LETTERS TO THE EDITOR.

*** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Sense of direction.

I HAVE been much interested in the different methods of preserving the relative situation of places, as given in late numbers of *Science*, and will venture to add my own experience.

I refer all objects to two rectangular co-ordinate axes which agree with the cardinal points. In all places where I feel at home, these lines are consciously present, and all roads running north and south, or east and west, coincide with, or seem to be parallel to, these axes. All places which I have visited, from Massachusetts to Nebraska, are, with few exceptions, connected together in one system.

The principal origin of this system is in the northwest corner of a schoolhouse in Hamilton county, O. There, when a boy, I sat under the direction of a teacher to study geography. With face toward the north, I looked through a window along the meridian. I could at pleasure see east or west, or, if need be, south, through opposite windows. A thorough course in geography fixed in my mind the axes of my system, which have been present with me ever since, a secondary origin going with me everywhere. All places with which I am familiar form parts of this system, and any new place visited is immediately referred to its proper location.

Now for the exceptions. There was another schoolhouse, where I attended sometimes, at which I was turned a quarter round. East was north, south was east, etc. I account for the anomaly in this way: in going to the schoolhouse where my system was fixed, I went east, along a road from which I turned to the left into the south or front door of the schoolhouse; but, in going to the second school mentioned, I went through fields into a road along which I passed toward the south some distance, and then turned toward the left into the west or front door of the schoolhouse. I lost the direction of my axes of reference in crossing the fields; so that the west side of the new schoolhouse seemed to coincide with the south of the old, and thus unconsciously my axes were turned a quarter round. No plan I could adopt had the least effect in changing the apparent position of the cardinal points. Many a laugh was raised at my expense because of my promptness in pointing in wrong directions; and to this day, after nearly half a century, if I wish to think of directions from that schoolhouse, I am obliged to change my first decisions through an angle of ninety degrees.

Washington City is another place which is entirely out of my system. I entered the city after nightfall. Somewhere between Baltimore and Washington, I lost my co-ordinate axes, so that, when I came to consider directions, Pennsylvania Avenue was turned half round, east was west, west, east; and I had not and have not the least sense of north or south. No study of maps, and no thinking over the subject, has the least effect in arranging things properly.

Boston is another place which is not in my regular system. In that city and vicinity, Washington Street takes the place of my usual east and west axis, and the street that leads to Mount Auburn is the other axis; but these are not in my mind coincident with my principal axes.

Mistakes made at different times have been quite a study to me. Once, in a city which is regularly laid out, going along the west side of a street toward the south, I crossed the street, and turned toward the north upon the opposite side, and went into an office at my right hand. Coming out, and wishing to continue my course toward the south, I really went north, and spent several minutes before I could convince myself of my error. Possibly the mistake arose in the following manner. I lost my axes in passing from the street-crossing to the sidewalk, and turned north when I supposed I turned south; going into the office toward the right, I seemed to go west; coming from the office, I seemed to be going east; and turning to the right, I was to my mind going south.

It is my custom to travel with a map before me; and, on visiting a city for the first time, I secure a plan and study the direction of the principal streets, obtaining correct knowledge of the points of compass. I then carefully classify my acquisitions, and commonly have no difficulty in finding my way without a guide. MILTON L. COMSTOCK.

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Barn-owls in southern Ohio.

Until recently barn-owls have been of rare or accidental occurrence in this part of the Ohio valley. In the records of the birds in the vicinity of Cincinnati, there were only three specimens noted; and in the record of the birds of Franklin county (Indiana), there has been a vacancy under the head of this species. On Oct. 25, 1883, I was pleased to have a friend bring me a fine male of this species, killed within a half-mile of this town. Soon after this a number of specimens were taken near Cincinnati, at Glendale, where they had taken up their quarters in the town-hall; and others were killed near Jones Station, O. In all, this makes fourteen specimens that I know to have been taken within fifty miles of Cincinnati. A. W. BUTLER.

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Phosphates in North Carolina.

The successful exploration last spring, under the direction of our board of agriculture, of the large beds of phosphatic nodules embedded in marl in New Hanover and Pender counties, started the search for phosphates in North Carolina again. Stray coprolites had frequently been found; but these nodules, forming beds four to five feet thick, and extending through the country for twenty miles or more, suggested an origin different from that of the true coprolite.

Phosphatic rock has recently been discovered in the up-country, which corresponds exactly to the water-worn nodules entering into the calcareous conglomerate of the lower Cape Fear.

In the latter region, about Wilmington, and twenty miles above, we find the nodules embedded in, and forming the lowest layer of, a ground and hardened eocene marl. The nodules show the same fossils, but differ from the marl in the large amount of sand they contain. They vary in composition from fifteen to fifty-two per cent of phosphate of lime, neighboring fragments having often very varied composition, of all shapes, but mostly kidney and egg shaped; perforated; color, gray to greenish black; specific gravity, 2.6 to 2.7. Freshly broken or rubbed, they give the odor of burnt powder characteristic of such phosphates.

Higher up the country, in Sampson, Duplin, and Jones counties, we find the eocene marl above, and the phosphatic rock below, in distinctly separate layers. Here the formation is such as to leave little doubt that the rock is phosphatized marl (according to Holmes's theory), and not true coprolites. It is found in large indented slabs, six to eighteen inches thick, and weighing sometimes several tons, or in

smaller pieces, evidently broken from this, and somewhat worn. This rock presents all of the characteristics and all of the grades of the nodules found in the marl conglomerate, — the same shells, same large amount of sand, and the same appearance. The character of the rock changes gradually here. Between Warsaw and Kenansville it is richest, yielding forty to fifty per cent phosphate, while both east and west it grows more sandy. Between Sampson on the west and Jones on the east we find all the grades of rock which were found in a single place in the conglomerate beds of the lower country. We conclude, therefore, that this conglomerate was formed from extensive breaking up and mingling of beds similar to those seen at the present time in Sampson, Duplin, and Jones counties, and not from stray coprolites, as has been supposed.

