

Howard Hinton's eggs — a monumental bequest for entomology

Charles Neville

Biology of Insect Eggs. By H. E. Hinton. Pp.1,125. Three volumes. ISBN 0-08-021539-4. (Pergamon: 1981.) \$400, £167.

THIS posthumous work is monumental in both senses of the word. Professor Hinton tried courageously to finish it during his terminal illness, but the final stages of publication, including compilation and checking of the extensive references and index, had to be completed by his research assistant, Mrs Joyce Ablett, and by Dr Colin Mapes. Information on insect eggs was previously scattered throughout the literature. It now becomes available in one source, which is certain to become the standard work on the subject. But these three volumes constitute no mere review; they also contain an enormous amount of original information, based upon a lifetime of work divided between field and laboratory.

The egg stage of insects is no less important than those which follow. Yet most entomologists would be content if they could recognize even the adult stage of those species of flies found on cow pats. Howard Hinton could, however, with the aid of a hand lens, identify their eggs down to species *in situ*. As might be expected from one of the world's most knowledgeable entomologists, the text is packed with interesting examples of evolutionary adaptations.

Some of the most fascinating arise from the fact that, being small, insect eggs have a relatively large surface area. Whereas this is an advantage for oxygen uptake, it means that terrestrial eggs are prone to desiccation; conversely, eggs in aquatic surroundings are threatened by drowning. Professor Hinton shows how these factors explain the greater complexity of insect eggshells compared with those of larger animals, and relations between respiratory structure and function receive extensive coverage in the first volume. The inner layer of insect eggshells is filled with air, and it communicates with the outer surface through channels (aeropyles), some of which open on elevated turrets, or even horns. In some eggs, which might otherwise drown, trapped air bubbles function as gills which both provide oxygen themselves and give access to a further supply from the surrounding water. Such bubbles eventually shrink, however, and need replenishment. This is fine for motile stages but not for eggs, which cannot move. To solve this problem, some eggs which are laid in dung begin respiration by a shrinking bubble, and then change over to a constant-volume bubble trapped between hydrofuge hairs (a respiratory plastron). Hinton has shown how there are even more examples of plastrons in terrestrial eggs than amongst aquatic larvae. Plastrons are particularly

appropriate for eggs which are subjected to alternate drying and flooding, and have independently evolved in unrelated species many times. A further chapter describes how some eggs can absorb water via special organs (hydropyles).

Subsequent chapters in the first volume cover the interrelations between adults and their eggs (fecundity, oviposition and parental care). There are also chapters on the adult glands which secrete protective egg cases; on the proteins which form them; on eggshell proteins and their chemical cross-linking; and on how eggs interact with their enemies, often fooling them with deceptive colours or shapes.

The second volume describes the egg structure and adaptations of insects, order by order. Numerous keys to identification will prove invaluable to future workers,

though, sadly, there was not time for a chapter on fleas. These two volumes are profusely illustrated: I counted 911 photographs, mostly original scanning electron micrographs, a technique which Howard Hinton used right from its introduction. In addition there are 32 tables and nearly 300 clear text diagrams, most of which are original.

The final volume provides the overwhelming bibliography (over 5,000 references) and separate indexes to species, authors and subjects. The work ends with a list of Professor Hinton's publications: these three volumes now complete it. His contributions to entomology thus end on a resounding note. □

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Children who are left to themselves

P. E. Bryant

Developmental Psychology and Society. Edited by John Sants. Pp.389. ISBN 0-333-21340-8/0-312-19751-9. (Macmillan Press, London/St Martin's Press, New York: 1980.) £20, \$35.

D. W. WINNICOTT, a well-known child psychiatrist, is quoted as having remarked in a heated discussion that there is no such thing as a baby. He meant that it is absurd to treat babies in isolation. They are in constant contact with parents and others, and most of the significant things that they do are social in some way or other. This is a point which most child psychologists accept nowadays, but they still find it hard to incorporate into their work.

The clearest example is the question of the importance of language in intellectual development. It seems obvious that people talk to children and tell them things, and that this contributes significantly to the child's growing understanding of his world. Yet the effects of this sort of communication have been virtually ignored by child psychologists. Some, like Piaget, go to great lengths to show that language is of small importance to a child's development; others think that it might have some effect but in the form of "inner speech" — the child talking to himself. Nobody seems to realize that grown-ups actually talk to children. As usual, the social element is left out.

The great merit of the book which John Sants has edited is that it attempts to fill this gap. Nevertheless, the clearest point to emerge is how indirect our knowledge is of the effects of different kinds of social contact. Even the best chapters show this. Those, for example, by Roger Goodwin on

language and by Neil Warren on cross-cultural psychology are particularly impressive. Both are comprehensive and entertaining. But the chapter on language has virtually nothing on people talking to each other — rather odd in a book with society in its title — and the cross-cultural chapter is more concerned with connections between "primitive" and child-like mentalities than with the transmission of culture from one person and generation to another. The topics seem to be social, but the meat of social behaviour — social interactions — is left out.

A more glaring example of discrepancy between appearance (the chapter heading) and reality (what lies beneath) occurs in Wallace's chapter on educational competence. Nothing is said in it about teaching the child, who is left to get on with his own development without any help from anyone else. This abandonment reflects a Piagetian bias, which also dominates a chapter by Furth on Piagetian perspectives. Nothing social there, and very little in a chapter by Archer and Lloyd on sex differences. The closest one gets to social interactions is in an interesting though speculative chapter by Trevarthen on very early physiological and social development, and by Isbell and McKee on social cognition.

None of the authors should be blamed too harshly for neglecting social interactions in a book on children in society. It is the fault of developmental psychology, which still has to get to grips with Winnicott's insight. □

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