

## WHAT IN THE WORLD?

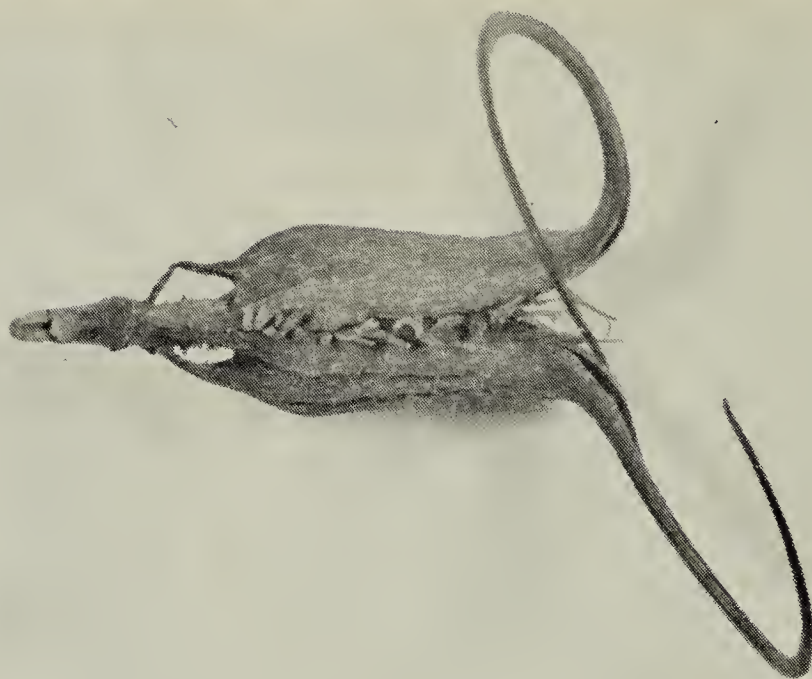


Photo by Keith Best

Can any of our readers identify the object pictured here? We provide you with two clues to its identity: the specimen was received from the Regina Research Station of the Canada Department of Agriculture and it was found in the tail of a horse shipped north into Canada from the United States.

In the next issue of the *Blue Jay* we shall publish the correct answer and summarize our readers' responses.

## The Blue Jay Bookshelf

**SASKATCHEWAN INDIAN HERITAGE: THE FIRST TWO HUNDRED CENTURIES.** By Zenon Pohorecky. Published by the Extension Division, University of Saskatchewan, Saskatoon, 1970. 54 pp. Illus. \$2.00.

This booklet is actually the first in a series that will describe the cultures of all tribes native to Saskatchewan. This first volume deals with all the prehistoric peoples and with three tribal groups historically present but living elsewhere today. The series is evidently intended for the general reader, for pre-University instruction, and for those wishing some basic infor-

mation on Saskatchewan's Indian people. As such, the series will make a real contribution and the University is to be commended for undertaking the project. This first volume offers as ready and readable a synthesis of data on prehistory as the casual reader is likely to get without delving into the more serious literature of site reports, ethnographies, etc. One could imagine this booklet's being used to good purpose in elementary and secondary schools, by visitors to historic Indian sites, and by lay study groups. Dr. Pohorecky has appended an excellent reading list for those wishing to pursue their interests further.

As in all works meant to compile and digest complex bodies of fact, there has been a certain amount of condensation and simplification. Some of the author's fellow scientists will likely object to this, but it is hard to see how these modifications could have been avoided. Further, considering the series' intended audience and the booklet format adopted, a broad treatment seems more appropriate than the carefully detailed approach of a technical report.

On the other hand, one can feel more serious concern over the author's occasional tendency to speak figuratively. At times, this can be charming, as when we hear of "paddle-in art galleries" — a reference to rock paintings by lakes throughout the Shield. At other times, though, a glib phrase is misleading. For example, we hear that "high priests from the southeast—met virtually head-on with the independent men from the northwest." It is well known that influences from the far-away Ohio River valley did extend into southern Manitoba and Saskatchewan, and there even seems to have been some indirect trade, but nowhere is there any direct evidence that this contact included movements of people. Dr. Pohorecky knows this as well as anyone else, and surely he was speaking figuratively. Yet the implication is there and we can almost imagine a Jeffreys-like illustration of these Hopewell priests, bedizened in pearls and copper, as they crash local society on the Qu'Appelle.