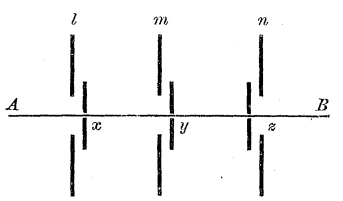
Whether this field will yield any phosphate of more than local value depends upon conditions yet to be determined. CHAS. W. DABNEY, Jun.

N. C. experiment-station, Jan. 2.

Radiant heat.

While it appears that Mr. Fitzgerald's criticism upon Dr. Eddy's hypothesis is conclusive, yet the latter makes a statement in your issue of Dec. 21 which is misleading, since it implies that the device will produce the desired result. Dr. Eddy says, —

"Thus the fact remains, that, although a definite amount of heat from *B* remains entangled in the region *m n*, which is not increased with the lapse of time, there is a continued passage of heat through this region into *B*, that being the very object sought to be accomplished by my process."



Now, the fact is, there cannot be 'a continued passage of heat through this region into *B*,' without permitting the passage of heat from *B* to *A*, by any of the processes described. Granting that heat is entrapped in the space *m n*, it will escape into the space *l m* whenever the door *y* is opened for the passage of heat from *A* into the space *m n;* and the heat so entrapped in the space *l m* will pass on to *A* whenever *x* is opened to admit heat from *A*. This is so plain, that it is only necessary to call attention to the fact, to have it admitted. If the only object sought, as stated in the above extract, was to permit the passage of heat from *A* to *B*, it could be secured at once without any device between *A* and *B*. As originally stated, the object was to transfer more heat from *A*, the colder body, to *B*, the hotter one, than was passed in the opposite direction. The writer has shown in another place[1] that Dr. Eddy's system of moving screens fails to accomplish this result. DE VOLSON WOOD.

Limits of tertiary in Alabama.

The announcement in *Science* (ii. 777) of Professor Johnson's extension of the border-line of the tertiary in Alabama to a position ten miles north of Allenton, and six north of Camden, recalls similar observations made by Alexander Winchell in 1853, and published in *Proc. Amer. assoc. adv. sc.* for 1856, pp. 88, 89. These sub-Claiborne beds he designated 'buff sand;' and the overlying ledge of calcareous grit was traced by him "eight and a half miles north of Allenton, which" was "twenty-five miles farther north than the tertiary beds had been hitherto recognized in this part of the state." The undescribed fossils collected were left with Professor Tuomey, who pronounced them eocene, and held them for description till his death in 1857. A few years later the vicissitudes of war involved the destruction of the Tuscaloosa cabinet by fire. Mr. Winchell's observations were communicated orally in December, 1853, to Professor Tuomey, who noted them down on a manuscript map, from which was compiled the map published in 1858 in Tuomey's (posthumous) second report, edited by Mallet. This places the boundary of the eocene a mile north of Allenton, which, as shown above, is not so far north as Winchell traced the formation. There is, however, nothing in the text of the report on which any change in the older map of this region could be based. Professor Tuomey's observations had been directed to other parts of the state; and Mr. Thornton, his assistant, reports tracing this line through Monroe county, while the map shows it located nine or ten miles north of that county, and, if fully conformed to information in Professor Tuomey's possession, would have shown it seventeen and a half miles north. These statements are only important on the principle of *suum cuique*.

A. W.

Italics for scientific names.

The scientific name of every described plant and animal consists of two or more words: namely, that of the genus, used as a substantive; and the specific name, which follows, and is an adjective adjunct. A species may have a dozen or a hundred common or vulgar names, in half as many languages; but there is only one name in the dead, unchanging, scientific nomenclature. It seems to me that the importance of scientific names, over all others, makes them deserving of a more emphatic type than that of the general text. In the ordinary print — as that of this page of *Science* — any scientific name should be given in italics. Take, for example, the American larch, tamarack, or hackmatack. This tree of our swamps may have many local names, but it has only one in science the whole world over. The emphasis of this fact is largely lost if it is written without an underscore, or printed thus, Larix Americana. It would be only a short step farther to have it larix americana.

It does not follow that names of groups need to be italicized. Thus we can have the order Liliaceae, which contains the genus *Lilium* with its Canada lily (*Lilium Canadense*), the golden-banded lily of Japan (*L. auratum*), and *L. candidum*, or the common white lily. *Quercus*, *Pinus*, *Prunus*, *Ranunculus*, and the thousands of other genera of plants and animals, when used alone, may be set in the common type of the page, and stand thus, — quercus, pinus, prunus, and ranunculus; but I do not like it. Many of the generic names are derived from proper names, as Linnaea, Magnolia, Tournefortia, Begonia, etc.; and these certainly should begin with capitals. When, however, the name of any genus is the common name of all the plants in that genus, it is reasonable to use it without a capital, when employed in a general way. We may say of a plant, it is a fine begonia, or a stately magnolia, or a delicate linnaea, and the absence of

[1] *American engineer*, Chicago, 1883, Jan. 12, Feb. 9, 23, and April 6; also *Journ. Frankl. inst.*, May, 1883, 347.