Discussion

One of the most startling aspects of this study, to this writer at least, has been the considerable number of Peregrines which once inhabited this area. In the Okanagan Valley, for which records of various sorts have been kept since the beginning of this century, the main reduction in numbers of Peregrines seems to have occurred prior to the mid-1930's. Some seem to have survived in the northern part of the valley till somewhat later, some until the late 1950's, and possibly one is known to exist still. In mid-June of 1966, a pair was seen by E. Biglow in a relatively remote area in the center of the study area. He was unable to locate the exact eyrie site.

Two active Prairie Falcon eyries were found in northern parts of the study area in 1966. While active Prairie eyries, or even Peregrine eyries, may still exist in southern parts of the Okanagan, it is significant to note that none appear to be known--as far as my inquiries have reached, and as far as I have been able to check myself. The eyrie of Prairies found by this writer was in a fairly safe area (from the falcons' point of view), and the other one, located by E. Biglow, is similarly quite removed.

The reduction in numbers of Peregrines in other areas has been suggested to have resulted from a conflict with increasing numbers of Prairies, the conflict being almost directly for nesting sites on the cliffs. The results above suggest that few of the Peregrine sites have been "lost" to Prairies. The Prairies seem to have preferred a different type of cliff--and they appear to have conflicted only slightly for some food species. It is the belief of this writer that the increase in numbers of Prairies did not cause the reduction of Peregrines, but that it indicated a change occurring in the area, a change making life for Peregrines more difficult. With a reduction in Peregrines, the Prairies may have been allowed to move into more areas--or, more likely, the change made the area more suitable for Prairies and allowed their expansion northward up the Okanagan.

It is possible to explain parts of the declines of these two species by many means. The suspected factors at the start of this study were: 1. indiscriminate shooting; 2. scientific collecting of skin specimens and eggs; 3. removal of eyasses (young) by falconers; 4. widespread disease; 5. general interference by man as concerns roads, boats, hikers, etc.; 6. habitat alteration; 7. climatic change in the Pacific northwest or larger areas; 8. poisoning through the food chain from various biocides. These possible factors will be considered briefly.

Factors in the Decline. It must be admitted that losses of these birds during the nesting season may have been considerable due simply to indiscriminate shooting of "hawks" and "vermin." Such losses cannot be determined, but the widespread nature of these species' populations makes it highly unlikely that such shooting would have had a greatly decimating effect.

"Scientific" collecting of specimen skins and eggs earlier in this century is known to have accounted for many birds--actually as late as the early 1950's. I have data on some 28 Prairie skins taken in the study area since the beginning of this century, as well as some 11 Peregrine skins. I am attempting to gather as much information as possible about such specimens as they may indicate other once-used eyries, food species used, etc. While the number of birds removed in this way may have been great, it does not appear to have been great enough over the years to be entirely responsible for the declines. It may have had a fairly substantial significance in the early part of the Peregrine decline, although other information suggests other factors as being of primary importance.

Removal of eyasses by falconers in this area is considered as being entirely incidental to the declines to date. I know of only two eyasses taken in the area in this century. At most, maybe eight have been taken.

There is no indicative evidence suggesting disease as being a factor.

General interference by man admittedly has been responsible for part of the declines. These birds have indicated abilities to live close to man in certain areas, however, notably near Okanagan Falls (till the early 1950's), and at Cosen's Bay on Malamalka Lake (until about 1958), yet they have declined also in areas quite well removed from man's general travels.

The Okanagan Valley has passed through several phases in its agricultural history. In this century parts of the Valley have changed from ranching areas to orchard and farming areas. Changes in the flora and fauna of these areas have likely been considerable--but, again, these two falcon species were not entirely in such areas. This factor of habitat alteration seems to have had little significance in the over-all decline when considering the present evidence.

In recent years much evidence has been gathered suggesting that the western part of North America is gradually warming and becoming drier. Morlan W. Nelson, in a paper presented to the Peregrine Conference at Madison, Wisconsin in 1965, has put forth evidence indicating that such climatic changes are occurring and that they affect the reproductive success of the Peregrine. That such changes are reducing the likelihood of survival of Peregrine nestlings in southern parts or warmer parts first seems to agree with the picture seen to date in the Okanagan area. Certainly a great deal more information is needed before an order of importance can be attached to the above possible factors with any certainty at all.

One factor which appears to have an undeniable major significance in the last fifteen years of the decline is that of biocide influence on the birds of prey. In Britain there is little doubt now that biocides are of primary importance in the recent reduction of Peregrines there. The gradual decline in the Okanagan that has occurred in the earlier parts of this century suddenly increased in rate shortly after the Second World War. The correlation in time and space of the last uses of eyries suggests strongly that the

birds near to man, in the sense that they were near enough to take prey that may have become "loaded" with biocides from orchard sprays, etc., have disappeared first. It is also of significance to note that few of the above factors seem to have affected the Prairies--until the late 1940's. The increase in Prairies during the first half of the century suggests that the final decimating factor arose very suddenly. It is also of importance to note that the surviving Prairie eyries and the possible Peregrine eyrie are removed from what might be termed "biocide hazard areas."

It is unfortunate that the biocide hazard is year-long for these birds. During migration they might well be able to acquire doses sufficient to cause their eggs to be infertile or otherwise incapable of hatching, or even sufficient to kill the full-grown birds. A note of hope--some of the companies producing the myriad of biocides are presently attempting to produce biocides of very short-lived danger to wildlife.

Recommendations. It must be recommended that the Peregrines and Prairies in the B. C. southern interior be completely protected as far as possible. Removal of any adult birds, young falcons, or eggs (unless known to be addled) should be prohibited entirely. Such protection should include that area east of a line drawn 75 miles inland from the Pacific coast, and south of the 52nd parallel. At absolute minimum, such protection should be given to those falcons in the wild in the area covered by this study.

A second recommendation, for intensive study of these species in the areas just to the north of the present study area, might prove which factors are actually of prime importance in such a decline. Careful but detailed investigations into the distribution, numbers, behavior, and inter-relationships of these two species, as well as detailed recording of climatological factors (especially relative humidity) during the breeding seasons may show a decline actually occurring in the Peregrine numbers shortly in the future. Biocide analysis of eggs and prey would be useful as well. Study of the actual decline in progress might indicate what is necessary for the perpetuation of these species in the wild in these areas.

Further Work in This Study. I am continuing the gathering of as much information as possible about the Peregrines and Prairies in the study area. Much more data concerning the histories of the various eyries and the disturbances to which they were once subjected as well as of the reasons for their cessation of use are needed. Information on presently occupied eyries, their accessibility, the food items used, and the future of the surrounding areas are also important in the effort to protect those still in existence and to find just why the others have vanished. Any help in any of these aspects would be gratefully received.

In another year or so it is hoped that a far clearer picture will be available and that the observations and conclusions might be published with photographic and map evidence of the declines. No occupied eyries, or eyries of unknown status will be indicated on maps or in photographs because of the possible detrimental effects this might bring to them.