

SOME ASPECTS OF THE BREEDING BIOLOGY OF SALVIN'S PRION

PACHYPTILA VITTATA SALVINI AT MARION ISLAND

A. BERRUTI & S. HUNTER

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INTRODUCTION

The Salvin's Prion *Pachyptila vittata salvini* breeds at only two island groups - the Prince Edward Islands and Iles Crozet, southern Indian Ocean (Jouventin *et al.* 1984, Williams 1984). At the Prince Edward Islands (Marion and Prince Edward) it is the most abundant breeding petrel, forming an important portion of the avian biomass at these islands (Williams 1984). Harper (1980) recognizes *P. salvini* as a full species. However, Cox (1980) suggests that the Broadbilled Prion *P. vittata* is a polytypic species, and that *P. v. salvini* is intermediate between the nominate *P. v. vittata* and *P. v. desolata*.

While carrying out a detailed study on the ecology of Whitechinned Petrels *Procellaria aequinoctialis* at Marion Island (46 52S, 37 51E) during the 1980/81 summer, one of us (AB) was able to collect a small amount of data on the breeding biology of the Salvin's Prion. These data are presented here.

METHODS

Burrows were prepared as described by Sinclair (1981) with removable earth plugs cut from the roof of the nest chamber. Twenty burrows were initially marked in the vicinity of the meteorological base on 9 November 1980 before egg laying. They were then checked daily to determine laying dates. Adults were not tolerant of disturbance, frequently deserting or extending burrows. Pairs laid eggs in only nine of these burrows, therefore an additional 15 were located and marked on 16 December during mid-incubation. Eggs were measured and some fresh egg masses recorded. The nests were checked daily around hatching time to determine exact hatching dates. Subsequently, wing, tarsus and culmen lengths and mass of the chicks were measured at three or four-day intervals throughout the fledging period. Measurements of adults have also been collected by various FitzPatrick Institute workers at Marion Island over a number of years.

RESULTS

Laying in nine pairs of Salvin's Prions extended from 13 to 27 November, with an average date of 21 November. The mean

hatching date of 15 eggs was 7 January ($\pm 4,0$ d), the first chick hatching on 2 January and the last on 19 January. Four incubation periods averaged 49 d (45, 48, 51 and 52 d). C.R. Brown (pers. comm.) recorded incubation periods of 53 d in two pairs at Marion Island in 1985. Measurements of eggs are given in Table 1.

Nest chambers of Salvin's Prions were measured by M. Schramm during 1979-80. Ten chambers had a mean height of 111 ± 13 mm (range 80-150) and a mean width of 147 ± 24 mm (range 120-250).

Of the original nine eggs laid, four (44 %) hatched successfully. Of 15 chicks that hatched, 11 (73 %) successfully fledged. Three chicks were definitely killed by Subantarctic Skuas *Catharacta antarctica* whereas the fourth was found dead in the burrow with peck wounds. Subantarctic Skuas are known to excavate prion burrows (Sinclair 1980). In this study skuas learnt to recognize and excavate earth plugs covering nest chambers, even opening unoccupied burrows. This behaviour probably accounted for all the chick deaths and the 27 % chick mortality recorded in this study is unnaturally high.

The growth of nestlings using four parameters (wing, tarsus and culmen lengths and mass) is illustrated in Figs. 1-4. All the surviving chicks fledged at between 52 ± 2 d and 63 ± 2 d, with birds leaving between 25 February and 9 March. Table 2 summarizes the biometric data for adults caught ashore at Marion Island.

DISCUSSION

In most respects, the breeding biology of Salvin's Prions at Marion Island is similar to that at Iles Crozet where Despin *et al.* (1972) and Derenne & Mougin (1976) studied this species more intensively. Hatching occurred at a similar date to that on Ile de l'Est (Despin *et al.* 1972) but slightly earlier than that at Ile aux Cochons, although this is probably explained by year-to-year variations (Derenne & Mougin 1976).

It has already been shown that Salvin's Prion egg measurements do not differ significantly between Iles Crozet and the Prince Edward Islands (Derenne & Mougin 1976) and the data here support their conclusions.

