to be supposed that they have a harder struggle for existence than others, as is shown by trying to grow them under artificial conditions. *Fouquieria splendens* seems to reach its optimum development in the delta lands. Cactuses with sheathing spines were noted and some of these shed their spines. The flora is not Arizonian. In San Felipe there are no plants with storage organs, for there is no surplus of water to store.

In the discussion it was mentioned that the poison cacti are all unarmed.

Professor Underwood remarked on a specimen of the southern brake sent from Burlington, Vt. This form described in recent years as *Pteris aquilina* var. *pseudocaudata* by Clute, is the *Pteris latiuscula* Desv., described in 1827.

WILLIAM T. HORNE,
Secretary pro tem.

SCIENCE CLUB, UNIVERSITY OF MISSISSIPPI.

THE last regular meeting of the club for the year 1903–4 was held May 20 in the chemical lecture room.

Mr. H. R. Fulton read a paper the purpose of which was to give some account of the life histories and habits of the common mosquitoes. It was stated that of the thirty species of mosquitoes occurring in North America, ten have been found in Mississippi. Attention was directed particularly to three genera: *Culex, Stegomyia* and *Anopheles*. The first was said to be the most numerous and widely distributed, not, however, transmitting disease, so far as known, and important chiefly because of the annoyance which it occasions. The second, found in many of the southern states and flourishing in the tropics, was charged with being certainly instrumental in the transmission of yellow fever. The last, also widely distributed, was said to convey malaria.

The four distinct stages—egg, larva, pupa, adult—in the complete metamorphosis through which every mosquito passes in its development were fully treated, as, also, the peculiarities of size, shape, markings, movements, etc., which differentiate the three genera.

Length of flight, local breeding places and the methods used by the author of the paper in attempting to check and exterminate mosquitoes in this vicinity were discussed.

In speaking of the movements of the larva of *Culex,* Mr. Fulton stated that he had observed a movement of which he had found no mention, this being in a horizontal plane, taking place as the larva moves under the surface or over the bottom or through the intermediate water, unaccompanied by violent body-movements, and probably caused by rapid vibrations of the numerous hair-like processes covering the body.

Dr. J. B. Bullitt added some remarks on those mosquitoes which transmit malaria and yellow fever.

ALFRED HUME,
Secretary.

DISCUSSION AND CORRESPONDENCE.

A CASE OF PLAGIARISM.

TO THE EDITOR OF SCIENCE: In a note on 'The Mechanism of the Mont Pelée Spine' (SCIENCE, June 17, 1904), I say: 'So far as the literature has come to my attention, it has failed to include a factor which appears to me of prime importance,' etc. Through this sentence I claim originality, and presumptive novelty, for an idea which I now know not to have been novel, and think not to have been original. The idea was published six months earlier by Dr. A. C. Lane in a note on 'Absorbed Gases and Vulcanism' (SCIENCE, December 11, 1903). It is not necessary, in dealing with my friend Dr. Lane, that I disclaim intentional plagiarism, but, as I find interest in the mental process of my blunder, I venture to relate what I suppose to be its history. It is altogether probable that I read Dr. Lane's note when it appeared, but the mental impression it made was so faint that in re-reading it now I can not definitely remember seeing it before. Nearly a half year later an idea as to the Pelée spine occurred to me and I wrote it out for publication. While I supposed the idea original, there was in my mind a faint suspicion that the suggestion might have come from some outside source, and this suspicion led me to search all the literature of the spine that I could recall having seen—but I did not recall that Dr. Lane had made a contribution. Thus a

mental impression too faint for complete identification, now that attention is directed to it, nevertheless rose into consciousness with the semblance of a spontaneous idea, and gave rise to a distinctly plagiaristic publication.

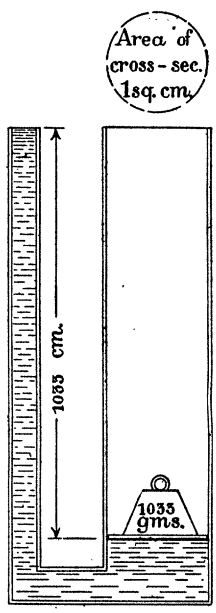
G. K. Gilbert.

San Francisco,
June 28, 1904.

SPECIAL ARTICLES.

THE ASCENT OF WATER IN TREES.

Recent discoveries by Vesque and E. B. Copeland and others have brought us very near the solution of this inveterate problem; but botanists seem agreed to halt at the last



Hydrostatic Paradox.

step, awaiting some occult signal from the physicists. The old toy of the 'hydrostatic paradox' ought to teach them that water pressed upwards by the atmosphere has no divine right to call a halt at 1,033 centimeters. One fluid may support and also elevate another fluid to any required height. Thus the supported weight in the annexed diagram may be represented by a column of water raised a mile high or more. The condition is that there shall be no immediate continuity of mass between the fluid to which the atmospheric pressure is applied, and that which is to be lifted. This condition is secured in the tree by the numerous transverse septa on its water-ducts, which prevent the transmission of air or water in mass, but permit a very free molecular diffusion of water, and of everything dissolved in it.

Assuming the diameter of a water-duct to be half a millimeter, it is easy to estimate the weight supportable by a septum at its base; seeing that its upward parts are protected from other atmospheric pressure. The area of the cross-section of the basal part, in centimeters, if multiplied by 1,033 (the height in centimeters of a column of water equaling the atmospheric pressure), gives 2.028 cubic centimeters, or the same number of grams, as the load which the basal septum can support. This load may be a column of water filling the whole duct for a height of 34 feet, or it might be a column or stream of water twelve times as high and only one twelfth as large in cross-section. If the duct were filled with one part of water and eleven parts of air, the water and air together should be supported by the atmospheric pressure at the base to a height of about 403 feet. Assuming that there were in this course about 90 cross-septa, approximately equidistant, we should have a fall of pressure with each succeeding stage, equivalent to about one third of an inch of the mercurial barometer, reaching zero at the summit.

The mechanism in the xylem-ducts, however, can not be of this kind; because not only would the gas-bubbles obstruct the current if they came between it and the walls, but the spreading out of the pressure of the ascending current over the septa would cause the 'hydrostatic paradox' to work backwards with greatly increased force. This compels us to favor the view of interning the gas-bubbles within the water. Dr. MacDougal states that 'the cavity of a wood-cell contains a bubble of gas' ('Plant-Physiology,' p. 29). And Strasburger describes the water as freely streaming round the gas bubbles, or between them and the walls. This arrangement of water surrounding gas-bubbles constitutes what is