degree of doctor of medicine after about six years of university residence, to which, however, there must be added at least a year of hospital work, and these men, like many doctors of philosophy, would have a rather narrow education. Such an education is, however, less narrow than that of many Harvard doctors of philosophy, under our present system. Others would devote eight or even nine years to their university careers, and their training would be correspondingly broader. Surely there is room at the Harvard Medical School for these different classes of students. But, in any event, the six-year men can be excluded only by an act which will inevitably cut us off from an important and rapidly growing group of American institutions, the great middle western and western state universities. We may not need the numbers thus lost; surely we should not lose their influence, if we are to be national and not local in scope.

As we believe, the greatest of all the needs of the Harvard Medical School is free, and, so far as possible, untrammelled intercourse with every other department of Harvard and with every other American university. No small changes are necessary if our medical education is to be made thus elastic, but surely it can not injure Harvard College to broaden the elective pamphlet by the introduction of suitable courses, nor can it hurt the Harvard Medical School to broaden its scheme of admission, to bring itself into relation with American universities in general, and into correspondence with the Harvard Graduate School, if this be done without diminishing the requirements for the degree of doctor of medicine.

These results may be accomplished by the following arrangements:

1. Count towards the A.B. suitable courses in medical sciences. 2. Admit unconditionally to the medical school all holders of a respectable bachelor's degree. 3. Grant the M.D. (*a*) after not less than a fixed minimum of residence; (*b*) upon evidence of theoretical and practical attainment in the medical sciences (including the present admission requirements) and in the clinical branches. 4. Establish a simple administrative mechanism for the degree of M.D., modelled after the present mechanism for the Ph.D. 5. Execute the above arrangements in the broadest spirit, to establish and preserve academic freedom, as exemplified in the greatest variety of preparation, of medical course, and of finished product. 6. Relax the present rigid organization of the medical school curriculum and lay stress upon the quality of our doctorate rather than the means of its attainment. 7. In all ways encourage the better students. Permit them to advance at their own rate and in their chosen paths.—*The Harvard Bulletin.*

SCIENTIFIC BOOKS

Life and Letters of Peter and Susan Lesley. Edited by their daughter, Mary Lesley Ames. In two volumes. Pp. ix + 526, 562, New York, G. P. Putnam's Sons.

The founders of American geology are only names to most of the living. Not one remains of those who were engaged on the surveys of 1836 to 1841 and only one survives of those who shared in the Pacific Railroad surveys. Tradition relates that many of the early geologists were mighty men; the record of their work and of their warfare has been transmitted to us, but, for the most part, their personality is unknown. Obituary notices, presented in societies, usually discuss only the value of the subject's scientific work and leave the reader anxious to learn something of the man. No such defect is present in these volumes, for here is revealed Professor Lesley[1] as he knew himself and as his friends knew him.

Peter Lesley's father, third of the name, was born in Philadelphia, son of a revolutionary soldier, who, coming from Scotland, had established himself in that city as cabinet-maker. Just as Peter third was about to enter the university, his father died and the young man was compelled to take the father's business in order to support the family. In

[1] Professor Lesley was always dissatisfied with his name and when he became of age he placed the "Jr." as a prefix instead of suffix; thenceforward he was known as J. P. Lesley.

due time he took to wife the daughter of John Allen, a woman of sprightly mind and artistic temperament, with, like himself, strong religious convictions. (J.) Peter, the eldest son, was born in 1819.

Ninety years ago, parents were not afflicted as now with grievous anxiety respecting the health of their children, and boys, especially eldest sons, found themselves scaling the heights of Parnassus at a tender age. Young Peter was sent to the best school in Philadelphia, where he applied himself so well that when eight years old he gained the prize for an examination in Bonnycastle's algebra. At home, the father drilled his children in geography, mechanics, literature, statistics and above all in the accurate use of language, so that Lesley could well say in later years:

> He started us in our careers equipped for seeing, thinking and describing what we felt to be useful and beautiful as what we believed to be true.

Professor Lesley was a nervous, excitable youth and his health gave way frequently, but then, as in after life, he exhibited remarkable recuperative power. After many interruptions, he was graduated from the University of Pennsylvania in 1838 but with health so broken that he could not begin study for the ministry, as he had intended. By advice of Dr. Dallas Bache, he sought and obtained from Professor H. D. Rogers the position of assistant on the geological survey, which he retained until the close of the work in 1841. The letters during this period show the strange combination of temperaments which made him so delightful a companion in later years. The keen observer of actual conditions and the impressionist artist struggle for supremacy, while at times a philosopher of medieval type bursts in with abstruse discussions. A curious grouping in a lad of twenty, which gives to his letters an incomparable charm. These letters tell much of his associates on the survey; one shows that geologists then had the same burden as now:

> I got a lecture on geology from W[helpley], who complains bitterly that the landscape is ruined to him because he looks down on a valley and can't help saying, there's No. 7—that next hill is No. 6, etc. In fact geology destroys all poetry and one can not be an Arcadian, as long as he knows what formation he's standing on and what one he is looking at.