Derenne & Mougin (1976) found some differences in the biometrics of adult Salvin's Prions between Ile de l'Est and Ile aux Cochons, Iles Crozet. Birds at the former sites had significantly larger and wider bills though mass, winglength and tarsus measurements did not significantly differ between the two localities. Marion Island birds have similar masses and tarsus lengths to Ile de l'Est birds (mass $d = 2,084$; $P > 0,02$, tarsus $d = 0,996$; $P > 0,10$) and Ile aux Cochons (mass $d = 1,632$; $P > 0,10$, tarsus $d = 2,069$; $P > 0,02$). Wing length is significantly shorter than Ile aux Cochons birds ($d = 3,076$; $P < 0,01 > 0,002$) but similar to Ile de l'Est birds ($d = 1,024$; $P > 0,10$). The bills of Marion birds are longer but narrower than either Ile de l'Est ($d = 2,492$ and $6,788$; $P < 0,02 > 0,01$ and $<$

TABLE 1
MEASUREMENTS OF SALVIN'S PRION EGGS AT MARION ISLAND, 1980

	Length (mm)	Width (mm)	Fresh mass (g)
Mean	50,0	35,9	34,7
S.D.	1,6	1,7	3,2
n	24	24	9
Range	46,9-53,8	30,8-40,8	31,0-41,0

TABLE 2
BIOMETRICS OF SALVIN'S PRIONS AT MARION ISLAND

Parameter	Mean	S.D.	Range	n
Mass (g)	161,8	17,87	115-210	325
Wing length (mm)	190,1	5,84	171-205	260
Culmen (mm)	32,2	1,60	28,6-35,0	260
Bill width (mm)	16,6	0,84	12,9-18,1	260
Tarsus (mm)	33,5	1,32	31,0-37,7	261
Tail (mm)	88,8	3,40	82-101	162