By and large, however, the text is well-written and filled with much good general data. The illustrations are numerous, well-chosen, and attractive. Unfortunately, the juxtaposition of the two is not always satisfactory. In many cases, the illustrations are not pertinent to the adjacent text. Further, the layout is often cluttered and distracting. It was interesting to note that the booklet could almost be read twice: first the text and secondly the numerous illustration captions. These latter make a second narrative by themselves, and detract from the coherence of the main text.

These criticisms are not major ones, and the booklet's good points do certainly over-balance them. I do feel this booklet (and hopefully the whole series) can be used widely by students in schools and by the general reader to their profit.—*Richard Conn*, The Heard Museum, Phoenix, Arizona.

**VERTEBRATE PESTS: PROBLEMS AND CONTROL. PRINCIPLES OF PLANT AND ANIMAL PEST CONTROL. Volume 5. 1970. By the Subcommittee on Vertebrate Pests, Committee on Plant and Animal Pests, Agricultural Board, National Research Council (U.S.A.). National Academy of Sciences, Washington, D.C. 153 pp.**

The stated objective of this series (p. iii) "was to outline, for each of the several classes of pests, the principles of control where these are established; to call attention to effective procedures where true principles are not yet established; and to indicate areas of research that appear to warrant early attention." Volume 5 considers pest situations involving vertebrates.

After a brief foreword and preface, an introduction by R. A. McCabe, R. E. Lennon and E. L. Kozicky outlines the basic problem to be considered and mentions the participation of various scientific bodies in solving pest-man conflicts. Individual chapters (2 through 7) then outline pest situations involving given vertebrate groups, methods by which pest problems can be eliminated or reduced in each group, and potential dangers which may result from control methods. Each of these chapters contains a Literature Cited section and usually an appendix of common and scientific names of the animals discussed. These six chapters include: "Fishes in pest situations" by R. E. Lennon; "Amphibians and reptiles as pests" by J. C. Neess; "Birds in pest situations" by E. L. Kozicky and R. A. McCabe; "Small-mammal pest situations" by W. R. Eadie and N. B. Kverno; "Predatory mammals that become pests" by R. A. McCabe and M. Caroline; and "Pest situations involving big game" by R. D. Taber.

A chapter by McCabe, Lennon and Kozicky entitled "Where we stand" concludes the book.

In general, this book appears to have been well written and thoroughly researched. Certainly, all the major and most, if not all, minor "pest" situations involving vertebrates are at least mentioned, and the difficulties involved in controlling these problems without adverse side effects are well presented. In spite of the number of authors, the chapters are consistently readable and appear to have been equally well researched. Typographical and editing errors are fewer than in many books of comparable length (I encountered only four, all relatively minor).

The only major improvement that I feel could be made on the book is a re-organization of the subject matter. The organization used in considering pest situations by taxonomic group resulted in considerable repetition of basically similar problems with basically similar techniques and resultant dangers. In addition, discussions of some types of pest situations receive much more space than others. For example, problems involving predatory animals are repeated in several chapters in addition to comprising an entire separate chapter. On the other hand, in spite of the current intense amount of research on bird-aeroplane strikes (e.g. see Solman *et al*, 1971), only four pages are devoted to this important problem. I believe a preferable organization would treat pest situations individually, with problems involving various taxonomic groups being mentioned under each situation if appropriate. This could include such topics as: predators, damage to native and artificial habitats, damage to man-made structures, problems resulting from introductions of animals into new areas, and transmission of disease. I should point out that all these topics are treated in the book, and my comment on the organization is not intended to imply that any topic is treated poorly.

