Letters

Montana's Crusading Scientists

In Nelson's article concerning the role of the St. Louis Committee on Environmental Information (25 Aug., p. 903), Margaret Mead is reported to have suggested that there is no need for joint groups of scientists and citizens in small communities (because those scientists are already involved in other community organizations). However, the history of the Western Montana Scientists' Committee for Public Information would seem to argue otherwise. WMSCPI grew out of the concern of a small group of local scientists over radioactive fallout from nuclear testing. At that time, their expressions of concern were labeled "agitation," and these men were subjected to personal and political attacks by the public and the press. The Missoula group has never numbered more than 15 and, until recently, its budget has come directly from its members' pockets. Furthermore, rather than being able to exert influence through organizations in the community, the views of the members of WMSCPI have generally been opposed by these organizations. For example, despite the fact that Missoula has a higher concentration of tars in its atmosphere than Chicago, Pittsburgh, or New York City, influential organizations fought desperately to postpone effective air-pollution control and maintain the *status quo*.

In the past few years, WMSCPI members have worked successfully for the passage of state laws to restore land after strip mining, to prevent unnecessary alteration of stream courses, to block the downward reclassification of major streams and lakes, and to set stringent ambient air-quality standards. They have testified in the first intrastate air-pollution hearings which led to the temporary closing of a phosphate plant whose fluoride emissions had destroyed vegetation and crippled animals. They have campaigned to halt dumping of raw sewage and mining wastes into the Clark Fork of the Columbia River. They have continually condemned the practice, recently abandoned by the Forest Service, of aerial spraying with nonspecific antibiotics under the white pine blister rust-control program. They have fought to preserve wilderness areas. Perhaps, most notably, they have helped to change the climate of opinion in this area with respect to man's previously unquestioned right to pollute his environment and that of his neighbor. . . .

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New Source for MS-222

Van Bergeijk's "thunderstruck" colleagues (Letters, 27 Oct.) will be happy to learn that MS-222-Sandoz is available from Fisher Scientific Company. It is listed as 9671 ethyl *m*-aminobenzoate methanesulfonate and is assured to be of highest purity.

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We suggest tricaine (ethyl-*m*-aminobenzoate methanesulfonic acid), obtainable from the Sigma Chemical Company, among others, for use on frogs and salamanders at doses similar to those previously used with MS-222. We have had entirely comparable results thus far. As in the case of MS-222, tricaine is not particularly effective as an anesthetic when made up in distilled water or isotonic sodium chloride, but has maximum potency in "spring water" or isotonic potassium chloride.

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Persistence Transfer

The following is a brief account of some preliminary experiments we have made that appear to demonstrate the transfer of certain innate characteristics from one oscilloscope to another. More specifically, our object was to see whether a Tektronix 502 oscilloscope could be converted to a storage-scope with indefinite persistence. While this could, of course, be achieved by altering the tube and modifying the electrical circuits by conventional techniques, it nevertheless seemed worthwhile to test whether transfer of persistence could be effected by an extract made from a storage oscilloscope. Accordingly, a Tetronix Storage scope (RM 564) was allowed to run until there was no doubt about (i) the persistence of traces on the tube face; (ii) the effectiveness of the erasure mechanism; (iii) the stability of the image with respect to X- and Y-axes. The machine was then pounded with a Sears Roebuck ball peen hammer (Cat. No. 28B4652) on a Fisher Lab bench (Cat. No. B148) covered by a ½-inch stainless steel plate. The hammering was continued until all the electronic components and the tube were reduced to sufficiently small pieces to pass through a filter made of 007-mesh nylon stocking (seamless). In several experiments (2) the chassis was also ground up on a benchtop grinder (Sears No. 5634), but this procedure was not followed routinely, as it did not seem to affect the results materially and was both time-consuming and tedious. The storage oscilloscope fragments (S.O.F.) were next washed for 24 hours in CCl_4 in a cold room, dried at 70°C for 12 hours and stored in stoppered jars (Fisher Cat. No. 6139). For the actual experiment, S.O.F. was sprinkled over the chassis of a Tetronix 502 oscilloscope. The persistence of the after-glow was used as an index for evaluating the effects of this procedure. The complete results are shown in Table 1. In 9 out of 33 experiments there was no change in the persistence, in 6 there was a decrease in persistence, but in 18 there was an increase which was highly significant ($< .001$, t-test). Control experiments in which nonstorage oscilloscopes were extracted showed no change. While the average increase in persistence was not large—3.2 msec—it nevertheless suggested that some change had been wrought in the recipient oscilloscope by the S.O.F. Another point of interest was that such affected oscilloscopes required

Table 1. Persistence of transfer.

