no morning light preceding the test were injured 84 per cent., while those that had been exposed to the forenoon light preceding the test were injured 21 per cent. Wheat plants which had been three feet below a 200-watt Mazda light during the night were injured 24 per cent. when tested for five hours at 120° F., whereas similar plants that had been in the dark during the night were injured 70 per cent. by the treatment. Wheat that had been kept in the dark during the night and forenoon was injured 95 per cent. compared with 15 per cent. injury to plants that had been treated in the same way except that they were exposed to daylight for one hour immediately before the test. Corn plants in some cases exhibited increased resistance to heat following exposure to light for less than one hour. Wheat that had been in daylight throughout the forenoon was injured 10 per cent. by heat, whereas the plants that were prepared in the same way except for being in darkness one hour immediately preceding the test were injured 30 per cent. Sorghum in the heading stage was injured less by exposure to 150° F. for five hours beginning at 1 P.M. than to 140° F. for the same length of time beginning at 8 A.M.

The photosynthetic production of organic material suggests itself as an explanation for the increased resistance of plants to heat. It appears, however, that the amount of organic material that might be manufactured during the short exposure to light, which is needed to bring about a marked increase in resistance, would probably be insufficient to account for so much change in resistance. Perhaps a photochemical change or some other influence of light which can be induced quickly may be responsible for the increased resistance of plants to heat when they are exposed to light.

Investigations seeking an explanation for the phenomenon resulting in a daily cycle of heat resistance in plants are being continued.

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NIEVES PENITENTES NEAR BOSTON, MASSACHUSETTS

ON March 11, 12 and 13, approximately 11 inches of snow fell in the Greater Boston area. This, together with what had already fallen, made 14.2 inches of snow. For ten days following this storm, the temperature remained below freezing much of the time (Table 1). During this period the humidity was continuously low and there were several clear days (Table 1).

As these conditions are ideal for the formation of nieves penitentes, it is not surprising that on March 21, 22 and 23 the writer observed larger and more perfectly formed nieves than he had ever before seen around Boston. These features are usually found on the snow fields of lofty mountains. They have been described from the Himalayas,[1] Sierra Nevada,[2] Kilimanjaro[3] and also from the Andes,[4] where apparently they reach their greatest size and most perfect development.

TABLE 1

U. S. WEATHER BUREAU, BOSTON, MASSACHUSETTS

Date	Max. temp. F°	Mean temp. F°	Humidity at noon	Sunshine
March 14 ...	38°	30°	59	clear
" 15 ...	38°	30°	74	cloudy
" 16 ...	45°	36°	95	cloudy
" 17 ...	38°	32°	47	clear
" 18 ...	35°	29°	52	partly cloudy
" 19 ...	31°	24°	35	clear
" 20 ...	40°	32°	64	cloudy
" 21 ...	36°	30°	54	clear
" 22 ...	35°	28°	44	clear
" 23 ...	41°	31°	40	clear
" 24 ...	58°	46°	43	clear

As is shown in A of Fig. 1, a great many were

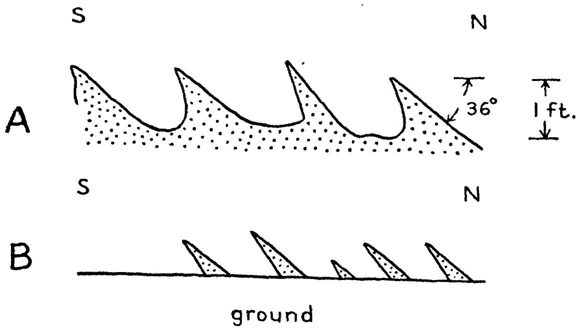

FIG. 1. Diagrammatic sketch of nieves penitentes near Boston, Mass. A—Pinnacles separated by snow. B—Pinnacles separated by bare ground.

approximately one foot high. They ranged, however, from a fraction of an inch to 2 feet in height. They were usually separated by pits, although some of the smaller ones were separated by east-west trenches. The pinnacles pointed toward the south, and the back slope (north facing) of many was approximately 36 degrees. Some of the pinnacles were separated from each other by bare ground, the result of complete melting and evaporation of the snow between them (B of Fig. 1). Many of the snow banks, which were originally of irregular shape, had cliffs two and three feet high on the south side and a flat slope on the north. As March 24 was a warm day with the temperature almost continually above 32 degrees (Table 1), much melting took place and the nieves were largely destroyed.

