The prevalence of this disease at the present time will be seen from the statistics taken from the health reports of the following southern cities. The figures given represent the per cent of deaths from consumption, as compared with the total mortality from all causes; and also the proportion in 1,000 per annum.

	Proportion to Total Mortality.		Proportion in 1,000.	
	White.	Colored.	White.	Col red.
	Per cent.	Per cent.	Per cent.	Per cent.
Atlanta, Ga., 1892....	9	18	1.7	7.7
Baltimore, Md.....	9	15	2	4.8
Charleston, S.C., 1892.....	8	13	1.2	4 9
Memphis, Tenn.....	10	21	1.8	5.8
Nashville, Tenn.....	11	21	1 5	5.1
St. Louis, Mo., 1890.....	9	18	Average 1.6	Average 5.6
Norfolk, Va., March, April, and May, 1893	16	17		
Twenty-five towns in North Carolina, Feb., 1893....	8	22		

It will be seen from the above table that the rate of mortality in proportion to 1,000 of population per annum is nearly four times as great among the colored people as among the white. It is probable, however, that consumption is much less prevalent in the country districts.

I will now consider some of the causes that have probably produced this excessive death-rate from this disease.

1. Unhealthy dwellings, often situated on narrow alleys, reeking in filth and moral and physical pollution. 2. Improper food, often of poor quality and lacking in quantity. 3. Insufficient clothing and exposure in inclement weather. 4. Irregular habits and a lack of a proper amount of sleep. 5. Excessive use of alcoholic drink. 6. Ignorance concerning the laws of health. 7. Lack of medical attention and good nursing.

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.*

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

The editor will be glad to publish any queries consonant with the character of the journal.

Variation and Evolution.

No branch of the study of natural history is more interesting, or more likely to lead to valuable results, than that of the causes of the large amount of variation which is exhibited by many species of animals.

If, as seems certain, what were at first varieties, in the process of time, by increase of the differential characteristics, or simply by these becoming permanent, originated new species, we are, while studying the causes which favor these variations, at the same time gaining an insight into those of the origin of species themselves.

No class of animals offers more favorable conditions for this study than the terrestrial and fresh-water mollusca. The great variety of conditions under which many species live, and the numerous varieties into which they are divided, together with the ease with which they may be collected and kept under observation, make them peculiarly suitable for our purpose.

Darwin says in an extract from one of his letters which I have lately seen: "In my opinion, the greatest error I have committed has been in not allowing sufficient weight to the direct action of environment, independently of natural selection." Probably those changes which are commenced in a species by the influence of environment are, in process of time, fixed by means of natural selection. That there is a preference exhibited for individuals of a like variety, even where the variation cannot be supposed to confer any benefit, may be proved by anyone who will observe the pairing of that most variable species, both in color and banding, *Helix nemoralis*, he will find, though with many exceptions, that among the pairs which he may discover by the roadside, soon after sunrise or in the evenings during spring and early summer, that there is a decided preference shown by these animals for individuals similar to themselves, the red varieties prefer to mate with those of their own color, as do the yellows; while, in a less degree, it will be found that the many-banded select mates among their own class rather than from the one-banded or unicolorous forms.

That in the majority of instances, at least, the progeny in those cases in which individuals of a similar variety have mated resemble the parents I have been enabled to prove by selective breeding. I am still continuing these experiments, and hope to have something further to say on the subject at a future time. Doubtless other species show preferences of this kind. I have referred, however, to those of which I have most experience. Is it not probable that *Helix hortensis* and *H. nemoralis* have been derived from a common form in comparatively recent times through varietal differences which have at last become specific?

Malacologists in America have opportunities denied to us in the old country. They have the great advantage of being able to study the variations, in introduced species, which have been produced as the consequences of that introduction.

As species introduced into a new country, under different climatic conditions to those under which they have previously lived, are in some degree similarly circumstanced to species living through climatic changes produced by alterations of land and water surfaces, etc., during the changes which all parts of the world have undergone during the long geological ages, we have in their cases a means of studying what changes certain conditions are able to produce, and consequently of gaining an insight into the causes which have helped to the development of our present fauna from their remote ancestors of the past. We can study the effects of a more equable climate in some parts, of greater heat or cold in others, of more and less moisture, of changes in the food-plants, of exposure to the attacks of new enemies, etc

The more this subject is investigated, the more, I believe, will become apparent the fact that all species possess latent powers which the proper stimulus in the shape of altered circumstances, such as those suggested, is capable of bringing into action for the benefit of themselves and their descendants.

