226: "The formation of intracellular or intranuclear gels, in other words, would not interfere in the least with enzyme activity." This statement probably is not true.[4, 5]

It should be pointed out that nuclei prepared by my method at pH 6.0–6.2 are not in the same state as they were in the living cell. It is doubtful whether any isolated nuclei could be in exactly the same state unless they were suspended in undamaged cytoplasm itself. The lowering of the pH from cell pH to 6.0–6.2 causes a shrinking of the nuclei and very possibly some coagulation and dehydration of nucleo-protein, which results in a microscopic appearance similar, as Hoerr states on page 226, to that of fixed tissue. Moreover, it should be remembered that the object of the preparation of nuclei at pH 6.0–6.2 was to obtain nuclei which would be satisfactory for enzyme studies, and this was accomplished.

ALEXANDER L. DOUNCE

DIURNAL BEHAVIOR CYCLE IN SPIDERS

IN connection with Dr. Haseman's and Dr. Craig's notes on twilight behavior patterns in horseflies and birds,[1] the following field observations are offered concerning allied characteristics in orb-weaving spiders.

In general, evening brings transition to a phase of greater activity, dawn to a lesser. This may be related to the lesser nocturnal activity of their principal enemies, the wasps and birds. Among locally common species the variation of day-night behavior is especially marked in *E. strix,* relatively slight in *A. aurantia* and *A. trifasciata.* The writer's observations on this point have been mostly with *C. conica* and *E. cavatica.*

If a vibrating tuning fork is opposed to the dorsum of *C. conica,* resting as normally at orb-center, during the daytime, the creature drops a distance not commonly less than three nor more than eighteen inches, and after a few seconds returns. If the fork is presented at night, the fork is instead attacked. The transition from the escape to the attack pattern, which is gradual, and its reverse, may be observed with relative precision by making rounds among a series of nests about sunset and sunrise.

E. cavatica may be similarly observed and more conveniently, as it is the most nearly "social" of locally common species. Dozens of them, in all stages of maturity, with webs intimately interconnected, have been observed on this point in old outbuildings, mostly in central New Hampshire. Till the individual is about one-fifth adult size, it behaves in this respect substantially like *C. conica.* The adult does not exhibit the dropping response, rather a form of "spreading," as elsewhere described,[2] and is generally more aggressive. The dropping response seems to be a function of the size of an individual rather than its species. Small individuals show it in the daytime irrespective of maturity; large ones do not. To the tuning-fork, the dropping response is notably absent in the young *Argiopes.* This dropping response is not an avoidance of the fork as such; small *E. cavaticas* have repeatedly been observed to drop through the tines, held slightly below the resting place in the orb. Also I have observed *C. conica* to drop to the human voice. A farmer once told me of a barnful of young *cavaticas* responding similarly to the blast of a toy horn.

In observations with *E. strix* and *E. insularis* it has been possible in some sort to restore the daytime pattern of behavior by crude artificial illumination (electric or acetylene handlamps). *Strix* goes back, after minutes, to its daytime retreat. In *insularis,* the main change recalled is the replacement of "seizing" the fork, by the less aggressive "spreading" pattern, though retreat may be expected to ensue with protracted illumination.

In *E. insularis* and *E. trifolium,* around sunrise and sunset, response threshold changes have been observed. These species, practically identical in their behavior, spend the daytime in a retreat not usually more than eighteen inches from orb-center, and directly connected to it by a stout thread. If during the daytime the orb is touched with a vibrating tuning-fork, they do not ordinarily emerge. At dusk they emerge of themselves, and they emerge to the tuning-fork more and more readily as dusk approaches. Shortly after they have as normally retreated about sunrise, they can be brought out again by the tuning-fork, but less and less readily as daylight increases. Such observations can easily be made to a desired degree of control with species that frequent buildings, such as *cavatica* or *strix.*

F. L. WELLS

HARVARD UNIVERSITY

MORE ABOUT WHITE BLACKBERRIES

A YEAR or so ago I sent you a note about some wild white-fruited blackberries I discovered near Gainesville, Fla., and named the variety *albifructus.* I planted the seed of these berries and in two years had 104 fine bushes in bearing. When the fruit ripened every single berry on all the bushes was black. Near the wild plants from which the white berries were taken there was a patch of normal black-fruited plants. The pollen of these plants was carried to flowers of the white-fruited plants by insects and, black being dominant, the seed produced black-fruited

[5] A. L. Dounce and D. Seibel, *Proc. Soc. Exp. Biol. Med.,* 54: 22, 1943.