Two major points emerged both from the book as a whole, and from

the final chapter in particular. The first point involves the emphasis on considering pest situations as conflicts between man and some other species, rather than considering any given species as a "pest" in itself. This view is clearly stated in the definition of a pest situation on page 1 as one which "results when the activities of another vertebrate conflict with the interests or welfare of man . . ." and in the comment on page 147: "That an animal is a pest means that the environment has been altered." The reader is continually reminded that most "pest" situations are direct or indirect results of the activities of man, and that "control" should never involve elimination of the so-called "pest". Moreover, many situations involve conflicts between different groups of people, especially where methods used to "control" a situation of concern to one interest-group may create a situation of concern to another interest-group. Thus, on the whole, the book is in harmony with current ecological and conservation thinking. I did, however, detect a few lapses, such as the mention of hunting predators from planes for "sport" on page 123, without comment on the unsporting aspects of this form of "hunting." The inclusion of the prairie dog in a list of "quite palatable" species, whose good flavour should be publicized to encourage hunting (p. 96) hardly fits with current efforts to prevent the prairie dog's extinction! At the opposite extreme, the harmlessness of some species is over-stated. For example, the suggestion that the predatory reputation of the snapping turtle is based largely on its appearance (p. 53) may be true, but that "there is no evidence for any of it" is untrue, as snapping turtles are known to occasionally eat other animals, even birds (e.g. Alexander, 1921; Bent, 1921).

The second major point emerging from this book is the need for much more research before most "pest" situations can be truly resolved. Emphasis is placed on the need for a better understanding of the ecology of the problem species, and of the effects

on "control" measures both on the environment and on other species.

In summary, I would recommend this book to anyone wishing a thorough but concise review of the basic problems which may involve vertebrate species in pest situations. The enlightened ecological approach to the subject is most refreshing in an age when bounties and poison bait are still not past history.

#### LITERATURE CITED

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—*Martin K. McNicholl*, Winnipeg.

#### PESTICIDES AND WILDLIFE. 1971. By Richard Fyfe and J. A. Keith. Information Canada, Ottawa. 24 pp.

This booklet contains articles by two members of the Canadian Wildlife Service, R. Fyfe and J. A. Keith, in which the use and effects of certain pesticides, notably DDT and mercury, on wildlife are discussed.

Mr. Fyfe's article, pesticides and wildlife, summarizes current knowledge concerning DDT and mercury and states that nearly all samples of Canadian Wildlife analyzed during the past five years contained pesticide residues. The samples were taken from all parts of Canada including the Arctic and both migratory and resident species of birds were examined. Samples taken in Saskatchewan revealed that pesticide levels in the resident birds were similar or higher than those in migratory species which is a matter of great concern since it had been assumed that the migrating birds were bringing in the residues from outside Canada.

The ways in which pesticides can be dispersed are outlined and Mr. Fyfe states that in spray operations up to 90% of the chemical never reaches the intended target but is carried into the atmosphere to be deposited far from

the spray area. This would account for the presence of pesticides in the Arctic in areas which have never been sprayed.

Persistence of pesticides in the environment and their incorporation into food chains is another area which is covered in this article. The fact that organisms can concentrate chemicals to high levels in their bodies has only recently been discovered, and requires further study because of its implications for the human species. Mr. Fyfe stresses that the environment in terms of volume and mass is constant but man frequently ignores this fact and causes great ecological damage by altering the balance of nature.

The final aspect of this article concerns the toxic effects, lethal and sub-lethal, of these chemicals. Little is known about the sub-lethal effects of pesticides particularly on species for which they were not intended to control. Some effects have manifested themselves notably the marked decrease in hatchability of some birds due to the interference of DDT with egg shell development. Direct toxic effects on smaller organisms are also evident, for example minute quantities of DDT can kill brine shrimp in streams thus affecting food chains, and can also kill trout fingerlings. Even more drastic is the possible effect of pesticides on the photosynthetic activities of marine phytoplankton which contribute 70% of the oxygen we breathe. Destroying our principle source of oxygen can only have one result—Death to mankind as a species.

