Letters

Rainbow Bridge

A. M. Woodbury [*Science* **132**, 519 (26 Aug. 1960)] certainly made his point that any of the proposed engineering works designed to protect the Rainbow Bridge would result in permanent disfigurement that would be even worse than the damage they are designed to prevent. It seems foolish to push this approach to the problem when such a result can be clearly foreseen.

This, however, leaves the present plans which will extend an arm of the Glen Canyon Reservoir into the monument in clear violation of the provision of the law as quoted by Woodbury. The actual dilemma, whether or not to violate these provisions of the law, would seem on first sight, at least, not at all difficult to solve. To have, at no time, water backed up under the Rainbow Bridge, the Glen Canyon Dam would simply have to be, according to Woodbury's figures, 46 feet lower than planned. It is not clear how much more would have to be cut off the height of the dam in order to protect the monument completely. It is obvious, more so than ever after reading Woodbury's article, that having this magnificent country unimpaired would be a far greater asset to the U.S. than having the additional water storage capacity provided by the top 75 feet or so of the dam. It is also clear that no encroachment on the national park system should be permitted. Lowering the level of the top of the dam would avoid damage to these values and would also undoubtedly make the dam cost less, thus saving the taxpayers' money.

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The question raised in F. R. Fosberg's letter does not lie within the purview of my article dealing with the protection of Rainbow Bridge, but something about the background of the dam may be worth while.

As I understand it, the dam was planned so that the investment would yield its greatest economic return. The dam could have been higher or lower, but deviation from its present planned height would reduce its economic efficiency. Once the height of the dam was determined, then engineering plans and specifications were drawn to fit the height. Construction of the dam is under way. The foundation is being laid, the cliff faces are ready, and the overflow outlet tunnels at the planned height are partly complete. Reducing the height of the dam at this stage of construction would require expensive modifications. To make these changes would require alteration of the foundation design, further work on the cliff faces, drilling of new overflow outlet tunnels, revision of all contracts for the work, and redesign of power outlets and turbines.

Instead of saving taxpayers' money, the alterations would greatly increase the cost, thus making the whole project more expensive as an investment. The problem of getting the approval of Congress for the change and the cost of redesigning the dam by engineers would run the expenditure sky high. A loss of 75 feet in height of the dam would decrease by 48 percent the active storage capacity of the reservoir and reduce its effectiveness in regulating stream flow.

Fosberg's question still remains. Obviously, if change in the height of the dam is impractical and it is senseless to disfigure the surrounding scenic landscapes to protect the bridge, then the only sensible thing left to do seems to be to incorporate the bridge into the proposed national recreation area and leave the problem in the hands of the National Park Service.

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Intramural Research

A recent issue of *Science* [**132**, 75 (8 July 1960)] carried a news article entitled "Basic research in the Defense Department: the department's view," in which the research and development budget of the Department of Defense was discussed in relation to basic research. Unfortunately, both the report and its title suggest that all the department's basic research is done elsewhere; intramural research is completely ignored.

It should be well known that there are a number of active research laboratories within the military establishment, that they cover a variety of scientific fields, and that they carry on considerable basic, as well as applied, research, much of which is published in scientific journals. Financial problems have been even more serious for them than for the over-all research program since, at a time when the department's total research and development budget is slowly increasing, these laboratories have had their allotments reduced and are having to curtail activities to adjust to this reduction as well as to increasing costs of both goods and services.

A discussion of the value and support of intramural research in the Department of Defense would be out of place in this letter, since it would involve considerations of social and political attitudes as well as of competition for prestige and funds. However, the almost complete lack of awareness of the problems on the part of the scientific community can hardly lead to any intelligent handling of the situation.

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Disarmament

The news article entitled "Thinking about disarmament" [*Science* **132**, 282 (29 July 1960)] demonstrates to me the utterly naive concepts about the world in which we live that are apparently held by some scientists engaged in research on "disarmament." Of course Morgenthau is right in believing that valid national interests may be protected by an international judiciary with the power to enforce its decisions, but I would challenge the other side of the coin—the view which implies that in the absence of such a judiciary a nation can protect its interests by the use or threat of use of military power.

In this ICBM–H-bomb age in which we live the only sane goal seems to me to be one that has recently been aptly stated by Adlai Stevenson. "One of the two main preconditions of peaceful human society [is] economic solidarity and mutual help. The other precondition of peace—and this, of all priorities, is our highest—is our unwavering search for peace under law which, in our present context, means controlled and supervised disarmament. Only a disarmed world offers us security worth the name any longer."

If the scientists, and others, who are "thinking about disarmament" would accept this as the goal toward which American foreign policy should be directed we could, I believe, begin to spell out the kind of world institutions (executive, legislative, and judicial) which alone stand a chance of creating a just and peaceful world.

This is not meant to suggest that unilateral destruction of nuclear stockpiles tomorrow is the answer or that total disarmament under enforceable world law will be easy to achieve, but rather to decry the emphasis on such limited, and I feel provocative, objectives which suggest—on the basis of a balance-of-terror concept—that "stability might be increased by additional armaments, including certain types of nuclear weapons."

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