TABLE 9
CONTINUED

Date	Comment	Source
	6 and 20, and June 23, 1916." Also noted that Northern Phalaropes are "numerous . . . during seasons of migration."	
1944	Not mentioned.	Grinnell and Miller 1944
1963	"Many . . . in spring and autumn."	Storer and Usinger 1963
1974	"At times of spring and fall migration . . . thousands."	Small 1974
1976	Tens of thousands in fall; first quantitative data.	Winkler 1977
1977	"Very abundant."	Cogswell 1977

might be invalid. Indeed, that significant numbers of grebes, at least, were unrecognized among concentrations of unspecified waterfowl is suggested by R. K. Colcord's description of abundant, fat but inedible "ducks." Colcord, who settled in the region in 1859 and was later Governor of Nevada, noted (1928) that "thousands of ducks [almost certainly including many grebes] swam there every season and become hog-fat in a very short time. Those of us who had had the experience do not hunt this game."

I think it likely, nevertheless, that the abundance and composition of the Mono Lake avifauna prior to 1940, when salinity approximated 40‰, differed importantly from current conditions. Under a less saline regime the lake would have accommodated a greater diversity of birdlife (Jehl 1988), and the relative abundance of the salt lake specialists would have been reduced. This is illustrated by data from the south arm of Great Salt Lake, which has been largely avoided by grebes and phalaropes since it freshened in the early 1980s. Changes are further suggested by accounts that former waterfowl numbers at Mono Lake greatly exceeded those that are currently realized. Fisher (1902), for example, reported that in early autumn "thousands of ducks, grebes, and gulls dotted the surface as far as eye cold see," with "teal, shovellers, and redheads mingling together." That is no longer the case; indeed, Redheads (*Aythya americana*) are rare, although they remain common at nearby lakes. Other accounts (e.g., *Bridgeport Chronicle-Union* 23 Dec. 1905, 24 Dec. 1948) indicate that waterfowl were sometimes numerous in winter as well.

Because the record is poor, and often based on second-hand information (Jehl unpubl.), it is risky to draw conclusions. If grebes and phalaropes were scarcer in the past, the change is unlikely to have been solely the result of less saline conditions because such conditions are acceptable to the two species elsewhere (e.g., Lake Abert), and prey populations of brine shrimp and brine flies were abundant in the 1800s (Clemens 1891, Fisher 1902, Dawson 1923, Browne 1865), although probably not in the same relative or absolute abundance as now. Perhaps alternative staging areas such as Owens Lake, California (dry since the 1920s) and Lake Winnemucca, Nevada (lost to water diversions in the first third of this century) attracted migrants that might otherwise have staged at Mono Lake.

EPILOGUE

So right away I found out something about biology; it was very easy to find a question that was very interesting and nobody knew the answer to.—Richard Feynman (1986).

Much remains to be learned about the biology of migratory birds at saline lakes. Important questions about the Eared Grebe include the timing and extent of migration through Great Salt Lake and the extent to which it is used as a molting area, the size of populations wintering in mainland Mexico, the significance of fat deposits and the extent of breast muscle atrophy at localities other than Mono Lake, and the origin and destination of migrants throughout the species' range. The variability in the Great Salt Lake flock and my inability in 1986 to follow the fall movements of 745,000 grebes from Mono Lake across deserts of southern California to their wintering areas might be contemplated by those who consider field studies passé or that our knowledge of the natural history of common North American birds is adequate.

Data from other phases of the post-breeding season are also needed. For example, there seem to be no dietary studies in winter. Circumstantial evidence from the Salton Sea, which lacks brine shrimp, indicates that grebes feed on larger prey (Mahoney and Jehl 1985c), including a tube-dwelling amphipod (*Corophium latreilli*) that is common in the Gulf of California but which was not known to occur in the Sea as late as 1961

(Linsley and Carpelan 1961). The Salton Sea (salinity 41‰), whose ecology is changing rapidly (Skrove 1986), may soon become too salty or polluted to maintain fish populations. If, as at other hypersaline lakes, this results in the establishment of brine fly and brine shrimp populations, the Sea might develop into a molting area in addition to its use as a wintering area. Given the grebes' reluctance to fly, the availability of year-round food there, in a saline lake adjacent to freshwater nesting areas, could set the stage for the evolution of a population or even a new species of flightless grebe.

Gaps in our knowledge of Wilson's Phalarope biology include the distribution, importance, and stability of staging areas, especially in the eastern part of the range, and the relative abundance of age and sex classes at different staging areas. Why do adult males and juveniles predominate at Lake Abert when adult females prevail at Mono Lake? How do juveniles, which by-pass saline lakes on their first migration, find these areas in subsequent years? Does the rate of salt-gland maturation affect the distribution of age classes on the wintering grounds? There are no data to test whether flocks at highly saline lakes on the altiplano are dominated by adults, although specimens taken elsewhere in South America show a preponderance of young (Appendix V).

Finally, I hope to have shown that many interesting questions remain for those interested in the biology of salt lakes and their avifaunas. While studies of individual lakes will be valuable, it should be obvious that from a bird's viewpoint these lakes represent an interconnected series of salty oases. Thus, our understanding is likely to be advanced most rapidly through broad, long-term, and comparative studies of these dynamic and evolving habitats.

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