The Status of the Black-browed Albatross
*Diomedea melanophrrys* at Heard Island

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The Black-browed Albatross *Diomedea melanophrrys* is abundant in the Southern Ocean and has a circum-polar distribution (Tickell 1976). Two subspecies are recognised: *D. m. impavada*, which breeds only on Campbell Island, and *D. m. melanophrrys*, which breeds in the Atlantic, west Pacific and Indian sectors of the Southern Ocean (Tickell 1976; Croxall et al. 1984). Colonies of *D. m. melanophrrys* at Heard Island, south of the Antarctic Convergence in the Indian sector of the Southern Ocean, were first reported in 1947 (Downes et al. 1959). Since then, the colonies have been visited irregularly. This paper summarises the information gathered, presents new data collected during the 1987–88 austral summer and discusses parameters affecting the current status of the population on Heard Island.

Breeding biology

Immature Black-browed Albatrosses forage at sea year-round and start returning to breeding sites as seven-year-olds, but it is several more years until they breed. On maturing, the adults breed annually and raise a maximum of one chick per pair per year (Tickell & Pinder 1967, 1975). Individuals can survive to at least 29 years of age (Copson 1988). During the breeding season, the nest site is occupied for approximately seven months (Tickell & Pinder 1975). For the remaining five months of the year, adults forage at sea, generally over continental-shelf waters (Weimerskirch et al. 1985). Although the Black-browed Albatross is considered faithful to its nuptial site, the resighting of an incubating adult at Heard Island which had been banded as a chick on the Kerguelen Islands (360 km to the north-west) (Woehler 1989) indicates that there is some mixing between populations.

Breeding chronology and breeding success at islands varies depending on location. At islands that lie...
south of the Antarctic Convergence, such as Heard Island and Bird Island, South Georgia, the arrival at breeding sites, the commencement of egg-laying and the peak of chick-hatching is delayed approximately two weeks from the timing of these events at breeding sites north of the Antarctic Convergence (data presented in Downes et al. 1959; Tickell & Pinder 1975; Copson 1988; Weimerskirch et al. 1989).

Breeding success is poorer at colonies south of the Antarctic Convergence. At the Jacka Valley colony, on Heard Island, breeding success (recorded as chicks raised to at least five-weeks of age as a percentage of eggs laid) ranged from 17-68% (n = 5 seasons, Table 1). This was similar to the range of actual breeding success (chicks fledged from eggs laid) at Bird Island (0% to 67%, n = 11 seasons; Prince 1985; Croxall et al. 1988) and lower than at Macquarie Island (48% to 86%, n = 7 seasons; Copson 1988), which lies north of the Antarctic Convergence.

Presumably the lower breeding success and the delayed breeding chronology at islands south of the Antarctic Convergence reflects the longer, harsher winter conditions experienced.

Population status and trends
There are four colonies of Black-browed Albatrosses on Heard Island (Fig. 1). Opportunistic counts of breeding pairs and chicks raised to at least five weeks of age have been conducted at these colonies since 1948 (Table 1). The Jacka Valley colony has been censused most often and, in a total of seven seasons, the number of breeding pairs ranged from 57 in 1950–51 to about 150 in 1987–88 (although the population would have been greater in the 1982–83 season when 153 five-week-old chicks were counted). Overall, the Heard Island population appears to have increased from about 230 breeding pairs in the early 1950s to 600–700 in 1987–88.

This apparent trend should be viewed with caution. Regular monitoring since 1976 at Bird Island found the size of the breeding population of Black-browed Albatrosses to fluctuate annually (Prince 1985; Croxall et al. 1988). Further information is needed to clarify whether the present data records an increase in the population at Heard Island or annual fluctuations in the breeding numbers.

Dramatic population changes have occurred in several vertebrate species at Heard Island (Burton 1986; Gales & Pemberton 1988; Goldsworthy & Shaughnessy 1988; Woehler 1991). These changes may be related to climatic ameliorations at Heard Island which have been
Table 1 Numbers of breeding pairs (bp) and chicks raised to at least five-weeks of age (ch) of Black-browed Albatrosses counted during the breeding season at colonies on Heard Island between the 1948-49 and 1987-88 seasons. Values marked '+' represent minimum numbers; values in brackets are numbers of adult birds recorded at the time of late-incubation or early-chick-hatching.