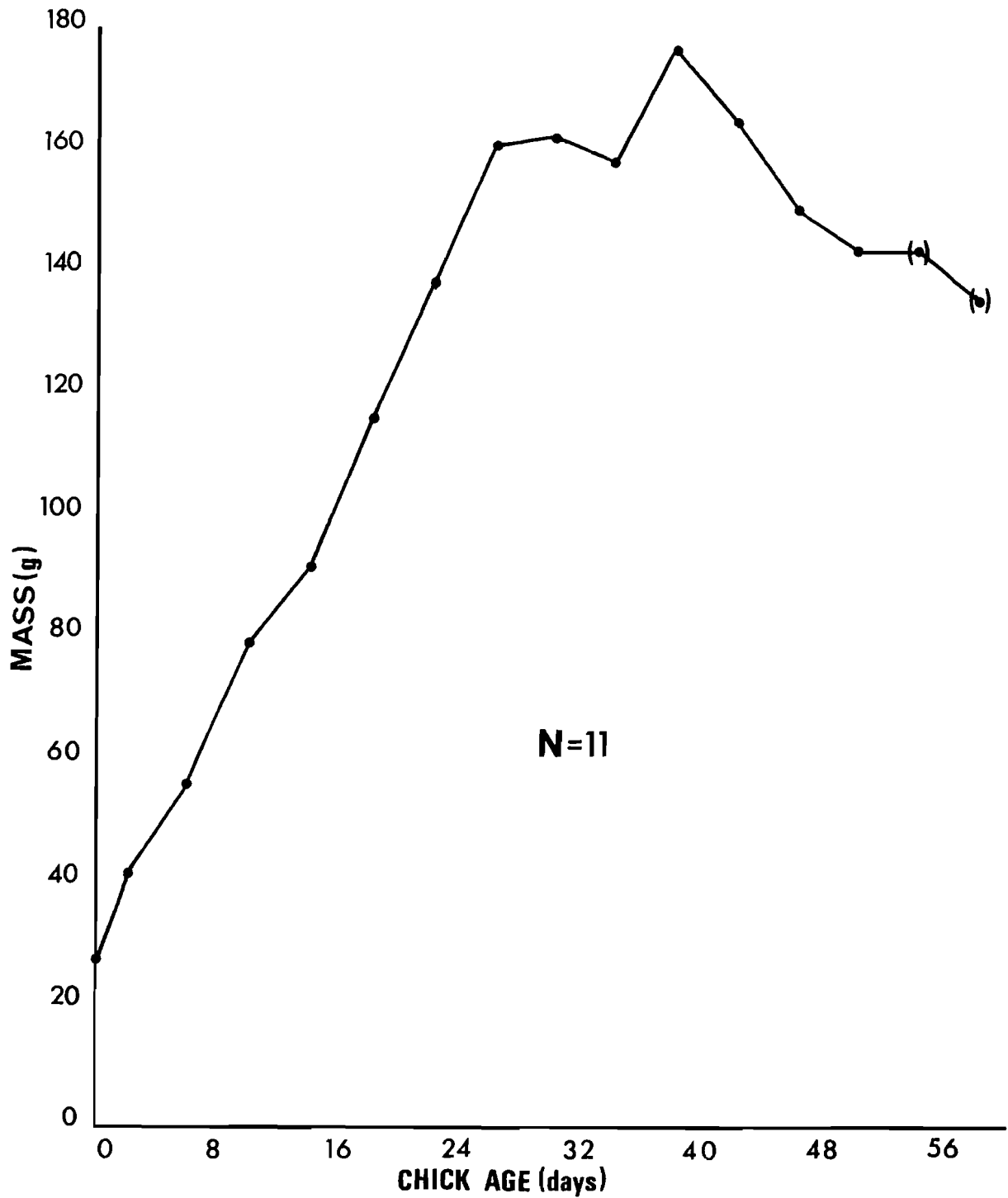


Figure 1

Change in mass with age in Salvin's Prion nestlings.
 (●) indicates that sample size was reduced by birds fledging.

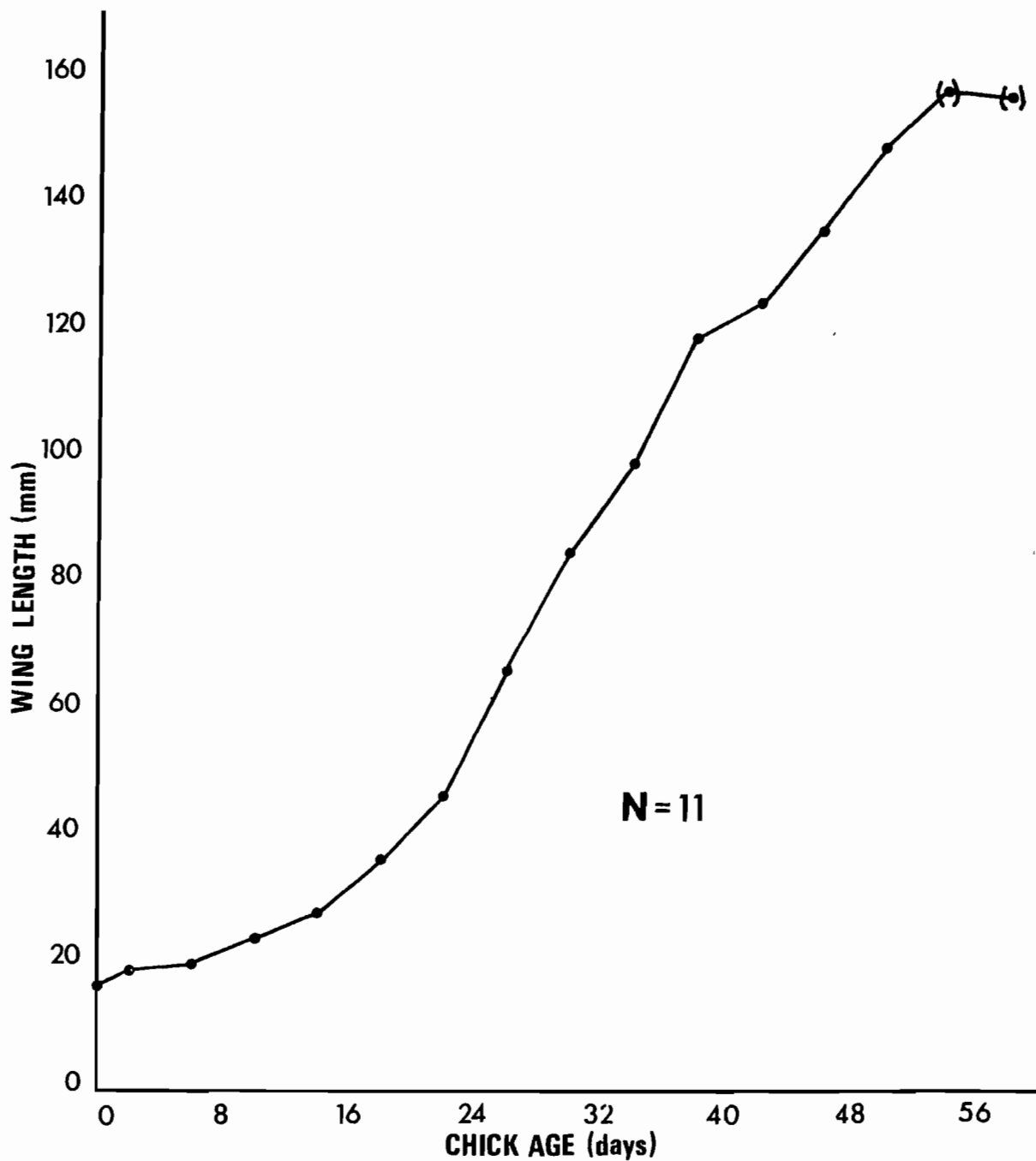


Figure 2

Change in wing length with age in Salvin's Prion nestlings.
 (•) indicates that sample size was reduced by birds fledging.