The second group of articles in this booklet deals with the toxic effects of pesticides and stress that man himself is subject to danger as a result of his consumption of lower animals. The potential dangers of DDT, mercury and the P.C.B.'s are stated and Mr. Keith is hopeful that the ban on DDT and mercury treated seed grain will reduce the levels of these chemicals in animal species. Some research work on the toxicity of mercury carried out by the Canadian Wildlife Service on the prairies is described including work on the Prairie Falcon and Her-

ring Gull in southwest Saskatchewan. The problem of developing adequate screening tests and of measuring impact effects of pesticides on the environment is stressed and the author calls for more research in these areas.

Two points occurred to me on reading this booklet:

1). On what basis are safe levels for humans determined? Perhaps man can adapt to and tolerate quite high levels of these chemicals without harm. To cite an example, no one knows what the background levels of mercury in humans were before research work began on this substance. Analyses of fish which had been preserved for 50 years showed levels higher than are now deemed "safe" by our experts. At the present time uninformed "scare" articles in the popular press are misleading the public.

2). One wonders with all the emphasis on pesticide effects on animals if any research has been carried out on spray drift affecting rare plants?

This booklet provides an excellent summary of the work carried out on pesticides and wildlife in Canada up to end of 1970. It is very readable and provides valuable background information both for the scientist and non-scientist.

One criticism is that Mr. Keith's articles tend to be repetitive and perhaps some other views on the subject of pesticides might have been included. —*E. McCann*, Regina.

**SCIENTIFIC ACTIVITIES IN FISHERIES AND WILDLIFE RESOURCES.** A Background Study for the Science Council of Canada. 1971. By D. H. Pimlott, C. J. Kerswill and J. R. Bider. Information Canada, Ottawa. 191 pp. \$3.50.

The Science Council of Canada, now a Crown Corporation, has the duty to assess Canada's scientific and technological resources, requirements and potentialities and to make recommendations concerning these to the Prime Minister. This report studies the areas of fisheries and wildlife and

emphasizes the fact that maintaining high-quality environments throughout the world is vital to man's continuing survival. The book is written by three experts in their fields but they have obviously consulted with many specialists and refer frequently to the background papers on fisheries and wildlife in *Resources for tomorrow conference*, Vols. 1 and 2, 1961.

Having recently considered (in a brief on Prince Albert National Park) the long-term need of preserving the health of the ecosystems in our National Parks I found it valuable to read this book which deals not with a limited area but with the total environment. Canadian naturalists in general and fishery and wildlife ecologists in particular are acutely aware of the degradation of the environment. "The fish fauna of the Great Lakes has been completely altered in a decade." Some species of birds, mammals and other animals, and, no doubt plants too, are vanishing. The authors believe that "the diversity of species [should not] be destroyed in a questionable quest to feed 50 billion people in an overcrowded world which would be unfit to live in."

It is proposed that we adopt as a major national goal the restoration and maintenance of a stable and healthy environment. "Man shares this earth with a variety of other life. All use the same general environment as man, and are influenced variously by man's modification and frequent degradation of that environment." To achieve this goal we must develop an ecological conscience in society and in order to do this we must realize that the problems requiring solution are physical and social as well as biological.

Man frequently attempts to evaluate things in economic terms. The Canadian Government in 1961, in attempting to give a dollar value to wildlife, defined a hunter as one who had hunted for at least an hour during that year. R. Y. Edwards is quoted as saying, "Any survey of naturalists in Canada, based on the same sort of broad definition, would turn up almost

as many naturalists as there are Canadians." R. D. Symons is quoted as saying, "I can only wish for all my readers the many happy hours spent in watching birds that I have had." But in addition to recreational and economic values fish and wildlife also have therapeutic, artistic, ecological and educational values. In a statement concerning the educational value of wildlife I. McT. Cowan is quoted: "Each [living organism] offers a potential enrichment of human knowledge and enjoyment that is limited only by our capacity to appreciate."

