LETTERS

Dana, the Geologist

My colleague, Nathan Reingold, editor of the Joseph Henry Papers at the Smithsonian Institution, wrote me the following note upon your publication of my biographical sketch (26 Apr., p. 490) of Margaret Mead, AAAS president-elect: "James Dwight Dana was not an anthropologist. Is this historical ignorance on your part or an instance of disciplinary imperialism?" I confessed that both of his hunches were correct. Nevertheless, Dana, the geologist, if alive today, probably would applaud the affinities between students of rocks and students of human beings that have resulted from a shared dependence on fieldwork. My apologies for identifying Dana as an anthropologist. Why not exploit my error by suggesting that anthropologists learn some geology, or take geologists along on their field expeditions?

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Demand for Scientists and Engineers

The editorial by Betty M. Vetter (5 Apr., p. 11) "Assessing the demand for scientists and engineers" dealt principally with the small minority of that group who are new graduates. Experienced and mature professionals find no signs of a technical manpower shortage; some are still unemployed, having been declared "surplus" or "overqualified." Drop-outs have been conveniently excluded from employment statistics.

Vetter notes many of the shortcomings of current technical manpower policy, and her call for long-range manpower planning is widely endorsed; societal needs for engineering services should be planned years in advance. But when these are translated into manpower needs, it becomes apparent that the crux of the technical manpower problem is the chronic shortage of committed money.

Prediction of future demand for engineering manpower (meaning dollars to pay salaries) is highly speculative, since it depends on dubious economic and political predictions. The dominant governmental role is subverted by the absence of coherent long-range planning; the needs are thus not correlated with jobs.

Statistical exercises involving new graduates cannot be equated with an assessment of the demand for scientists and engineers. The lack of accounting for the majority of workers who have served many productive years in science and engineering is bound to have an impact on career-bound students.

Effective technical manpower planning must include long-range financial commitment, to ensure that educational funds are not squandered on the production of yet another generation of highly educated technical professionals without jobs.

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Betty M. Vetter suggests that "fewer than 1500 doctoral holders in the physical sciences and engineering were unemployed and seeking employment in 1973—an unemployment rate well below 1.5 percent." In my own field (physical chemistry), my file of job-hunting correspondence reveals that last year about 150 individuals, and this year 300, competed for about 20 new faculty positions in colleges and universities. This seems perilously close to a situation in which a career of teaching and research is not a realistic goal for a Ph.D. And it seems an unreasonable situation, in view of the cost of academic positions relative to the national research and development (R & D) budget. For example, the cost of financing 1000 faculty positions (including research support) would be less than one-fourth of 1 percent of the total federal R & D budget of $19.6 billion. Perhaps a comparatively small reallocation of funds could do much to support a resource of considerable value and to alleviate a problem of considerable magnitude, while contributing to the quality of science education in this country.

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I am in hearty agreement with the total thrust of Betty M. Vetter's editorial. I agree that it is urgently necessary to establish the best possible method for estimating the supply and demand for scientists and engineers. But I must quarrel with her penultimate paragraph, in which she talks about the " 'Ph.D. glut.' " She states that the best statistics now available indicate that "fewer than 1500 doctoral holders in the physical sciences and engineering were unemployed and seeking employment in 1973—an unemployment rate well below 1.5 percent." The American Chemical Society's *1973 Report of Chemists' Salaries and Employment Status* (*1*) indicated in a survey response that 1.7 percent overall and 1.5 percent of Ph.D.'s were "unemployed." However, if the whole group of people with employment problems included temporary or part-time employees, those subprofessionally employed, postdoctoral or other fellows, and retired people seeking employment, it would amount to 8.3 percent of the membership or over 8000 persons in the United States. Among Ph.D. members, 9.5 percent, or almost 5000 individuals, are in these categories, with about half of them hanging on at universities and colleges as postdoctoral fellows. Similarly, the recently released National Academy of Sciences–National Research Council survey (*2*), while reporting overall unemployment of only 2643 Ph.D.'s in all categories of science and engineering, shows a difference of 15,781 individuals between the "total labor force" and the "full-time employed." This number must include all those with employment problems.

In fact, it was only the growth of postdoctoral fellowships through the period 1971 to 1973 that kept a lot of our recent graduates in bread and butter and up-to-date in their fields. It is fortunate that this ad-hoc method of handling the unemployment situation was available. Even so, every person who had to do this was sacrificing thousands of dollars of salary. But the castoffs from academia, nonprofit labs, and particularly industry did not have this resource available to them. Many of these did not show up in the "unemployed" column simply because they found something else to do to try to keep themselves and their families going. Scientists and engineers generally do not sit around and twiddle their thumbs when they are unemployed. They find a way to bring in some bread.

The great tragedy of this situation is that scientists and engineers, when they are not working at their profession, rapidly lose their ability to stay in the profession. It is urgently necessary that we devise better methods for handling these apparently inevitable downturns in employment. I have suggested that we set up an Exempt Employees Emer-