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Review: History of Marihuana

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el might then be strung together to simulate the whole. The behavior of the whole ecosystem was to emerge from the combination of the component models; then human impacts were to be applied. Since the parts' models were in great detail, the synthetic combinations were cumbersome, costly, and too complex for easy understanding, and thus not very amenable to representation or to have confidence in.

In summary and synthesis sections of IBP 19, only simple overview sketches, aggregated grazing models, and budget diagrams are given for nutrients and organic matter. There are no representations of the complex synthetic models of the whole grassland, which were extensively studied as the main purpose of IBP. In *Ecological Studies* 26, the report on the complex total system model, ELM, includes component models and equations overview sketches, comparisons of submodel and total model simulations with time series data, a critique discussion by Woodmansee, and extensive discussions of the steps and thoughts in evolving the project and its models. However, the only representation of the whole model relationships is a sketch of sub-model boxes.

In many places in these books, authors refer apologetically to the complex models with reservations about their meaning. Even if the

complex models were not what the authors had hoped, they should be given so that new science can build on the experience. If not dealing with complexity, the books represent the state of the science. Ecosystem science is being inhibited because people are not reading each other's models and are having difficulty visualizing their own complex ones. Editors discourage full representations of models in program form or as bulky sets of equations because of the difficulty in comprehension. Even in the detailed reviews of models in this book, ecosystem structures are not compared. Energy-language diagramming would help. Unfortunately, the books do not have all the information in a form for translating the ELM into a complete diagram.

An underlying question is whether complex large models of ecosystems are less useful because of limitations of modeling complexity, and whether there are integrative principles and features of ecosystem organization in real systems that do not get included when submodels are strung together. The books do not deal with ecosystem level organization and structure.

The alternative concept is that models should not get more complex because the size of the ecosystem is enlarged, but appropriate aggregations of detail should leave all models the same size regardless of the size of the system.

In this way, important features are not lost in details that are not important at the larger scale.

In the era before modeling, detailed descriptive, quantitative, and experimental research left scientists believing that they understood the systems they studied because the qualitative theories they carried seem to explain relations. What formal quantitative modeling did was show that expression of these ideas in simulation rarely coincided with expectations. In other words, scientists not doing modeling are kidding themselves about their understanding, and those who do know they have a long way to go. A paper without a model to demonstrate consistency of ideas and data offered may soon come to be regarded as second rate.

Although the IBP did not address the scale of size and time that was promised and required to understand the basic science of man and nature, it was nonetheless a marvelous contribution to biology and small-scale ecology.

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HISTORY OF MARIHUANA

Marihuana: The First Twelve Thousand Years, by Ernest L. Abel. Plenum Press, New York, 1980, 289 p., \$17.95 (80-15606).

It is refreshing to find, in the recent plethora of books on *Cannabis*, one that looks in such an equanimous way on the relationship of this ancient cultivated plant with human affairs. Against a historical background of thorough research, Abel follows the historic and economic significance of marihuana from the early years of the ancient world; the era of its importance to maritime needs of Europe and its introduction to the New World; its emergence as a medicine and narcotic in the Old World; to its acceptance in the Americas as a drug.

I have found all of the chapters equal in their reliability, matter-of-fact synthesis, and expert handling of a complete knowledge of the pertinent literature, epitomized in the carefully chosen bibliography of 293 entries. Personally, however, I rate the chapter entitled "Epilogue" a most original and succinct ending to an outstanding book.

The range of interests covers a broad spectrum. The book should long be of value to historians, sociologists, economic botanists, pharmacologists, lawmakers, and legal experts. Its message might be expressed in a nutshell by quoting sentences from its first and last chapters: "Of all the plants men have ever grown, none have been praised and

denounced as often as marihuana . . . undoubtedly a herb that has been many things to many people. . . . Whatever marihuana's past, its future will inevitably be that of decriminalization and eventual legalization. . . . Whether . . . the world faces a real threat to its social and economic stability, to progress and to morality . . . as a result of the liberalization of marihuana . . . is left to the future. If the past is any example, instability, lack of progress and immorality will or will not occur regardless of whatever happens where marihuana is concerned."

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ANATOMY TEXT

Human Anatomy, (Laboratory Textbook) by Kent van de Graaff. William C. Brown Company, Dubuque, Iowa, 1981, 322 p., illus., \$12.95 (80-65740).

As the title indicates, this textbook is designed to augment work in the laboratory. It is written systemically and for paramedical students. With this textbook, no other in anatomy is necessary.

The text is divided into five units with appropriate chapters under each unit. These units are: (1) Organization of the Human Body; (2) Body Support and Movement; (3) Control

Systems of the Human Body; (4) Maintenance of the Human Body; and (5) Continuity of the Species.

Each chapter starts with a list of learning objectives, followed by a list of materials needed to study this particular system, and student instructions immediately after. Then comes an introduction and descriptive material about the system being studied. Clinical considerations have been added to maintain interest. The text is well illustrated.

Outlines of laboratory reports are also provided, and the text is structurally arranged so that punched pages may be removed from this spiral-wire bound book and later filed in a 3-ring notebook.

If I were the student using this text, it would take some time for me to become accustomed to having the legends placed above the illustrations. The use of figures for labels, requiring glancing down constantly to obtain the actual name of the structure labeled, can become annoying after a while, but perhaps what would be most frustrating is the inadequate space in the many tables the student is expected to fill in. For example, on page 192, how could anyone describe the function of the pituitary in a space 1 cm high and 6½ cm wide?

Another problem with tables is the use of so many that students may memorize them rather than visualizing and understanding the anatomy. I also am concerned that the descriptions are not detailed enough for the