<table>
<thead>
<tr>
<th>Breeding season</th>
<th>Jacka Valley bp</th>
<th>Van Hoffen Bluff bp</th>
<th>North of Jacka Valley bp</th>
<th>Henderson Bluff bp</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1948-49</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td>Downes et al. 1959</td>
</tr>
<tr>
<td>1949-50</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
<td>Downes et al. 1959</td>
</tr>
<tr>
<td>1950-51</td>
<td>57</td>
<td>38+</td>
<td></td>
<td></td>
<td>Downes et al. 1959</td>
</tr>
<tr>
<td>1951-52</td>
<td>69</td>
<td>46+</td>
<td></td>
<td></td>
<td>Downes et al. 1959</td>
</tr>
<tr>
<td>1952-53</td>
<td>44</td>
<td></td>
<td></td>
<td></td>
<td>Downes et al. 1959</td>
</tr>
<tr>
<td>1953-54</td>
<td>87+</td>
<td>33+</td>
<td>22</td>
<td></td>
<td>Downes et al. 1959</td>
</tr>
<tr>
<td>1954-55</td>
<td>102</td>
<td>17</td>
<td>(110)</td>
<td></td>
<td>Downes et al. 1959</td>
</tr>
<tr>
<td>1979-80</td>
<td>98 (Jacka Valley &amp; Van Hoffen Bluff)</td>
<td></td>
<td></td>
<td></td>
<td>Johnstone 1982</td>
</tr>
<tr>
<td>1982-83</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
<td>Smith 1986</td>
</tr>
<tr>
<td>1985-86</td>
<td>125</td>
<td>20</td>
<td></td>
<td></td>
<td>Woehler 1991</td>
</tr>
<tr>
<td>1986-87</td>
<td>(18)</td>
<td>(40)</td>
<td>(400)</td>
<td></td>
<td>Woehler 1991</td>
</tr>
<tr>
<td>1987-88</td>
<td>147+</td>
<td>100</td>
<td>(44)</td>
<td>(60)</td>
<td>Present study</td>
</tr>
</tbody>
</table>

emphasised by recent, rapid glacial retreats (Allison & Keage 1986). While being detrimental to some species, conditions at Heard Island may be improving for the Black-browed Albatross. A lessening of the harsh winter conditions could have increased the breeding success of recent generations of this population. At present it is not clear whether these changes represent long-term trends in species abundance, or shorter term fluctuations.

It is interesting to note that although there is evidence of an increase in numbers of Black-browed Albatrosses at Heard Island, colonies at the nearby Kerguelen Islands are declining (Weimerskirch et al. 1987, 1989). This decline has been attributed to fishing activities both near to the Islands (Weimerskirch et al. 1987, 1989) and throughout the Southern Ocean (Brothers 1991).

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References


An Investigation of Blood Smears of Northern Australian Finches

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Haematology can be used to diagnose avian (Hawkey et al. 1985; Campbell & Dein 1984; Campbell 1988) and mammalian diseases (Bubenik 1987). It can be used to indicate the presence of intra- or extra-cellular parasites, a high white blood cell count or a low count of mature red blood cells (Campbell & Dein 1984).

The aim of this study was to investigate the possibility that Gouldian Finches Erythrura gouldiae were diseased, as far as it was possible to determine from blood smears, by comparing blood smears from them with those of co-occurring finches. The reason for focusing on the Gouldian Finch was that their numbers have declined in the wild (Blakers et al. 1984) to the point of their being endangered (Brouwer & Garnett 1990). If the measures of red and white cells of Gouldian Finches lay outside the ranges of the other finches or intra- or extra-cellular parasites were present in Gouldian Finches but not the others, it could suggest that Gouldian Finches might be affected by disease. More refined methods could then be used to re-examine blood composition and investigate the nature of the disease.

Methods
Blood was taken from eight species of finch, Long-tailed Poephila acuticauda (n = 81), Masked P. person-