The observations at present recorded relating to the causes of variation are scattered through a large number of publications, these, in a short series of articles for another journal, I have endeavored to bring together and arrange for reference. Some of the causes which the various writers have assigned as probably inducing variation may be mentioned. Deficiency of lime in the soil produces thin, horny shells, and in some degree may cause change in their shape. Moisture, when deficient, is supposed to favor the formation of thick, white shells among the terrestrial mollusca, while its extreme abundance prevents the formation of colored bands in those species usually possessing them. Deficiency of light (as in dense forests) has been referred to as the cause of dull, unicolorous shells, while those more exposed to its influence are often gaily colored. Heat, combined with moisture, is considered conducive to brilliant coloring, with dryness as increasing the influence of the latter, while among the fresh-water species it tends to the production of fragile, dwarfed shells, overcrowding among the latter having a nearly similar effect. Dense vegetation, impeding the progress of aquatic species, has been considered a cause of scalariform varieties. Flowing and stagnant water are well known to effect the *Limnacidæ* to a large extent. Muddy, rocky, and sandy bottoms also have their effects. Food is undoubtedly an element of great importance in the manufacture of varieties in its relative abundance and luxuriance, while other circumstances have been observed where certain plants existed in unusual abundance. The presence of certain molluscan enemies has been found coincident with peculiar deformities, e.g., that of *Hydra viridis*, with deformed examples of a species of

Limnæa. Again, Mr. W. Doherty, writing from Cincinnati, records a remarkable dentate variety of *Conulus fulvus;* he further remarks that dentate species of *Helix* are the forms there prevalent, and points out that this formation is useful in obstructing the entrance of a grub which lives in beds of leaves and preys on small snails.

An American malacologist, Professor Wetherby, adduces evicence which goes far to prove that even malformations resulting from individual injuries may, under certain circumstances, be transmitted to the offspring.

In investigating these phenomena and their causes, I would suggest, first, that the manner of variation should be investigated and described, and, second, the exact nature of the surroundings as regards possible causes, always bearing in mind the conditions under which the species lives in its original home, and especially noting all deviations from these which may be supposed to induce the varietal character.

Among the species common to North America and Britain are the following: *Vertigo alpestris, V. edentula, Conulus fulvus, Helix aspersa, H. hortensis Limnæa peregra, L. auricularia, L. stagnalis, L. palustris, L. truncatula, Physa fontinalis, Bullinus hypnorum, Planorbis albus* (= *P. hirsutus,* Gould), *P. glaber* (= *P. parvus,* Say).

W. A. GAIN.

Tuxford, Newark, England.

Books for Children.

IN answer to Mr. Waldo's request printed under the above heading in your issue of *Science* for June 16, let me suggest that such books as he desires are a desideratum not only for children, but for adults who, while not scientifically inclined, are yet interested in the wonders and beauties of nature. Unfortunately our attention has been too exclusively absorbed with the struggles and the problems incident to a new country for us to have time to educate the men who could study and name all our plants and animals, much less those who could translate scientific monographs into popular language. Especially in the insect world a good collector could bring in from any summer-day's excursion dozens of specimens which have never yet been christened.

