found to be only three to one. Observations on other areas indicated that the general average for the region was closer to five to one. This lowering of the ratio may have been due in part to the unfavorable weather conditions which prevailed over the Middle Atlantic states during the growing season of 1925, but even a ratio of three to one is encouraging.

The older trees mentioned in the previous note have continued growth and they bore a copious crop of nuts last autumn. The nuts, however, were promptly consumed by squirrels and boys of the neighborhood, and branches of some of the trees were broken by stones and brickbats thrown against them. These trees and others similar to them (for they seem to be by no means rare) should now be carefully protected from injury and given opportunity to propagate the species.

ARTHUR PIERSON KELLEY

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SPECIAL CHARACTERS FOR THE TYPEWRITER

I WAS much interested in reading "Special Characters for the Typewriter" as set forth by Mr. Hulse in SCIENCE for March 26.

One company (the Remington) makes special keyboards, as the medical keyboard and the mathematical keyboard.

The medical keyboard appears to be fairly well suited to the physicians. But the mathematical keyboard is not so well suited to the mathematicians. It leaves off the useful characters \$, %, ¼, ½ and ¾, in order to put on some other mathematical signs.

I think that if a successful mathematical keyboard be made with a forty-two-typebar machine, it will have two shifts, instead of one, and 126 characters instead of 84. Then it could have exponents, as well as many other useful mathematical signs. Of course, such a machine would cost more, and it would be worth more.

I think the mathematical societies should investigate this problem, and tell the typewriter companies what should be done.

AD INFINITUM

THE UNIVERSITY OF WASHINGTON AND FISHERIES RESEARCH

ON page 91 of the January 22, 1926, number of SCIENCE appeared the following note about the University of Washington, which I would like to correct.

> The University of Washington is to be an international center of the United States and Canadian fisheries research work on the Pacific Coast, according to announcement from Dean John N. Cobb, of the College of Fisheries. The International Fisheries Commission, composed of official state fisheries commissions of Pacific coast states, Alaska and British Columbia, together with the entire Canadian department of fisheries, will consolidate all work here. The university was selected especially because of its proximity to the halibut and salmon supply. Eight leading fisheries scientists will locate in Seattle, among them William S. Thompson, of the California state fisheries, and Dr. H. F. Rich, of Washington, D. C.

About a year ago a treaty was entered into by the United States and Canada looking to the conservation and control of the Halibut fisheries of the Pacific coast. The commission was organized early in the year 1925 and appointed a staff to take care of the scientific investigations. As the commission found it desirable to locate its scientific staff in Seattle, and wished to be within reach of the College of Fisheries library and laboratory facilities, the University of Washington offered to furnish quarters for them in one of the group of buildings housing the College of Fisheries.

A short time after this the various fish commissions of the states of Washington, Oregon, California, the territory of Alaska, Province of British Columbia and the Federal Fish Commissions of United States and Canada met in Seattle and organized a federation looking to better cooperation in working on the many salmon problems of the Pacific coast. Dr. H. F. Rich, of the U. S. Bureau of Fisheries, in conjunction with an executive committee, were selected to outline plans for standardizing and coordinating the work of the various commissions so far as possible. It was not the intention in the formation of this federation to have the research work done by other than the agencies heretofore operating. In other words, Canada, British Columbia and the other commissions function just the same as they always have done, the idea being merely to meet and exchange ideas looking to a more effective attack upon our salmon problems. For the same reasons as outlined above in connection with the International Fisheries Commission, Dr. Rich was also granted quarters in the same building.

Since then, at the request of the U. S. Bureau of Fisheries, the university has furnished quarters for those scientists of the bureau, who are working upon Pacific and Northwest problems and whose headquarters it has been found convenient to locate in Seattle.

JOHN N. COBB

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SCIENTIFIC BOOKS

Researches of the Department of Terrestrial Magnetism, Volume V.

THE Department of Terrestrial Magnetism of the Carnegie Institution of Washington, established in

1904 for research in terrestrial magnetism and allied phenomena, was faced at the outset with the lack of sufficient accurate data on which to base its researches. Various governments had done much in the way of operating magnetic observatories and conducting magnetic surveys in their respective territories, but there were many countries where the governments had not been able or willing to have the needed observations made and the data for the oceans were meager and unreliable.

