall is equally ready with varied comment and plenteous references. No one person could estimate the completeness, accuracy and relevancy of this body of information as a whole. If the citations and summaries under each topic do represent adequately the views of the experts, President Hall's tremendous zeal will result in a corresponding saving of time and gain in insight for future students. If they do not, very many will be misled. In any case the array of information will, in these volumes as in the author's teaching, stimulate and suggest. In those fields where the reviewer could presume to judge, there appears an unhappy tendency toward the selection of authors and extracts which fit President Hall's own prepossessions. And this suspicion is too frequently confirmed in cases where expertness is not requisite. We tend to lose confidence in no matter how eminent a scholar, when, in a description of 'Adolescence in Literature and Biography,' he gives a thousand words to a summary of Mary Mc-