Stones placed in pine-trees by birds.

About seventy-five miles south of the United States boundary, near this place, at an elevation of six thousand feet, is a stretch of table-lands covered with large pines (Pinus Jeffreysi?), broken by many ridges of giant granite bowlders, decomposing sufficiently to add materially to the soil. Broad, grassy meadows furnish food for cattle and deer.

My father and myself, in riding through this forest in July, 1883, noticed several pines with the bark bored into at varying distances from the base of the tree to the branches; and in about one-third of the holes were the acorns of the here common Quercus Emoryi, very tightly fitted, the holes containing the acorns apparently newly made. The remaining holes were weather-beaten; and in them were equally tightly fitted bits of the granite gravel, of size corresponding with the acorns in the other holes. In the Cuyamaca Mountains, of this county, a gentleman observed Colaptes auratus visit pines that contained similarly disposed acorns. The woodpecker tapped the acorns, breaking one now and then; the broken shells showing plain traces of having contained a worm, while the other acorns contained sound kernels. But what object could the birds have in substituting stones as shown above? Possibly they served as hiding-places for many insects which would otherwise have secured places inaccessible to the birds. C. R. ORCUTT.

San Diego, Cal., Feb. 16.

How a spider sometimes lifts heavy objects to its nest.

Last summer, while at Lynchburg, Va., I observed a spider — probably an Epeira — spinning a thread down from the upper section of a large fountain on the lawn of the Arlington hotel. He was some eight feet from the surface. I watched him descend to the water, where he captured a beetle that had unfortunately fallen into the large basin. The beetle must have been an inch long. Our Epeira made a turn of his line around his captive, and ascended all the way to his nest; immediately descending, he threw another loop around his prey, and again ascended to his nest, continuing this process for full ten minutes: to my surprise, while the spider was at his web, apparently overhauling and tightening the several threads that he had spun to and from the beetle, it left the water, and, evidently by elastic contraction of the threads, ascended full an inch from the surface. The spider spun down another lasso, and threw it round his victim, then retired and was busy with his lines, when the beetle again moved upwards. These operations were repeated, until, at the end of forty-five minutes, he had snugly secured his prey in his nest, at a distance of at least eight feet from the water, by this curious and interesting method.

Cambridge, March 3. E. P. LARKIN.

The use of the method of limits in mathematical teaching.

I notice in a recent number of *Science* a proposal to discuss the different methods of teaching the elements of the infinitesimal calculus and, in connection with this, an allusion to Professors Rice and Johnson's 'New method of rates.'

I trust it is not out of place to suggest that the method in question seems to me very like the method given in Maclaurin's 'Fluxions,' which the author attributes, at least partially, to Newton; and that the present very general use of the method of limits is probably a case of 'the survival of the fittest:' for I have found in my experience as a teacher that those who are either too young or too slow to acquire at once the deeper conceptions of mathematics are often capable of doing very good work when the demonstrations are adapted to their comprehension.

The method of limits seems to me that which must be used with a class, if it is desired to give a sure foundation to as many as possible; the method of rates or fluxions requires rather more preparation of mind; and the infinitesimal method is best adapted to those who have mathematical genius.

The average engineer or architect is a person whose natural bent is towards construction and the use of tools. Such a person will, in all probability, require the infinitesimal calculus as a tool rather than as a recreation or a profession, and should therefore be trained by a slow and certain process — like the method of limits — in order that his real abilities may not be disguised by any slowness of comprehension in a matter which he can by patience acquire.

The weakness of mathematics as a general study in our institutions lies in the rapidity with which the successive steps are passed over; so that the slower pupils are left behind, and become discouraged. Old country schools do more solid work in average cases.

TRUMAN HENRY SAFFORD.

Williams college, March 1.

THE INTERNATIONAL BUREAU OF WEIGHTS AND MEASURES.[1]

THE annual report of operations for 1883 has just been received. It shows a steady advance towards the completion of the international standards. All the principal instruments and apparatus have now been procured, and are in position. The *comparateur géodésique*, for which a contract was made with the *Société Génevoise* in 1882, was to have been delivered by August of last year. Various events conspired to delay its complete delivery; but at the close of the report the entire apparatus was on its way, and was to be set up in the early part of January. All necessary masonry work was done in the spring of 1883.

Changes have been made in the method of heating the room of the Brunner comparator. Hitherto it has been done by regulating the temperature of water held between the double zinc walls in which the room is enclosed. It has been found, however, that, in addition to the difficulty and expense of maintaining a constant temperature of the water day and night, trouble was experienced from frequent leaks in the zinc walls, necessitating repairs, and stopping the observations: consequently the maintenance of temperature by the use of hot water has been discontinued; and for it has been substituted hot air, which so far has proved satisfactory, and which, it is hoped, will solve the problem of heating.

[1] Comité international des poids et mesures. Septième rapport au gouvernements signataires de la convention du mètre sur l'exercice de 1883. Paris, 1884. 54 p. 4°. See also *Science*, No.