[1] SCIENCE, 97: 285, 1943; *ibid.,* 99: 125, 1944.

[2] *Psyche,* 43: 11, 1936.

plants. This showed me at once that in order to propagate my white-fruited berries I could not rely upon seed. Experiments are still in progress and the results will be reported later.

WILLIAM A. MURRILL
UNIVERSITY OF FLORIDA

INSTIGATOR OF THE WEATHER BUREAU

I WISH to add some evidence to the article by Edward P. Alexander in SCIENCE for March 31, 1944, showing that Increase A. Lapham was the father of our present system of forecasting the weather. The question of originality is of long standing. It is mentioned in a memorial to Lapham written by Dr. P. R. Hoy in 1876.[1] On page 234 of this volume is to be found the following letter:

SMITHSONIAN INSTITUTE,
WASHINGTON, Feb. 3, 1876.

DR. P. R. HOY, Racine, Wis.:

Dear Sir: Your letter was received during a great pressure of business, and I now embrace the first opportunity to give it a reply.

The action of Congress in regard to the signal service was due to the immediate exertions of Mr. Lapham through the member of Congress from his district, General Payne, in setting forth the advantages of the system to the commercial interests of the great lakes.

Yours very truly,

JOSEPH HENRY.
Secretary.

A. W. SCHORGER
MADISON, WIS.

SCIENTIFIC BOOKS

CIVILIZATION AND DISEASE

Civilization and Disease. By HENRY E. SIGERIST. xi + 255 pp. Cornell University Press. 1944. $3.75.

THIS volume of approximately two hundred and fifty pages is based on the Messenger Lectures delivered by Sigerist in 1941 at Cornell University. In scope, these lectures represent the attempt to correlate medicine with the processes of the humanization of man in society. The method by which Sigerist seeks to attain his end lies in the linkages between civilization as a whole and disease and the more detailed relationships between disease, economics, sociology, law, history, religion, philosophy, science, literature and art. This constitutes a fairly large order which must needs have failed had its fulfilment been undertaken by any other than such an intellectual amphibian as Dr. Sigerist.

The first chapter which lays down the thesis that the broad, general processes of civilization necessarily involve the incidence of disease, because social progress along the path of man's ascent is bound up with proper food supply, avoidance of physical hazard, protection against the elements and the general safeguarding of body functions. This in turn means, by and large, the preservation of function or the sacrifice of it to disease. Sigerist, in common with all the other well-known historians, starts his story with primitive man. Indeed he starts back farther than that, with the transition from paleolithic to neolithic man. I have been waiting for years for some medical historian to go even farther back than that and show what primitive man himself learned from animals, by way of mutual aid and self-cure. It can be done. Prince Peter Alexander Kropotkin has well defended the thesis that mutual aid has been a greater factor in evolution than has conflict in the struggle to survive. Sigerist himself hints at this fact in his chapter on "Disease and Law," in which he comments on the social life among animals.

Throughout the entire volume there is clearly manifest the author's profound interest in the sociological problems of health. This slant, however, is most clearly manifest in the first chapter in which malnutrition, maldistribution of goods and wealth and the consequent evils are pictured. The effect of clothing and climate, personal hygiene, housing, lighting and heating of homes, sewage disposal and water supply is discussed in their historic relation to disease. Even gluttony is not overlooked.

These considerations lead logically to the chapter on "Disease and Economics," in which is laid down with broad and sure strokes the author's picture of the influence of economics on disease. Starting with the basic concept that work is a powerful factor in health, he travels along the road of occupational health hazards, documenting his views with citations from the literature dating as far back as Ulrich Ellenbog's 1473 treatise on toxic fumes and coming as far into recent times as Falk's 1936 work on "Security Against Sickness." He relies on McCready to support the thesis that no small part of the ill health of Americans is due to the struggle after wealth, and he quotes the founder of experimental hygiene, von Pettenkofer, in support of the truth that the economic loss due to disease is enormous.

No bridge is necessary to cross the gap from economics to social life in relation to disease. Sigerist slides smoothly into this topic with the opening sen-

[1] *Trans. Wis. Academy of Sciences, Arts, and Letters,* Vol. 3, 1876, p. 265.