The survey came to an end, Lesley entered Princeton Seminary, graduated in 1844, was licensed to preach and went to Europe to make a pedestrian tour. Returning, he spent two years as colporteur among the Pennsylvania-Germans and then went to Boston to complete the Pennsylvania geological map for Rogers. In 1848 he assumed the pastorate of a congregational church at Milton, Mass., and early in the following year he married Susan Inches, daughter of Judge Lyman, of Northampton, Mass.

According to all accounts, the young couple began married life with very little to encourage their friends. They had bad prospect of health and worse prospect of pecuniary support, for Lesley's position as clergyman was precarious, owing to his theological views. They were wholly contrasted in temperament; she calm and loving quiet, he restless and loving excitement. But their friends erred. The marriage in 1849 was the beginning of an ideal life, which ended only with his death in 1903. They lived happily in Milton for three years amid most attractive surroundings. The letters during this period show how broad their social relations were, for they tell of Channing, Desor, J. Freeman Clarke, Lesquereux, Edward Everett Hale, Agassiz, Emerson, Lyell and a host of others in science, literature and theology, who were entertained in the hospitable little house at Milton.

In 1852 Lesley entered the employ of the Pennsylvania Railroad Company with his office in Philadelphia, and in August of that year the young couple removed to that city, where for forty-one years they were increasingly influential. He soon became secretary of the Iron Masters' Association and librarian of the American Philosophical Society. In 1863, the railroad company sent him to Europe to study methods of hardening the surface of rails and to investigate the Bessemer process. During a stay of three months he found opportunity to renew old acquaint-

ances and to make many new ones and his letters give interesting glimpses of the men. Here is one on Lyell:

I must tell one of Sir H. Holland's jokes on Lyell. He saw him running across the street to him one day saying, "Have you heard the news?" "No is Lucknow relieved?" "Oh, I don't know anything about Lucknow—but haven't you heard that we have just got another new marsupial from the dirt-bed at Lyme?" I find Lyell just as nervous as ever—more so in fact—and far more interesting.

In 1866, after a year of tremendous work as expert, his health gave way and he was compelled to go abroad, where with Mrs. Lesley he spent twenty months, wandering as far as Palestine and the Nile. They returned to Philadelphia in 1868 and soon afterwards occupied the home on Clinton St., where they remained until 1893, when his final break came and necessitated removal to their house at Milton. With this return to Philadelphia, there began another period of incessant activity. The danger of poverty, prophesied by their friends, had passed away many years before, but Lesley's appetite for work was insatiable. Mrs. Lesley was scarcely less active in her sphere of organized philanthropy, to which her letters make only incidental references. Mrs. Ames has done well in supplementing them.

The life in Clinton Street is common property, for that house was a Mecca to which all scientific men turned when in Philadelphia, assured of a welcome which would make them think better of their kind. The story has been told so often that it need not be repeated here.

Any notice of this work, brought within reasonable compass, must be only a patchwork of fragments, giving no proper conception of its importance. The long unreserved letters, covering the period from 1838 to 1893, concern not the writers alone; they tell of men and women who have graven their names deeply in science, literature and even in politics; they throw interesting sidelights upon many obscure matters in our country's history, for the Lesleys were associated intimately with many who were leaders in great movements. Mrs. Ames has woven the material so skilfully that Peter and Susan Lesley tell their own story and that of their time. The volumes contain numerous portraits, the last of which is copied from a painting made by their daughter, Mrs. Bush-Brown, not long before they passed away. Professor Lesley, old, feeble, yet cheerfully content, sits with one hand resting on the shoulder of Mrs. Lesley, who still retains the beauty of feature and expression which had endeared her to all acquaintances. The scene is the fulfilment of a prophecy made by Lesley almost fifty years before:

I half believe that when I am an old decrepit man, sitting all day in a well-worn armchair, my volatile and restless nature fixed like carbonic acid into a solid, snow-like equanimity, she will be briskly moving about me like a bright planet around a gone-out sun, and returning to me the little borrowed light and heat that I have ever been so happy as to give her.

Professor Lesley passed away in June, 1903; Mrs. Lesley survived him, but she faded away gradually, until the following January death came to her also. "They were lovely and pleasant in their lives and in their death they were not divided."

John J. Stevenson

The Cambridge Natural History. Edited by Harmer and Shipley. Vol. IV. Crustacea and Arachnida. 8vo; pp. xviii + 566; 287 figures. London, Macmillan & Co. 1909. $4.25.

This volume completes the set of ten of the Cambridge Natural History, and the editors are to be congratulated upon bringing to completion such a comprehensive work, one that exhibits so many excellencies and has been of such great service as a reference work to zoologists.

The delay in the publication of this last volume is due to the death of Professor Weldon, "who had undertaken to write the Section on the Crustacea"; he, however, completed only the chapter on Branchiopoda, while the remainder of the group has been written by Mr. Geoffrey Smith. The Crustacea occupy 217 pages. Chapter I. treats of