

the task devolves largely upon the teacher and youth club leader. His book is a guide for bridging the transition period between the present and a future of fully enlightened parents. How practical it is can be seen by the appendixes, which contain specimen lecture material, suggestions for concrete activities and a tentative but comprehensive scheme for sex education throughout the whole early period to full maturity and parenthood. The body of the book contains sound advice, documented by references to research, and illuminated with well-chosen examples of questions put by children, adolescents and adults. Particularly valuable to the parent is Chapter 3, which swiftly and effectively deals with the major problems of sex as they arise in the home and which may well clear away cobwebs in the adult mind. The discussion which follows, of the place of sex education in the school curriculum and the kind of teaching appropriate to the various stages of development, is based upon unimpeachable psychological and educational principles. Chapter 6, which gives a brief outline of the changes, intellectual, emotional and physical, of adolescence will have special significance for youth leaders and all who have to do with boys and girls in that most critical of all phases.

The book is comprehensive in scope and framed to meet the needs of the intelligent but not specially instructed reader. This, however, does not mean that it is either superficial or elementary. Indeed, it might well be recommended as a text-book on the educational aspects of sexology. The bibliography will introduce the interested reader to literature of more specialized kinds, and the author's brief comments on the books he recommends will be found of the greatest value. It is a pity that an index is not provided, for, although the author seeks to justify the omission in his introduction with the plea that his subject must not be viewed piecemeal, this reviewer feels that a speedy reference to particular passages would be of value to the busy teacher, the more so since many topics are dealt with in their several aspects in different parts of the book. An index would serve to bring together all that the writer has to say on any important aspect of his subject. A further point concerns the vexed question of acknowledging the source of quotations and references. Mr. Bibby has obviously drawn extensively upon the work of others: lengthy footnotes are out of place in a book like this; but it would be helpful to the reader who wishes to pursue the subject, if sources and page references were given.

These, however, are small criticisms of a book so sane and moderate in its outlook, so much needed at the present time, and so calculated to further both the general cause of education and the more specific purpose of spreading enlightenment and banishing prejudice.

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THE SPIDER'S WEB

La toile géométrique ces araignées

Par André Tilquin. Pp. 536+8 plates. (Paris: Les Presses universitaires de France, 1942.) 150 francs.

IN this work Dr. A. Tilquin sets out the results of six years research on the making of the familiar orb-webs spun by spiders of the family Argiopidae, and it may be said at once that the book is well worth the attention of all, whether arachnologists or not, who are interested in the study of instinctive behaviour.

The author begins by clearing away any psychical

factors. He finds it impossible to detect any evidence of mental relationship between a man and a spider of the kind which is common between a man and his dog. Whereas to the dog his master seems to appear as an individual, to the spider a man represents no more than a source of shade or warmth, so that in all its life the spider never shows more recognition of man than is expressed in an inhibition of the reflex dropping from its web at his approach. Clearly, therefore, a mechanistic description of web-making is to be expected throughout.

The difficulty of getting Argiopidae to make normal webs in captivity has been overcome by providing each spider with an isolated wooden framework, to which the web is fixed. An Argiopid spider, it is clear, must have sufficient space for its operations, which cannot be reduced to a smaller scale, and Dr. Tilquin has devoted two rooms in his house to their accommodation. More than a dozen species have been kept under observation, but most of the work has been done with *Argiope bruennichi*.

Two chapters are occupied by a description of the web, an accurate analysis of its constituent parts and their variation among different species; for the author observes that a minute study of web-structure, made independently of the actions of the spinner, is the best introduction to the study of these activities themselves. It clarifies the problems set and points the way to their solution.

Chapter 3 is chiefly a consideration of experiments on the influence of light and gravity in determining the direction of the *fil suspenseur*, or the strong cable from which the web hangs and which forms the upper limit of the whole field of operations. The next two chapters deal with the construction and spacing of the radii. A new conception is introduced here, namely, that solid and stable points of support exert an attraction for the spider, whereas unsteady flexible ones are less attractive or even repellent. This determines the distance of the hub of the web from the *fil suspenseur*, and so affects the area and symmetry of the circular portion. It also influences the angles between the radii, so that often these angles have different values above and below an approximately horizontal middle line. These chapters expound Dr. Tilquin's concept of the web as a *champ dynamique*, an area in which forces of attraction and repulsion are at play, and the spider is moved into equilibrium with their resultants.

The next three chapters apply this hypothesis or concept to the laying down of the temporary spiral, its removal and replacement by the viscid spiral. The effects of age, sex, moulting, mating and egg-laying are included, and form one of the most original portions of the monograph. A chapter follows on the special features peculiar to the webs of a single genus or species, and the tenth chapter is a general summary. It is characteristic of Dr. Tilquin's methods that he here introduces the term *séricophilie* to describe a spider's apparent preference for touching silk rather than anything else: for example, the spider's 'foot', placed on the thread which leads from the hub of the web to its hiding-place, is exhibiting *séricophilie*, rather than awaiting the occurrence of vibrations.

Dr. Tilquin, writing of these and other matters with an almost excessive attention to detail, has made an advance on the researches of Peters and of Wiehle, both of whose theories he criticizes; and he has made a notable contribution to our understanding of an object which is unique among the products of animal industry.

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