SHORT NOTES

THE LIFE CYCLE OF *NOTOTHENIA ROSSII* FROM SOUTH GEORGIA

M. S. BURCHETT

British Antarctic Survey, Natural Environment Research Council
High Cross, Madingley Road, Cambridge CB3 0ET, UK

The life-cycle of N. rossii at South Georgia includes several distinct stages (Figs. 1 and 2). Offshore there are the pelagic larvae, post larvae and young fingerling stages. The young fingerling metamorphoses into a blue phase fingerling and this stage migrates to the nearshore environment where it changes into a brown phase fingerling. In turn this stage develops into a demersal juvenile which inhabits the coastal beds of macroalgae before migrating offshore to join the adult population. The morphology of many of these stages has been described by Burchett (1983).

Adult *N. rossii* have been described as spawning demersally on the continental shelf surrounding South Georgia, at depths of 120–350 m (Permitin and Silyanova, 1971). *Notothenia rossii* are widely distributed over the shelf surrounding South Georgia and the adult population consists mainly of specimens of age classes V to XV (Freytag, 1980). The maximum length observed is in the region of 900 mm (Shust and Silyanova, 1971).

Spawning takes place around April and May (Shcherbich, 1975; North and others, 1980) and the fertilized eggs have an average diameter of 4.8 mm (Permitin and Silyanova, 1971).

Hatching takes place about September and October and the pelagic offshore fingerlings inhabit the 0–15 m depth zone (Shcherbich, 1975; Burchett and others, 1983).

Notothenia rossii fingerlings enter the fjords along the northern coastline of South Georgia between late January and late February of each year. These are the results of spawning six to seven months earlier (Burchett, 1983*a*). Soon after arrival nearshore, the pelagic blue phase fingerlings undergo rapid morphological changes and become demersal in habit. By the end of April most fingerlings have developed into demersal brown phase fingerlings. Development from larva to recognisable juvenile stage with the characteristic marbled pattern takes 15 months (Burchett, 1983*b*). Immature juvenile *N. rossii* spend about five years nearshore, mostly inhabiting the shallow water zone in the upper 90 m, living amongst the macroalgae beds of *Macrocystis pyrifera* and *Himantothallus grandifolius* (Burchett, 1982). Juvenile *N. rossii* feed opportunistically on benthos nearshore until they reach a length of about 380 mm when they start to move away from the coastal environment. Most individuals have migrated offshore to join the adult fish population by the time they have reached 410 mm in length (Burchett, 1982). Males mature one year earlier than females (Olsen, 1954) and males move offshore one year earlier than females (Burchett, 1983*b*). Once offshore, adults remain over the continental shelf areas of South Georgia. They have not been recorded migrating away from the island.

ACKNOWLEDGEMENTS

I would like to thank my colleagues for all their help, especially S. Jones, T. Flood and D. Hamilton during 1978; R. Edwins and K. Cameron during 1979 and R.