Fragments	Increased	De-creased	No change
S.O.F.	15 ($P < .001$)	6	9
Control fragments	3	3	3

far fewer alterations in their circuitry to convert them to storage oscilloscopes.

The mechanism by which such changes are brought about is not clear as yet. Experiments are in progress to see how such information is transferred from machine to machine. In other experiments, standing patterns are being stored in the donor oscilloscope before preparing the S.O.F. with the expectation that similar patterns of persistence may occur in the recipient. The electronic uses of this procedure if further developed could be widespread.

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Names Are Not Enough

Reed's exasperation (Letters, 25 Aug.) with the failure of biologists to name organisms upon which they have experimented is warranted. For data to be properly indexed and compared, organisms used must be identified. However, it should be noted that many biologists are exasperated with researchers who do *name* their material but who, in doing so, fail to properly *identify* it.

Studies of reproductive behavior in diverse groups (crickets, frogs, fruitflies, fireflies) have shown that species—reproductively isolated breeding populations and therefore separate evolutionary entities—are often overlooked in the most careful analyses of the morphology of preserved specimens. Yet scientific names, especially in invertebrates, are based largely on such analyses. This means that even if a competent taxonomist has associated a scientific name with some organisms for a researcher, the identification may be inadequate.

For instance, physiologists have used the house cricket as a convenient experimental animal, sometimes obtaining their initial material from fish-bait dealers. Such crickets are given the binomial *Acheta domesticus,* but Ghouri (*1*) has noted that at least five species exist that would be identified as *Acheta domesticus* by competent taxonomists. In how many of the papers dealing with the physiology of "*Acheta domesticus*" can we now establish with certainty which species was used?

The scientific life and comparative value of a researcher's work are dependent upon the confidence future scientists can place in it. To prevent a devaluation of their work as a result of erroneous or questionable species identifications, researchers should (i) know the source of their material and confirm its identity; and (ii) deposit some of the specimens used for experimentation (voucher specimens) in a maintained museum collection. For material collected in the field, researchers should record *locality*, date, ecology and behavior. When publishing, authors should indicate the precautions taken in procuring and identifying material and the depository of voucher specimens.

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Reference

1. A. S. K. Ghouri, *Nature* **192**, 1000 (1961).

Commas Awry

The random distribution of commas in the italicized lines of the box (6 Oct., p. 99) disturbs the location of the point of view and deserves clarification:

1) I am one person, not two, or a trinity. Gordon McKay, a Harvard benefactor, is dead, but his memory is honored in half of my title which in its entirety is "Professor of Linguistics and Gordon McKay Professor of Applied Mathematics" without any commas.

2) The somewhat telegraphic insertion of the word "address" in the third italicized line is mysterious. It need not be. My address entitled "The hardware-software complementarity" was delivered at the annual meeting of the Division of Mathematical Sciences of the National Academy of Sciences–National Research Council as part of a symposium on the academic role of computers held on 13 March 1967. The full text is accessible in either of the following two sources: (i) the Annual Report of the Division of Mathematical Sciences of the National Academy of Sciences–National Research Council; or (ii) *Communications of the Association for Computing Machinery* [**10**, 604 (1967)].

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Fresh Water and Cheap Power for Tropical Islands

I would like to belatedly comment on Gerard and Worzel's report, "Condensation of atmospheric moisture from tropical maritime air masses as a freshwater resource" (15 Sept., p. 1300). In the Cayman Islands we have problems similar to those of the Virgin Islands, although our overall groundwater resources are not insignificant. Since we need ample resources of cheap electric power, it seems that Gerard and Worzel's proposals could be coordinated with that of J. Hilbert Anderson and James H. Anderson for the generation of "Large-scale sea thermal power" as outlined in the latters' paper given at the November 1965 meeting of the American Society of Mechanical Engineers. The Andersons proposed to drive a turbine by boiling propane under suitable pressure at a temperature of 21°C to 27°C (surface water temperature in the Caribbean) and condensing it at about 13°C, using deep water of about 9°C. This might well provide the power for Gerard and Worzel's condensers and leave quite a bit over for ordinary power uses.

Grand Cayman has very deep water within a stone's throw of the shore and, moreover, our North Sound has over 51.8 square kilometers of shallow and therefore warm water. This combination would seem to be ideal for sea-thermal power generation because both pipelines and cables would be short. Our low altitude in the path of the trade winds seems also ideal for water condensation.

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