Letters

Draft Policy Dangers

The recently announced changes in draft policy bear all the earmarks of a short-range compromise between political and military expediency, pleasing no one and carrying with them long-range consequences of considerable danger. Historically, the previous draft policy arose out of experience in World War I. In times of national emergency there is always a tendency for well-trained and public-spirited individuals to volunteer for dangerous service, and in a country like Great Britain the result was disastrous. The flower of the British universities volunteered in 1914, and most of them died in Flanders or Gallipoli, delaying the development of scientific research for at least 10 years and perhaps for a generation. In World War II, I wrote that our long-range objective for either war or peace must be a strong, well-organized, and productive society [*Science* **96**, 39 (1942)] and suggested that each scientist who had some choice should take the long view and continue to contribute to knowledge which might eventually win the peace.

This is another war, unpopular and unprofitable, and there is little danger that many of our gifted and well-trained young men will volunteer for service. The real danger today arises from the fact that the war is distracting attention from the solution of our own serious internal social problems. The hope of meeting these problems in a peaceful and constructive way lies in having a large body of well-educated citizens who are capable of solving them. We are working toward this end with the increased numbers of people who are getting into higher education, and the previous draft policy encouraged this trend.

However, our universities are already in trouble because the graduate schools cannot turn out well-trained teachers and scholars as fast as the undergraduate enrollment grows. Increasing numbers of undergraduates are becoming discontented and alienated rather than becoming potential contributors to a strong society. The new draft policy will compound these difficulties by further weakening the teaching of undergraduates, and if it is long continued, the results may well be disastrous. The United States is likely to emerge from the Vietnam war not only with diminished international prestige but with a society torn by dissension and weakened by malaise.

We should begin to develop a long-range draft policy as soon as possible. If, as seems likely, the United States must maintain a large military force for many years, the only possible course is to continue some form of universal service. One alternative, a large professional army, is so potentially dangerous from the viewpoint of a possible military coup and dictatorship that it should not even be considered. The most desirable alternative is some form of national service without exemptions in which the draftee would have a choice between military and a variety of nonmilitary services that would serve the national interest: aiding hospitals, the aged, the underprivileged, or educational institutions. The present limited choice between immediate military service and college-plus-delayed service is emotionally unsatisfactory to most participants and inefficient from the viewpoint of both military and civilian agencies.

We cannot afford to devote the energies of our society solely for the purposes of war but must maintain our strength for the purposes of peace. Among other long-range results of a strong program of advanced education we could anticipate that future political leaders would have the information to develop alternatives to war and be well enough educated to use them.

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Clifford briefly describes some of the problems and pitfalls caused by the latest decision to remove college graduates and graduate students from eligibility for deferment ("The draft: Administration orders end to graduate deferments," 23 Feb., p. 859). . . . In addition to the expected drop in graduate school enrollments with all its attendant problems, one of the most unfortunate effects of the new ruling will be a tendency for college seniors to suddenly alter all their well-established educational plans. Students planning professional careers in such vital fields as oceanography, biomedical engineering, and education will either take their chances of adhering to these plans while still hoping to escape the draft, or, what is more likely, will try to switch into one of the "preferred" medical fields. Thus, the nation will witness an increasing shortage of trained scientists in the abandoned fields and an increased pressure on the already overburdened medical school facilities.

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DDT and Robins

Yannacone referred to Environmental Defense Fund scientists as "virgin witnesses" and Jukes clearly enjoyed the point (Letters, 16 Feb.). It was with some relief, however, that we noted a recent newspaper article from Jukes's home state referring to us as "nine potent scientists" (*1*).

Jukes suggested that robins were not killed by DDT in Hanover, New Hampshire, but had simply flown across the Connecticut River to Norwich, Vermont, thereby explaining the population decline in Hanover and rise in Norwich. Any substantial movement of robins between Hanover and Norwich during May is most unlikely however, since the birds are territorial during nesting season and generally remain within a few hundred yards of the nest. As is clear to "worldly readers" of the original paper (*2*), a freezer full of dead robins collected in Hanover and containing lethal concentrations of DDT in their brains attests to their failure at evacuating the town. In Norwich the population rose because young birds were added to it.

As is customary where a complete population cannot be measured, representative study areas were used as a

sample and results were extrapolated. Our article stated that 12 robins was an average of many counts within these study areas, not a single count of 12 robins as Jukes inferred. The potential inaccuracies of extrapolation are quite evident to any scientist, which was why we used the process only as a "rough estimation." Major conclusions were not based on the accuracy of this extrapolation in any event.

Jukes has erected, then demolished, the abominable straw man of robin extinction. We never mentioned this point however, nor have other scientists. While treatment of elms has killed millions of robins, high reproduction rates, increased habitat (suburbia) and decreased predation all contribute to rising robin populations. DDT does contribute to substantial population declines among many other avian species, however (*3*). Jukes's is an example of the kind of thinking that concludes all is well with pesticides as long as there is food on our tables and robins on the lawn.

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References

1. E. McPherson, *Grass Valley Union* (California), 14 Feb. 1968.
2. D. H. Wurster, C. F. Wurster, W. N. Strickland, *Ecology* **46**, 488 (1965).
3. C. F. Wurster and D. B. Wingate, *Science* **159**, 979 (1968).

Federal Animal Care Projects

Cohen's report on the evaluation of animal care programs by the American Association for Accreditation of Laboratory Animal Care (Letters, 29 Dec.) should be encouraging to all who believe that peer evaluation within the scientific community can be successful. With the introduction of the Javits-Rogers bills (S. 2481, H.R. 13168), this concept and all issues regarding research-animal care will be increasingly debated.

The debate will probably cause some to inquire about current federal efforts to improve care and treatment of research animals. The Department of Agriculture's role through enforcement of PL 89-544 has certainly been significant in "persuading" some institutions to improve their animal care programs. Other federal agencies contribute through exemplary "in house" animal programs and research on animal care problems.

The National Institutes of Health has a program to assist institutions in meeting their requirements for research-animal resources. This project grant program may support a variety of activities for improvement of animal resources and animal care programs. The projects range from highly specialized unique colonies of research animals to programs for improving the facilities, the scientific medical management of institutional animal colonies, and training programs for specialists in laboratory animal medicine. The program further supports projects for elucidating new model animal systems for more efficient and effective research into human health problems.

As more and more scientific institutions and their investigators recognize the significant contributions that can be made by the use of the correct animal model, properly cared for, we can expect even greater benefits than heretofore realized from animal research.

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Interstellar Travel

Although I endorse "Clarke's Third Law" (Letters, 19 Jan.), I challenge his statement that "any really competent extrapolation shows interstellar travel to be a rather simple engineering accomplishment."

An eminent practitioner of space vehicle design, Maxwell W. Hunter II, concurs with Clarke that fusion propulsion holds great promise for interstellar space ships capable of traveling at fractional speed-of-light velocities (*1*). However, he underscores the incomprehensible energy requirements necessary to propel spacecraft of realistic sizes. These demands would be measured in proportions of the total power output generated by the sun. Accordingly, the radiation-shield requirements, which compound the hazard of inadvertently vaporizing the manned spacecraft itself, appear to pose formidable problems based on any materials or cooling techniques known today. Further, each pound of spacecraft mass would necessitate initial space vehicle weights, which can be measured only in terms of significant fractions of the earth's total weight. Associated with