professor in the department of hygiene at the Harvard Medical School.

Dr. George D. Louderback has been advanced from associate professor to professor of geology at the University of California.

Professor D. L. Crawford, of Pomona College, Claremont, Cal., has been appointed professor of entomology in the College of Hawaii, Honolulu, for a term of three years, beginning in September, 1917.

DISCUSSION AND CORRESPONDENCE

A TOPOGRAPHIC MAP OF WISCONSIN

The movement to expedite the completion of the topographic map of the United States by the U. S. Geological Survey, of which some account was given in Science a year ago, is to-day greatly promoted by the increased interest in topographic preparedness on the part of army officers. Doubtless at their instance the sum of $200,000, in addition to the usual large appropriation for topographic maps under the Geological Survey, has lately been voted by Congress to be expended for geodetic and topographic surveys at the discretion of the Secretary of War. Members of the Coast and Geodetic Survey and of the Geological Survey have already taken the field, chiefly in the Southern States, in areas designated by the war department, and a much desired increase in topographic output will be the result. It is interesting to note in this connection that, although the additional sum thus appropriated is spent under military direction, the work for which the sum is spent is performed by the experts of the two civilian surveys, who are all listed in the reserve corps.

In the meantime the civil uses of topographic maps must not be forgotten, and among these the educational uses are by no means the least important. An excellent statement of them follows with respect to the needs of a single state in a letter by Professor Lawrence Martin, of the University of Wisconsin, to the state engineer at Madison. Educators and engineers elsewhere would do well to organize a similar movement for promoting the topographic survey of their states also.

W. M. Davis

LETTER, DATED MAY, 1917, FROM PROFESSOR LAWRENCE MARTIN, OF THE UNIVERSITY OF WISCONSIN, TO THE STATE ENGINEER AT MADISON

My Dear Sir: In support of the proposed state appropriation for topographic maps I am writing to explain the need of these maps for educational purposes. This is only one of the many uses for which I regard these maps as desirable, but it is the one to which I am giving especial attention as a member of our committee.

Topographic maps are an admitted need for school and college use, as explained later. Let us compare Wisconsin with Ohio, states not dissimilar in area, topography and educational system. We are proposing to ask the legislature for $20,000 a year for twenty years to complete the topographic map of Wisconsin in the next two decades. Twenty years ago there was not a single topographic map of any part of Ohio. Mapping was started nineteen years ago, and to-day the topographic maps cover the entire state. Every college, normal school, high school, grade school and other educational institution in Ohio has a topographic map of the home area for use by its students.

Twenty years ago Wisconsin had twenty-seven topographic maps. In these two decades we have added seventeen maps, while Ohio has added more than two hundred.

The states of Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland and West Virginia are completely mapped. More than half of Kansas, Oklahoma, Utah, Arizona, California, Vermont, Virginia, Colorado, Tennessee and Pennsylvania are covered by topographic sheets. Only about a fifth of Wisconsin is mapped.

There are 413,000 school children in Wisconsin who live outside the area covered by topographic maps. Five of our nine normal schools have no topographic maps of their home area. Twenty-two of the county training schools for teachers and the county schools of agriculture are outside the mapped area. For fourteen of the cities which maintain continuation schools there are no maps. There is no topographic map covering the area about the Stout Institute at Menomonie. There are none for the colleges at Appleton (Lawrence University), at Plymouth (Mission House College), at Ashland (Northland College), at Beaver Dam (Wayland Academy), or for a number of the Catholic colleges and some of the private schools. There are no maps for the Indian schools near

Tomah, at Hayward, and on the other reservations (Carter School, etc.). Beside these there are many large high schools which need maps, some of them at places listed above, others at various cities.

Of course topographic maps are quite as important for the smaller cities and villages and for the country schools as for the places listed above. Wisconsin ought not to lag behind Ohio, New York, West Virginia, or any other state, or behind England, France, Germany, or Italy, all of which are completely mapped, in providing topographic maps for educational use.

In addition to the very necessary local use of topographic maps of the home area, it is desirable that students in one region should use the maps of other parts of the state. Pupils in the Milwaukee, Racine, Madison, Superior, and other high schools ought to have a chance to study topographic maps of the vicinity of La Crosse, Eau Claire or Ashland, where there are no maps as yet. Students in the country schools need them even more. College students at Beloit, Ripon, Milton, Carroll, Watertown, Marquette and Milwaukee-Downer, and normal-school students at Platteville, Whitewater, Milwaukee and Superior, where there are topographic maps, need maps of the other four fifths of Wisconsin where there are none.

At the University of Wisconsin we need not only the completed topographic sheets of the adjacent country, which our students now use extensively in laboratory work and field study, but maps of all other parts of the state, for our students come from everywhere in the state, they go back to all parts of the state to work or to teach, and we can not adequately study other parts of Wisconsin without maps of these decidedly different areas. The same thing applies to the other colleges, to all the normal schools, the large high schools, the country schools and the educational system generally. The State Geological Survey is considering a plan of publishing and distributing lists of topographic maps for schools of varied size and situation, with simple, comprehensive directions for their use in classes; this can not be done effectually until much more of Wisconsin is covered by topographic maps.

Very truly yours,

LAWRENCE MARTIN

WINTER ACTIVITY OF THE BROWN BAT, VESPERTILIO FUSCUS (BEAUVOIS), AT BROOKLYN, N. Y.

THE sporadic appearance of *Vespertilio fuscus* on mild winter evenings, in the latitude of New York, is a well-known phenomenon,[1] but the following account describes altogether extraordinary behavior on the part of a bat of this species.

A few minutes after five o'clock P.M., on February 14, 1917, Mr. George P. Engelhardt, of the Brooklyn Museum, and the writer entered the Brooklyn Botanic Garden with the purpose of finding a mocking-bird that had been observed to be wintering in the section of the grounds devoted to a Japanese garden. While we were hunting through a copse of evergreens bordering the small frozen lake, we were astonished to see a bat flying above the ice. The creature made several trips back and forth, over a distance of seventy or eighty yards, passing so close to us that we had no difficulty in recognizing the species. It circled about just as though it were pursuing insects over the water on a summer evening, except that its flight was slow and obviously labored, and we expected to see it drop at any moment. Presently it fluttered westward, beyond the end of the lake, and seemed to descend on a grassy meadow. We hastened in that direction, searching the ground, but, as we saw no more of the bat, Mr. Engelhardt left the Garden.

I then walked to the Botanical Laboratory in order to note the temperature, which was 30° F. The afternoon had been cloudy, and the setting sun shone only as a red ball through the calm, chilly, misty air. It is worth remarking that the first slight thaw after a protracted period of severely cold weather had occurred on this date. On the morning of the previous day, February 13, the thermometer had registered +3° F., in this part of Brooklyn.

Returning to the edge of the lake at 5:25 P.M., I saw the bat again, and ran after it, but soon lost sight of it. Then, as I approached the outlet of the lake, I spied it on a sheet of thin ice almost surounded by the running water of the brook, three feet above a small waterfall. While I stood quietly within ten feet of it, the bat crawled rapidly about the ice, lapping it with its tongue. Next it

[1] Murphy and Nichols, *Sci. Bull. Brooklyn Inst. Mus.*, Vol II., No. 1, 1913, p. 7.