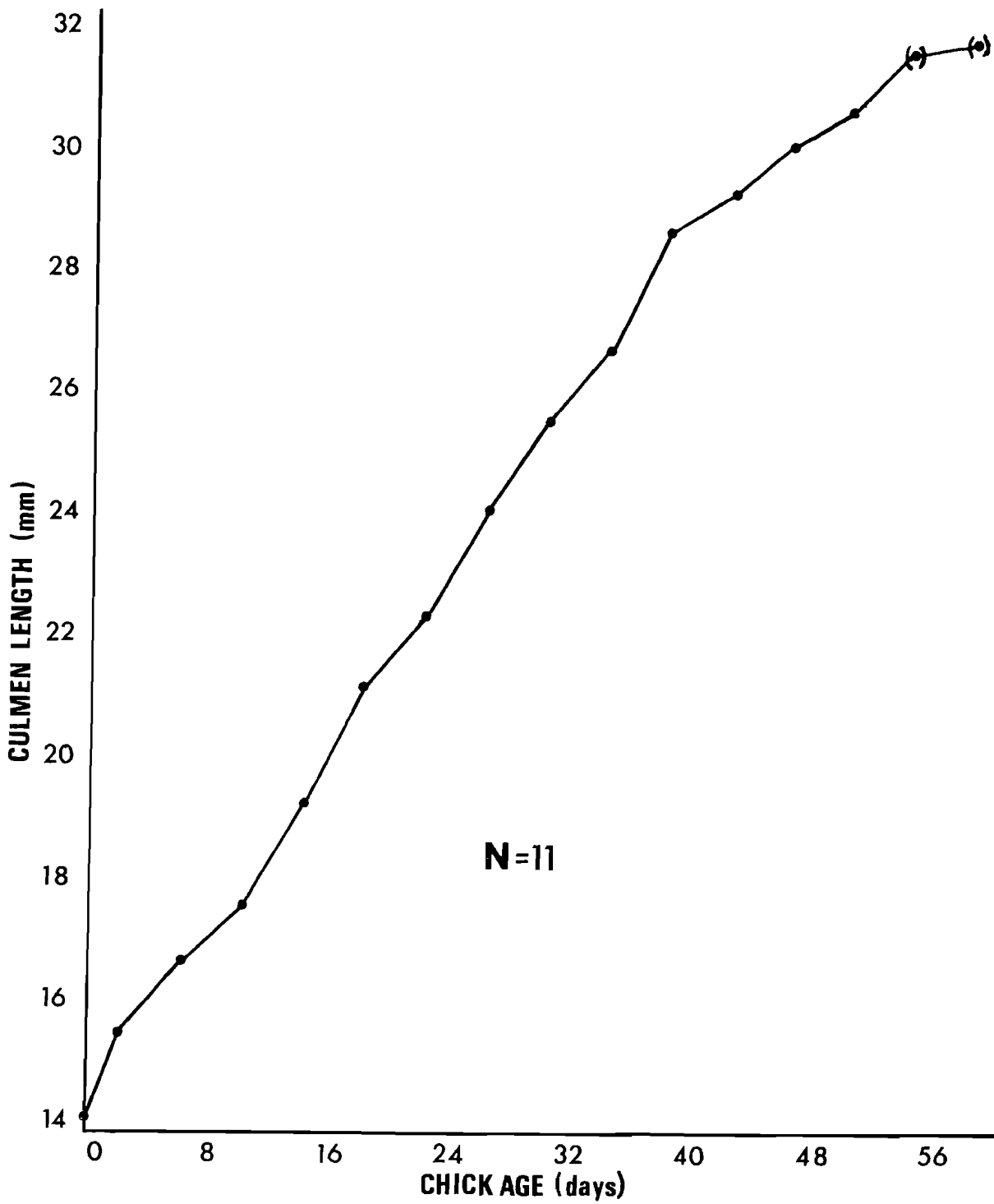


Figure 3

Change in culmen length with age in Salvin's Prion nestlings. (•) indicates that sample size was reduced by birds fledging.