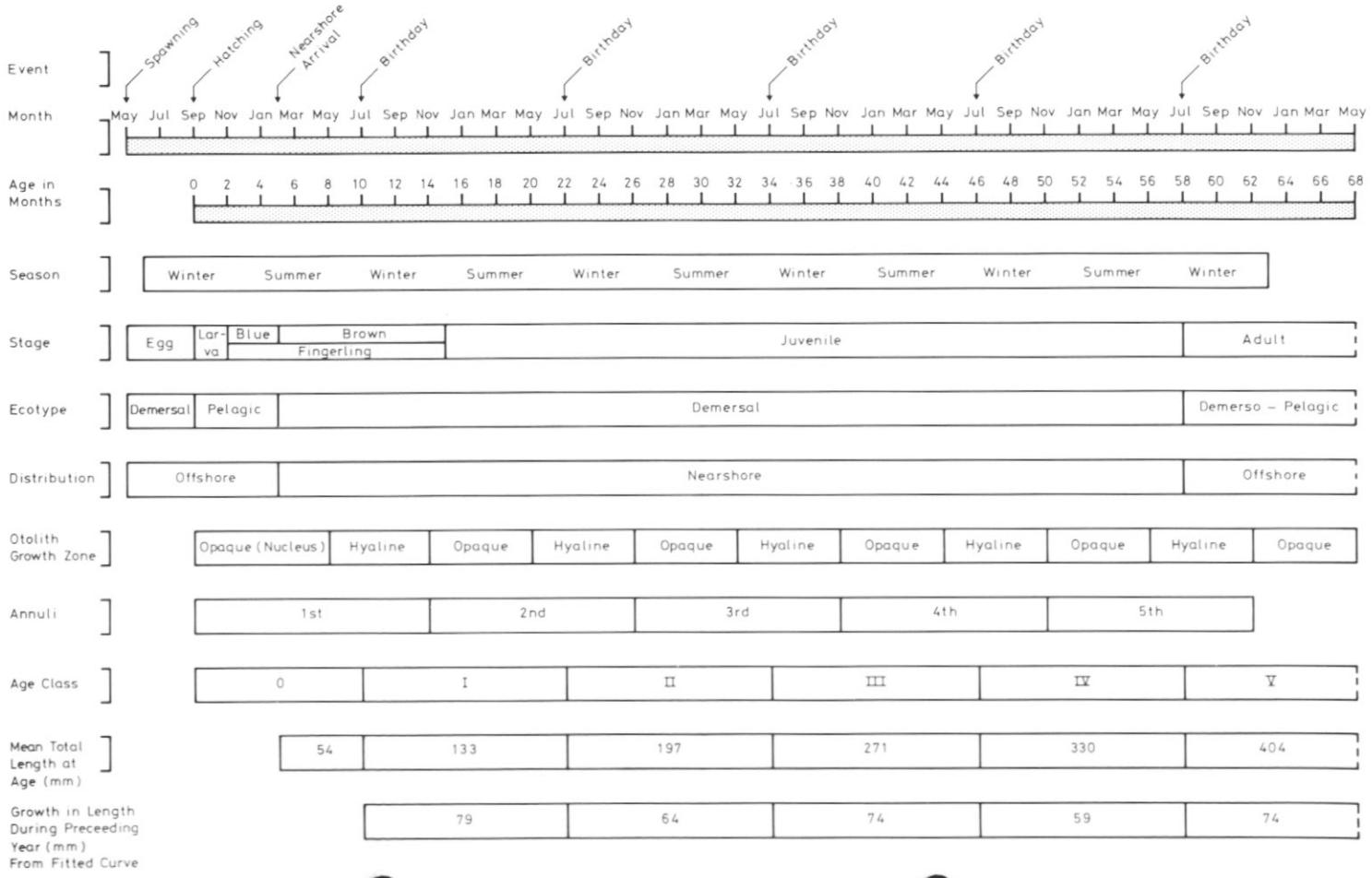

Fig. Chronology of the early life-history of *Notothenia rossii* at S. Georgia.

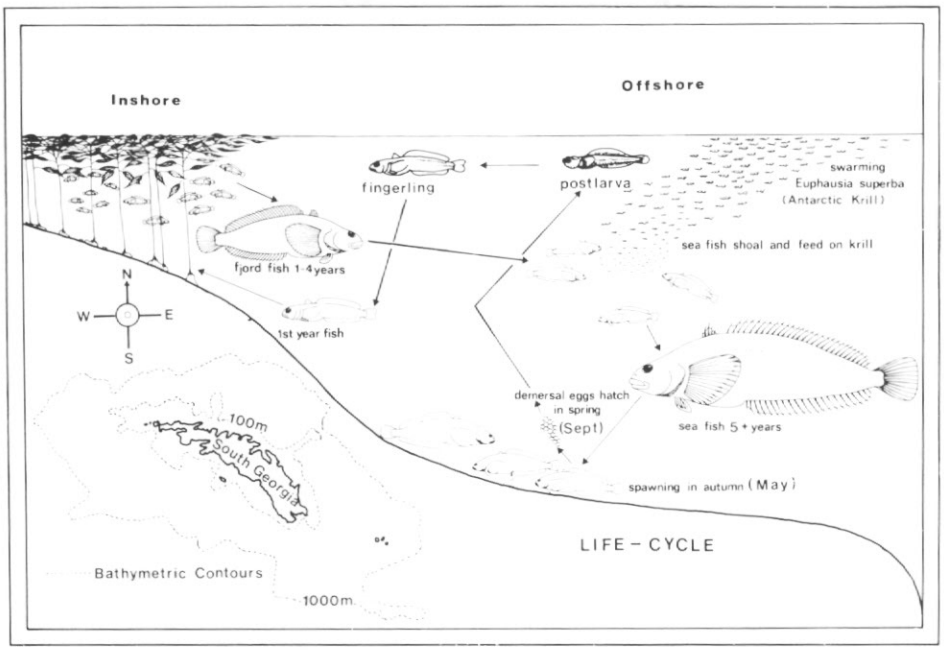

Fig. 2. Diagram representing the life-cycle of *Notothenia rossii* at South Georgia.