Thanks to the energetic and efficient world magnetic survey operations of the Department of Terrestrial Magnetism, the needed data have now been supplied for practically all the land and water areas between latitude 60° north and 50° south. One of the immediate practical results of this work has been the furnishing of accurate information regarding the compass variation over the ocean areas, of great benefit to the navigator.

Volumes I, II and IV of the researches of the Department of Terrestrial Magnetism contained the results of observations made on land between 1905 and 1920 and Volume III was devoted to the results of observations at sea between 1907 and 1916. Volume V, recently issued, contains the results of magnetic and electric observations made aboard the *Carnegie* between 1915 and 1921 and reports of several special investigations. The cruises during that period covered over nine thousand two hundred miles and extended into the Atlantic, Pacific, Indian and Southern oceans. A cruise of special interest was the circumnavigation of the Antarctic Continent in 1915 and 1916. The tracks of previous cruises were crossed at many points, thus furnishing information regarding the change of the earth's magnetism with lapse of time. The ocean magnetic survey has now reached the point where this class of observations is the most important one and it is gratifying to know that there is prospect of the resumption of the operation of the *Carnegie* for that and other purposes in the near future.

With the accumulation of observations in terrestrial magnetism and atmospheric electricity, not only from the work of the Carnegie Institution, but from that of the various governments, it has been found possible to study the correlations of the various magnetic and atmospheric electric elements with each other and with solar and other phenomena. The correlations appear to be fundamental to adequate explanation of these observed phenomena.

Volume V contains also a discussion of navigation of aircraft by astronomical methods, which is one of the difficult problems, especially in the Arctic. It also contains a description of the compass varimeter, an instrument which fills a long-existing need for the investigation of local magnetic disturbances, hidden magnetic objects and materials and for registering intensity variations with accuracy under field conditions.

N. H. HECK

Sermons of a Chemist. By EDWIN E. SLOSSON, author of "Creative Chemistry," etc., director of Science Service, Washington, D. C. New York, Harcourt, Brace & Co.

DR. SLOSSON has been long known and honored as a clever, straightforward journalist, with a liking for accuracy, and the saving grace, where such is needed, of humor. He has been still longer if not better known as a chemist, and as interested in the human side of all problems he now comes before us as a preacher. For there are no facts in chemistry or anywhere else in the world that do not somehow have human bearings. It is not well to leave these all to the clergy, for even a truth must be seen from several different aspects, and new truths not yet moss-grown or even seasoned constantly sweep into our line of vision. It is no use for us to resist them. Whether we like them or not, if spurious they will soon fade away—if genuine they are here forever. If so it is well for us to know what they signify. And as a guide in this quest, we can ask nothing better than this whimsical, jovial, scholarly and sympathetic chemist.

This volume is made up of twenty-two discourses, actually delivered and all related on the one hand to science, on the other to the spiritual side of scientific knowledge. These range widely from "The Greatest Miracle of the Bible," the creation of man from the dust of the earth (that is from carbon, oxygen, hydrogen, nitrogen, lime and the rest of the ingredients, which pass into and through his body, never to stay) to the "Seven Sons of Satan," which torment and divert the even current of man's life.

The fine humor, overlying a ripe common sense, makes every chapter excellent and profitable reading. Often a new way of putting a new idea suddenly makes it self-evident. Thus:

> Science is based not on verified facts but on verifiable facts. If some antiquarian should unearth a death-bed confession of Joseph Priestley, stating that he had never discovered oxygen, and that his paper claiming that discovery was a hoax, most chemists would not care enough about it to read it. Priestley may have been a fraud for all we know, but oxygen is a reality, as we know.

I may quote a few more passages:

> Jehovah appears from the first as a decent God, although bloody, while Zeus had a past he could not live down. To ascribe wings to God was a primitive inspiration. To ascribe morals to God was not thought of for a thousand years later. . . . God is not affected by what we think of Him. He is not annihilated when we forget him.

> We all specialize in the virtues, devoting ourselves to such as suit our purposes. Some of us favor the lower end of the moral spectrum and display the red badge of courage. Others cultivate the more delicate vibrations of the blue end, purity, constancy and truth. Most of