Chapter IV of *Scientific activities in fisheries and wildlife resources* deals with the economic aspects of fisheries and wildlife. The section on fisheries is forthright in its analysis. Although it has frequently been thought, the book points out, that the fishery resources of the seas were inexhaustible, it seems obvious now that overfishing is a real threat to the fishing industry and that forward planning is therefore needed. According to the authors birdwatching and nature photography can even be given an economic value. Extrapolation from M. T. Myres' study in the Calgary Bird Club in 1966 lead to the conclusion that Canadians spend some \$162 million on these non-consumptive uses of fish and wildlife. Since this is about half the market value of commercial fisheries in Canada, birdwatching and nature enjoyment should receive considerable government consideration.

Chapter V deals with "organization for research, management and development." To date government agencies are concerned mainly with the harvest of fisheries and wildlife; university research studies supported by such agencies tend to dwell on those species which have economic importance. Although there is some indication of improvement in such an attitude at the federal level, at the provincial level the non-consumptive values of fisheries and wildlife are still not recognized. A closer co-operation between federal and provincial governments is obviously needed in research and management of both resources.

The next chapter deals with the international aspects of fisheries and wildlife. Although many treaties have been signed, some animals are not adequately managed. The Migratory Birds Treaty does not provide adequate basis for management or protection of migratory birds. For example, it does not provide protection for endangered species such as the Peregrine Falcon and the Bald Eagle. Canada (through its Natural History Societies and other interested groups) should make a thorough study of the section of the BNA Act dealing with fishing in our coastal waters and of the Migratory Birds Treaty in order to initiate appropriate changes.

Chapters VII and VIII (pp. 87-131) discuss scientific activities in fisheries and in wildlife. It is impossible to give an adequate summary of these two key chapters which every naturalist should have on his shelf. As most of us know, research on wildlife is very recent (nearly all post-dating World War II). Though it is now sophisticated, there is still much to learn especially in regard to diseases, parasites and environmental needs. The authors say, for example, that support of research on the effects of pesticides on wildlife has been inadequate. They point out that in spite of rapidly increasing research on waterfowl the resource has "steadily declined, with a low point reached in 1968." They maintain that a complete reappraisal of the present approach to waterfowl research and management is needed and they offer some concrete suggestions.

The remaining three chapters are titled: Education and the use of resources; Influence of resource development on fisheries and wildlife; Getting the job done. Like preceding chapters, each is well-organized and contains many challenging ideas. One minor fault of the book is that though nearly every page has several footnotes, sometimes these are not so complete as one would like.

In this review of *Scientific activities in fisheries and wildlife resources* I have attempted to summarize for readers of this journal a number of

the ideas presented because I believe that the authors have looked appraisingly at scientific activities in fisheries and wildlife resources and that they have offered frank and constructive criticism. We welcome readers' opinions on the arguments presented in this provocative book.—G. F. Ledingham, Regina.

**THE DELTA MARSH. 1971.** By Peter Weller Hochbaum. Department of Mines, Resources, and Environmental Management (Conservation Extension Branch), Winnipeg, Man. 52 pp. Distributed free by the Delta Research Station, Delta; the University of Manitoba Field Station, Delta; and the Conservation Extension Branch, 139 Tuxedo Blvd., Winnipeg 29.

The Delta Marsh is of world-wide renown, and this little booklet tells why in a simple, popular way. The first eight pages are devoted to introducing the Marsh, its wildlife, and the types of research carried on there. This introduction is then followed by de-

scriptive species lists of the birds and mammals of the marsh and adjacent areas. In addition, there are short lists giving dates of the spring arrival, spring and summer shifts, and late summer and fall movements of Delta waterfowl. The records and comments are drawn from the author's personal observations, the records kept at the Delta Waterfowl Research Station from 1939 to 1970, and from personal observations of Peter Ward, H. Albert Hochbaum and Louis Ducharme of the Research Station, and Dr. Frank McKinney of the University of Minnesota, who kept careful records of migration 1952-63. For the mammal records, the author has also consulted an unpublished manuscript on the mammals of the Delta Marshes by D. D. Moore (1965), and an article published in 1962 by J. R. Tamsitt in the *Canadian Field-Naturalist* (76:71-78), "Mammals of the Delta Marsh region of Lake Manitoba."

