Support, Sequential Polypeptides, Mass Spectroscopy in Peptide Chemistry, Miscellaneous Subjects, and Biologically Active Peptides.

The opening main lecture, "A critical evaluation of coupling methods," by M. Brenner, is an intriguing attempt to get peptide chemists to apply physicochemical principles in designing coupling methods. Another main lecture, "Biological and chemical synthesis of polypeptides," by R. Schwyzer, is also conceptual in approach, with the proposal that biochemical methods might have a future in peptide synthesis. Maybe so, but peptide chemists will be competing with nature for a while yet.

The ingenious uses of polymer supports appear to have a bright future. The Merrifield procedure and variations thereof were well worth a session. The use of insoluble active esters is one of the promising variations.

The paper which is most valuable to the synthetic chemist is "Attempts for a synthesis of glucagon," by E. Schröder. Its value results from the fact that difficulties and not successes are emphasized. As the author says, "The glucagon example demonstrates clearly enough the different problems of synthesis with respect to individual types of polypeptides and shows that one should not generalize positive results and successes which were made with one or the other type." Amen.

For future reports of these symposia, I plead for recording the discussions after papers. Valuable information is often disclosed in such discussions, and critical comments (constructive or not) add interest for the reader. It is the next best thing to being present at the symposium.

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Games of Chance

The Theory of Gambling and Statistical Logic. RICHARD A. EPSTEIN. Academic Press, New York, 1967. xvi + 492 pp., illus. $10.

Pure science has traditionally been subject- and method-oriented, whereas applied science has been problem-oriented, and in the solution of its problems anything from any field can be used. In this view the current emphasis on interdisciplinary groups is in the direction of applied science. The book under review is a similar example of the applied approach, since the author uses such diverse tools as probability, statistical inference, and game theory to study a very wide range of games.

After a brief history of gambling the book takes up the necessary mathematical preliminaries and the fundamental principles of a theory of gambling, including a beautiful selection of ten theorems that are central to, but do not exhaust, the study of gambling. The author wisely does not attempt to prove everything with full mathematical rigor; he is more concerned with making the reasoning understandable to the reader.

The study of gambling properly begins with coins, wheels, and dice games such as one plays in casinos. Here the author's vast knowledge (which suggests an ill-spent life in gambling dens around the world) is revealed by his discussion of coups, of the problem of the detection of bias and its practical consequences, and of miscellaneous pieces of fascinating information.

Analysis of another broad class of gambling pastimes, card games, rests on the difficult topic of shuffling. The author gives many results for simple distributions of cards which are straightforward, though tedious to calculate, as well as for more complex problems like "matching" and knowing certain facts. He gives, for example, the well-known paradoxical calculation of the probability that a five-card hand will have a second ace: If you know it has an ace, then $p = .1222$; if you know it has the ace of spades, then $p = .2214$; if you know it has a red ace, then $p = .1896$. The paradox rests, of course, on how the information is obtained, and thus on the correspondingly implied equiprobable sample spaces.

The game of blackjack occupies an entire chapter, probably because of the recent interest aroused by the development of winning strategies based on the use of knowledge of the cards that have already been used. His discussion is both informative and stimulating. Contract bridge, with both distribution and bidding problems, is significantly more difficult. Even here the author does not turn away from difficulties that are not completely analyzable, but plunges into the relative merits of different bidding systems.

Problems such as horse racing, psychological betting systems, the stock market, war games, hide-and-seek, and games and duels are subjects on which he has something worthwhile to say. Pure skill games, Tic-tac-toe, Mill, Nim-type games, the recent polynomial games, Hex and Bridg-it, chess, and checkers are all examined. A final chapter takes up psychological matters like gamblers' fallacies and studies of paranormal phenomena, including ESP.

All in all, the book is a liberal education and a fine demonstration of the power of a determined attack on a difficult and diffuse topic.

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Note: A Translation

Genetics of Fungi. KARL ESSER and RUDOLF KUENEN. Translated from the German edition (Berlin, 1965) by Erich Steiner. Springer-Verlag, New York, 1967. x + 500 pp., illus. $18.50.

The literature in fungal genetics consists of a vast and scattered collection of original papers and two books. The more comprehensive of the latter, *Genetik der Pitze* by Esser and Kuenen, has been available in detail to most interested students in this country only at the price of considerable effort. The appearance of an English translation is thus most welcome. The translation adheres closely to the original text, with just a leavening of German-language flavor slipping past the translator and the several experts who reviewed the several chapters. The text of this work is thus now as readily available to English-language readers as were the extensive bibliographies and annotated tabular materials in the original edition, features that justified its price even to those with only a stumbling knowledge of German. The authors (p. vii) recognize the impracticality of the simultaneous translation of the work and revision of it to accommodate the new findings. To "compensate somewhat for this deficiency," the titles of about 500 papers that appeared after the German edition have been added to the bibliographies. All in all, the English edition certainly prompts no reassessment of this work by this reviewer: "This book has much to recommend it to those interested either in fungi or in genetics, and it should be indispensable to those interested in both of these subject areas" [*Science* **151**, 315 (1966)].

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