fluoride intake would be between 1.69 and 3.39 milligrams. The consumption of such high amounts of fluoride during the period of tooth development would undoubtedly influence the prevalence of dental caries and may also produce some mottling of the teeth.

I urge that studies be undertaken regarding the effect of fish-flour ingestion on the prevalence of dental caries and the degree of mottled-enamel development among children. Particular attention should be given to the consumption of fish flour by children in areas where considerable amounts of fluoride are also ingested daily from other sources, such as water and crude sea salt.

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More on Conservation

I write in reply to some of the letters (8 Apr., p. 152) commenting on my article "Geology and the new conservation movement" (28 Jan., p. 409).

H. E. Weaver accuses me of wanting to tear down the Alamo to build a shopping center. I want to go on record here and now as in favor of preserving the Alamo, Lincoln's home, the Acropolis, Mount Vernon, and Independence Hall solely because of their historical value. (I might note, however, that all of Weaver's examples are important economic assets, attracting thousands of tourists yearly.) I believe that, no matter how values are assigned, the cost of preservation must be considered. Perhaps a classic facade might be preserved as an architectural monument if the building can be made to serve a useful purpose. As I said, "The question is—what is the price of preservation and can we afford to pay it? In some cases we can and should pay the price; in others, the price is too high." The price must be set by the community. I do go along with Weaver in giving architects and historians a free hand in selecting the buildings to be preserved. There is more involved than architecture and history. Decisions on preservation should be informed community decisions based on consideration of all the many factors involved. In the case of buildings, I would not ask for a geological opinion, but I certainly would want an economist, an engineer, a planner, and a business representative on the team with the architect and historian. . . . I do not quarrel with Weaver's view that plant ecologists, taxonomists, landscape architects, and park planners can contribute to evaluation of woodland glades; I argue for inclusion of geologists in groups making land-use decisions. There are many woodland glades and, in fact, woodland glades can be planted and nurtured. On the other hand, mineral deposits cannot be planted. They are relatively rare, and they do not grow back.

I must take exception to Chester B. Beaty's limited concept of multiple use. I think the concept offers more value as a guide for land-use policy if it includes sequential multiple use as well as simultaneous or contemporaneous multiple use. Although extraction of minerals from wells or shafts is compatible with other surface uses such as agriculture, strip or open-pit mining is an exclusive surface use for the duration of the extractive process. The whole purpose of reclamation is to permit other uses following the harvesting of minerals. To anyone viewing land use in terms of generations of users, this is multiple use.

R. C. Clement's letter challenged my statement (incompletely quoted in the letter) that "Although conservation is frequently defined as effecting a harmony or balance between man and his environment, such a goal can never be achieved in an industrial society because an industrial society by its very nature consumes and changes its environment." Clement's argument indicates a lack of agreement on what constitutes harmony or balance. More is implied than disfigurement of the landscape. With the powerful tools and immense energy resources of an industrial society, man modifies natural earth processes, reshapes the land, transports vast quantities of earth materials from place to place, and changes the chemical composition of the water and soil. He does this in utilizing earth resources and in constructing and maintaining complex engineering systems. In my opinion, no balance in an ecologic sense can be achieved. There are too many irreversible actions.

Robert R. Curry argues that "Conservationists are rightly protesting the very recent forms of exploitation based on the use of large, modern, earth-moving equipment." To me this

is a most unworldly view. If wastes are disposed of in safe systems and surface-mined lands are reclaimed for subsequent uses, surface mining is the most economic and efficient method of extracting solid mineral matter. I use "economic" to include social values as well as production costs. Any rational approach to the problem must include consideration of what, for example, about 152 million tons of coal at $3.50 per ton means to our society. I recommend to Curry, David B. Brooks's excellent article, "Strip mine reclamation and economic analysis," in the *Natural Resources Journal*, January 1966. I admit land abuse and poor mining practice exist today. They are being stopped both voluntarily and by legislation. My point is that it is illogical to indict today's mining industry, which in large part has moved to meet changing standards of land use, for practices which prevailed in the social and economic world of a half century ago. . . .

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. . . H. E. Weaver has a good point regarding the lack of exposure of professional conservationists (broad sense) to the humanities and social sciences. Some professional schools are trying to improve the situation, but the catalog now open before me, from a major university, illustrates the difficulty they face. I would be hard put to select undergraduate courses in the social sciences that give promise of being helpful. And a frustrating 2-year effort to hire a sociologist to do research on a specific conservation problem has convinced me that few social scientists are aware that they have an opportunity for work relative to natural-resource management, and even fewer are disposed to do anything about it. A research committee of the Rural Sociological Society is now taking a look at possibilities for fruitful cooperation between social scientists and foresters.

Without naming names in substantiation, I dispute Weaver's statement that "The conservation movement is severely handicapped by a shortage of men of broad vision. . . ." Today there are many such men. The handicap may stem from the fact that most of them are professionals, hence largely anonymous within their agencies and companies. But they are making broad-

ly based conservation concepts work on millions of acres. Unfortunately, the headlines go to the crusaders who ride one horse hard and who usually claim to be *the* true conservationists. To the extent that Weaver is talking about these people, I agree with him.

Porter's letter lauds "the development of resources by American private enterprise for the use of the American people." He sees the attacks by conservationists on the practices of the extractive industries as simply part of a scheme to promote government control. It is indeed, as Flawn suggested in his article, pointless to beat the dead horse of despoliation that occurred in the past—to blame present operators for the sins of their predecessors. But a trip through almost any mineral extraction or refining area raises doubt that the horse is really dead. The same profit motive that brings successful exploitation of certain resources for the good of mankind also dictates minimizing of costs, with consequent harm to other natural and human values. Apparently the people's concern can be expressed effectively only through government regulation. The extent to which industries regulate themselves should have considerable influence on the degree to which they are regulated.

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Ruchlis's letter hits the crucial problem in conservation, probably the most important problem in our lives. The assumption that economic growth is always desirable is an idea one rarely hears questioned, almost never by political or business leaders. As Flawn says in his article, conservation depends on control of population. The earth's resources cannot supply the wants of an unlimited number of people. If population cannot be stabilized, and in many areas reduced, and if we cannot build a stable economy to supply the desires of a stable population, it seems certain that most of the things in the world which make life worth living will be destroyed, if not the necessities for the very existence of our species. If Flawn is correct that the best an industrial society can do is to minimize damage necessary for the operation of the system, then our industrial system must be modified. . . .

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