It is generally agreed that the nieves are produced

[1] W. H. Workman, *Zeitschrift für Gletscherkunde*, 3: 241–270, 1909.

[2] F. E. Matthes, Trans. Amer. Geophy. Union, 15th annual meeting: 380–385, 1934.

[3] F. Jaeger, *Zeitschrift der Gesellschaft für Erdkunde*, No. 2: 101–103, 1908.

[4] H. Meyer, *Zeitschrift der Gesellschaft für Erdkunde*, No. 2: 98–101, 1908. See also R. Hauthal, *Zeitschrift der Gesellschaft für Erdkunde*, No. 2: 95–98, 1908.

by the radiant heat of the sun. For their best development there must be a prolonged period with the temperature below freezing, low humidity and strong sunshine, together with an abundance of clear snow with surface irregularities. As these conditions are found as a rule only at high altitudes, the nieves penitentes are rare at or near sea level. The direction and angle of inclination of the pinnacles is a function of latitude. North of the equator they point south, south of the equator they point north, while on the equator they are vertical.

Their unusual size was due in part to the fact that they were formed in March. On March 21 Boston receives 1.3 times as much heat from the sun as it does on December 21. Assuming the necessary temperature conditions, low humidity and sunshine, it would take approximately 1.3 times as long to form nieves of any given size in December as in March. Although insolation would be still stronger in April, it is almost impossible to have snow and freezing conditions for more than a few days at this time. Hence large nieves are not to be expected in Boston in April.

It was estimated from the number and size of the pinnacles that as much as ¼ of this snow-fall wasted away by evaporation. If this condition was general over Massachusetts and New England, the loss of melt water due to this evaporation must have been considerable.

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AMERICAN scientists, linguistically provincial, often have an apprehension about going to Europe to confer or conduct research in the scientific laboratories because of the "language difficulty." During the past year I had the occasion to converse with the directors (or persons in charge) of 66 biological field stations in 16 European countries (including Russia). In my experience, two thirds of the scientists interviewed spoke understandable English (universally, in Denmark, Sweden and the Netherlands), and of those who did not speak English, 80 per cent. spoke French, and the others German. There are good assurances, therefore, that if an American scientist does go to Europe on business, he can make himself understood scientifically, although there is no evidence that the percentage of political understanding is that high.

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BOOKS AND LITERATURE

BIOLOGY

General Biology. A Textbook for College Students. By PERRY D. STRAUSBAUGH and BERNAL R. WEIMER. xi + 555 pp. 284 figs., including 13 colored plates. John Wiley and Sons, Inc., New York. 1938. $3.75.

To the writing of text-books on general biology there seems to be no end. The urge undoubtedly reflects the growing trend of formal instruction away from general botany and zoology toward general biology. This trend has been marked during the past two decades in America. It is noted in the high schools as well as in the colleges and universities. In fact, it probably began in the secondary schools. Such a trend is a phase of the larger movement toward general science courses. And the latter is a phase of the still larger movement toward the orientation course, the general college and what have you. Many teachers of science feel that all these movements tend to debase science. They tend to force higher educational interests to bow to more and more secondary and even elementary objectives. Maybe so, maybe not. At any rate the general biology course is with us. It will be with us for a long time. We must accept the challenge and set out to solve the associated problems. These are about the first major problems related to biological teaching that we have faced for a third of a century. Will the older generation of botanists and zoologists in our universities forget their prejudices and background, dig into a new batch of meristem and do this important job that society demands of the schools? That is the real challenge.

Literally dozens of authors have given us new books in the hope that they would supply an important aid in the above evolutionary movement. The most of such books are poor. Some are downright bad, or almost silly. Some are so extremely dilute as to challenge only the "man on the street." Others are so complex and technical as to stump a Nobel prize winner in biology. Some are so broad and general as to embrace the universe. Others are so restricted and specialized as to be worthless for this job. Many such books are of value merely to throw light upon the narrow point of view and limited experience of the authors. Others only emphasize the author's specialties.

It seems to us that the new book by Strausbaugh and Weimer more nearly represents the proper point of view and more nearly furnishes the material for a good course in introductory biology for colleges and universities than any book we have seen. The book is fairly well balanced. That alone is a real accomplishment. The pedagogy and style are fitted to the undergraduate student. Fundamental phenomena and conceptions are not completely buried in technicalities.