that the author is a confirmed invalid! His definition of physiology is certainly unique:

"Physiology proper naturally divides itself into three departments, Anatomy, Physiology and Hygiene." "Bones, like all other organic structures, consist of cells; the cells are more or less of a hexagonal form." He seems especially hazy about the lymphatic system: "The lymphatics perform the office of absorption, chiefly in the skin." At one time he has the lymph 'poured into the blood through the thoracic duct into the *vana cava* in the neck,' but farther on he modifies this by saying that the lacteals 'terminate in two ducts, which open into the large veins, and finally into the heart,' one on the right side and the other on the left side of the chest! "The liver performs the double office of separating impurities from the blood and secreting bile." The 'bile acts as a solvent of the fatty portions of food,' while we are informed that 'fat is an oily concrete substance, composed of stearine and elaine!' One of the chief functions of the saliva is to 'quench thirst,' and the 'epiglottis serves to deaden sound!' Among other 'important facts' the author says that the 'heart of quadrupeds lies in the middle line, and not to the left, as in man.' "All reptiles have two auricles and one ventricle." From the fact 'that coagulation is greater in the lower animals' he derives the very interesting conclusion that 'this seems to be a wise provision, since these animals can not stop a flow of blood from a wound by artificial means.'

But enough. These few examples are chosen almost at random. The book contains more poor English, wild and loose statements of fact, errors and absurdities than I ever saw before in a text-book of modern times. One might be amused at such stuff, published as 'science' were it not that tens of thousands of children in this State are compelled to learn it, usually taught by teachers whose ignorance of the subject is greater than that shown by the author himself.

Everywhere that a moral can be lugged in by the ears or tail the baneful effects of the poison alcohol are urged. Can such a book be expected to serve any useful purpose in teaching the principles of temperance?

And this is what politics may do for science in the public schools!

S. W. WILLISTON.
UNIVERSITY OF KANSAS, LAWRENCE.

THE STORING OF PAMPHLETS.

ON reading Professor Minot's explanation of his method of storing pamphlets as given in the issue of December 30th I feel inclined to add a word in commendation of the method. I began using these boxes six or seven years ago and now have 152 upon my shelves. About one-half are devoted to Experiment Station bulletins, the boxes being labeled by States and arranged alphabetically. The other half is used for miscellaneous pamphlets on subjects pertaining to my line of work. The boxes have proved perfectly satisfactory in every way, and as a simple time-saving device they are worth many times the cost. My system of pamphlet arrangement differs in some ways from that adopted by Professor Minot and has been adopted only after trial of several other methods.

Each case is labeled and is also given a number. The pamphlets are numbered consecutively and arranged in the cases, as far as possible, by subjects, and each one is stamped with the number of the case in which it belongs. The location of each is, therefore, permanent. It is always returned to the same case and the same relative position as regards others in the case.

In a convenient drawer of my desk is a card index where all papers are recorded by author and by title. Each card carries the pamphlet number and the case number, thus indicating the exact location of the pamphlet desired. Often a dozen or more pamphlets may be in use, scattered over my work table for several days; when ready to be returned, the numbers direct to the case and to the correct position within the case. If each pamphlet contained but a single article the alphabetical arrangement would be the most simple; but many contain more than one title, often several, and not infrequently by different authors. These were a sourse of annoyance until the present system was adopted. I do not find the system cumbersome, and the time employed in keep-

ing it up is saved many times over by the facility with which reference is made.

CHARLES S. CRANDALL.
THE STATE AGRICULTURAL COLLEGE,
FORT COLLINS, COLORADO.

ZONE TEMPERATURES.

MY attention has been recently called by Dr. Walter H. Evans, of the United States Department of Agriculture, to an error in the temperature tables accompanying my paper on the 'Laws of Temperature Control of the Geographic Distribution of Animals and Plants,' an abstract of which was printed in my recent bulletin on 'Life Zones and Crop Zones.' The error in question relates to the effective temperature or 'sum of normal mean daily temperature above 6° C.' In the tables bearing the above heading the quantities actually given are the sums of normal mean daily temperatures (*without deducting* the 6° C. each day) for the period during which the mean daily temperature exceeds 6°C.

The temperature data, as stated on the first page of my original paper, were furnished by the Weather Bureau. Not being of a mathematical turn of mind, I did not detect the error until my attention was called to it by Dr. Evans. Corrected tables will be given in the next edition of 'Life Zones and Crop Zones.'

C. HART MERRIAM.

PHYSICAL NOTES.

DR. OLIVER LODGE, in a recent paper before the Institution of Electrical Engineers, speaks of the probable importance of leakage currents in the usual methods of telegraphing by magnetic inductance through space. This form of wireless telegraphy has usually been accomplished with long parallel wires on poles and ground returns. In some experiments made by Stephenson near Edinburgh horizontal coils of wire were used and signals transmitted half a mile with a morse key in one coil and a telephone receiver in the other. Mr. Lodge used similar coils covering areas of about 4,500 square yards and transmitted signals about two miles. The characteristics of his method are the use of an alternating current of a rather high frequency, about 380, and the tuning of the line to this frequency by the use of condensers, that is, the balancing of the inductance so that the current becomes equal to the induced E. M. F. divided by the ohmic resistance. As a result, he gets much greater effects than where the current is principally determined by the inductance of the circuits. This he shows by mathematical determination will be the case, the value of $2\pi x$ the frequency, coming in one instance in the denominator, while in the other it comes in the numerator of the expression giving the ratio between the secondary current and the impressed primary E. M. F.

F. C. C.

CURRENT NOTES ON METEOROLOGY.

THE WINDWARD ISLANDS HURRICANE OF SEPTEMBER, 1898.

THE practical advantages gained by the establishment of the new West Indian Service of our Weather Bureau are forcibly illustrated in the account of the hurricane of September 10th and 11th last, published in the September number of the *Monthly Weather Review*. The Weather Bureau Observer at Bridgetown, Barbados, sent a special cable to Washington at 12:40 p. m., September 10th, announcing the approach of a hurricane. Warnings were immediately cabled to Weather Bureau stations in the Lesser Antilles, and the officials in charge were directed to give the widest possible distribution to the warnings. Advisory messages were sent to other islands, as far west as Jamaica and eastern Cuba, to points on the South American coast of the Caribbean Sea, and to Admiral Watson's fleet, lying in the harbor of Caimanera, Cuba. The careful reports of the Weather Bureau Observers at Kingston, Jamaica, at St. Kitts and other stations also made possible an early and complete record of the hurricane.

In this connection another paper, in the same number of the *Review*, is of interest. It concerns the telegraph service of the Weather Bureau with the West Indies, and is illustrated by a chart showing the routes of the submarine cables over which reports are transmitted and the points at which the cables connect with the land lines.

At the December meeting of the Royal Meteorological Society (London) Captain A. Carpenter, R. N., gave an account of this disastrous hurricane.