

ments, birds are neglected. Several chapters deal with comparative aspects of certain parts of the spermatozoon—the neck region in urodeles (Werner), the flagellar tubular pattern in insects (Phillips), mitochondria (Favard and André), the development of the nuclear pattern (Chevaillier), and the centriolar adjunct (Cantacuzene), to mention a few. A number of investigators were enticed by the esthetic pleasure provided by the patterns of insect sperm and by the fascinating variations and modifications they offer; 20 out of 47 contributions are devoted either wholly or in part to aspects of spermatogenesis or sperm structure in insects.

Throughout the book, emphasis is on conventional electron microscopy of fixed and thin-sectioned material, with a very few papers dealing with freeze etching (Koehler) and histochemical techniques (Anderson and Personne, and Bigliardi *et al.*). Although mentioned on the dust jacket of the volume with equal emphasis, the physiological aspects of spermatozoa and spermatogenesis are not in fact adequately represented, although the volume includes studies of the motility of spermatozoa (Brokaw *et al.* and Nelson *et al.*).

The space allotted to each author is ample in that the data are presented and discussed adequately and the findings are well documented with illustrations. The group of participants was small enough and well enough selected that significant questions were further explored in the discussions, which add valuable information in several instances and help to round out the presentations. The participants took full advantage of this opportunity.

In the closing chapter Afzelius raises several physiological questions and puts them in perspective. The significance of the morphological changes of the components of the spermatozoa has tended to be abstracted from their functional roles when isolated segments of the male reproductive tract are examined, and Afzelius redirects attention to the essential role of the spermatozoon in fertilization and development. Not only does he reflect on our current understanding of the functions of sperm components but he calls attention to a long list of unsolved problems whose attack in the future he believes would lead to the solution of riddles which have been posed by recent studies. One of these riddles, important but neglected, concerns the presence or absence of DNA in sperm mitochondria and whether it may contribute in any

way to the development of the offspring. This question was at least raised during the discussion period.

The papers and illustrations are uniformly of good quality, and some contributions are outstanding. This volume will serve as a valuable summary to "spermatozoologists" and as a source of material for students just embarking on a new field.

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