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**Limits to Egg Size in the Western Gull, *Larus occidentalis*.**—Among *Larus* gulls, most species usually lay clutches of 3 eggs, occasionally 1 or 2, and very rarely more than 3. Egg size in normal 3-egg clutches is related to the laying sequence: the first egg is often the largest and the third egg is usually the smallest (Preston and Preston, 1953; Barth 1967-1968; Parsons, 1975; Mills, 1979; Coulter, Ms). Furthermore, Parsons (1970) has shown that in the Herring Gull (*L. argentatus*) chick survival during the first few days posthatching is related to hatching weight and egg size; small chicks hatch from small eggs and suffer higher mortality during the first few days. He suggested that because of the low survival of small chicks it is not advantageous for Herring Gulls to lay eggs smaller than a "minimum" egg size and that birds do not usually lay eggs smaller than this "minimum" size.

In the Western Gull (*L. occidentalis*) also, egg size is related to laying sequence (Table 1). Furthermore, hatching weight is correlated with egg size ( $r = 0.783$ ,  $P < 0.001$ ) and chicks with lower hatching weights suffer higher mortality during the first few days than all chicks combined: the average hatching weight (57.5 g) of chicks that died within the first 10 days was significantly lighter than the overall average chick weight (63.2 g, Mann-Whitney U-Test,  $P < 0.001$ ). Because the Western Gull is similar to the Herring Gull both in the relation of egg size to laying sequence and in survival during the first few days after hatching, I examined the size distribution of Western Gull eggs collected on the Farallon Islands, California, in 1970, to determine whether the distributions according to laying sequence would support Parsons' hypothesis of a "minimum" egg size. In the case of a "minimum" egg size one would expect the distribution of the third, usually the smallest, egg to be skewed toward small eggs. That is, if few small eggs are laid, the tail on the small side of the statistical distribution would be lacking and hence the distribution would be skewed. Egg-size distributions are shown in Figure 1. The distribution for third eggs

TABLE 1.  
Ranking of egg volume according to laying sequence for the Western Gull.

Position in laying sequence	n	Numbers of eggs, ranked according to egg volume within the clutch		
		Largest	Middle	Smallest
First eggs	32	21	7	4
Second eggs	32	9	20	3
Third eggs	32	2	5	25

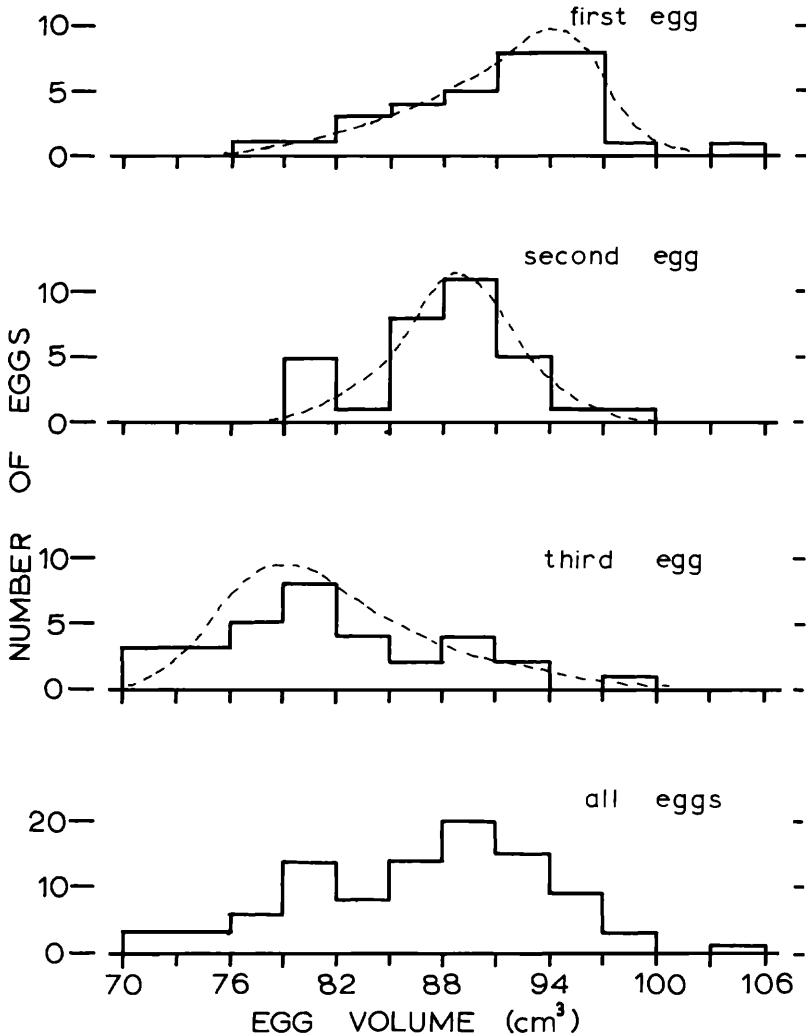


FIGURE 1. Egg volume according to position in the laying sequence.

is skewed toward small egg-volumes ( $\chi^2$ ,  $P < 0.001$ ), that for second eggs is normally distributed ( $\chi^2$ ,  $P > 0.1$ ), and that for first eggs is skewed toward large egg volumes ( $\chi^2$ ,  $P < 0.01$ ). Thus, the skewed distribution for third eggs does indeed support Parsons' hypothesis: Western Gulls do not normally lay eggs smaller than a "minimum" size. The distribution for first eggs may be explained by an "upper limit," perhaps imposed by adult female body size on egg volume. The distribution for second eggs, intermediate between the upper and lower limits, is normal.

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