this translation, the approach and the information presented are perhaps more representative of 1956 than of 1968.

The author's stated intention was to consider the evolution of slopes and the cycle of erosion under the following climates: normal, tropical, arid, semiarid, savanna, and periglacial. Nevertheless, the first third of the book is a general review of the processes of rock weathering, hillslope erosion, and river mechanics. Considerably more complete reviews of this material are presently available in English, and little is gained from this first part of the book. The remaining two-thirds of the book is a discussion of erosional processes and landform evolution under the different climatic environments. Much of this material is very interesting. However, many statements are made in a dogmatic fashion without supporting references, and it is difficult to separate fact from hypothesis. In view of the increasing amount of quantitative information on erosion rates and the hydrology of humid, subhumid, and semiarid regions, one would expect that in a truly up-to-date volume an attempt to summarize this information and to bring it to bear on the problems of landform evolution would be made.

A relatively serious criticism is that the author frequently refers to what is presumably relatively recent detailed research without providing a reference to it. There are six pages of references at the end of the book, but many of these are not cited in the text, and some of the most interesting work cited in the text has not been included among the references. For example, on page 85 the "notable work of Lamego (1938)" is mentioned, but Lamego's name doesn't appear among the references. Such a casual approach toward referencing seriously detracts from the purpose of the translation, which was to bring to an English-speaking audience a review and summary of the results of European climatic-geomorphic research.

For these reasons, the book is a disappointment. This is unfortunate for the French geomorphologists, and Birot himself has much more to offer than is presented here. Nevertheless, the author does raise many interesting questions in this book, and it is clear that here is a subject that deserves further investigation. In addition, Birot's description of his field observations in Brazil and his evidence that sugarloaf mountains are definitely related to fracture patterns are a welcome revelation. The application of this conclusion to the origin of other isolated erosional remnants (inselberg) relieves geomorphologists of the burden of attempting to explain their origin without structural controls.

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Contributions to Biology

Investigations into Generation, 1651–1828. ELIZABETH B. GASKING. Hutchinson, London, 1967, 30 s.; Johns Hopkins Press, Baltimore, 1967, $6. 192 pp., illus.

This book is a selective review, exposition, and critique of the history of theories of generation during the 17th and 18th centuries. "Generation" is taken to refer to the origin of new living organisms, chiefly by sexual reproduction, and to include a characterization of the nature of development of the new individual. Besides chapters dealing with the concepts of preformation, animalculism, ovism, epigenesis, and their modifications in the course of progressive investigations, whole chapters are devoted to Harvey, Maupertuis, Wolff, Haller, Bonnet, Spallanzani, Prévost and Dumas, and von Baer. Bibliography and index are appended, and there is also a time chart of significant dates in the development of the concepts discussed.

The work receives high marks for bringing its subject up to date for the general scientific reader interested in intelligent historical reconstruction and interpretation. The present reviewer cannot help feeling—perhaps fancifully—that we have here a model for a series of scholarly and thoughtful lectures on a topic that has been parroted and vulgarized beyond rational comprehension in generations of textbooks. One sees the author selecting, with critical rigor, a limited number of sequential contributions to the subject, and embodying each one in a brief, economical chapter. Each chapter in turn bears the marks of careful selection, doing justice to individual contributions, emphasizing their interrelations and their intrinsic logic and development without burying the whole in detail or irrelevant commentary. The approach is that of understanding scientific thinking in the context of a man's own work and of the scientific milieu.

A reviewer, even if not an expert, is permitted to record some personal reactions. I found some chapters more successful than others. Those on Harvey and Spallanzani seemed particularly clear and concise; that on Bonnet was perhaps most stimulating in impelling one to go back to the original writings. The brief extracts from von Baer's thought were less well chosen and cogent than I had hoped. One might also question the omission of some important landmarks (for example, Kölliker) from the time chart. Note to the publisher: might one ask why it is possible nowadays to print a well-designed, comfortably-reading book—all that is desirable, in fact, complete with Library of Congress catalog card number—without anywhere visibly recording the date of its publication?

Investigations into Generation is highly recommended as a pleasantly composed, selective but well-balanced account of its subject, based on patently sympathetic understanding of the original and secondary literature. Particularly for students of developmental biology immersed in laboratory investigations, many of whom are perforce very deficient in historical comprehension and insight, it should make excellent supplementary reading, not at all hard to take.

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Biochemistry Meeting

Peptides. Proceedings of the 8th European Peptide Symposium, Noordwijk, the Netherlands, Sept. 1966. H. C. BEYERMAN, A. VAN DE LINDE, and W. MAASSEN VAN DEN BRINK, Eds. North-Holland, Amsterdam; Interscience (Wiley), New York, 1967. xii + 292 pp., illus. $14.50.

The European Peptide Symposia have become established as a fine example of international cooperation in promoting research in a specialized but important field. Since attendance at the symposia is limited, the published proceedings are particularly important to other workers in the field. The report of the 1966 symposium is especially well done and should be worth the cost to peptide chemists. The scope of the papers is indicated by the section headings: Coupling Methods, Protecting Groups, Racemization, Synthesis of Peptides with the Aid of a Polymeric

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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