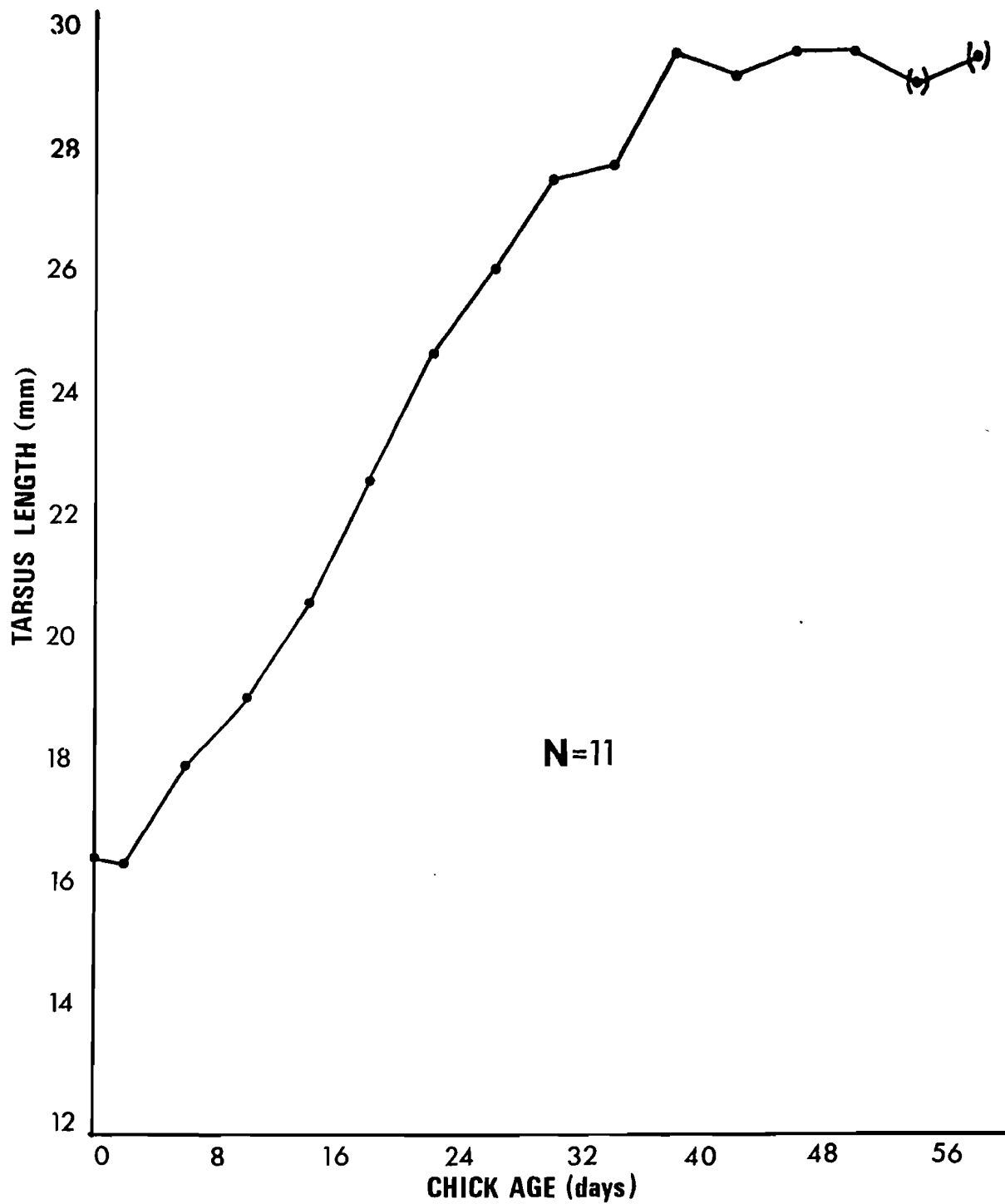


Figure 4

Change in tarsus length with age in Salvin's Prion nestlings. (•) indicates that sample size was reduced by birds fledging.

0,001) or Ile aux Cochons ($d = 13,484$ and $3,156$; $P < 0,01$ and $< 0,002 > 0,001$) birds.

Unfortunately, no quantitative dietary information is available for Salvin's Prion from any locality so it is not possible to test if any relationship exists between breeding biology, bill morphology and feeding ecology.

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A. Berruti & S. Hunter, Percy FitzPatrick Institute of African
Ornithology, University of Cape Town, Rondebosch 7700, South
Africa.

*
Present address: Sea Fisheries Research Institute, Private Bag
X2, Roggebaai 8012, South Africa.

