

the steam-leak and air-leak accidents as possibilities in the HTGR, calling the latter "less likely" but "more serious." The RAND study also pointed out, quoting General Atomic, that the company's safety data were "'based on a best estimate or more realistic evaluation of fission product inventories,' etc., use 'median values and statistical uncertainties,' and 'lead to a more realistic consequence assessment' than the licensing approach." The RAND paper concluded, in other words, that the Nuclear Regulatory Commission would be more conservative in estimating accident risks.

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Biological Survey

Michael Kosztarab's timely editorial (3 Feb., p. 443) focuses on the pressing need for critical basic information about the U.S. biota. He does not, however, discuss the history of this effort. Next year marks a century of continuous support of biological survey activities by the U.S. government that began in 1885 with the formation of the Economic Ornithology branch in the Division of Entomology, U.S. Department of Agriculture (1). Expanded 1 year later as the Division of Economic Ornithology and Mammalogy with the munificent appropriation of \$10,000 "for the promotion of economic ornithology and mammalogy; an investigation of the food habits, distribution, and migrations of North American birds and mammals in relation to agriculture, horticulture, and forestry" (2), this organization began the formidable task of systematically gathering specimens of the vertebrate fauna of North America. Personnel from the divisions of entomology and botany of the Department of Agriculture accompanied some of the early expeditions.

In 1896, this organization became known as the Division of Biological Survey and in 1905 became a full bureau in the Department of Agriculture. Transferred to the Department of the Interior in 1939, the Bureau of Biological Survey was joined with the Bureau of Fisheries in 1940 to form the Fish and Wildlife Service.

As Kosztarab mentions, the Fish and Wildlife Service publishes the *North*

American Fauna, which was established in 1889 as an outlet for the results of work done by the Division of Economic Ornithology and Mammalogy "of use mainly to those engaged in scientific research . . ." (3). In 1889 also began the formal relationship between the division and the U.S. National Museum (now the National Museum of Natural History), which continues to this day. Under an agreement between the Department of Agriculture and the National Museum, the collections resulting from the biological surveys were turned over to the National Museum, but were retained under the exclusive control of the survey personnel and kept separate from the other National Museum collections.

In 1910, with completion of the Smithsonian's Natural History Building, survey personnel working with the collections were brought together under one roof. The major museum-oriented work involved research on mammal and bird specimens, which mainly resulted from biological investigations in the United States, Canada, Mexico, Guatemala, Panama, and the West Indies. The impracticality of maintaining research collections separate from those of the National Museum led to the merger of the bird collections in 1945 and the mammal collections in 1953. Up to that time, specimens originating from the Fish and Wildlife Service or its predecessor agencies bore labels identifying them as Biological Survey specimens; that practice continues today.

The Fish and Wildlife Service unit still stationed in the National Museum is the Museum Section of the Denver Wildlife Research Center. The Museum Section has borne several names over the years as wildlife-related activities have proliferated in the old Division of Biological Survey. These include the Division of Biological Investigations, the Section of Wildlife Surveys, the Section of Biological Surveys, the Bird and Mammal Laboratory, and finally the National Fish and Wildlife Laboratory, which merged with the Denver Wildlife Research Center in 1981. Many of the management activities of the Fish and Wildlife Service originated as research functions within the museum-based unit. As the management importance of these functions became established, these activities took on separate identity and were moved out of the museum.

The program proposed by Kosztarab redescribes the focus developed within the first few years of survey activities, which led to adoption of the name Biological Survey in 1896. That first decade

also saw a shift from the initial economic emphasis to the scientific. Yet, as was argued with limited success before congressional critics early in this century (4), and as Kosztarab makes clear, detailed scientific information is essential for practical informed decisions concerning man's impact on natural habitats. We know considerably more about terrestrial vertebrates than about invertebrates and plants; however, much remains to be done.

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References

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2. C. H. Merriam, *Annu. Rep. Dep. Agric.* **1886**, 227 (1887).
3. ———, *North Am. Fauna* **1**, vii (1889).
4. J. Cameron, *The Bureau of Biological Survey* (Johns Hopkins Univ. Press, Baltimore, Md., 1929), pp. 28–42.

Gardner's letter provides valuable information about the history of limited biological surveys in the United States and gives further evidence of the need to continue and broaden the efforts initiated by the U.S. government in 1885. The work of a National Biological Survey should focus on certain urgent needs of this nation: to assess the status of our biota, to establish baseline information for future comparisons, and to monitor future changes. Such a data base is essential for documenting the effects on our animal and plant communities of such things as changing land use, acid rain, changes in the ozone layer, and pollutants generated by man.

We must inventory and monitor our natural resources now, before more habitats are irreversibly altered or lost. The proposed survey project can serve as catalyst for such an important effort.

It is clear that the many administrative changes made in connection with federal survey efforts have hindered their work. With a new start and the aid of a legislative bill authorizing the establishment of a National Biological Survey, this nation can succeed in filling the existing gaps in our knowledge of the biota.

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Erratum: The price of \$55 given for *Island Biogeography in the Sea of Cortéz* (T. J. Case and M. L. Cody, Eds.) in the review of the book that appeared in the issue of 18 May, p. 736, and in some announcements distributed by the publisher, is incorrect. The price of the book is \$45.