Few regions in North America have been studied more intensely than the Delta Marsh, which has two biological stations gathering information on the biology of marshes and their wildlife. The better known of these is of course the privately-sponsored Delta Waterfowl Station which studies mainly the ecology of ducks, geese and swan; it was originally established to return ducks to the marsh for hunting, but was taken over in 1938 by the North American Wildlife Foundation and expanded to its present stature. The second research centre is the University of Manitoba Field Station established in 1965 to study the dynamics of marsh ecosystems.

The booklet is obviously intended to tell the lay public what the Delta Marsh is and what is going on there, in a style that consciously and completely avoids the technical jargon of the waterfowl management specialist. The picture-evoking prose reveals an artist's eye, as well as the black-and-white sketches with which the booklet is freely illustrated, and one is reminded that the author's father is the artist-writer-naturalist, Al Hochbaum (whom we once had the pleasure of



hearing in Regina in a series of lectures on the writer's craft). Although Peter Hochbaum grew up at Delta among waterfowl biologists, the vocabulary of the trade is dropped when he creates for us the ambience of the prairie marsh with lines like these: "On calm spring evenings when a south wind blows, one may stand on the lake ridge and watch small parties of ducks

pass continuously overhead against the prairie twilight, heading in a north-westerly direction for their home somewhere beyond the horizon."

In its engagingly simple presentation, this bulletin represents an interesting departure from the usual type of bulletin distributed by a government agency to publicize its programmes.—*Margaret Belcher, Regina.*

## THE INTERNATIONAL DEVELOPMENT RESEARCH CENTRE

by **C. F. Bentley**, Professor of Soil Science, Edmonton

The International Development Research Centre (IDRC) is the result of an idea of the Rt. Hon. L. B. Pearson who, as Prime Minister of Canada, suggested that the Expo site of the 1967 World's Fair in Montreal would continue to serve mankind if it were used as headquarters for work devoted to development problems. Although not located in Montreal, the IDRC is now in existence and operational.

The Act establishing the Centre was passed by the Canadian Parliament in the spring of 1970 and the first meeting of the Board of Governors was held in late October, 1970. The act clearly sets out the objects of the Centre as follows:

"The objects of the Centre are to initiate, encourage, support and conduct research into the problems of the developing regions of the world and into the means for applying and adapting scientific, technical and other knowledge to the economic and soil advancement of those regions, and, in carrying out those objects

(4) to foster cooperation in research on development problems between the developed and developing regions for their mutual benefit."

Although established by, and funded primarily by the Government of Canada, the IDRC is not a Canadian Government Agency. Chairman of the Board of Governors is the Rt. Hon. L. B. Pearson; there are ten other Canadian members of the Board and there are ten non-Canadians of whom four are from industrialized countries and six from developing countries. The Centre has independence fully equal to and rather analagous to that of Crown Corporations.

A sum of about 30 million dollars has been provided for the initial five years of the Centre. It is expected that subsequent funding will be on a proportional basis related to Canada's total contribution to international development. Fortunately, the Centre is authorized to accept contributions from individuals, groups, businesses, national or international agencies and from governments. Contributors may specify how their monies are to be used—but the Centre is not obligated to accept all offers as some might be inconsistent with the Centre's programs or beyond its capabilities.

The Centre has designated four areas to constitute the primary program activities during the initial phase of its operation. These areas are:

- (1) to enlist the talents of natural and social scientists and technologists of Canada and other countries;
- (2) to assist the developing regions to build up the research capabilities, the innovative skills and the institutions required to solve their problems;
- (3) to encourage generally the co-ordination of international development research; and