tative and experimental course developed for students in zoology, is written in two parts, one theoretical and the other experimental. Part 1 gives a summary of Andrewartha and Birch's theory of environment. Following an introductory chapter, the properties and measurements of both the density and the dispersal of populations are discussed. The idea that the environment of an animal can be divided into four major components—weather, other animals and pathogens, food, and a place in which to live—is developed, and then each component is discussed in some detail on the basis of experimental evidence. The final chapter of part 1 is devoted to an exposition of a theory that is summarized as "the density of natural populations may be explained in terms of: (i) a shortage of time, (ii) a relative shortage of some essential resource, (iii) an absolute shortage of some essential resource, or interactions between these three mechanisms." There is also a short, critical review of the concepts of density-dependent factors and competition. Part 2 is a manual of practical exercises that arise from and are related to the theory developed in part 1. Twenty experiments, which deal with methods for measuring the distribution, density, and dispersal rate of animals and with the effects of the components of the environment on the survival, development, and behavior of animals, are described and analyzed in some detail.

As a general introduction to ecology, this textbook has some limitations. Emphasis is placed on the laws governing the physiology and behavior of individuals in relation to their environments and on the laws governing the numbers of animals in relation to the areas they inhabit; communities are discussed very briefly. The text is devoted to the development of a theory of population ecology which most workers in this field have not yet accepted. The quantitative aspects of the book require a very good grasp of statistical methods, such as analysis of variance and probit analysis. In table 3.07 the Poisson series appears to have been omitted. On the other hand, this well-written text, in addition to developing a concept, provides a wealth of experimental evidence and thus gives a good indication of current research in animal populations.

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## Stimuli and Response

**Bestiaire d'Amour**. Jean Rostand. Translated by Cornelia Schaeffer. Doubleday, New York, 1961. Illus. $5.95.

**Animals as Social Beings**. Adolph Portmann. Translated by Oliver Coburn. Viking Press, New York, 1961. 249 pp. Illus. $6.

If you have a friend who annoys you with the old saw that science is ruining life by eliminating sweet mysteries, just give him a copy of Rostand's little book. It may not be, strictly speaking, science, but it has plenty of romance. The text is a capsule survey—15 minutes' reading time—of "amorous evolution." The style is in the best tradition of the yellow-jacketed French novel. Consider—

". . . they press themselves against each other mouth to mouth" (in referring to the paramecia).

". . . the fiancees chastely holding each other by the claw" (the scorpion).

". . . and when she is seduced, the couple drops down on the grass" (the meadow brown butterfly).

". . . her slim little belly seems to have a life of its own, endowed with some exquisite sensitivity" (the dragonfly).

Still there is little danger of overstimulation, for the climax of the book is the chilling statement, printed in bold, black capitals, "In the secret coming together of two human bodies, all society is the third presence." The book also has a message: artificial insemination would ruin the whole thing.

But this is quite unfair, because the book should be judged on the basis of its major contents, the illustrations by Pierre-Yvyes Tremois. His work is first-rate, flawlessly executed, part bold and free, part beautifully detailed. There is one drawing of two elephants, for example, which can only be described as awe inspiring.

Judging from the two books reviewed here, and from other recent works as well, there must be a strong interest among general readers in the social doings of animals. Some publishers have responded with new works like Rostand's; others have seen fit to reprint or to publish translations of books which are really somewhat out-of-date. For example, Portman's book was originally printed in German in 1953 and just now appears in English. But the prospective purchaser must take a vigilant look at the back of the title page to determine that this is not recent, up-to-date work. This is unfortunate, because the field is a swiftly moving one, and Portman took great care to have the book up to the minute at the time of original publication.

Portman skillfully presents many examples of social interaction in diverse animals species, in a spirit which is perhaps more admiring than analytical. The first chapter, on dragonflies, is particularly nicely done. His interpretations are based on an awareness of the limitations of trying to interpret an animal's behavior solely in terms of the stimuli just received from the external world, and a strong mistrust for the argument that natural selection is sufficient for the evolution of social behavior.

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## Opaque Surfaces

**Ore Microscopy**. E. N. Cameron. Wiley, New York, 1961. xii + 293 pp. Illus. $10.50.

Cameron's *Ore Microscopy* fills a need long felt by people engaged in the study of polished surfaces of opaque minerals. It is really a pioneering attempt to explain the difficult complexities of elliptically polarized light and to systematize the optics so that they may be used for determinative purposes. The book brings together many widely scattered, miscellaneous data, and it should stimulate the study of opaque surfaces. It also demonstrates that quick and easy optical methods of opaque mineral determinations are possible.

The text presupposes a thorough knowledge of optical mineralogy and is designed for advanced students. The material it contains is excellent, but in places the reader becomes lost in a maze of Greek letters and other symbols. A table defining these letters would be most useful.

For the sake of complete coverage, the work of A. M. Gaudin and others, on the identification of sulfide minerals by selective iridescent filming, should have been mentioned. A brief paragraph on the possibilities of infrared light would also be helpful, and the very excellent loose-leaf folder entitled "Card index of ore photomicro-