

Ball J N & Baker B I. The pituitary gland: anatomy and histophysiology.
 (Hoar W S & Randall D J, eds.) *Fish physiology*.
 New York: Academic Press, 1969. Vol. 2. p. 1-110.

[Departments of Zoology, University of Sheffield and University of Liverpool, England]

This review summarizes pituitary anatomy and physiology in each fish group and, where possible, identifies each adenyohypophysial cell type in terms of morphology, location, staining reactions, and hormone secreted. Hypothalamic control, cyclic changes, and responses to other hormones are also covered. [The SC⁹ indicates that this paper has been cited in over 220 publications since 1969.]

John Nicholas Ball
 c/o Zoological Society of London
 Regent's Park
 London NW1 4RY
 England

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"Many of us who started work on the fish pituitary round about 1960, largely inspired by the important 1957 monograph *The Physiology of the Pituitary Gland of Fishes* by G.E. Pickford and J.W. Atz,¹ soon found ourselves stumbling in the pitfalls of pituitary histo- and cytophysiology, which then (as now) offered one of the more generally available technical approaches. It was a time of uncertainty, when even the most basic identification of the various adenyohypophysial cell types was in hot dispute—most workers perhaps agreeing about the gonadotrophs in a handful of teleosts but not about much else. Against this background, Olivereau had pioneered the experimental allocation of function to the cell types in the European eel (see, for example, reference 2), and somewhat later I embarked on attempts to perform the same service for the saillfin molly, *Poecilia latipinna*, working first at Liverpool University and then in Sheffield. Studies on the

eel, the molly, and a few other species were sufficiently advanced by the late 1960s to form the basis for this review that Bill Hoar commissioned for the multivolume *Fish Physiology*. I was fortunate in persuading Bridget Baker to join in, and I also leaned heavily on the generosity of Madeleine Olivereau, who knew, and knows, far more about the fish pituitary than anyone else.

"When it appeared, the review must have been useful to the many people new to the field, summarizing as it did not only the older work but also the voluminous research of the immediately preceding decade. No doubt it also helped in directing people to the standardized techniques developed by Marc Herlant for the mammalian gland, which were first applied to the fish pituitary by Olivereau and Herlant in 1954.³ That the review continues to be useful presumably hinges on technical reasons, in that even today direct measurement is possible for only a few fish pituitary hormones in a very few species. Thus, the study of structural changes in pituitary endocrine cells remains an important strategy in fish endocrinology. Refined by immunocytochemistry and by the use of quantitative electron microscopy, cytophysiology may be the only way, for example, to define changes in pituitary function in experimental investigations⁴ and during natural cycles,^{5,6} and it may point the way toward establishing new functions or new hormones.^{7,8}

"In one important aspect the review has been completely superseded by subsequent advances, and that is in the area of hypothalamic control of the teleost pituitary. The first comprehensive investigation in this field had been published in 1965,⁹ the outcome of my fortunate encounter with Klaus Kallman and his gynogenetic *Poecilia formosa*, a meeting engineered by Jimmie Atz when I was working in Grace Pickford's laboratory at Yale University. The 1969 review could add very little to our 1965 paper, but the 1970s brought major advances, and by 1981 the whole field had really taken off."¹⁰

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