Letters

Electrostatic Field and Freezing

In a recent report, Salt [*Science* **133**, 458 (1961)] presented experimental data which, in his opinion, show that supercooled water can freeze at a higher temperature in the presence of an electric field than it does in the absence of the field. Because this, if true, could have far-reaching effects in many areas, I feel his findings should be examined critically.

In the first place, Salt makes no mention of the ice-forming nuclei [Mason, *The Physics of Clouds* (Oxford Univ. Press, 1957)] that are present in the atmosphere. While most of these nuclei are usually relatively sparsely distributed and not active at temperatures above −10°C, high concentrations, of laboratory origin and active at near-zero temperatures, may have existed in Salt's laboratory at the time his experiments were performed. These nuclei, under the influence of the electric field, might have entered the supercooled drops and initiated freezing. Second, and more important, a pointed wire probe at a potential of 15,000 volts and held only about ½ inch from the electrically grounded supercooled water undoubtedly produces a corona current. This corona current is not easily detected and begins at a potential far lower than that required for the spark discharge. The possibility that ice-forming nuclei are created by the corona current, perhaps from material from the surface of the wire probe, should not be overlooked.

I suggest that the experiments be repeated in air from which the ice-forming nuclei have been filtered. Further, the electric field should be created by smooth, parallel, plane-to-plane electrodes. Only in this way will the possibility of a corona current be minimized. Until these suggestions are incorporated into the experiment, I do not feel that one can, with any certainty, conclude that an electric field can play a primary role in the initiation of freezing in supercooled water.

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Blanchard's criticism of my paper is, essentially, that I did not consider the possible action of airborne ice-forming nuclei. He proposes that these may be created, attracted, or concentrated by the electric field or corona and may thus supercontaminate the sample.

This is a reasonable possibility in the case of my exposed water droplets, but how could it be applicable to the insect larvae and rubber-encased water samples, which possess coatings resistant to nucleation from without? Nothing that is known about the nucleation of water would lead one to doubt that my insect larvae and encased water samples were nucleated internally.

Blanchard suggests that the experiments be repeated in clean air with parallel-plate electrodes to minimize the corona current. As stated in my report, I used parallel plates in some tests and found them quite as effective as the probe and plate electrodes.

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Advancement of Scientists

T. C. Kahn [*Science* **133**, 656 (1961)] does not, I believe, give sufficient credit to the AAAS for its newly effective policy of publicly relating science to human welfare and culture. I submit that, if the public is kept sufficiently aware of this relation, the advancement of scientists will be adequate. The "Ph.D. scientist," forced into a pecking order with "real doctors," may admire the American Medical Association from afar. Some of us, however, would not like to emulate the AMA, which threatens to replace the physician's concern for human health with "medical economics." I rejoice that the AAAS has not found it necessary to caution scientists not to carry professional insignia on their Cadillacs, as has been reported of a county medical society in California.

One large group of scientists—the teachers—is inadequately recognized and compensated, but I doubt that we would be wise to single out teachers of science for preferential treatment among teachers in general.

JOHN W. DUFFIELD
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Enzyme Nomenclature

F. Bernheim's delightful letter [*Science* **133**, 654 (3 Mar. 1961)] is somewhat inaccurate. He says, "In 1957, Wallach and Grisolia [*J. Biol. Chem.* **226**, 277 (1957)] further purified the enzyme, which they said we called hydantoin peptidase—a name we had not thought of." Actually Bernheim, in his article "Enzymes in detoxication" [in *The Enzymes*, J. B. Sumner and K. Myrbäck, Eds. (Academic Press, New York, 1952), vol. 2, pt. 2, p. 862], wrote a subsection entitled, "Hydantoin peptidase," referring to his previously named (1946–1949) hydantoinase.

I should not like to enter into a controversy over the proper name for the enzyme (actually I do not like very much the ones thus far used) and certainly not with Bernheim. If I had not regarded him with affection I should probably not have recalled the possible relation between our studies (in pyridine metabolism) and his discovery of hydantoinase (hydantoin peptidase). His comment relating political and metabolic status and enzyme nomenclature reminds me of an anecdote I heard when a child. A political appointee, when asked who had won the election, said: "It is a funny thing, we thought we Republicans were going to win, but instead we Democrats won!" (of course, since I was in Spain at the time, I have used some latitude in identifying the political parties).

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The Issue of Fluoridation

Local referenda in the first week of March 1961 administered serious defeats to those who have been in favor of the fluoridation of water supplies in Massachusetts. The proposal was voted down two to one in Wellesley and by a smaller margin in Brookline, and discontinuation was voted in Andover.

It is extremely difficult to understand the trend of voting on this issue in towns of the highest socioeconomic and educational levels at a time when the prestige of science, at least with respect to its capacity for achieving its objectives, is higher than ever before. It seems to me that this issue exemplifies the contemporary confrontation of science and antiscience, because of the overwhelming weight of scientific authority on the pro side—such as that of the official associations of the dental profession and the public health authorities at all governmental levels. If this evaluation of the issue is valid, one must draw the conclusion that communication between the scientific community and the public is still in a highly unsatisfactory state and that it should be a matter of continuing concern to the AAAS. This aspect of the situation may transcend in importance the lost potential for improvement in dental health.

Discontinuance of the fluoridation program in Andover after 5 years may provide the basis for another field study for interested investigators. But of even greater interest would be results of a competent sociological study to uncover the basic reasons for the astounding successes of the small, fanatical groups that have been organized to oppose the scientific experts. This issue may, in a sense, serve as a measure of the effectiveness of the AAAS with respect to one of its prime objectives—communication with the public at large.

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Government and Education

A recent editorial [*Science* **133**, 1043 (7 Apr. 1961)] confirms the need for truly liberal members of the AAAS to make themselves heard. I resigned from the AAAS in protest over the brave new social stand promulgated by the Association under the guise of "Science in the News." Now in this editorial, the Association has come out forthrightly for federal interference in local education.

The worth-whileness of integration should not blind anyone to the danger of encouraging Congress to contribute money *conditionally* to education. The conditions will multiply with time, to conform to every demagogic prejudice of any group wielding sufficient votes. I hope the editors of *Science* are prepared to convince Congress that somewhere between Negroes, Jews, Catholics, Nordics, Birchists, Irish, Baptists, Communists, Fundamentalists, Pragmatists, Conscientious Objectors, Beatniks, and Snuff-takers there is a fine line that makes federal interference right or wrong. If Congress is not convinced, the new loyalty oaths will be a multiple-choice form several pages in length.

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We wish to point out that what appears in Science, *either in editorials, in the news section, among the articles, or elsewhere, cannot in all fairness be called a "social stand promulgated by the Association."*—ED.

Reprints of Snow Address

C. P. Snow's significant address before the AAAS in December, "The moral un-neutrality of science" [*Science* **133**, 245 (27 Jan. 1961)] has been reprinted in pamphlet form by the Peace Education Program of the American Friends Service Committee.

We would like to let your readers know that the pamphlet is available at 10 cents a copy from Peace Literature Service, American Friends Service Committee, 160 North 15 St., Philadelphia 2, Pa.

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