But a slip of an anonymous *New York Times* typesetter symbolizes even better the discrepancy between promise and performance during the present Administration. In the *Times* edition of 29 January 1973, a tiny box on page 1 announced a sweeping new federal science support program, details of which were to be found on an inside page. This just happened to be the obituary page. I wondered then whether this entertaining slip was Freudian or sibyllic.

In view of subsequent government steps, characterized recently by the Federated Societies of Experimental Biology as "preparing the funeral march of the National Institutes of Health," I should have been alarmed rather than amused.

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Birth Order, Family Size, and Intelligence

The relation of birth order and family size to intelligence reported in the article by Belmont and Marolla (14 Dec. 1973, p. 1096) is remarkably similar to my observations in a study of almost 800,000 National Merit scholarship participants (*1*). However, whereas Belmont and Marolla determined the relation by means of a nonverbal test (Raven Progressive Matrices), my own study indicated that the effects were probably verbal in origin. Since the data used by Belmont and Marolla also contain language scores, I hope that the relation of this variable to the nonverbal scores will also be studied.

Belmont and Marolla note that the mean score for only children does not follow a family size gradient. I have also observed this phenomenon (*2*), but I have found no adequate explanation for it. That is, if scores tend to decline with both birth order and family size, why doesn't an only child follow this same rule and thus have the highest mean score of all?

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References

1. H. M. Breland, *Psychol. Bull.* **80**, 210 (1973).
2. ———, "Birth order, family configuration, and verbal achievement," *Research Bulletin 72-47* (Educational Testing Service, Princeton, N.J., 1972).

Occam's Razor and the Watergate Tapes

In his report "Watergate tapes: Critics question main conclusions of expert panel" (News and Comment, 22 Feb., p. 732), Nicholas Wade adds his contribution to the tape decoy that has been distracting our attention toward what constitutes consciously manipulable and easily distortable "evidence" ever since Alexander Butterfield accidentally (?) revealed the presence of the tapes last July. Wade apparently supports President Nixon's public relations and legal defense staffs in their allegation that the technical experts appointed by Judge Sirica and the White House (!) may have overlooked the possibility of technical failure in the Uher 5000 recorder.

But, if we accept this "explanation" of the 18½-minute silence on that tape, then we must formulate separate explanations for each of two already missing tapes, for any tapes or tape segments that turn out to be missing or rerecorded in the future, for missing dictaphone recordings, for portions excised from documents, for missing CIA records, and so forth.

As scientists who believe with William of Occam that "entities must not be multiplied without necessity," should we not seek a more direct and elegant explanation? There are two, both formulable in terms of "sinister forces." One posits mysterious spirit beings whose actions are beyond our understanding. The other points toward self-serving human beings whose actions would be defined as "cover-up to the third power" (a cover-up of a cover-up of a cover-up).

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Conserving Renewable Resources

Colin W. Clark (17 Aug. 1973, p. 630) presents an elucidating and useful model of how a resource with a regenerative capacity may be overexploited. He uses the Antarctic blue whale population as an example.

Regrettably, a quick reader may get the impression that Clark presents a strong mathematical argument in favor of the view that only through socialism would the world be able to avoid catastrophic overexploitation of its natural resources. The postulate of Clark's

subtitle, that depletion may result from high discount rates used by private exploiters, is unjustified. His model gives the same result irrespective of whether there is one or several private or nonprivate exploiters, provided they have the highest capital value of future net profits as their objective. To my knowledge this is the objective of most fishing fleets—whether they are operated by state agencies in socialist states or not.

However, extinction does not necessarily follow in the cases indicated in Clark's model, if the cost function is refined slightly. A major cost component in fishing whales with modern vessels is the capital cost of the vessels. This cost depends on the rate of interest (the discount rate), the depreciation time, and the initial investment. These dependencies all counteract the effect that interest and time have on the capital value of the revenue. Thus, for instance, since whale catching and factory vessels have little value without whales, extinction of the whale population would mean that depreciation of these costly vessels would occur at the same time; therefore, a quick extinction strategy may imply a drastic increase in harvesting costs, which, in particular, is important when investment decisions are made. If these capital variables are included in the harvest cost function, extinction does not, when catching is at all profitable, generally follow as the optimal strategy for the catcher, whose sole goal is the highest capital value of net profits in the future.

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Clark argues that overharvesting a renewable resource leads to reduction or possibly to destruction of the supply. But, despite his application of the principle of discounted cash flow, I do not agree with his conclusion that overfishing results particularly from the operation of private (capitalist) forces.

Discounted cash flow is at best only a convenient means for expressing the time-dependent relationship among alternative uses of resources. Any operator, private or public, who has a large investment in facilities geared to a highly specialized operation and not easily translated into other channels of use, will tend to operate those facilities until the return from them approaches the direct cost of operation.

The public operator is even more likely than the private to continue beyond this point for a variety of reasons, including administrative inertia and the need to avoid labor redundancy. Further, because of his politically convenient accounting practices, it is unlikely that the public operator will really know when he is no longer covering his direct costs. Operators, public or private, when faced with a declining resource, are unlikely to view their immediate problem through the remote concept of discounted cash flow.

The foregoing has no bearing on the ethical or long-range economic desirability of striving for an international agreement to avoid the destruction or severe depletion of the blue whale. But such an agreement must stand on its own merit and, to be effective, must limit public operators as well as private.

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Both Christensen and Whipp make the valid point that the effect of discount rates is independent of the social form of management. Forests provide another example of a slow-growing resource for which the sustainable yield is highly sensitive to the rate of discount used by planners—public or private (*1*). Perhaps my article did not sufficiently stress the need to consider this effect critically. Many economists would agree that, in an imperfect world, social and private discount rates may differ significantly (*2*).

Christensen also makes a useful observation regarding capital costs. I am open to suggestion as how best to incorporate these costs into the mathematical model.

Another important phenomenon for the economics of whaling is the presence of several distinct species which are harvested in the same location. This situation is analogous to the two-prey, one-predator systems studied by ecologists. In such systems it may happen that the more productive prey species "supports" the predator population at a level high enough to eliminate the other prey species. I have argued elsewhere (*3*) that Antarctic whaling is perhaps subject to this effect.

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References

1. G. F. Schreuder, *Yale Univ. Sch. For. Bull. No. 72* (1968).
2. M. S. Feldstein, *Econ. J.* **74**, 360 (1964).
3. C. W. Clark, unpublished data.