But while we cannot hope for books which will enable us to attach names to everything we may find in a ramble through Nature's museum, most of the more conspicuous animals and plants have been studied, at least enough for this purpose, though the results have been put forth in scientific works. But on the stores of knowledge thus accumulated popular writers are beginning to draw to meet the demand created by our growing out-of-door life, our increased out-of-door interests. As was to be expected, plants have received the greater amount of attention. Mrs. William Starr Dana's "How to Know the Wild Flowers," just published by Charles Scribner's Sons, at $1.50, is intended to teach one to identify the commoner flowers by color, size and shape of leaf, size of plant and so forth. Ten-year-old children would seem to me rather young to use such a book, but it is admirable for those of twelve or thirteen. Newhall's "Trees of Northeastern United States," published by G. P. Putnam's Sons, at $2, teaches one to identify trees by the leaves, bark, and so forth. This I know from experience to be admirable for children. The same author is at work on a similar book upon shrubs, but I believe it is not yet out. I know of no such book on birds as the ones I have just suggested on plants. The best thing for children I believe to be Florence Merriam's "Birds through an Opera Glass," published by Houghton, Mifflin & Co., at 75 cents. The appendix to this little book contains lists giving form, color, size, habits, song, flight, nest, and so forth of our common birds. A fuller and altogether admirable book on birds is Minot's "Song and Game Birds of New England," published, I believe, by Casino, at $2.50 or $3. The best book on insects is one which Professor Comstock, of Cornell University, has in hand. It will probably be out now in the course of a very few months. Prepared especially for the school children of California, it is written in a manner attractive to children and will contain tables by which any insect may be traced to its proper family. Farther than this it would be hardly possible for a child to go, as the characteristics on which genera and species are founded are often so difficult of observation that the best tables which could be prepared would be only a source of perplexity and worry.

After all the best method of teaching children is that which Mr. Waldo quotes as employed by his former teacher. And there are many books which occur at once to the mind of any teacher as valuable aids to the parent who wishes to work with his child. I have not named these because I understood the request to be for books which the child could use alone. But I should be happy at some future time to extend my list if it is not done by some other person better qualified for the task.

M. A. WILLCOX,
Professor of Zoölogy, Wellesley College.

Two Queries.

AN incident of a recent personal experience may interest those of your readers who are studying the subject of mimicry. On the 21st of May last, I was botanizing with two companions in the thinly populated sand-dune region at the south end of Lake Michigan, and about forty miles east of Chicago, when the event I am about to relate occurred. I was walking rather in advance of my companions across a level area that separated two series of high dunes, when I accidently stepped upon two large snakes which were lying close together, doubtless enjoying the warm sunshine. It was a case of mutual surprise, and as the snakes, or one of them, suddenly sprang upward into unpleasant proximity to my face, I only a little less suddenly sprang backward, believing for the instant that I had encountered a rattlesnake. I soon discovered, or thought I did, that the reptiles were only fine specimens of the kind of black snake, popularly called the blue racer. One of the two had been considerably hurt by my heavy tread, and with violent contortions of his body made what haste he could to a hole about six feet distant, and disappeared in it. The other was uninjured and crawled rather leisurely away in another direction to a distance of twenty feet or more, and then lay quiet, watching our movements. Irritated by the violent start I had received, and cherishing no great love for snakes in general, I seized a club, and, while his snakeship lay broadside to me, I aimed a vigorous blow at him. I was again surprised, even more so than before, though in a different way, for with lightning rapidity the lithe reptile dodged the blow which otherwise would have struck him near the middle of the body, and instantly threw himself into a coil precisely resembling that of a rattlesnake when about to strike, and shook his erected tail with such vigor and rapidity that it was scarcely more distinctly visible than the spokes of a bicycle wheel when propelled by a fast rider. At the same time a sound was emitted, less shrill perhaps, but continuous and distinctly similar to that produced by the rattlesnake. Whether the sound was produced by the very rapid vibration of the tail, assisted perhaps by its scaly covering, or whether it was a hiss produced in the ordinary manner, I am of course unable to say. So close was the mimicry that I was for the moment almost deceived into the belief that I had mistaken a rattlesnake for a racer. The illusion was soon dispelled however, for a stick which I threw at him hit him on the head and stunned him, and I then had the opportunity to scrutinize him closely and verify my first conclusion.

I have frequently heard of other constrictor snakes mimicking venomous ones, in fact have occasionally observed such mimicry myself, but never before in this species and never in such perfection. It would be interesting to know if others have observed the habit in this species.

On the same trip another fact of interest came under our observation. The region visited contains many ponds and lagoons, and in these turtles (mainly *Chrysemys picta,* Ag. and *Nanemys guttatus,* Ag.) abound. About these ponds, often many rods from the water, were the remains of hundreds of turtles that had evidently all been killed since the opening of the spring, and some of them within a few hours. The dead turtles varied in size from those with carapaces two inches long to those fully six inches in