Forster during 1980. Also my thanks to M. White, I. Everson, A. North and C. Ricketts for their help and criticisms.

Received 19 May 1983; accepted 29 June 1983

References

Burchett, M. S. 1982. The ecology of some coastal fish populations at South Georgia. *Progress in Underwater Science*, **7**, 15–20.

Burchett, M. S.1983*a*. Morphology and morphometry of the Antarctic Nototheniid *Notothenia rossii marmorata* Fischer (1885). *British Antarctic Survey Bulletin*, No. 58, 71–81.

Burchett, M. S. 1983*b*. Age and growth of the Antarctic fish *Notothenia rossii* Fischer (1885) from South Georgia. *British Antarctic Survey Bulletin*, No. 60, 45–62.

Burchett, M. S., Sayers, P. J. North, A. W. *and* White, M. G. 1983. Some biological aspects of the nearshore fish populations at South Georgia (Antarctica). *British Antarctic Survey Bulletin*, No. 59, 63–74.

Freytag, G. 1980. Length, age and growth of *Notothenia rossii marmorata* Fischer 1885 in the west Antarctic waters. *Archiv für Fischeriwissenschaft*, **30,** 39–66.

North, A. W., White, M. G. *and* Burchett, M. S. 1980. Age determination of Antarctic fish. *Cybium* 3e Serie 8, 7–11.

Olsen, S. 1954. South Georgian Cod (*Notothenia rossii marmorata* Fischer). *Norsk Hvalfangst – Tidende*, **7,** 373–82.

Permitin, Y. Y. *and* Silyanova, Z. S. 1971. New data on the reproductive biology and fecundity of fishes of the genus *Notothenia* Rich. in the Scotia Sea (Antarctica). *Journal of Ichthyology*, **11,** 693–705.

Shcherbich, L. V. 1975. Method of determining age and onset of sexual maturity in the marbled Antarctic cod *Notothenia rossii marmorata*. *Journal of Ichthyology*, **15,** 82–8.

Shust, K. V. *and* Silyanova, Z. S. 1971. Neue Fakten zur Biologie einiger Fischarten de SW-Atlantiks. *Trudy VNIRO*, **86,** 70–81.

THE TYPE SPECIMEN OF THE MOSS *DICRANUM OLEODICTYON* DIX.

B. G. BELL

Institute of Terrestrial Ecology, Bush Estate, Penicuik, Midlothian EH26 0QB, Scotland, UK

ABSTRACT. The type specimen of the moss *Dicranum oleodictyon* Dix. has been traced. Examination of it confirms the identification of material from South Georgia and the South Orkney Islands.

During the taxonomic revision of several species of robust dicranoid mosses known from South Georgia (Bell, 1973*a*), the type specimen of *Dicranium oleodictyon* Dix. was not traced. Hence, referral of material from South Georgia and subsequently from the South Orkney Islands (Bell, 1973*b*) relied on its agreement with Dixon's original description of the taxon (Dixon, 1935).

Syntype specimens have now been found in the British Museum (Natural History) (BM) and examination of them (Syntypes; Tröim, 125, 136; BM, *Dicranum oleodictyon* Dix. sp. nov., 'Albatross', Grytviken, S. Georgia, 300 m alt. Coll. T. Tröim, 13 Mar. 1933. Comm. Herb. Mus. Nidaros) establishes that the remaining South Georgian material has been correctly determined. The Tröim specimens agree well with Dixon's description particularly in the falcato-secund arrangement of the leaves and the abundant oil globules in leaf cells.

ACKNOWLEDGEMENT

I am grateful to the curator of the British Museum (Natural History) for the loan of specimens.

Received 19 May 1983

REFERENCES

BELL, B. G. 1973*a*. A synoptic flora of South Georgian mosses: II. *Chorisodontium, Dicranoloma, Dicranum, Platyneurum* and *Conostomum*. *British Antarctic Survey Bulletin*, No. 37, 33–52.

BELL, B. G. 1973*b*. Notes on Antarctic bryophytes: I. New records from the Antarctic botanical zone. *British Antarctic Survey Bulletin*, No. 36, 131–2.

DIXON, H. N. 1935. More mosses from South Georgia. *Kongelige Norske Videnskabernes Selskab Forhandlinger*, **7**, 1–3.